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FOREIGN BANKS AND CREDIT GROWTH IN CENTRAL AND EASTERN EUROPE

Master's Thesis in
Accounting and Finance

Finance

VAASA 2013

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Degree: Master of Science in Economics and Business Administration
Department: Department of Accounting and Finance
Major Subject: Finance
Line: Finance
Year of Entering the University: 2011
Year of Completing the Thesis: 2013 **Pages:** 72

ABSTRACT

The study aims to identify systematical differences in bank lending with respect to ownership structure of the banks in Central and Eastern Europe, using bank-level data of 197 banks in the region for the period from 2004 to 2011, as well as macroeconomic indicators for 10 countries of the study. Panel data analyses reveal that ownership structure indeed has an effect on credit growth among banks analyzed. Foreign owned banks are shown to have higher credit growth in comparison with domestic banks, which is largely explained by their higher ability to access funds on international market through parent financing. The analyses however also show that in a crisis scenario foreign banks reduce their lending at a faster pace than domestic banks of similar characteristics do. This suggests that foreign banks' credit growth is influenced by exogenous factors, including the stance of parents in home countries and their appetite for exposure to host countries. Among foreign banks, those that are the result of greenfield investment, displayed a higher reduction in credit in a crisis scenario, than those that resulted from takeover of established local banks - suggesting a lower independence of greenfield banks from their parent decisions. Interestingly, while before and during the crisis the credit growth of foreign banks was correlated with banks own balance sheet indicators, the relation is much looser after the crisis, indicating a higher dependency on parent companies' decisions and other factors exogenous to banks' characteristics and standalone financial strength.

KEYWORDS: foreign banks, credit growth, crisis

1. INTRODUCTION

Foreign banks have the potential to improve and enhance the development of the financial sector in a host country, due to, inter alia, superior management techniques and higher skilled professionals; innovative products and services; higher access to funding from parents and international capital market. This, together with the increased competition with local incumbents, often translates into higher availability of credit by enterprises and individuals, and lower interest rates (Clarke, Cull & Martinez Peria 2006).

Better capitalization of foreign banks improves stability of the banking sector in emerging markets, because they have higher solvency and liquidity indicators. According to Vogel and Winkler (2011), foreign banks are better secured due to the fact that their portfolios are well diversified geographically as well as by type of assets held, which makes them less sensitive to macroeconomic conditions in the host country, while this not always holds for domestic banks. Foreign banks, can also contribute to smoothen the effects of negative conditions in the host country (being shielded by parents' wider access to funding). Dages, Goldberg & Kinney (2000) and De Haas & Lelyveld (2006) analyzed the behavior of foreign banks during the crisis in a host country, seeking to assess whether foreign banks reacted in a procyclical way - withdrawing their operations from the host country in favor of more attractive jurisdictions, but concluded that foreign banks were more stable providers of credit than domestic banks in those instances, largely due higher ability to obtain external funding.

At the same time, foreign banks have the potential to introduce vulnerabilities to the host country. The increased competition they create in domestic markets can create negative dynamics of 'race to the bottom' as banks seek to maintain or enhance market share even in unsustainable ways. While foreign banks due to information asymmetries tend to lend to transparent firms, it leaves domestic banks with less creditworthy borrowers and increase their risk-taking (Degryse 2010).

Negative aspect of strong relation with parent bank can be demonstrated in terms of strategy with which the banks entry, for example short-term speculative strategy seeking for profits and then leaving the region. Parent banks may withdraw lending activities from host country in favor of more attractive regions. Dependency on macroeconomic conditions in home country is more severe by its possible outcomes - foreign banks can be channels for transmission of external crises into the host market (through deleveraging decisions taken unanimously by the parent regardless of the impact on the host market). In 2009 Cetorelli and Goldberg show that when liquidity conditions worsen in developed countries loan supply in emerging countries drops, thus inducing shock transmission. De Haas, Korniyenko, Loukoianova & Pivovarsk (2011a) also suggest that foreign banks are significant channel for crisis contagion. When international markets shut down and liquidity dries up, foreign banks become limited in funding sources, whereas domestic banks that rely more heavily on local deposits funding may be less affected. During the last crisis, for example, Austrian and German banks were pressured by their regulators not to fund their Eastern European subsidiaries because they see it as using Austrian and German savings to lend to borrowers in other countries.

Since middle 1990s Central and Eastern Europe has undergone enormous changes of the financial sector. The major step was financial liberalization that facilitated the penetration of foreign banks in the region, which have achieved dominant positions in most of their host markets. Liberalization did facilitate a major growth in lending throughout the region. But the financial crisis brought credit growth to an abrupt halt, which has affected significantly borrowers and contributed to high levels of non-performing loans.

1.1. Purpose of the study

The present study aims at identifying whether the presence of foreign banks contributed to exacerbate the negative impact of the financial crisis through a more procyclical behavior than that of local peers – a more exuberant credit

growth in pre-crisis years and a more drastic credit crunch in the post-crisis period.

The present study examines the trends of credit growth in Central and Eastern Europe countries during the period of 2004 to 2011. For this purpose the data was collected on 197 banks across the region. In particular, the study disaggregates banks with regards to their ownership to identify differences in credit growth patterns. The first hypothesis tested in the study is stated as follows:

H_1: In a positive scenario, foreign banks provide more credit to the private sector than domestic banks.

The hypothesis is a consequence of advantages that foreign banks have in terms of ability to raise funds. Foreign banks are very likely to supply more credit because they have innovative credit products and more opportunities to access funding from international markets and their parents at potentially lower cost of funding than local peers. Parent support can also translate into higher ability to increase capital. In comparison, domestic banks are more reliant on local deposit base and potentially lower ability to raise capital.

H_2: Foreign banks reduced credit at a faster pace than domestic banks during the crisis in 2008 – 2009.

The hypothesis reflects the perception that in the aftermath of the financial crisis, the overall exposure to host countries may have been diminished in response not only to the situation of the host country, but also to the concerns and difficulties experienced by parents in the home country – including the need to enhance capital to cover increased risks and hoard liquidity in a scenario or dried up interbank activity.

1.2. Contribution of the study

The current study aims to contribute to existing literature concerned with the impact of foreign banks on credit stability. Although the topic has been paid a big attention in the last few years, the patterns of foreign banks in Central and Eastern Europe are not very clear yet. The countries were included in other studies only together with a set of other regions and the conclusions therefore are implicit rather than distinct for this region in particular.

De Haas and Lelyveld (2006) conducted a research on the same set of countries as that in this study, the period however was at the early stage of countries development: from 1993 to 2000. The authors did find a positive impact of foreign banks on credit stability. Since then however, the infrastructure has undergone significant changes and improved substantially. The differences in foreign and domestic banks behavior could have diminished, as the latter had time and chance to improve their own business and learn from their foreign peers. Recently, De Haas et al. (2011a) and Claessens et al. (2012a) reexamined the impact of foreign banks again, though with inclusion of other developing countries. Foreign banks' contribution to credit growth was confirmed, as well the slowdown of banks during the crisis. It may be however, that due to dissimilarity of banking sectors structure (e.g. the extent to which foreign banks are dominating the local market, institutional development), the trend would be different for Central and Eastern Europe in particular, as opposed to generalized results for the whole set of countries. Market share of foreign banks in each CEE countries is comparable, as well as historical development of the countries is similar. Isolating the region for the purpose of analysis thus will contribute to more precise results.

The main contribution of the paper though, remains an extended period of study – as far as is known, the post-crisis period was not analyzed yet[1]. This however is very important to examine whether deleveraging by parent banks

[1] The post-crisis period in this study is identified by 2010 – 2011 years, as of the time writing the thesis the information on 2012 was not available yet, though it would be interesting to include it.

had a short-term or longer-term implications. Macroeconomic situation in European Union (that is where most of the parent companies of CEE banks are based) remains not very stable. The financial crisis has shifted to sovereign debt crisis and has different implications on banks' behavior – while liquidity on the markets has stabilized, banks remain very cautious with allocation of their assets. Tracking this period can prompt the hint whether parent banks continue to restrain their capital flows to subsidiaries in CEE countries, or if foreign subsidiaries continue to surpass domestic banks in terms of credit growth.

1.3. Structure of the thesis

Chapter 2 includes a review of foreign banks' impact on banking sector in a host country. In particular, the chapter discusses the potential positive and negative effects of foreign bank presence with regards to banking sector development and financial stability. Chapter 3 provides an overview of the existing empirical results about the relationship between foreign banks and credit stability. Chapter 4 presents the trends of foreign banks penetration in CEE countries together with the major patterns in lending, financing structure and interest rates changes across the countries. It also discusses the effect of deleveraging during the crisis and actions undertaken to limit it. Chapter five describes the data collection process and introduces the statistical methodology. Chapter 6 presents results of the empirical analyses. Chapter seven includes a summary of results obtained and advances conclusions for policy makers.

2. FOREIGN BANKS AND DEVELOPMENT OF THE FINANCIAL SECTOR IN HOST COUNTRIES

Foreign banks can contribute significantly to the development of the financial sector in host countries, but they can also introduce vulnerabilities. This chapter summarizes the main benefits commonly associated with the entrance of foreign banks into local financial markets. The benefits are largely related to enhanced competition, efficiency and innovation, all usually translating into higher access to financing to enterprises and individuals and, in many cases, a lower cost of credit. However, the entrance of foreign banks also may create vulnerabilities, stemming from unsustainable credit practices, increased exposure to external shocks and credit decisions that may be exogenous to the situation of the banking subsidiary and the host country.

2.1. Benefits of foreign banks presence

Financial integration has been widely embraced by many countries. This has some reasons behind, why is it thought to be beneficial for economies and why despite the possible risks, countries tend to open their financial markets.

First of all, foreign banks generate additional cash inflow in the host country. Cross-border lending from a foreign bank to domestic institution or enterprise is the most obvious one. Additionally, purchasing existing bank in a host country provide it with a sizeable FDI inflow. And finally, establishing a new bank or a subsidiary often requires injecting it with adequate capital size, as well other payments in a host country. Due to the fact that foreign banks entering the country are related to larger and sounder international banks, capitalization of new banks is often higher than of their domestic peers.

Better capitalization of foreign banks improves stability of the banking sector in emerging markets, because they have higher solvency and liquidity indicators. According to Vogel and Winkler (2011), foreign banks are better secured due to

the fact that their portfolios are well diversified geographically as well as by type of assets, which makes them less sensitive to macroeconomic conditions in the host country, while this not always holds for domestic banks. Furthermore, foreign banks are supported by their larger parent banks and are likely to have access to international capital markets and hence have less restriction on funds available for conducting and maintaining their activities in a host country. Because they have ability to draw on additional financing, these conditions also induce credit growth in the country. In particular, during adverse economic conditions in a host country foreign banks due to their better connections with international market may be source of more stable credit, while domestic banks experience shortage of funding (cf. De Haas & Lelyveld 2006). There is a debate on whether foreign banks indeed enhance credit growth and whether it is stable or not, and this research aims to shade more light precisely on this topic, but deeper review of the relevant literature to date will be given in the subsequent chapter.

Secondly, foreign banks are deemed to have superior management quality and governance structure. Positive spillover may arise and management of domestic banks can be improved as a result, particularly if foreign bank participates in governance of domestic bank (e.g. take-over cases of domestic banks). Development is related to such important areas as risk management, portfolio diversification, financing methods and efficient custom attraction. Employees, if brought by foreign bank, can also directly benefit domestic human capital through sharing the experience and presenting new techniques. Foreign management also can finance organization of professional trainings for domestic employees.

Foreign banks frequently bring new financial services to the market. Bonin, Hasan and Wachtel (2005) show that foreign banks indeed provide better financial services than domestic private and state-owned banks. Domestic players are usually pressed to catch up to develop and provide them to the market. This usually increases the financial deepening of economy, give more flexibility to existing and attract new customers. Domestic banks can also obtain experience and replicate new banking techniques. Additionally, due to their reputation in

mature economies foreign banks deepen the trust of local population, which helps to mobilize the sector.

Cost and profit efficiency of foreign banks is higher than those in domestic banks. Claessens, Kunt and Huisinga (2001) find that foreign bank are more efficient than domestic banks and notice that in the long run presence of foreign banks have positive impact on the national banking markets. However they stress that regulators should ensure adequate regulations and supervision in order to minimize risks, which incur to domestic banks with increasing competition. Claessens and Van Horen (2012a) conduct a similar research covering a new time period 1995-2006 and investigate more closely the factors, on which the success of foreign banks depends. Namely, they find that foreign banks from high-income countries perform better and weak regulations in host country also enhance the performance of foreign banks. Similarities in hosting and originating country of the bank improve the profitability, while geo-graphical closeness doesn't have the same effect. Other studies, Havrylchyk and Jurzyk (2011), Matthews and Ismail (2006), Nikiel and Opiela (2002), Yildirim and Philippatos (2007) confirm their findings on prevailing efficiency of foreign banks.

