THE STABILITY OF THE CREDIT SUPPLY IN THE GLOBALIZED BANKING SECTOR ENVIRONMENT: THE CASE OF THE EU NEW MEMBER STATES-10

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Abstract:

The influence of foreign banks on a host country's lending depends on several factors, including the policy of the parent bank, the strategy of entry, economic cycles in the home country and abroad, growth prospects, the indebtedness of commitments and the capital adequacy of the parent bank. During the most recent economic crisis, the credit supply of foreign banks in the 10 new European Union (EU) Member States has not remained stable in the crisis. More specifically, we find evidence that foreign banks have cut the credit supply slightly in the new EU Member States.

Keywords: credit supply, cyclicality, stability, crisis, foreign ownership
JEL Classification: E32, E51, F34, G21

1. Introduction

Globalization provides banks with more opportunities to diversify their business strategies, thus reducing the exposure of the banks to particular markets. On the other hand, the low cost of entry into foreign markets intensifies competition among banks and consequently increases their exposure to the risks of international financial shocks. This is the reason why globalization has intensified the effects in terms of the exposure to international shocks and leads to a greater systemic risk.

In order to assess the banking sector's vulnerability to the global environment, we tested the hypothesis that foreign bank ownership has impacted credit supply stability during the financial crisis in the analysed host countries. We analysed the relationship between the loan supplies of foreign banks in the host economies during the period of the recent financial crisis. In our estimates for the European Union (EU) new Member States-10 (NMS-10), we also tried to find evidence for the hypothesis that the foreign banks reacted pro-cyclically to changes in the host country's macroeconomic environment. When economic growth in the host countries decelerates, the foreign banks in the host country might attempt to scale down the credit supply in favour of other profitable regions and may also be encouraged to decelerate the credit supply growth, due to increased bad loan performance.

The rest of the paper is structured as follows. The characteristics of the macro environment in the NMS countries are summarized in Section 2. In Section 3, we present an overview of the empirical literature regarding the stability of the credit supply. In Section 4,

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a theoretical background of the empirical analysis, discussion of the data, methodology of the empirical analysis and the results are explained in detail. The implications of the empirical analysis are revisited in the conclusions.

2. The Macro Environment in NMS Countries before and during the Crisis

Most of the NMS-10 banking sectors, having undergone similar structural changes over a relatively short period of time, share some common structural characteristics. Foreign banks have significantly contributed to the transformation of the banking sector in the NMS-10, owing partly to the increasing integration of the EU banking sectors.[1]

Economic growth in the NMS countries has been high and widespread. Domestic demand boosted by a foreign-financed boom in bank lending, the positive impact of foreign direct investment (FDI), the import of capital goods, real wage growth on the back of productivity gains, and export growth, have all contributed to GDP growth after EU accession. Since the less-developed economies required investment levels that exceeded domestic savings, the NMS countries financed part of their investment through FDI. The extensive current account deficits were financed by a steady increase in the net-inflow of FDI, net portfolio investment and foreign currency loans. Credit growth in the NMS countries has been largely foreign-funded. Loans to the private sector grew at a rapid pace during the period from 2002 to 2007. Bank credit has remained an important source of financing for both investment and consumption.

The structural dependence on external financing in the NMS countriess, which is, in part, a by-product of the effect of the low levels of internal savings, have led to extensive current account deficits and financial instability in recent years. Despite solid foreign direct investment coverage and the recovery of export growth, the sustainability of the external imbalance has been an issue of concern. Broad-based contraction in economic activity, accompanied by a strong decline in both exports and imports, could already be seen at the end of 2007 and continued through 2008. This trend remained in 2009 and 2010. In 2011–2013, the NMS countries were slightly recovering. The deleveraging of economic subjects is a normal process in a post-crisis period.

The deterioration of the economic outlook after 2007 resulted in a substantial increase in the share of distressed banking assets throughout the region, for both the retail and corporate sector. The non-performing loans (NPLs) for the entire banking sector have been increasing rapidly. This began in the second half of 2008.