The gap in the development level of foreign and domestic banks causes competition to increase. And competition is the factor, which helps to secure the development of the sector. Banks face significant incentives for innovative solutions in order to remain competitive and preserve their market niche. Claessens et al. (2001) and Micco, Panizza, and Yanez (2007) conclude that foreign banks in developing countries are relatively strong competitors and can exert pressure on domestic banks to become more efficient and competitive.

And finally, foreign banks may also improve supervision policy and regulation of banking sector, because their parents are supervised by stronger authorities from developed countries and known to be more demanding and stricter banks (cf. Peek & Rosengren 2000). Mishkin (2006) also suggests that presence of foreign banks create incentives for developing host countries' banking regulations. For example they may set conditions for domestic supervisors to change some

of the regulations, to reassure the safety of cross-border as well as domestic operations.

Combining all the mentioned benefits, foreign banks directly and indirectly can improve the efficiency of host country's banking sector through additional capital inflow, increased competition, brought innovative management techniques and services, high skilled professionals and access to international markets.

2.2. Risks associated with the presence of foreign banks

Existing literature suggests that there are also downsides of foreign banks presence. Generally, every possible advantage of foreign banks presence may turn into harmful outcomes. Possible negative impacts are discussed below and review of empirical evidence is provided in the relevant chapter.

First, competition, which can be quite beneficial for development of banking sector, may in fact be dangerous at the same time. This is due to the fact, that learning process and applying new techniques requires some time from domestics banks, then the gap in levels of development of foreign and domestic banks can be so large, that domestic banks will not sustain the competitions. Foreign banks may obtain much bigger market niche, because they have a better reputation and therefore more trust of the customers. Due to their better capitalization and overall soundness, they have higher ability to raise funds under low interest rates, which allows them to have lower margins on credit they supply and hence attract more clients and increase their As a result of intense competition, domestic banks in a short run incur higher costs and lower profitability. Foreign banks have information asymmetry and when enter the country face a shortage of information on borrowers. It induces "cherry picking" (De Haas & Lelyveld 2004), or choosing only large firms with transparent financial reports and good credit history for providing a credit and other services to them. Such behavior leaves domestic banks with only less creditworthy borrowers and increases

their risk-taking (Degryse 2010). If domestic banks fail in competition, it heavily destabilizes the banking sector.

Foreign banks may be dependent on parent banks and macroeconomic conditions in their home country. Dependency on parent banks shows in terms of strategy with which the banks entry, for example short-term speculative strategy seeking for profits and then leaving the region. Parent banks may withdraw lending activities from host country if economy slowdown appears to invest in more attractive regions. Moreover, Maechler et al. (2007) show that foreign bank in Eastern Europe are less stable, mainly because they have low capitalization as they can rely on funding from their parent companies, which however is not sustainable during adverse economic times.

Dependency on macroeconomic conditions is more severe by its possible outcomes. Chava and Purnandam (2011) and Cetorelli et al. (2009) show that shocks to parent companies can be transmitted to their subsidiaries. For example, when a crisis hits, international financial markets shut down, and interbank lending dries up, thus cutting financing opportunities for foreign banks. The parent bank is often asked by its local regulators to stop financing foreign subsidiaries and focus on lending in their home country in order to cope with the crisis. During the last crisis, for example, Austrian and German banks were pressured by their regulators not to fund their Eastern European subsidiaries because they see it as using Austrian and German savings to lend to borrowers in other countries. So actually the parent bank asks its subsidiary to pay back what they borrowed in order to provide necessary credit level in their country. This is known as 'deleveraging' and is a huge risk for host countries because suddenly the money flow stops and companies cannot receive new loans and need to pay existing ones. Although there have been made some agreements among banks to avoid the risk of deleveraging (e.g. “Vienna initiative”), the risk still persists. De Haas et al. (2011a) show that foreign banks in developing cut their lending more than domestic banks during the most recent financial crisis.

Moreover, because foreign banks borrow money on international market and receive it in a foreign currency, they may prefer to make loans also in a foreign

currency (cf. Degryse 2010). Credit in foreign currency may be attractive to borrowers because it has lower interest rates, which are in fact only to compensate for inherent currency risks, of which borrowers are not usually aware (ECB 2006). This originates additional exchange rate risk and especially during the crisis many host countries devalue their currency, so firms that were borrowing in euros or dollars face higher debt in terms of their local currency. And if economy is experiencing recession, many companies cannot pay back to the banks and it leads to a higher degree of non-performing loans (NPLs). When NPLs increase, risk of the bank increases and parent banks reduce the funding to subsidiaries even further.

Due to their financing sources, foreign banks may experience transmission of the crisis earlier and probably to a higher degree than local banks do. As the result, in countries where banking industry is mainly represented by foreign banks, banking crisis may arise. In contrast, domestic banks have higher chance to receive support from the government in various forms and continue to operate. Indeed, empirical research suggest that foreign banks play a significant role in transmission of financial crises (Cetorelli & Goldberg, 2009; De Haas et al., 2011a; Jeon, Oilvero & Wu 2012; Triki and Maktouf, 2012**).**

Current financial markets indeed are different from those few decades ago – not only by the amount of products and services available, but importantly financial markets became very integrated and financial institutions nowadays do business worldwide, each playing their part in local economic environment. This became possible because many developing countries liberalized their financial markets and let foreign institutions enter domestic markets in order to achieve higher economic growth. By doing so, they explicitly become more integrated with the worldwide trends and can experience growth when leading economies go up, or contagion effect when these economies pass through difficult times. That is why it is important to know why financial liberalization is needed, what are the risks of opening the economy to foreign markets and what trends in banking sector emerge. Next subchapter presents a further discussion on financial liberalization and its impact on foreign banks penetration and overall banking sector stability.

2.3. Financial liberalization and its effect on foreign bank penetration

Financial liberalization was undertaken by many developing countries in 1980s and 1990s when the governments realized that state-led financial system is not effective enough for economic development. The major constraint of financial system managed by the government to economic growth was state owned banks. State owned banks primary followed public sector firms' interests, specialized lending institutions favored particular parts of private sector and secured credit allocation to those parts, while other areas remained unfinanced. Firms hunting for credit created high level of corruption and usually loans were allocated to larger firms. Biased selection of credit allocation does not guarantee efficient outcomes and indeed many favored companies had low returns and frequently loans remained unpaid. This created two-sided problem, on one hand - waste of capital on inefficient companies, and on the other hand - potentially successful and necessary for economy growth companies remained in a shadow. Moreover, interest rates for both deposits and credits were kept at low levels, which in turn demotivated finance circulation (e.g. low deposit savings). Such a mechanism did not contribute to economic development and was very costly for the government.

Financial liberalization on the contrary, implies deregulation of financial sector and setting up of market relationship between its participants. Deregulation can be done to a different extent, depending on government decisions, but generally refers to liberalizing capital account and reducing government intervention by lessening the requirements and rules applied to financial institutions. It is intended to increase financial sector efficiency, while relying on self-control of the market participants e.g. allowing private banks to invest in more risky asset within the certain limits, but leaving them responsible for it. In emerging and developing countries during 1980s and 1990s (Africa, East and South Asia, Latin America, Central and Eastern Europe) the most important and usually primary step was to liberalize interest rates (increase them towards market-based level) in order to mobilize more resources for supplying government's needs and enhance the role of private sector in economy development. The next step was to liberalize capital accounts, which allowed capital flows

inside and outside the country, cross-border transfers and broader use of foreign currency in order to attract more investments.

To implement the steps mentioned above the whole financial system needed to be restructured to compliment liberalization and reassure it's positive and stable effects. As a result Central banks were given more autonomy and reduce the role of the economy developer to narrowed stabilizing programs and inflation control. Foreign participants were allowed to participate in domestic economy, companies could raise funds abroad and use of foreign currency became permitted. Funding of government debt switched from forcing the private sector to hold its debt to a market platform where participants make a decision to invest in it. Additionally, state banks were privatized, and competition in the sector increased as a result of foreign banks penetration and credit allocation based on market demand. Setting equity markets and pension funds managed by private intermediaries contributed to enhancing competition and effective finance distribution (WB 2005).

The conventional view of financial liberalization was that it leads to more rapid economic growth, because new regulations allow capital inflows from international markets, efficient credit allocation and risk sharing. Financial liberalization induces economy growth by increasing financial deepening and thus enhances access of private sector to financing. However, empirical evidence to date points out different results. Fore example, Rodrick (1998), and Prasad, Rogoff, Wei and Kose (2003) find no evidence that financial liberalization stimulates investment flows and economic growth in developing countries. Later, Henry (2007) and Bekaert, Harvey, and Lundblad (2005) come to the opposite results and conclude that liberalization has positive impact on growth. Nonetheless, the vast majority of literature agrees that the effect of liberalization strongly varies across the countries depending on their level of development. Edwards (2001) suggests the capital account liberalization has stronger effect on growth when the economy is substantially developed, while Arteta, Eichengreen and Wyplosz (2001) find that the effect is stronger when there is a rule of law rather than financial development. Bekaert, Harvey and Lundblud (2006)

confirm that stock market liberalization reduce consumption growth volatility and enhance international risk sharing, which increases welfare of the country.

In line with Arteta et al. (2001) findings, Kunt (1998) shows in his empirical research that financial liberalization increases the probability of banking crisis in countries where institutional environment is weak and suggests that countries adopt financial deregulation not when their macroeconomic situation is stable, but when they have an appropriate infrastructure. The paper also concludes, that even if the banking crisis occurs, financial development achieved is greater in liberalized country after financial repression than in skeptical economies, which is also confirmed by Ranciere, Tornell and Westernmann (2008). Broner and Ventura (2010) summarize the possible effects of liberalization and discuss in their work that conventional view of financial liberalization is not likely to fit all countries. The success of it depends on country specific characteristics and while the timing of liberalization should be carefully chosen according to a country's needs, that is no guarantee for its success.

Some literature specifically investigates how the imperfect regulation of credit institutions, in particular banking sector, may result in excessive risk taking and turn the economy into a crisis. For example, Ranciere et al. (2006), Angkinand, Sawangngoenyuang and Wihlborg (2010) and recent article by Triki et al. (2012) support it providing evidence that financial liberalization is positively correlated with the arising risk of banking crisis. Daniel and Bailey (2007) find that even if the country has well-established financial infrastructure, crisis may arise in aftermath of financial reforms. Triki et al. (2012) points out that banking sector and particularly lending activities were important channels of contagion during the last financial crisis.

A possible explanation to that would be the importance of banking sector for the economy. And although financial liberalization refers to a series of actions and financial institutions to be reformed, banks indeed take a special place and are considered to be a key element of financial infrastructure. Banks play an important role in economic development due to their intermediation role. Accumulating resources of the population, they mobilize them by supplying credit

for enterprises and firms who needs it for increasing the production outcomes. Companies improving their productivity increase job creation; created jobs supply more tax income for the government; and consequently the government can satisfy individual and collective needs and develop infrastructure of the economy. Thereby, banks intermediation enhances money circulation in the economy and facilitates production, distribution and consumption of wealth. They secure the effective use of money, by redirecting it from those who has a surplus to those who experience deficits.

Based on the steps of money circulation process described above, it is fair to say that credit supply and credit growth are essential for economic development. The difficulty is that developing and emerging countries have limited ability for credit supply, there is not enough resources and savings inside the country to provide the necessary level of credit. Easy answer to that would be to issue more money, provide credit to the economy and then wait for its repayment. But this cannot be done, because first and most importantly, money not backed up by real resources cause inflation. That is why economies are keen on attracting foreign investments in order to provide more credit to the economy. And since the banking sector is the one who intermediate credit in the economy, penetration of foreign banks in the economy is a major step to bring more foreign investments. Foreign banks have multiple effects on domestic banking sector due to the fact that they are not absolutely autonomous, but rather a part of larger foreign institutions. And therefore their policy and strategy is influenced by it's holding company (parent bank) and has positive, as well as negative impact, as discussed in the beginning of the chapter.

3. EMPIRICAL RESULTS TO DATE

Existing literature on the relationship of bank's ownership and stability of financial sector provides no unity in the results. Results vary across regions, time period examined, as well as on macroeconomic and bank's characteristics. Related important issues are credit growth, credit allocation, bank's soundness and transmission of crises from one region to another.

Some literature suggests that foreign banks have positive impact on loan growth. Dages et al. (2000) analyze behavior of banks in Mexico and Argentina during 1994 – 1999 via weighted and unweighted averages of banks quarterly loan growth, and summarize that foreign banks were more stable source of credit during the crisis and financial weakness of the countries. They conclude, however, that loan growth depends rather on bank's health, not on the ownership, as some cyclical behavior is similar of the banks with different ownership but comparable loan impaired ratios. Crystal, Dages and Goldberg (2002) employ CAMEL analysis (Capital adequacy, Asset quality, Management, Earnings and Liquidity) with focus on banks balance sheet and behavioral pattern in Argentina, Chili and Colombia during 1995 – 2000. They find that foreign banks as a result of additional international financing available, rely on deposit funds less than domestic banks do. Since non-deposits financing is more volatile and risky, they maintain higher liquidity ratios. Their findings are consistent with Dages et al. (2000) in that foreign banks have stronger credit growth, though private domestic are not much behind. Analysis also differentiate newly acquired banks and those which operate for longer period of time, the latter being more active provider of credit.

Foreign banks during adverse economic conditions in a host country didn't decrease their lending, but on the contrary were a stable source of credit in Latin America (Argentina, Brazil and Mexico) according to Peek et al. (2000). Primarily based on descriptive statistics the paper concludes that foreign banks (originated in US) saw the economic downturn in those countries as opportunity to expand, thus increasing the supply of credit. Martinez-Peria, Powell, and Hollar (2002) extend the period to 1985 – 2000 and using BIS data (not bank-

level, but country level data) empirically show that although foreign banks may transmit home shocks and shocks from other regions where they operate, on average they continue to supply credit during crises, which is also in line with Goldberg (2001).

De Haas et al. (2004) conduct research on whether credit stability in Central and Eastern Europe during 1993 – 2000 was supported by foreign banks. To perform analysis they combine BIS data on total claims by BIS reporting banks on the five CEE countries they study (Estonia, Hungary, Poland, Slovenia, Czech Republic) and individual bank data from Bankscope, which allows them to capture both cross-border lending of foreign banks and lending through subsidiaries established in a host country. Their findings are compared and consistent with Peek et al. (2002) in that foreign banks used adverse economic conditions to expand their presence through establishment of new subsidiaries or extending activities of existing banks. Cross-border lending although was affected by host country downturns and was retrenched to some extent.

De Haas et al. (2006) expand their previous research (De Haas et al., 2004) to ten countries of CEE, namely, they add Croatia, Latvia, Lithuania, Romania and Slovak Republic with the remaining period of 1993 – 2000, but focus only on within the border activities of foreign bank in a host country. Important contribution of this paper is that it is the first to analyze credit growth depending not only on ownership (foreign or domestic), but also on the mode of entry of foreign bank.

As mentioned by Martinez-Peria and Mody (2004) mode of entry may influence banks behavior, because it defines in some way a strategy of the bank. The banks that entered through acquisition of already existing banks in a host country (*take-over*) will have few advantages, such as immediate obtaining of a certain market share and secondly having more information on borrowers, since some databases are already created and at least part of domestic personnel remains in place. This however will also lead to reflection of former management decisions for some time. Indeed, De Haas and Naaborg (2005) show that *take-over* banks remain more independent of parent company for some time. *De*

novo banks according to De Haas et al. (2005), on the contrary employ parent company's methods and techniques in managing the business. Newly established banks (*greenfields* or *de novo*) can choose an aggressive strategy in order to quickly gain market share. This can lead to several outcomes: they may induce excessive lending, and since they have less information available they will tend to borrow only to transparent firms. And as transparent companies are more competitive in receiving a credit, *de novo* banks probably will have to offer lower interest rates to gain a market share.

De Haas et al. (2006) obtain information on ownership from Bankscope database and manually gather changes of banks' ownership during the period studied from other sources. Foreign bank is defined as such, if more than 50% shares owned by foreign shareholder, further in their model they separate foreign banks into *take-overs* and *greenfields* and create corresponding dummy variables. Before proceeding to empirical analysis, they provide descriptive statistics of domestic and foreign banks balance sheet structure. Significance of differences in the means of size and growth, and in coefficients of variations shows that greenfields are smaller than domestic and take-over banks. Take-overs have higher cost to income ration, which can be explained by incurred restructuring and reorganizational costs. The growth rate is as expected the highest in greenfield banks, confirming aggressive strategy of obtaining a market share. Since descriptive statistics cannot explain the role of bank's specific characteristics, the authors proceed to panel data analysis.

In econometric methodology two regressions are run, in the first one dependent variable is the percentage growth in total credit of an individual bank and in the second regression dependent variable is percentage change in the credit market share of an individual bank in a given year. In the models, besides dummy variables for banks with different modes of entry they include dummy for crisis year in host country in order to capture banks behavior during adverse economic times. Additionally they include home and host country macroeconomic variables (GDP growth, interest rate on lending, and inflation) to control for their effect. Authors expect GDP growth and higher lending rate in host country to be positively related with credit expansion. In the model, there is also

important set of bank specific characteristics, which may have an impact on credit growth incentives, such as solvency, liquidity, size, profitability and efficiency. To avoid endogeneity problems, solvency, liquidity and size one period lags are used. All of the bank specific variables are expected to be positively correlated with credit growth, except bank's size.

In contrast to De Haas et al. (2006) model's specification, Detragiache, Tressel and Gupta (2008), employ a different set of variables. They regress credit to private sector (as percentage of GDP) on share of banking assets held by foreign banks and include a set of country- and bank-level characteristics as control variables. In their theoretical model foreign banks have higher efficiency when serve transparent companies and therefore can induce "cream skimming effect" - that is leaving opaque borrowers off side and inducing higher costs for domestic banks serving these more opaque borrowers. The drawback of such model is that private credit levels and growth are averaged across the period studies and do not capture timing of foreign bank entry. (The paper concludes that with higher share of foreign banks in low-income countries, credit to private sector can shrink.)

Several estimation techniques were applied to regressions specified: random effects, feasible generalized least squares and panel-corrected standard error and Hausman and Taylor (1981) instrumental variable estimator. Results only of the latter test show that greenfield banks grow faster on average. Although, based on results of other tests authors suggest that this difference is not in fact due to ownership type. However, during crises times, bank ownership starts to matter and foreign ownership have stabilizing effect. At the same time foreign banks reach somewhat procyclical to changes in local economic conditions. Greenfields' credit growth also has strong negative relationship with home country economic growth and weaker health of parent bank, while take-over banks' doesn't. The paper concludes, that foreign banks and, greenfields in particular, contributed to stability of credit supply in CEE countries. The negative effects of home country poor economic conditions may be decreased if foreign banks are diversified on the basis of their home markets and parent company.

This strand of literature can be summarized to say that foreign banks' activities are not so much influenced by host economic conditions (pull factor), but rather by home country conditions (push factors, which can be positive if weak conditions in home country decrease lending in host country and negative if weak conditions in home country lead banks to extend their activities abroad to seek for better opportunities).

As the global financial crisis began in 2011, impact of foreign banks presence on financial stability again became of a big matter. Much of the previous literature concentrated on reaction of foreign banks to host country economic conditions, while most recent literature focuses on influence of shocks in home country and their transmission to other regions. The most recent financial crisis may indeed be a good case for analyzing the impact of foreign banks presence on financial stability of host country, as this crisis had spread across the globe very quickly. Considering the level of financial globalization, and bank's intermediation role, banks undoubtedly played a significant role in its transmission. The main channels through which contagion may arise are cross-border lending and lending through domestic subsidiaries of foreign banks, as well as through international capital markets.

In 2009 Cetorelli et al. show that when liquidity conditions worsen in developed countries loan supply in emerging countries drops, thus inducing shock transmission. In particular, they find that while both domestic and foreign banks were influenced by dried liquidity in international markets, foreign banks experienced it deeper. Cross-border lending had the same negative impact on banks with all types of private ownership, while foreign banks were additionally more triggered by shortage of funding from their parent companies. The more heavily foreign subsidiaries rely on funding from their parent companies, the more likely they to become a crisis transmission channel (Jeon et al, 2012). Hence entry mode of bank matters again, as greenfield banks rely more on funding from parent company, while take-over banks also use deposits of their clients. With different approach Vogel et al. (2011) show that higher

share of total banking assets held by foreign banks associated with more stable cross-border lending, however it didn't improve stability of domestic lending.

De Haas et al. (2011a) show that in Emerging Europe only foreign banks which took a part in "Vienna Initiative" were a more stable source of credit, compare to domestic and foreign banks that didn't participate in it. Other banks were strongly affected by global financial crisis and significantly reduced their lending. It intuitively drives to a conclusion, that foreign banks, if not supported, are most likely to shorten or withdraw their lending from regions others than their home countries. The risk of it is that not always parent banks eager or able to support their subsidiaries and maintain indispensable level cross-border lending. Indeed, De Haas et al (2011b) find, that during the crisis foreign banks provided more stable supply of credit to those countries, which are geographically close and where they have built long-term relationship. Claessens et al (2012b) summarizes and points out a general trend that foreign banks in developing countries (except countries where they dominate the market) decreased their lending earlier and faster than domestic banks during the global financial crisis.

4. BANKING SECTOR TRENDS IN CENTRAL AND EASTERN EUROPE

Financial liberalization of Central and Eastern Europe (CEE) countries in 1990s has brought enormous changes in the way the economies develop and function. Governments decreased their marginal regulative role and allowed to set more market relationship between economy participants. Importantly, interest rate, credit allocation and capital accounts were liberalized. The role of Central banks narrowed to managing macroeconomic stability and reducing inflation rates, rather then financing economy sectors in order to develop them. Banks increasingly accepted deposits and granted loans in foreign currency, credits were granted in accordance with market demand, rather than to favorable sectors. Foreign investors were allowed to enter the countries and participate in banking management. Available sources of banks funding increased and overall, banks intermediated larger amounts of money. Finally, regulation and supervision of financial sector improved significantly. As a result, the structure of banking industry has undergone significant changes as well.

4.1. Foreign banks penetration in CEE[2]

Penetration of foreign banks underwent differently throughout CEE countries and the presence of foreign banks varies across countries. The first country to allow foreign banks entry was Hungary, gradually increasing the allowance of foreign investors participation in management of domestic banks in order reduce fiscal costs of bank's recapitalization and finally allowing strategic foreign investors to take control under the largest banks. Poland followed in 1993, under the condition that foreign banks could enter through rehabilitation of distressed local banks. In Baltic states (Estonia, Latvia and Lithuania) strategic foreign ownership could only be achieved after the fall of the Soviet Union, which critically affected banks in the region given their exposure to the Russian market, and led to privatization and large market share by foreign banks. Bal-

[2] Countries referred to Central and Eastern Europe in this thesis include: Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia.

kan states enforced financial liberalization also only after the crisis in 1988 – 1999 when after frequent recapitalizations of state banks it was decided to privatize them, allowing foreign participation. Czech Republic followed mass privatization via vouchers and incurred the highest fiscal costs across CEE region (24,5% of GDP). Although the first privatized bank through foreign ownership was declared insolvent soon after it was acquired, the government continued privatization after it adjusted legislation to protect foreign investors from risks occurring as a result of a former management. Slovak Republic has a similar story, with foreign banks entering the country in 1999. Slovenia however was more cautious and reluctant with foreign ownership in the beginning, which secured smooth development without major crises.

As a result, all of the countries have very high level of foreign banks presence (67% on average across studied CEE countries). Mainly banks entered through acquisition of existing domestic banks, when privatization was ongoing and governments were looking for strategic investors, who would be able to recapitalize banks and secure further development. Fewer established greenfield banks followed their customers abroad and primary were focused on them. The share of foreign banks in the total number of banks in each country is given in Figure 1. As of 2009 Hungary had the highest foreign ownership, followed by Slovak Republic and Romania and all countries except Slovenia and Croatia have at least 50% of banking sector dominated by foreign investors. Slovenia remains as reluctant to foreign ownership as it was in the onset of financial reforms.