Given the dependency of the local economies on external funding, primarily in the form of international private debt and foreign direct investment, the receding capital inflows meant a constraint on growth. The international liquidity crisis was reflected in the drying up of the international interbank and debt markets, as well as in the higher cost of external funding. Since most of the NMS banks belong to international banking groups, the NMS banking industry was partially protected from the crunch, as parent banks acted as a lender of last resort for their own subsidiaries. While trying to rebalance the business mix leveraging on the deposit collection strategies, the economic crisis also pushed banks out of the lending market.

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1   The NMS-10 used different strategies for privatization (Festić *et al.*, 2010).

The low demand for credit and rising concerns about credit quality are behind this credit crunch, rather than liquidity concerns. Uncertainty over income and employment prospects, coupled with the tightening of credit standards, has been responsible for a visible adjustment in household sector behaviour. This has resulted in a weakening dynamic of consumption expenditures and borrowing during the period from 2008 to 2011. Within this context of high unemployment and low consumption, the retail sector can only slowly develop its potential. Lending activity in the corporate sector has also remained subdued and is expected to remain tied to deposit generation capacity.

In the aftermath of the global crisis, the economic environment in the NMS countries showed signs of recovery in the first half of 2011. The driver of the current recovery is corporate business as the engine of future growth. The economic convergence process between the NMS countries and Western Europe is still ongoing, although with a more rebalanced economic model.

3. An Overview of the Empirical Literature about the Role of Foreign Banks on the Stability of the Loan Supply in Host Countries

This section provides an overview of the findings of previous research investigations with regard to questions about the role of foreign banks on the stability of the loan supply in host countries. It is expected that in the case of shocks, foreign banks can promptly leave the host country, thus reducing their operations in the local market more than domestic banks, who have less possibilities when it comes to portfolio diversification. Additionally, Galindo *et al.* (2010) demonstrated that in a global financial environment, cross-border shocks quickly transmit the loan supply volume - as the loan volume offered by foreign banks subsidiaries to borrowers in host countries responds to the shock more quickly and more intensely than the loan volume of domestic banks.

The stress experienced by internationally active banks appears to have limited the supply of cross-border lending due to the fact that cross-border bank lending is one of the channels through which the crisis propagated to emerging markets (Takáts, 2010). According to Kamil and Rai (2009) liquidity restrictions reduced both cross-border lending and the number of foreign bank affiliates in host economies. According to Schnabl (2011) after the shock, international banks reduced bank-to-bank lending in the host economies. The weakest effect occurred among locally-funded banks. These results suggest that bank-to-bank lending establishes an international transmission channel for liquidity shocks and that foreign bank ownership mitigates, rather than amplifies, transmission through this channel. The propagation of the global credit crunch was significantly more muted in countries, where most of the foreign banks' lending was channeled in domestic currency.

Megginson (2005) stated that the stability of the credit supply was made possible by a good credit portfolio and lower share of non-performing loans (NPL). Clarke *et al.* (2003) argued that the lending volume contracted after the sale of domestic banks to foreign buyers, due to subsequent portfolio cleaning. Weller (2000) confirmed that the arrival of foreign banks is connected to a lower loan supply of domestic banks, while their lending portfolio quality improves. Excessive caution in lending activity can lead to a contraction of the loan supply and lending volume that only reaches its previous level several years after the sale.

Popov and Udell (2010) found strong evidence that the credit tightening of foreign banks, in the relatively early stages of the crisis, was caused by the low equity ratio, low Tier 1 capital ratio and losses in the financial assets of the parent bank. Navaretti *et al*. (2010) proved that the banks' foreign affiliates in Europe have been faring well during the recent financial crisis and that the retail and corporate lending of foreign affiliates has been stable overall, but was increasing between 2007 and 2009. According to Arena *et al.* (2006), the arrival of foreign banks in a less-developed banking environment has, to a certain extent, contributed to the stability of the loan supply. Galindo, Micco and Powell (2003) noted that foreign banks can stabilize the loan supply when domestic deposits are in a crisis.