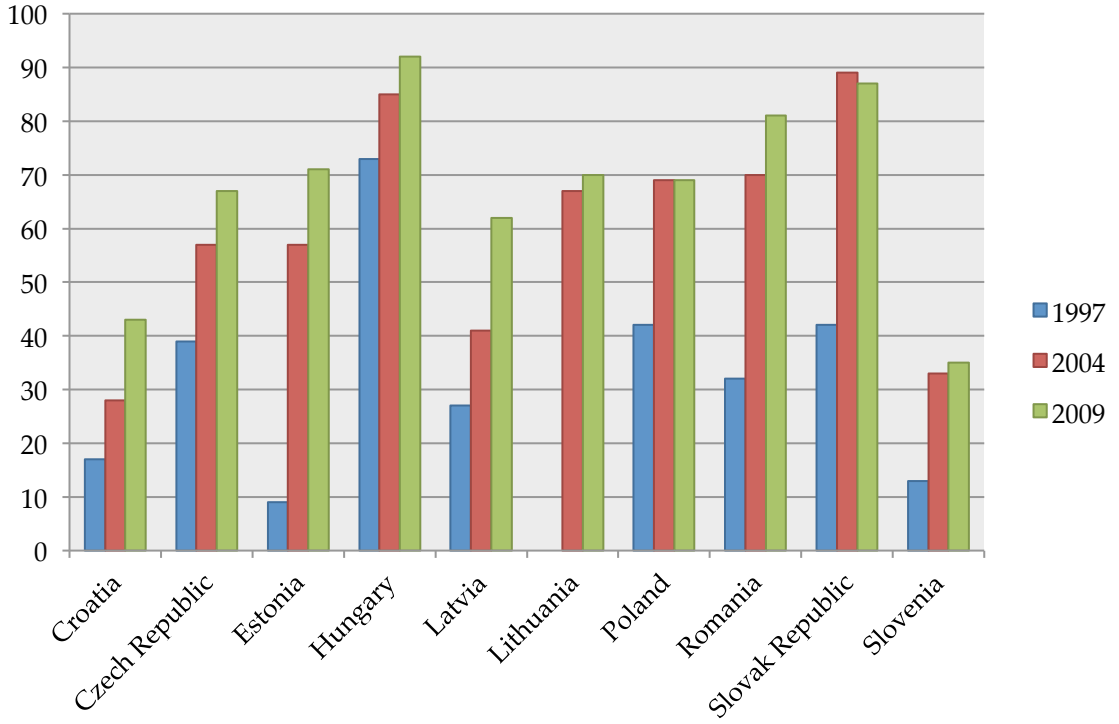

Figure 1. Share of Foreign Banks in Total Banks (number of banks).

Source: Claessens et al. (2012); author's calculations.

Foreign banks took a preponderant position in their host countries, often dominating the banking sector. Figure 2 shows that assets concentration in foreign ownership is extremely high in most of the regions and has grown up dramatically since financial liberalization took place. While in 2004 average foreign ownership constituted 44% across CEE countries, in 2009 this figure almost doubled, largely driven by Croatia, Estonia and Lithuania. Interestingly, Croatia, which has a limited number of foreign banks, also has one of the highest indicators in terms of assets. It is explained by the fact that although few, the largest banks are owned by foreigners. Such trend, in fact, holds almost for all CEE countries, that the largest banks are those controlled by foreign investors. Banking sector in Slovenia remains dominated by domestic banks, both in terms of number banks and their assets share.

Foreign bank penetration was highest during the period 1997 to 2004. Conversely, while the number of foreign banks entering CEE countries between 2004 and 2009 increased, the total share of their assets not always followed that

trend and for most countries changed only slightly, while in some countries it even decreased. To this there may be few explanations. First, with the onset of financial crisis in 2008 foreign banks affected by conditions in their home countries, experienced capital losses and had to reduce their investment activities. Second, as host countries also experienced downturn in their economies, they became less attractive for investment opportunities. A higher degree of deleveraging took place in the subsequent years.

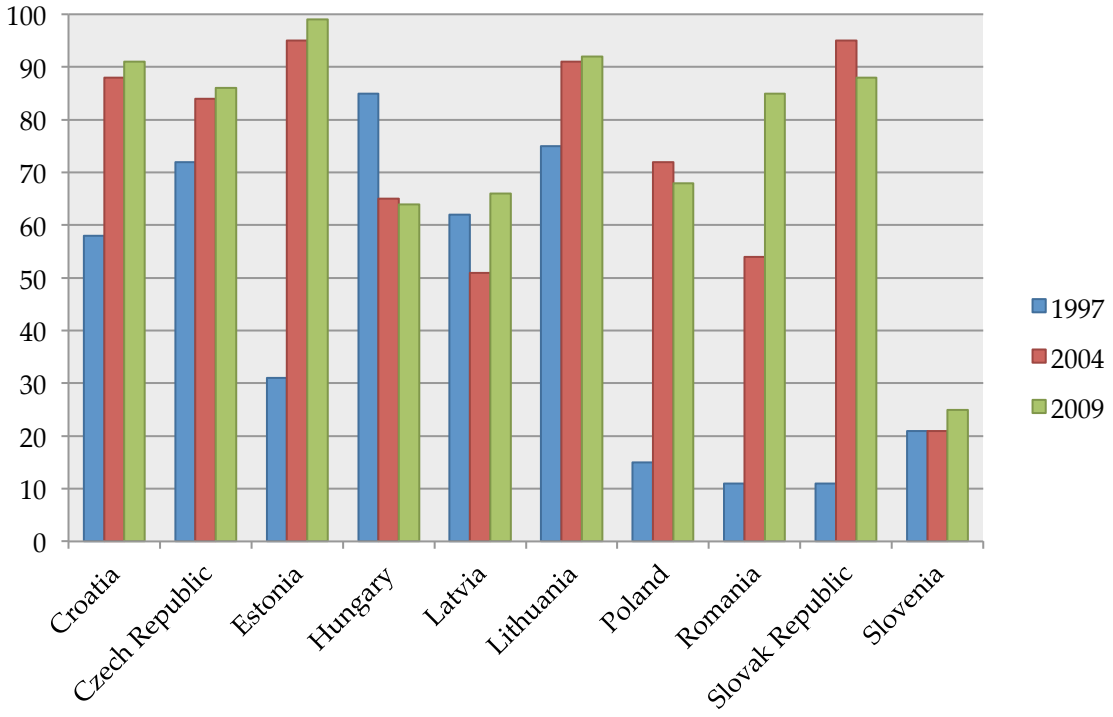

Figure 2. Share of foreign banks assets in total bank assets (%).

Source: EBRD; Claessens et al. (2012); author's calculations.

4.2. Credit growth

High presence of foreign banks in CEE inevitably leads to a strong dependency of economies on stability of foreign markets. The countries are highly vulnerable to changes in foreign banks' strategy, whether it is due to shocks in a home country or as a result of management decision. Development of real sectors of economy is inextricably linked to financial sector, and if limited capital flows

and financing sources are suddenly limited, it does affect companies and population strongly and negatively.

With a few exceptions, liberalization of the financial sector was followed by a high increase in credit to the private sector. Over between 1997 and 2008 credit grew at a much faster pace than GDP in all but two of the CEE countries (see figure below). A market prost-crisis contraction in credit has taken place throughout the region prompting concerns on the negative impact of the financial sector crisis on the real sector.

However, not all credit granted supported economic growth. Private enterprises are largely identified as the engines for economic growth, improvement in production process, promotion of innovative solutions and increase in productivity. However, as of 2009, only 49% of credit in the region was granted to enterprises, while the rest represented largely consumer credit and mortgages (Deloitte, 2012). Throughout the region the access to finance by Small and medium enterprises (SMEs) has remained modest, in spite of the major role of these enterprises in economic growth.

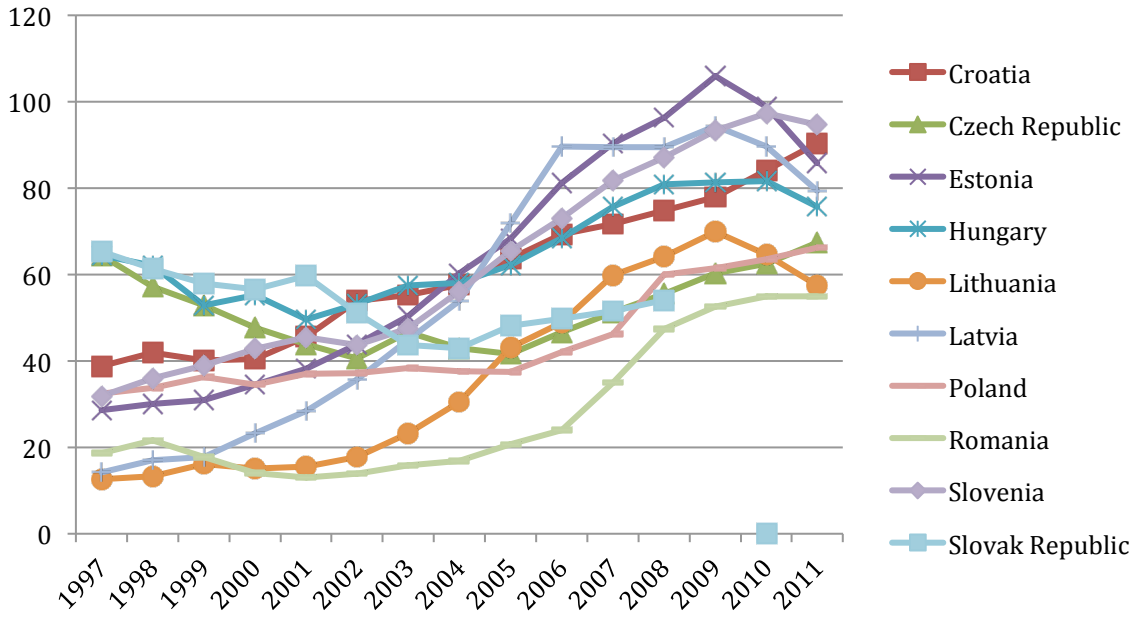

Figure 3. Domestic credit provided by banking sector (% of GDP).
Note: 2009 – 2011 are not available for Slovak Republic
Source: IFS; author's figure

The bias towards consumer credit likely responds to both profitability considerations as well as credit information deficiencies. Foreign banks entering new markets may find mortgage loans and consumer credit a good way to gain market share and profitability. The demand for it was quite high after times when population had very limited access to finance and moreover, they brought know-how techniques on customer lending to the country. At the same time, information asymmetries may be at play: foreign banks entering new markets do not have much information and tend to lend only to transparent companies. Clarke, Martinez Peria and Sánchez (2001) find that foreign banks, using new techniques, such as credit scoring, can increase SMEs access to finance, although larger firms still benefit more. De Haas, Ferreira and Taci (2010), argue that foreign banks in Central Europe and Baltic states have higher portion of assets allocated to consumer credits (including mortgages), than that of domestic or state-owned banks. On the contrary, private domestic banks lend more to corporates and particularly to SMEs, which is very supportive for the economy. They also find that a bank's size affects the lending patterns of the bank: smaller banks lend more to small businesses and larger banks concentrate more on large corporate financing. This also can be attributed to information asymmetry, as domestic banks have advantage on processing "soft" information on small companies because they know the local environment better, while foreign banks can rely only on hard information, which is mainly available for larger enterprises. The paper also concludes, that better legislation benefit all bank's customers.

4.3. CEE banks financing structure

Foreign bank participation likely facilitated credit growth beyond deposit growth**.** Throughout the region, banks rely heavily on capital markets and interbank credit to fund their operations. Just before the crisis, deposits accounted for 50% or less of total liabilities in Estonia, Slovenia, Hungary, Lithuania and Latvia. The entry of foreign banks into these markets may have enabled a pace of credit growth that de-coupled from deposits growth (through wider access to international capital markets and parent funding). However this reliance on

external (and unstable) sources of funding contributed significantly to the decrease in credit in the onset of the crisis.

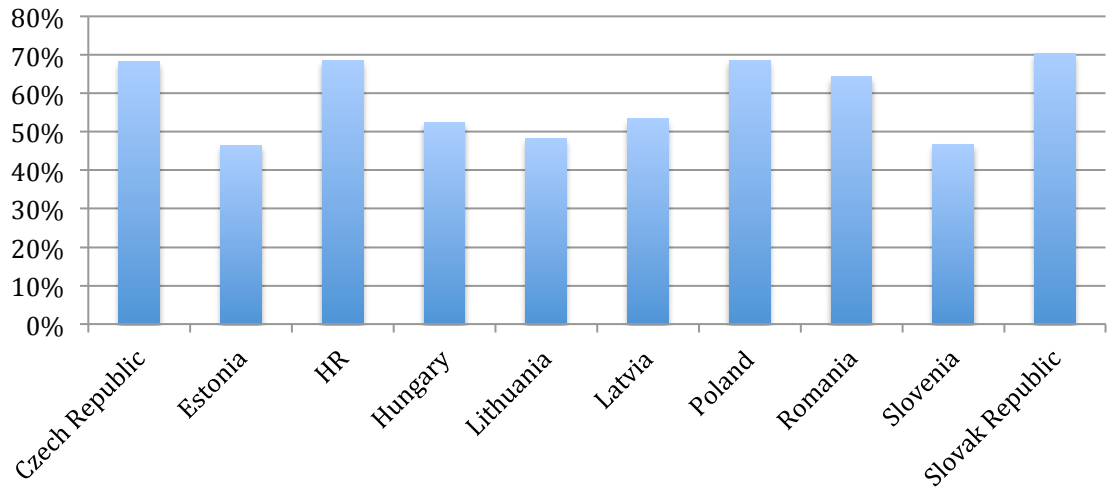

Figure 4. Deposits to total liabilities (2007).
Source: Bankscope, author's calculations

4.4. Interest rates

Entry of foreign banks contributed to decrease in cost of credit. According to literature, in transition countries with higher presence of foreign banks, even SMEs are positively affected and report interest rates to be a lesser constraint for financing their operation, whereas in countries with lower foreign bank penetration it remains an obstacle for companies (Demirgüç-Kunt, Laeven & Levine, 2004; and Clarke et.al, 2006). The graph below (Figure 5) shows that the penetration of foreign banks into CEE countries indeed translated to some degree into lower cost of credit for private sector (although lower interest rates are the outcome of various other factors as well). From as much as 17,3% in 1997, average interest rate on lending across the countries fell down to 6,8 in 2006, and increased slightly afterwards caused by coming financial crisis[3].

[3] The data on Poland since 2007, and Slovakia and Slovenia since 2010 is not available. Romania is excluded when calculating the average and building the graph, due to outlying values (it's lending rate in 1997 was 72%). During 1997 – 1999 Romania had very tight monetary policy, trying to cut budget deficit and simultaneously intended to build a sound base for economic growth. Accompanied high inflation by itself couldn't explain high interest rates, but rather fixed exchange rate, banks monopoly Treasury securities and interbank markets, and tax arrears, each had share in the phenomenon (Borc, 2000)

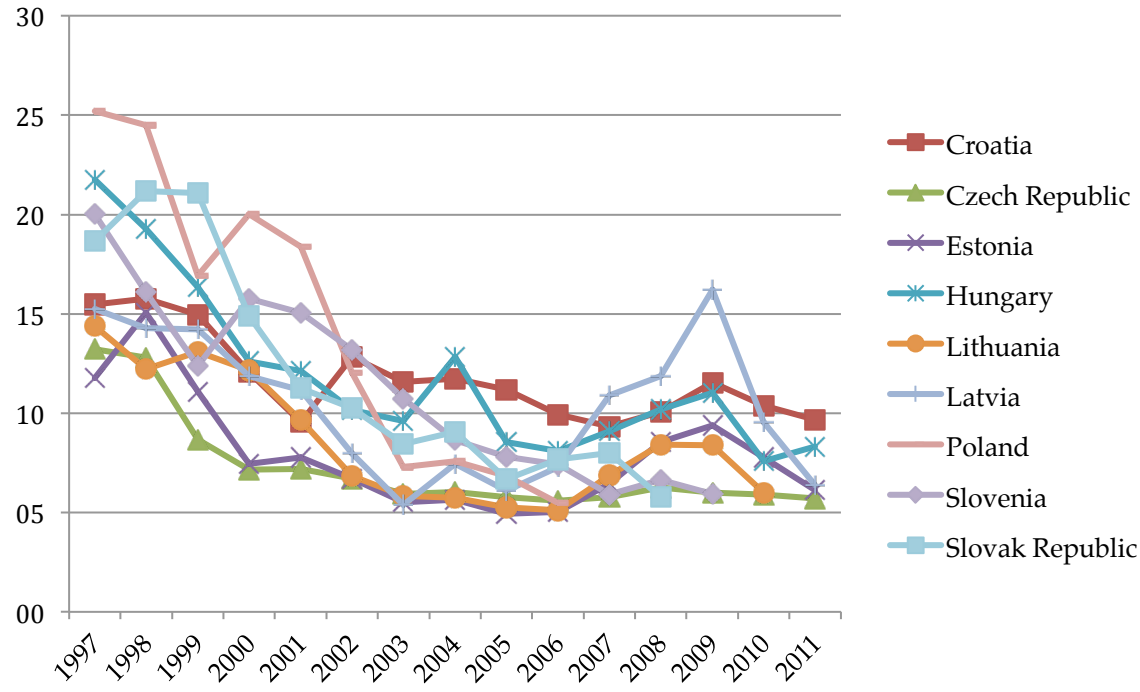

Figure 5. Lending interest rates in CEE.
Source: IFS; author's figure.

Credit spreads also decreased with foreign banks' entry. Credit spreads, the difference between lending and deposit rates, are commonly used to measure the costs of financial intermediation. High spreads trigger savings volume and economy growth, that is why the lower level of, the better. In CEE countries credit spreads lowered from 6,7% on average in 1997 to 3,5% in 2007[4]. It drives to a conclusion that foreign banks entry also contributed to improve the efficiency of the sector, mobilizing more resources and lowering costs of borrowing.

4.5. Soundness of the banking sector

While credit growth in general is good, it is so only until a certain limit. Catch-up effect characterized by rapid credit growth is welcomed after limited access to finance. However, excessive credit growth generates concerns on its effect on banking sector soundness. Foreign banks entering a new market may have

[4] Author's calculations based on IFS data. Does not include Romania.

aggressive strategy in gaining market share and thereby may cause excessive lending. If risks are not properly managed, which may be the case (due to lack of information), it can result in high level of non-performing loans (NPLs), undermining bank's stability and soundness.

The soundness of credit growth among foreign banks is influenced by a number of factors. First, lower cost of funding and higher operational efficiency of a bank (cost-to-income ratio) can translated into low interest rates to local borrowers, which may induce excessive lending behavior of foreign banks. Second, foreign banks' risk-taking is dependent on soundness of their parent banks, that is, due to their ability to rely on parent funding (cf. Tamirisa and Igan, 2008). Lack of coordination between home and host supervisors could result in overlooking important risks. Igan and Pinheiro (2011) conclude that credit growth overall became less dependent on bank's soundness during the last decade and rapid credit growth has weaken banks soundness, measured by distance to default. These findings are concerning as they imply that even banks which are already weak, take more credit risk thus, destabilizing even further. Credit booms can be a result of such behavior and cause financial instability.

The soundness of the credit growth was put to test during the financial crisis, with negative results. Rapid credit growth in CEE countries during 2003-2008 (Figure 3) was ended abruptly by global financial crisis, raising the portion of non-performing loans. While at the onset of financial liberalization percentage of NPLs equaled 10,4% on average across the region, it fell down to 2,4% in 2007 and was back at 10,8% in 2011. Countries, where economic slump was particularly deep, such as Latvia and Lithuania were at a higher exposure than their CEE peers during the last financial crisis (see Figure 6).

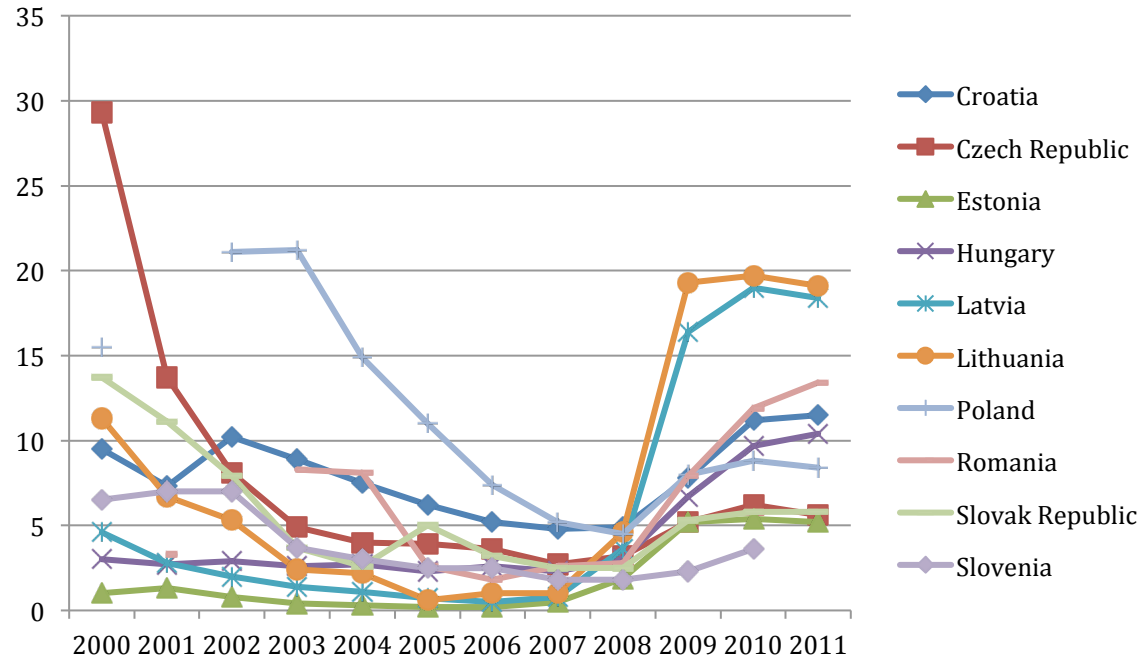

Figure 6. Bank NPLs to total loans (%).
Source: The World Bank; author's figure.

NPLs occurred across the board, in almost all the economic segments. While during earlier crises NPLs were mainly caused by corporate sector, this time households also contributed to the rise of NPLs, particularly in Latvia, Poland and Hungary. High portion of NPLs in Croatia, Hungary and Romania was additionally caused by excessive lending in foreign currency (4,3%, 66,1% and 63% of total loans, respectively) and further devaluation of local currency made it difficult for borrowers to pay back their debts. Borrowers, attracted by lower interest rates on foreign currency loans, were not aware of underlying exchange rate risk, and although with the onset of the crisis supervisors of Latvia, Poland and Hungary forced banks to disclose these risks to customers (Brown and De Haas, 2012), it was a bit late, as losses already incurred.

Another important factor for diminishing NPLs is an availability of information on borrowers. Private credit bureau coverage of population and corporate sector is essential to determine the likelihood of the customer repaying and improve risk management of a bank. Credit bureaus also help companies and individual customers to receive credit easier and at lower rates. In a mean time,

among CEE countries only Croatia prior to the crisis had at least 72% credit bureau coverage of population, followed by Czech Republic and Poland (52%), other countries have coverage lower that 40% and sometimes even as little as 10% (Hungary, Lithuania and Romania). Not surprisingly, the countries with least credit bureau coverage have also highest NPLs.

4.6. Deleveraging

While, owing to foreign banks presence in CEE countries, there was a good credit growth in mid 2000s, access to finance by corporates and population increased, and efficiency of the banking sector improved, it turned out to be unsustainable when global financial crisis hit.

A high concentration of banking assets in foreign banks inevitably led to a strong dependency of the CEE countries on stability of foreign markets. In distressed times, parent banks may receive injections and support from their governments, but in turn they are often asked to stop financing foreign subsidiaries and focus on lending in their home country in order to cope with the crisis. Thereby, during the recent crisis, for example, Austrian and German banks (which have many subsidiaries operating CEE countries) were pressured by their regulators not to fund their Eastern European subsidiaries because they see it as using Austrian and German savings to lend to borrowers in other countries. So actually not only they could not provide more credit to foreign markets (whether as cross-border lending or through their subsidiaries) but they also asked its subsidiaries to pay back what they borrowed in order to provide necessary level of credit in their home country. This is known as 'deleveraging' and is a major risk for the 'host countries' (the CEE countries in this case), because suddenly the money flow stops and companies cannot receive new loans and need to pay existing ones.

In light of these, concerns about withdrawing operations from emerging Europe increased. While some banks committed to keep their support to CEE countries, there was no certainty that other banks will do the same. So, to miti-

gate the risks of deleveraging, there was a launch of "Vienna Initiative" in January 2009. The purpose of the initiative was meant to be a coordination mechanism for the banks, international financial institutions, home and host country supervisors and IMF, in order to secure emerging Europe against systematic risks and ensure that credit kept flowing to the real sectors. As a result, major multinational bank groups promised to recapitalize their subsidiaries in most exposed regions (Bosnia and Herzegovina, Hungary, Latvia, Romania, and Serbia), rollover their financing to the country at a certain level (on the base of pre-crisis volume) or to increase minimum capital adequacy ratio (commitments differed across countries). Those actions reduced risks in mentioned countries, but left risks in less vulnerable ones, as parent banks could focus on their commitments, but decrease attention to other regions. Later, in the end of 2011, when Eurozone crisis deepened, risks of deleverage multiplied again and a new "Vienna 2.0" was created to ensure more close coordination of home and host countries supervisors.

Undoubtedly without these action plans, financial crisis would be more severe in Central and Eastern Europe. De Haas et al. (2011a), show that banks, which participated in Vienna Initiative were a more stable source of credit, than those, which did not. While this initiative mitigated the risks during the recent crisis, it did not diminish them fully. Even with its launch, level of NPLs increased in all banking sectors of CEE countries, banks soundness was undermined and capital flows decreased. Cetorelli et al. (2010) conclude that possible transmission doesn't mean markets should be closed, but rather that regulation should be more appropriate. Analysis of foreign banks impact on credit supply in host market therefore are needed to create appropriate joint regulation of foreign bank activities on more sustainable base, rather then undertaking initiatives.

5. DATA AND METHODOLOGY

The empirical analyses built on the bank-level and country-level indicators from 2004 to 2011. The period chosen as such, because it provides the banking trends in 3 major periods: the rise of transition economies (2004 – 2007), during its distressed time caused by global financial crisis continued (2008 – 2009), and recovery period (2010 – 2011). Geographically the dataset consists of the following countries: Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia; and referred in this paper as Central and Eastern Europe countries (CEE, CEECs). The set of countries is justified by their common trends in financial and economic development, as well as geographical closeness and similar trends of banking sector. Relationship between credit stability and presence of foreign banks in countries is tested employing panel data analysis.