Goldberg (2002) argued that the international operations of foreign banks do not correlate substantially with the business cycle specificities of the host countries. Similarly, Cull and Martínez-Peria (2007) confirmed that the demand responsiveness of foreign banks to the specificities of the host-country environment decreases by increasing the aggregate exposure of the host country.

If there is a slowdown of economic growth in the local economy, the first thing to be reduced is the lending activity of foreign bank affiliates and their subsidiaries. Lending will be redirected in favour of other regions, where the economic dynamics are more favourable. Therefore, the correlation between lending operations in the host country and the cycles of the local economy is positive (Goldberg, 2005). This relationship intensifies with the weakening of the parent bank.

Cull and Martínez-Peria (2007) claimed that countries with a major share of foreign banks were confronted with a more significant crisis in comparison with countries that had a smaller presence of foreign banks. In the case of the more pro-cyclical reaction of foreign banks in the host country, as a response to the cycles, the loan supply of foreign banks is found to be unstable (Morgan and Strahan, 2003). Even Stiglitz (2002) claimed that financial stability in times of globalization and the arrival of foreign banks was questionable. Studies that confirmed better financial and loan supply stability in host countries at the time of the arrival of foreign banks in NMS countries were found to be incomplete.

4. Empirical Analysis: Theoretical Background of the Explanatory Variables, Data Specification, Methodology, and Empirical Results

4.1 Theoretical background

The choice of explanatory variables in the model reflects the evidence provided by the large amount of empirical literature. The theoretical background of the empirical analysis is supported and explained in the following paragraphs:

Low bank capitalization (and low deposits with banks) can often lead to the adoption of imprudent lending strategies with direct implications for banks' loan portfolios, which tend to be heavily skewed towards high risk projects. On the other hand, high deposits with banks offer ample liquidity and enough banking finances to offer more credit to the private sector. The impact of savings with banks (as bank deposits to the GDP ratio) on the quality of the loan portfolio and credit supply stability is thus ambiguous (Babihuga, 2007). The loan-assets ratio is positively correlated with banking problems, increasing the NPL ratio and insolvency as a result of the bank's long-term mismanagement (Männasoo and Mayes, 2009).

The increased banking sector concentration has a negative impact on financial soundness (Uhde and Heimeshoff, 2009) due to the axiom that high deposits with banks offer ample liquidity in the banking sector and enough banking finances to offer more credit to the private sector (Podpiera, 2006). Excessive credit lending is usually associated with a decreasing capital ratio (Dell'Ariccia and Marquez, 2006). The higher the banking sector concentration and the higher the financial sector depth, the more possibilities the banks have for offering more credit – subsequently resulting in more non-performing loans (and creating lower capital adequacy).

Loans and investments represent two competing sources of income. It indicates that a loss on a bank hedge will cause a retrenchment, whereas an increase prompts the bank to increase its credit potential and credit supply (Galindo, Micco and Powell, 2003). On the other hand, a higher value of securities, used as collateral, stimulates credit growth (Haddad and Hakim, 2009).

The share of a bank's loans to the private sector in total banking assets is considered a proxy of risk taken by the banks. If the available banking finances come from abroad, foreign banks ensure a stable credit supply. The loan to deposit ratio could be used as a proxy for the loans that come from abroad (Männasoo and Mayes, 2009; Fofack, 2005).

The higher the banking sector concentration, the higher the ownership of foreign banks, the more foreign direct investment in the financial sector comes from abroad and the higher the financial sector depth, the more possibilities the banks have for offering more credits, ensuring a stable credit supply and creating lower capital adequacy (Podpiera, 2006; Popov and Udell, 2010).