5.1. The data

The major source of the data on banks is downloaded from the Bureau van Dijk's BankScope database, access to which is kindly provided by University of Vaasa. The database has information on more than 30,000 banks worldwide and is constructed based on balance sheets, income statements and notes to audited annual financial reports of each individual bank that is reporting to the BankScope. The statements are converted to a universe global format to avoid inconsistency arising from different reporting standards. Apart from presenting absolute values of lines of balance sheets and income statements (raw material), there are also calculated most common bank-level ratios, used to evaluate its performance. The universal standardized reports therefore allow for cross- and within-country comparison of banks. The database keeps reports on both, currently active banks and those, which were active, but stopped operating at some point.

To build the panel data set (longitudinal data) of banks in CEECs, first all available information was downloaded, that was a set of 486 banks. All nominal

values are denominated in US dollars with exchange rate as of each closing date to ensure comparability across the banks. The first step was to exclude the banks with last reporting date prior to 2004, so that banks corresponding to the current research period are left only. Furthermore, as this study concentrates on credit volumes provided by banks to private sectors, the list of the banks was adjusted by type of its main activities. Namely, from the list were excluded central banks, specialized government credit institutions, multilateral governmental banks, brokerage institutions, as well as non-banking credit institutions. The database therefore comprises commercial, saving, cooperative and real estate/mortgage banks engaged primarily in retail (individual and SMEs), wholesale (large corporations) and private banking. Within the resulted dataset a check of data quality and consistency was undertaken. Some of the banks even at years when they were reporting had some variables unavailable, therefore making the whole bank-year observation inappropriate to be included in the analysis. It caused a deletion of 29 bank-level observations. The resulted database contained 197 banks in total or 1207 bank-level observations across the region.

The next step was to define the ownership of each bank. And moreover, as suggested by other studies, the mode of entry also plays a significant role in determining bank's behavior and performance in a host country. To take into account these differences, mutually exclusive categories of banks (e.g. only one can be assigned to each bank) were determined: domestic private, greenfield or takeover bank. A bank is considered to be foreign owned if at least 50% of its outstanding shares is held by foreign entity or individual. This definition of foreign bank is commonly used in related literature (Claessens et al., 2001, Bonin et al., 2005), and also suggested by the Bank for International Settlements (BIS, 2003). Subcategories *greenfield* and *take-over* assigned to foreign banks, if it is a newly established bank or emerged through acquisition of existing domestic bank, accordingly. Foreign – greenfield bank is recorded as such from year *t*, in which it was established and onward. For foreign-takeover though, if a bank was acquired by foreigners in year *t*, it is recorded as such only from a year *t+1*, in order to control for not immediate impact of new management, but rather a time-consuming process of internal restructure.

The BankScope database provides information on shareholder of the bank, including the country name and percent of shares held. However, important drawback of BankScope database is that ownership recorded only for the last year of reporting by the bank. Historical changes, such as acquisition, mergers or buyouts by the government therefore cannot be tracked back, which is crucial for comprehensive analysis of ownership impact. In order to complete this information in constructed database, manual collection of the data from other external various resources was needed.

Manually the information was obtained on 34 Hungarian and 41 Polish banks over the period, using individual banks' websites, Magyar Nemzeti Bank and Narodowy Bank Polski (Central Banks of Hungary and Poland accordingly), Budapest and Warsaw Stock Exchanges and other available publications (news and corporate governance reports). The mode of entry and changes in ownership during 2004 – 2011 period were tracked. However, major obstacles were persisting in obtaining the information, such as limited and imperfect publication rules of private entities, and not the least, language barriers constrained the ability to search the information, particularly in Croatia, Romania and Slovakia. To a large extent these shortcomings were overcome thankfully to information kindly provided by Ralph De Haas (De Haas et.al., 2011a). Shared database contained ownership information and also distinguished the mode of entry for foreign banks in all CEE countries included in present research and covered the period until 2010 (inclusive). Worth to mention, that existing results of author's own research were identical with those in the shared dataset.

Consequently ownership information for the last year of research period (2011) was collected from BankScope, in according with the rules defined above. Merger of two datasets was possible, because all banks in BankScope are assigned with a unique identifying number, so the banks could be matched and double counting is avoided.

Summary statistics in Appendix (Table 1 A) show the number of banks included in the obtained dataset with a breakdown by ownership type, year and a

country. Observations are distributed relatively evenly across the years, each year comprises about 13% of total observations, and only earlier years 2004 and 2005 make up fewer percentage – 10 and 11,5 accordingly. The sample is neither dominated by any of the countries, however Estonia and Lithuania contribute only by 3% and 6% to total number of observations. Croatia, Hungary, Poland and Romania add the most contribution, mainly due to a higher density of banking systems, rather than due to a biased sampling. Apart from bank-level variables, the dataset of macroeconomic indicators is also built. Variables include GDP growth and inflation rate in host countries. These variables are downloaded from the World Bank Databank and International Financial Statistics. The full list of variables, their description and source of obtaining are provided in Appendix, Table A 2.

Descriptive statistics in Table 1 (Panel A) show the mean loan growth in sample to be equaled 21%. Distribution of loan growth is highly and positively skewed, indicating larger portion of the sample demonstrates positive loan growth. Kurtosis of loan growth is high too, its excess kurtosis is higher than zero and indicates leptokurtic distribution. It suggests that results may be driven by few extreme outliers, rather than by general trends of the sample[5]. (Panel B) reveals that difference in loan growth by ownership of the bank – takeover banks have the slowest growth at 18% on average. This however may be influenced by impact of crisis on foreign banks' – if takeover banks were strongly affected by the crisis, credit growth may be averaged out across the years. Panel C confirms, that on average foreign banks were giving less credit than domestic ones, and after crisis this tendency even increases, average loan growth of domestic banks is at least 7% higher than that of foreign and takeover banks display even negative growth. It confirms the need of panel data analysis in three sub periods: prior, during and after the crisis. The table also shows that foreign takeover banks were on average larger then other banks, while domestic banks outperformed in solvency and liquidity.

[5] When performing the analysis, outliers by loan growth were excluded at 1 and 99 percentile; this however did not qualitatively change the results.

Table 1. Descriptive statistics of banks' characteristics.

Panel A

	Full sample statistics						
	N. of obs. per year	Mean	St.dev.	Min	Max	Skewness	Kurtosis
Domestic	50	0.3	0.5	0	1	0.7	-1.5
Greenfield	55	0.4	0.5	0	1	0.6	-1.7
Takeover	45	0.3	0.5	0	1	0.9	-1.2
Gross loans growth	151	0.21	0.3	-0.55	3.46	2.3	14.03
Size (log)	151	14.04	1.72	8.52	17.76	-0.18	-0.49
Solvency	151	23.32	29.12	-4.01	466.18	8.01	89.68
Efficiency	151	68.45	28.08	16.62	350	3.25	21.95
Liquidity	151	34.08	26.89	-6.58	348.26	3.51	29.71
Net loans to deposits	151	80.14	48.91	2.53	675.82	5.9	56.28
ROAA	151	0.85	2.23	-19.01	29.89	0.7	38.53
Deposit growth	151	1.39	3.39	0.00	116.17	32.25	817.65

Panel B

	Means by ownership type		
	Domestic	Greenfield	Takeover
Gross loans growth	0,.22	0,21	0,18
Size (log)	13.16	13.88	15.22
Solvency	27.41	24.07	17.48
Efficiency	70.07	69.46	65.40
Liquidity	40.82	32.32	28.72
Net loans to deposits	83.20	81.92	74.52
ROAA	1.02	0.67	0.86
Deposit growth	1.31	1.53	1.22

Panel C

	Loan growth means by periods		
	Pre-crisis	During the crisis	After the crisis
Domestic	0.33	0.09	0.12
Greenfield	0.36	0.08	0.05
Takeover	0.30	0.13	0.04
All	0.34	0.10	0.07

5.2. Methodology

The empirical analysis aims to shed light on differences in credit growth propensity of foreign and domestic banks. The hypotheses are tested with panel data analysis and generally abide the traditional approach in the field of studies (De Haas et al. 2006 and Havrylchyk et al. 2011). The dependent variable is the

annual percentage growth of gross loans of a particular bank. Independent variables include ownership dummies. They are constructed so, that equal 1 for foreign take-over and greenfield banks in each year after the bank was established or acquired (unless it was sold back to domestic investors), and take a value of zero otherwise.

In the right hand side of the model also incorporated a set of bank specific control variables, included in order to control for other factors rather than ownership, which can influence the credit growth of a bank. They include the following: size, solvency, liquidity, efficiency, net loans to deposits, profitability and deposit growth. The description of each variable is in Table 1B (Appendix). To preclude endogeneity of the factors and avoid reverse causality, they are included with one period lag. That is, dependent variable loan growth of a particular bank in year *t* is regressed on its specific characteristics in year *t-1*. Endogenous problems may be illustrated if for example bank's size increased exactly because it has high loan growth, or high liquidity of a bank can be caused by slow trends of loan growth. That is why positive signs are expected on liquidity and solvency ratios are in regressions, because high value of them in past period indicates a potential of a bank to increase credit growth in the next period. Banks with high loan to deposit ratios are expected to demonstrate slower loan growth, because their leverage on deposits is already high. This is also necessary because changes in bank's portfolio are not immediately incorporated by management and will influence new decisions only some time after.

And finally a set of macroeconomic explanatory variables is also included and comprises GDP growth and inflation rate of a host country. These variables are essential to include as controls, because they directly affect the potential of credit growth. GDP growth is associated with economy development and with increased demand for credit. Thus, changes in GDP would have a positive correlation with credit growth as a consequence of economic development stage, rather than bank specific characteristics. At the same time, higher host country GDP growth may stimulate foreign banks to expand their activities in that region. Inflation rate may boost or blow credit growth in nominal terms, and hence is expected to have a positive (negative) sign of correlation with loan

growth as it increases (decreases). However, as the nominal values of variables were converted to a single USD currency, the effect of inflation should diminish, to the extent that Purchasing Power Parity holds (De Haas et al., 2011a). The estimated baseline model then follows the equation:

$$(1) \qquad \Delta L_{ijt} = \alpha_1 + \beta_1 Foreign_{ijt} + \beta_2 Crisis_t + \beta_3 Macro_{ijt} + \beta_4 X_{ijt-1} + \mu_{ij} + \varepsilon_{ijt},$$

where

ΔL_{ijt} is the percentage gross loan growth of bank *i* in country *j* in year *t*;
α_1 is the intercept term and $\beta_{1,..,4}$ are coefficients (or vector coefficients);
$Foreign_{ijt}$ is the dummy variable that distinguishes from private domestic banks (control group);
$Crisis_t$ is a dummy variable that indicates a crisis 2008 or 2009 year;
$Macro_{ijt}$ is a matrix of host country macroeconomic characteristics;
X_{ijt-1} is a matrix of lagged bank specific control variables;
μ_{ij} are bank fixed effects and $\varepsilon_{i,t}$ is the idiosyncratic error, $\varepsilon_{i,t} \sim$ IID $(0, \sigma_\varepsilon^2)$;
$i = 1, \ldots,$ N where N is the number of banks in the sample;
$j = 1, \ldots, 10$ are the countries in the sample;
$t = 1, \ldots, T_i$ where T_i is the number of years in the sample of bank *i*.

The equation is estimated with several techniques and the best fitting specification was chosen. Panel data analysis allows to control for unobserved factors. The first step then was to apply conventional Ordinary Least Squares (OLS) estimation under assumption that error structure of banks is common for the whole sample. This assumption however is rather too strict, taking into account that there are many unobserved factors in the model, such as bank specific (management techniques, bank's strategy) and country specific (institutional environment, development of financial system, competition intensity) characteristics, that can consistently influence the dependent variable. These factors

may bias the coefficients of explanatory variables and hence there needs to be a control of these specific characteristics.

The next step was to estimate the equation with the random effects model (generalized least squares, GLS) a *between-entity error* $v_{i,t}$term was introduced This modeling assumes that variation across the banks is random and is not correlated with the explanatory variables. However, it still remains uncertain, whether unobserved variables are correlated with existing predictors or not. And hence a fixed effects model is also run. In contrast, fixed effect model allows latent variables to be constant over time and be correlated with other explanatory variables, which is most likely in present analysis as some of the bank's individual characteristics may be persistent over time (again it's strategy, for example). The advantage of this technique is that it removes a bias of regressor coefficients, absorbing and removing the time-invariant effects and hence, leaving the predictors net of its time-invariant effects.

To evaluate which of the two applied models fits better the equation, Hausman specification test (1978) is used. The test compares fixed and random effect models to examine whether there is a correlation between unobserved and observed explanatory variables, under assumption that idiosyncratic errors and explanatory variables are not correlated across the time periods (Woolridge, 2008, 452:453). The test indicates that there is a strong correlation between unobserved individual effects and explanatory variables, thus it is interfered that fixed effect specification of the model is more appropriate.

The remaining issue is heteroscedasticity. Modified Wald test reports that in all specification models heteroscedasticity is present, that is the variance of the error term is not constant for all independent variables. It is controlled though throughout the paper with robust estimators. To ascertain robustness, outliers in the dependent variables, namely size were excluded at 1 and 99 percentile, this however did not change the main findings.

And finally, in a baseline regression crisis dummies (*Crisis 2008* and *Crisis 2009*) are introduced to catch the effect of global financial crisis on banks' behavior. In

separated models these dummies are also interacted with ownership dummies to estimate, whether all else is equal, greenfield and takeover banks reacted differently to the crisis in comparison with domestic banks. Country dummies and country-year interactions are also embodied in some specifications to control for country specific effects and as noted by Claessens et al. (2012b) to the extent that demand side of the credit is not affected by the crisis, these interactions should control for demand changes across the countries.

6. EMPIRICAL RESULTS

Table 2 shows estimation of baseline equation model, where dependent variable the annual loan growth is regressed on bank's ownership and bank-level and macro-level control variables. Column 2 shows the results with inclusion of country-year interactions, whereas column 1 indicates the results without them. Both columns include fixed banks effects, as suggested by Hausman specification test (1978). The model explains as maximum as 47% when country-year effects are included, whereas without these controls it explains around 29%.

The first appealing result and the one corresponding to the stated hypothesis, is that foreign banks do indeed contribute to loan growth more than domestic banks do. The result is persistent (though to a lesser extent) even when controlling for country-year effects. In particular, with the significance at 10% level foreign ownership of a bank leads to 12,2 percentage points higher loan growth versus domestic banks of similar characteristics. This finding is in line with other researches (De Haas et al. (2006), Dages et al. (2000)), further complementing previous findings by extending the period of study and showing that the effect is persistent over time, even when foreign banks are already highly integrated in local markets and domestic banks are also well developed. In earlier periods, higher credit growth among foreign banks could be attributed to temporary competitive advantages from better management techniques and product innovation – while, in contrast, domestic banks immediately after financial liberalization did not have much experience and know-how technologies. Indeed, Poghosyan (2010) points out that domestic banks in CEECs benefited from foreign banks presence and improved their efficiency. Therefore the differences in credit growth in the latter years are not so sharp and variations of credit growth of foreign and domestic banks more likely to be attributed to financing funds available and dependency on foreign markets, rather than to performance differences.

Foreign ownership however doesn't solely guarantee increase in credit growth. Size has an important impact on credit growth too. In line with expectations, the correlation of this variable with loan growth is strongly negative and high in value. The more of total assets is held by bank, the slower loan growth rate this bank can support, that is banks with already large credit portfolios, all else equal, cannot maintain the same fast growth of credit expansion, or, conversely, smaller or nascent banks can display very high growth rates as they start from a small base. The model shows – 13,1% decrease of dependent variable with significance at 1% level.

A similarly negative correlation can be observed between the loan to deposit ratio and credit growth, although not so economically significant (the absolute value is very small). The correlation of these two variables has intuitive explanation, that is, the higher the proportion of loans to deposits, the lower the domestic funding base available to finance further loan growth expansion.

Liquidity and solvency play an important part in credit growth too. Although as opposed to size its' magnitude are smaller in absolute values of the coefficients and statistically less significant (10% level). 1% increase in solvency and liquidity ratios leads to 0,8% and 0,2% increase in credit growth respectively. That is well in line with banking behavior patterns. These ratios explain bank's ability to face debt repayments and the higher value of them indicates that banks have a potential to take more obligations without a risk of falling into insolvency or liquidity problems. Hence, for all ownership types, banks with less financial constraints have higher ability for credit growth.

And finally GDP growth also affects credit growth, e.g. credit growth is procyclical with economic development, as shown by positive sign of this variable (column 1). However, the effect disappears when country-year interactions are included. It can be explained that the interactions absorb the effects of peculiarities of a given country in a given year, and GDP growth is unique for each country in each year.

Table 2. Credit growth and foreign banks.

The table reports baseline panel regressions to estimate the impact of foreign banks on credit growth. The dependent variable is annual credit growth. The sample period is 2004 – 2011. All independent variables are defined in Appendix. All bank-level independent variables are lagged one period. Regression in column 2 includes country-year interactions (unreported). Robust p-values appear in brackets and ***, **, and * denote significance at 1, 5 and 10 percent level, respectively.

	Full sample	
	(1)	(2)
Foreign bank	0.164*	0.122*
	[0.036]	[0.017]
Size	-0.163***	-0.131***
	[0.000]	[0.000]
Solvency	0.00244	0.00816*
	[0.682]	[0.031]
Efficiency	0.00121	0.000760
	[0.118]	[0.054]
Liquidity	0.00305***	0.00220***
	[0.000]	[0.000]
Net loans to deposits	-0.00799	-0.00820**
	[0.058]	[0.005]
Profitability	0.0224	-0.00101
	[0.070]	[0.843]
Deposit growth	0.00181	-0.00107
	[0.470]	[0.606]
GDP	0.0122***	0.00108
	[0.000]	[0.942]
Inflation	-0.0101	-0.0281
	[0.058]	[0.066]
Constant	2.213***	2.054***
	[0.000]	[0.000]
№ of observations	1207	1207
Country fixed effects	No	Yes
R-squared	0.292	0.475

Table 3 reports the effect of a global financial crisis in 2008-2009 on loan growth. Interesting findings emerge in the table. First, the dummy variable crisis_2008

has a positive sign, meaning that not only the crisis in the first year of its appearance has not decrease the lending growth, but also during that year it was remaining positive and significant, both economically and statistically (at 5% significance level). This finding can be dubious from the first glance, however it has its explanation. As commonly accepted, the crisis (although the financial stability in the US was worsening before) started to spread across the globe only in September 2008. Before that point, while the confidence among financial institutions was not lost and international markets did not shut down, the credit could continue growing. Anecdotal evidence suggests that positive credit growth in the first eight months of 2008 could overweight the decline of credit in the remaining 4 month of that year, leaving the total annual growth at a positive value[6]. The dummy variable crisis_2009 in line with expectations has strong negative and significant (1% level) impact on credit growth. Due to the rising intensity of the crisis in 2009, credit growth declined by 11,6%.

The next interesting finding from the table 3 (Column2), and the one most relevant to the present study is that although all banks were affected by the crisis foreign banks cut their lending more than domestic banks. In column 2 country-year interactions are introduced, crisis dummies therefore are omitted but interacted with ownership dummies. In 2009 foreign banks slowed down their lending by 7,8% more than to domestic banks did. These findings are in line with those of Claessens et al. (2012b) and De Haas et al.(2011a). The findings are also consistent with another large strand of literature suggesting that while foreign banks may be a more stable source of credit during the crisis in host country, they are sensitive to their home country conditions and therefore can be a part of shock transmission mechanism (Cetorelli et al. (2009), Chava et al. (2011), Jeon et al. (2012)).

As opposed to this, the inflation variable turns out to be significant and negative – the higher the inflation the lower the credit growth. This is intuitive as inflation translates into higher nominal interest rates, thus making credit less appealing to potential borrowers.

[6] Although this cannot be confirmed from the data, as it is available only on an annual basis.

Table 3. Bank ownership and impact of the crisis.

The table reports baseline panel regressions with introduced crisis dummies to estimate the impact of foreign banks on credit growth. The dependent variable is annual credit growth. Crisis 2008 (2009) variable take on the value 1 in year 2008 (2009). The sample period is 2004 – 2011. All independent variables are defined in Appendix. Bank-level independent variables included, but not reported. Regressions include country dummy and country-year interactions in column 1 and 2, accordingly (not reported). Robust p-values appear in brackets and ***, **, and * denote significance at 1, 5 and 10 percent level, respectively.

	Full sample	
	(1)	(2)
Foreign banks	0.158*	0.161*
	[0.041]	[0.041]
Crisis_2008	0.0694**	
	[0.002]	
Crisis_2009	-0.116***	
	[0.000]	
Foreign*Crisis_2008		0.0866***
		[0.001]
Foreign*Crisis_2009		-0.0783*
		[0.011]
GDP	0.00366	0.00767*
	[0.333]	[0.016]
Inflation	-0.0244***	-0.0190**
	[0.000]	[0.001]
Constant	2.349***	2.359***
	[0.000]	[0.000]
№ of observations	1207	1207
Country fixed effects	Yes	Yes
R-squared	0.346	0.486

Table 4 below complements the findings from table 3 (column1) and shows that decrease in lending in 2009 was driven mainly by foreign banks. The coefficient of dummy variable crisis_2009 for domestic banks is although negative, not statistically significant. The highest portion of the decline is attributed to green-field foreign owned banks, for which the coefficient indicates 13,1% decrease of lending if the bank is foreign and was established as a new subsidiary. Foreign

banks that were established through acquisition of domestic banks, had somewhat less pronounced effect – their lending decreased by 11,3% in year 2009.

Another interesting results can be seen in the table: determinants of credit growth over the period are different for domestic and foreign banks. First, deposit growth only matter for domestic banks, indicating that deposits are one of the main sources of funding for domestic banks. These results are in line with the framework, that domestic banks have less access to international or other financial markets than do so foreign banks and hence rely more on deposits. Similarly, liquidity, as was seen in table 2, plays an important role in credit growth, but the table below shows that the variable is significantly important for domestic banks, less for greenfields and not significant at all for takeover banks. The findings can serve as a proof of higher dependency of foreign banks on their parents. Whereas domestic banks can rely largely on their own funding, foreign banks even if their balance sheets do not indicate very healthy conditions, can turn to their parent company and get additional funding. The difference between greenfield and takeovers could be due to the relationship with their parents. When subsidiary is established as a greenfield bank, it is most likely that the bank was established mainly for purposes of following parent bank's clients and therefore parent bank will be very supportive to its greenfield subsidiary. Takeover banks on the contrary enter the market through acquisition of existing bank, implying that client base is inherited from previous ownership and also that the bank is keen on extending market niche in general, not necessary in favor of particular sectors. Thus, takeover banks may have more freedom at the cost that their parent banks would have less responsibility and support to them.

Table 4. Credit growth and bank ownership during the crisis.

The table reports baseline panel regressions with introduced crisis dummies to estimate the impact of foreign banks on credit growth. The dependent variable is annual credit growth. Crisis 2008 (2009) variable take on the value 1 in year 2008 (2009). The sample period is 2004 – 2011. All independent variables are defined in Appendix. Regressions include country dummy and macroeconomic variables (not reported). Robust p-values appear in brackets and ***, **, and * denote significance at 1, 5 and 10 percent level, respectively.

	Full period sample		
	Domestic	*Greenfield*	*Takeover*
Crisis_2008	-0.00659	0.0579	0.138***
	[0.886]	[0.214]	[0.000]
Crisis_2009	-0.102	-0.131*	-0.113*
	[0.091]	[0.040]	[0.021]
Size	-0.127***	-0.208***	-0.173***
	[0.000]	[0.000]	[0.000]
Solvency	0.00128	0.000401	0.00354
	[0.273]	[0.534]	[0.267]
Efficiency	-0.000852	0.00178*	0.00158
	[0.218]	[0.010]	[0.100]
Liquidity	0.00384***	0.00340**	0.000576
	[0.000]	[0.004]	[0.557]
Net loans to deposit	-0.000440	-0.00118	-0.00157*
	[0.220]	[0.158]	[0.037]
Profitability	0.00131	0.0277**	0.0353**
	[0.859]	[0.002]	[0.001]
Deposit growth	0.0763***	0.000310	0.0169
	[0.001]	[0.903]	[0.107]
Constant	1.784***	2.971***	2.626***
	[0.000]	[0.000]	[0.000]
№ of observations	403	444	360
Country fixed effects	Yes	Yes	Yes
R-squared	0.315	0.374	0.416

Profitability, as measured by average return on assets of each individual bank, also matters, but again only for foreign banks, with a high gap to domestic banks. Credit growth of both, greenfield and domestic banks is positively correlated with their profitability (1% change in profitability leads to 2,7 and 3,5

percentage increase of credit growth) . It supports the idea that foreign banks are very attracted by profitable operations and may extend their credit in order to receive more return. Significant positive coefficient of lending rate would support it too, but lending rate is two-sides tailed indicator – higher rate may be caused by higher risks embedded in lending activity.