A higher degree of compliance with Basel core principles are associated with a narrower interest rate margin, while excessive credit lending and the stability of the credit supply are usually associated with a decreasing capital ratio (see Kaufmann, Kraay and Mastruzzi, 2009; Dell'Ariccia and Marquez, 2006). According to Podpiera (2006), a higher degree of compliance with Basel core principles is associated with a more narrow interest rate margin. Banks with higher deposit rates have more deposit funding and lower interest rate margins. Banks with larger loan and deposit shares tend to have higher interest margins. Moreover, according to Uhde and Heimeshoff (2009), the passing through of increased short-term interest rates to deposit rates contributes to an increase in banks' funding costs and leads to higher loan interest rates – subsequently resulting in more non-performing loans.

The reaction of foreign banks abroad depends on the capital adequacy of the parent bank and the business opportunities in the host economies (see De Haas and Lelyveld, 2006; Cull and Martínez-Peria, 2007; Navaretti, 2010). The compliance with the Basel Core Principles index is highly correlated with institutional conditions, like an index of government effectiveness and an index for measuring the rule of law (Kaufmann, Kraay and Mastruzzi, 2009).

The theoretical underpinning lending channel is that a contraction shrinks banks' reserves and consequently banks' deposits. Furthermore, banks with larger loans and deposit shares tend to have higher interest margins and a more stable credit supply (*more in* Ferreira, 2008; Agoraki *et al.*, 2009; D'Avack and Levasseur, 2007). The banking sector reserves, or the reserve ratio, can be used as a measure of the deposits to loans ratio and *vice versa* (Ferreira, 2008). On the other hand, the banks may offer more credit to clients having more (time) deposits in banks (Männasoo and Mayes, 2009).

4.2 Data specification

We analysed the relationship between the loan supply of foreign-owned banks in host economies and macro/banking sector variables as a source of determinants influencing the share of individual foreign bank credits relative to the total loans in the country as a proxy for the stability of the loan supply. This was accomplished in order to assess the banking sector's vulnerability to a financial crisis regarding the ownership structure, using the panel regression method.[2] Due to an unavailability of some data for the NMSs, we defined approximations for the variables stated in the chapter above (see Section 4, Theoretical background).

The stability of the credit supply is expressed by the proxy market share of foreign-owned banks in the NMS countries expressed as bank credit (in billions (bn) of domestic currency and deflated by the consumer price index) relative to the total loans of the banking sector in the country (in bn of domestic currency and deflated by the consumer price index) and utilized for the dependent variables in our analysis. The largest foreign banks were included in our observations with their balance sum in individual NMS countries.

Originally, the following time series for explanatory variables was considered. The non-performing loans (NPL) variable is expressed as the share of total assets (in bn of domestic currency and deflated by the consumer price index). The banks' loans to the private sector (*i.e.* loans to households and corporations, as obtained from banks in the individual country) as a share of deposits are considered the proxy for the degree to which funding comes from abroad. The banks' investments are expressed as a percentage share of the total banking assets. A time dummy that identifies the timing of the financial crisis and ownership (as an actual percentage of foreign ownership expressed as the sum of the foreign bank's balance sheet liabilities plus equity capital relative to the same item of the entire banking sector in the individual NMS country)[3] were included as additional explanatory variables. The ratio between cash flow hedges and the banks′ total loans (in bn of domestic currency, real terms) is used to measure any losses in derivative positions. A positive difference indicates that a bank has actually profited on its hedges, whereas a negative value indicates a loss. The index of the rule of law is used as a rough measure of creditor protection and as an institutional explanatory variable. We also included the interaction effect between the income level (expressed as average income per employee) and the business cycle (divided into the categories of low, middle and high) as an indicator of the procyclicality between the purchasing power and the economic cycle.