The table 5 describes determinants of the growth during and after the crisis for all ownership types considered in the paper. The most important finding is that while during the crisis credit growth at foreign banks appears dependent on banks' own balance sheet ratios (solvency and net loans to deposit ratio), the trend reversed after the peak of the crisis. In post-crisis period significance only of one variable remains – the size (column 4). The trend is very interesting, but can be explained again by dependency of foreign subsidiaries on their parents. If none of banks variables is significant for its growth it means it depends on some other exogenous factors, not included in the model. In the case of foreign banks, they most likely strongly dependent on their parent banks behavior, that is their decisions and willingness to operate in host countries.

Interestingly, deposit growth has a negative correlation with credit growth of domestic banks in the period of 2010 – 2011. The negative correlation here is most likely do not imply causality, but probably reflects the effect of the crisis on both credit growth and banks' interest to attract deposits. After the crisis hit, domestic banks that were relying on international markets experienced shortage of funding and had relied more heavily on deposits to fund their existing loan portfolio, probably attracting depositors by higher interest rates. In this scenario higher deposits do not lead to higher loan growth, as it just reflects a change in the funding mix of banks. Since credit decrease and deposit growth are caused by the same factor and happen at the same time it may appear as they have negative impact on each other, but it is rather explained by the same root cause.

Table 5. Determinants of lending behavior before and after the crisis.

The table reports panel regressions with fixed effect specification. The dependent variable is annual credit growth. Ownership dummy variable is omitted. Each equation is built on a sample corresponding to column headings of time period and ownership. All independent variables are defined in Appendix. Macro-level control variables included in regressions, but not reported. Robust p-values appear in brackets and ***, **, and * denote significance at 1, 5 and 10 percent level, respectively.

	Crisis period			**Post crisis period**		
	Domestic	*Greenfield*	*Takeover*	*Domestic*	*Greenfield*	*Takeover*
Size	-0.413	-0.564*	-0.832***	-0.130	-0.724*	-0.248
	[0.137]	[0.015]	[0.000]	[0.618]	[0.020]	[0.297]
Solvency	0.0152*	0.004*	0.029*	0.008*	-0.002	0.002
	[0.034]	[0.012]	[0.010]	[0.035]	[0.791]	[0.810]
Efficiency	0.0015	0.000	0.001	-0.001*	-0.0009	-0.0002
	[0.508]	[0.898]	[0.579]	[0.013]	[0.718]	[0.907]
Liquidity	0.004**	-0.006	0.005**	0.004	0.005	-0.001
	[0.007]	[0.212]	[0.007]	[0.112]	[0.426]	[0.819]
Net loans to deposit	0.001	-0.008*	-0.005***	-0.003*	-0.004	-0.002
	[0.256]	[0.031]	[0.000]	[0.031]	[0.400]	[0.196]
Profitability	0.0113	0.0496	0.0216	0.0101	0.0151	-0.002
	[0.699]	[0.381]	[0.406]	[0.540]	[0.292]	[0.898]
Deposit growth	0.235**	-0.015	0.033	-0.264*	-0.017	0.081
	[0.008]	[0.788]	[0.607]	[0.013]	[0.866]	[0.183]
Constant	4.592	8.881*	12.58***	2.808	11.10*	4.197
	[0.221]	[0.011]	[0.000]	[0.450]	[0.019]	[0.279]
№ of observations	100	117	105	99	110	100
Country year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.580	0.572	0.862	0.517	0.366	0.321

The mean tests difference points out that domestic banks as measured by log of assets on average are smaller than foreign ones by 1,263 points. At the same

time domestic banks have higher liquidity ratio (7,276 percentage points higher), which again confirms that while domestic banks maintain appropriate level of financial stability, foreign banks' access to parent funding may reduce the need for liquidity cushions. Interestingly, domestic banks had higher profitability than foreign banks, although the difference is not statistically significant.

Table 6. Mean test for predictors of the gross loan growth across banks ownership during 2008-2009.

The table reports mean and t-statistics of differences in bank-level control variables for foreign and domestic banks during 2008 – 2009 years. *** and ** denote significance at 1 and 5 percent level, respectively.

	Mean for domestic banks	Mean for foreign banks	T-test
Size	13.512	14.775	-6.888***
Solvency	20.543	19.203	0.426
Efficiency	66.052	65.919	0.045
Liquidity	35.461	28.185	2.696**
Net loans to deposits	88.904	84.126	1.119
Profitability	1.452	0.977	1.816
Deposit growth	1.304	1.244	0.8361

Summarizing the empirical analysis, the main findings confirm the stated hypotheses. First of all, foreign banks in Central and Eastern Europe countries displayed a higher credit growth than domestic banks, although the credit growth is also sensitive to bank's size, liquidity and solvency indicators. Interestingly, deposit growth as basis for credit growth matters only for domestic banks and was also higher on average, at least during the crisis. Secondly, foreign banks, being dependent on their parents and being more integrated in international markets, were affected more strongly by the recent financial crisis and reduced their lending more than did so domestic banks. Greenfield banks appear to be more dependent on parent company's decisions and support, than takeover banks, although this cannot be concluded explicitly from present analysis, due to unavailability of data on parent companies.

7. SUMMARY AND CONCLUSIONS

Distinguishing three types of bank ownership – domestic, greenfield and take-over, the study aimed to find systematic differences in their behavior in regards to credit growth. To analyze the trends, a dataset was constructed that includes 261 banks located in Central and Eastern Europe. The period studied is 2004 to 2011, which is unique in a sense that it represents three well-distinguished phases of the economy: period of accelerated growth, financial crisis years and stage of the recovery after the crisis.

Panel data analysis reveals that foreign banks surpass domestic banks in their ability to supply credit to private sector of the economy. Balance sheet indicators are not able to solely explain the credit growth trends, the differences in credit growth arise is linked to the ownership as well. Foreign ownership of a bank is seen to contribute by as much as 16% to credit growth in comparison with domestic privately held banks. The trend is persistent over time, which means that even after a longer presence in a host country, increased competition did not equalize the potentials of foreign and domestic banks. It also suggests that while innovative products and practices of foreign banks may give them a head start in early periods, over a longer horizon they are not the single decisive factors for their faster credit growth. Foreign banks' broader access to additional funding may account for their ability to display higher credit growth than domestic peers.

The 2008-2009 crisis led to a significant decline in lending of both domestic and foreign banks. However foreign banks were somewhat stronger affected than domestic banks. Despite their higher credit growth in periods of stability, this paper finds that, in a crisis scenario, foreign banks reduced their lending at a faster pace than did so domestic banks. It may mean that foreign banks' credit decisions respond not only to the conditions in the host market, but also to factors, such as the conditions in home markets as well as the parent's willingness and ability to maintain exposure to the host country.

Among foreign owned banks, the reduction in lending growth is largest among greenfield banks than among banks that resulted from takeovers of established local banks. This suggests a stronger relationship between greenfield banks and their foreign parents, suggesting as well a relatively higher degree of independence among takeover banks and parents.

Interestingly, in the aftermath of the crisis credit growth appears to be unrelated to the characteristics of foreign banks and their standalone strength. It once again indicates that foreign banks credit decisions are largely determined by exogenous factors such as parents' appetite for exposure to the host country. Subsequent research may expand on analysis of the situation in home countries and the impact on credit growth in host countries.

As differences in credit growth appear to be dependent on ownership structure and integration with international financial institutions, it is a big concern to ensure the continuous willingness of external counterparts to conduct business in the host countries. While during the last crisis as deleveraging emerged, some banks committed to support their subsidiaries in Central and Eastern Europe through the launch of Vienna Initiative and it reduced deleveraging, the regulation of cross-border banking activities has to be established in a more sustainable way.

Possible crisis contagion through international banks does not mean the economies should be closed - foreign banks still have a certain positive impact. It rather means that closer coordination between regulatory institutions in host and home countries should be established to reduce the risk and negative impact of sudden withdrawal of credit.

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APPENDIX. Summary of the data set.

Table A 1. Banks included in the dataset by ownership and country

		CZ	EE	HR	HU	LT	LV	PL	RO	SI	SK	Total
2004	Domestic	3	1	14	2	4	5	2	6	4	2	43
	Takeover	7	2	4	6	0	0	0	3	1	6	29
	Greenfield	2	0	3	10	4	4	6	8	3	3	43
	ALL	**12**	**3**	**21**	**18**	**8**	**9**	**8**	**17**	**8**	**11**	**115**
2005	Domestic	3	1	14	2	3	7	5	5	5	2	47
	Takeover	7	2	4	6	0	0	8	5	1	6	39
	Greenfield	2	1	3	12	4	5	7	9	3	4	50
	ALL	12	4	21	20	7	12	20	19	9	12	136
2006	Domestic	4	0	15	4	4	12	6	5	7	2	59
	Takeover	7	2	4	7	0	0	8	5	1	6	40
	Greenfield	4	1	5	13	4	5	9	9	4	5	59
	ALL	**15**	**3**	**24**	**24**	**8**	**17**	**23**	**19**	**12**	**13**	**158**
2007	Domestic	4	2	15	2	4	10	7	4	6	1	55
	Takeover	7	3	8	8			8	6	1	6	47
	Greenfield	6	1	6	14	6	5	9	8	5	5	65
	ALL	**17**	**6**	**29**	**24**	**10**	**15**	**24**	**18**	**12**	**12**	**167**
2008	Domestic	2	2	14	3	4	8	6	3	7	0	49
	Takeover	7	2	8	6	0	3	9	8	1	7	51
	Greenfield	4	1	6	11	5	4	8	7	5	7	58
	ALL	**13**	**5**	**28**	**20**	**9**	**15**	**23**	**18**	**13**	**14**	**158**

2009	Domestic	2	1	16	4	4	8	5	3	7	1	51
	Takeover	8	2	8	6	0	2	12	8	1	7	54
	Greenfield	5	1	5	9	5	4	10	9	5	7	60
	ALL	**15**	**4**	**29**	**19**	**9**	**14**	**27**	**20**	**13**	**15**	**165**
2010	Domestic	3	1	17	3	4	7	5	4	7	1	52
	Takeover	8	2	8	6	0	2	12	7	1	6	52
	Greenfield	4	1	5	9	5	4	9	8	5	6	56
	ALL	**15**	**4**	**30**	**18**	**9**	**13**	**26**	**19**	**13**	**13**	**160**
2011	Domestic	3	2	15	3	3	6	4	2	8	0	46
	Takeover	7	2	8	4	0	1	11	8	1	6	48
	Greenfield	4	1	5	7	6	4	8	8	5	6	54
	ALL	**14**	**5**	**28**	**14**	**9**	**11**	**23**	**18**	**14**	**12**	**148**
	Total	**113**	**34**	**210**	**157**	**69**	**106**	**174**	**148**	**94**	**102**	**1207**

Table A 2. Variable description

The table reports variables description and source of obtaining it. Bankscope refers to Bureau van Dijk's BankScope database; IFS refers to International Financial statistics.

Variable Name	Description	Source
	Bank level data	
Foreign	Equals 1 if a bank is foreign	Bankscope, websites, De Haas (2011a)
Crisis2008 (2009)	Equals 1 for obseravtions in year 2008 (2009)	-
Gross loans growth	Annual percentage growth of gross loans	Bankscope
Size (log)	Log of total assets in thousands of USD	Bankscope
Solvency	Equity/net loans (%)	Bankscope
Efficiency	Cost to income ratio (%)	Bankscope
Liquidity	Liquid assets /(Deposits + short-term funding) (%)	Bankscope
Net loans to deposits	Net loans / short-term funding (%)	Bankscope
Profitability	Return on average assets (%)	Bankscope
Deposit growth	Annual percentage growth in deposits	Bankscope
	Country level data	
GDP growth	Real GDP growth (%)	IFS
Inflation	Change in CPI inflation, end of period (%)	IFS

Table A 3. Pairwise correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Domestic	1.00											
(2) Foreign	-1.00	1.00										
(3) Greenfield	-0.54	0.54	1.00									
(4) Takeover	-0.46	0.46	-0.49	1.00								
(5) Loan growth	0.03	-0.03	0.01	-0.05	1.00							
(6) Size	-0.36	0.36	-0.07	0.44	-0.16	1.00						
(7) Solvency	0.10	-0.10	0.02	-0.12	0.17	-0.32	1.00					
(8) Efficiency	0.04	-0.04	0.02	-0.07	0.10	-0.39	0.13	1.00				
(9) Liquidity	0.17	-0.17	-0.05	-0.13	0.16	-0.24	0.47	0.08	1.00			
(10) Net loans to deposits	0.04	-0.04	0.02	-0.07	-0.08	-0.01	-0.16	-0.14	-0.16	1.00		
(11) Profitability	0.05	-0.05	-0.05	0.00	0.08	0.13	0.03	-0.53	0.03	0.12	1.00	
(12) Deposit growth	-0.01	0.01	0.03	-0.02	0.05	-0.01	-0.01	-0.01	-0.02	0.02	0.04	1.00