To control for a potential endogeneity problem (as explained later in the methodology section), several instrumental variables were employed. These include a financial sector depth measure (proxied by the deposits of the analysed banks relative to GDP, expressed in bn of domestic currency, in real terms), a market concentration measure (proxied by the assets of the foreign bank relative to the total banking sector assets in the NMSs), capital adequacy (as a share of capital to the risk-weighted assets of the parent bank, as a rough measure of the quality of regulation and supervision, and

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2   The sources of our panel data are the quarterly financial statements of banks, the central bank database and Bankscope (2011).

3   The variables related to individual foreign banks were integrated into one time series for the individual economy by weighting the size of the institution.

the robustness of the banking system), the reserve ratio (as minimum reserves, provisioning and secondary liquidity reserves relative to the deposits of the analysed banks, expressed in bn of domestic currency, in real terms), deposit rates (proxied by the interest expenses to the deposits of the analysed banks in real terms), the net interest margin (measured as a bank's net interest revenues as a share of the interest bearing – total earnings – assets of the analysed banks in the NMSs, in real terms) and the government effectiveness index as an institutional variable.

All nominal variables expressed in national currencies are corrected by an individual country's appropriate deflator(s) (using the second quarter of 2010 as the base). They were converted into EUR by using the exchange rate of the second quarter of 2010. We relied on quarterly financial statements of banks, Bankscope data and central banks' databases. The quarterly time series was used for the period from the first quarter of 1999 to the second quarter of 2010, to explain the banks' market share dynamics as a proxy for the stability of the loan supply in the NMSs.

4.3 Methodology

According to the similarities between the analysed economies, we decided to use a panel regression and obtain more information about the analysed parameters. This method controls for the omitted variables that are persistent over time and, by including the lags of the regressors, potentially alleviates the measurement errors and endogeneity bias. The advantage of the applied method is that it lowers the co-linearity between the explanatory variables. It also dismisses heterogeneous effects. By using the differences of the variables expressed as percentage changes, the problem of spurious regression is avoided.[4]

A long-term relationship for all of the variables could not be established, perhaps due to the transformational changes that occurred in the NMS countries or with specific events on the credit market and banking sector during the transition period. We decided to use a parsimonious model with four lags proposed by the Schwarz criterion. We also included the time dummy variable with a value of 1 during the financial crisis from the middle of 2007.[5]

The following variables may suffer from endogeneity: the loan to deposit ratio, the non-performing loan to asset ratio, derivative cash flow relative to loans and investments relative to assets.[6] In this case, a bias in the estimation could arise from the correlation between the vector of explanatory variables and the error term. To control for the problem of endogeneity of some variables, we eliminated the simultaneous causality bias by choosing suitable instrumental variables and employing a two stage least squares (TSLS) estimation (Hahn and Hausman, 2002; Murray, 2006).

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4   Since the dynamics of the NPL, stock exchange index returns, loan to deposit ratio and derivatives are sometimes considerable, the logarithmic approximation would produce a significant downward bias in the estimation (Lütkepohl and Xu, 2009).

5   Variables are seasonally adjusted by the X-12 ARIMA seasonal adjustment method on the basis of quarter-on-quarter data. The lag length selection in the specified model is based on the Akaike and Hannan-Quinn information criteria.

6   The correlations and endogeneity of used variables (as explanatory and instrumental variables in our empirical analysis) are explained in the Section 4 (Theoretical background).

We employed the following set of instrumental variables, which should be correlated with the offending regressors, according to economic theory: financial sector depth, capital adequacy, market concentration, the reserve ratio, deposit rates, net interest margins and the government effectiveness index.[7] Instrumental variable methods rely on two assumptions (Staiger and Stock, 1997): (i) the excluded instruments are distributed independently of the error process (*i.e.* instruments are valid), and (ii) the instruments are sufficiently correlated with the included endogenous regressors (*i.e.* the instruments are not weak). In our case, the Hansen-Sargan statistic of overidentifying restrictions does not reject the null hypothesis that the instrumental variables are uncorrelated with the error term. The rejection of the null hypothesis of the Kleibergen-Paap test, on the other hand, suggests that the chosen instruments are not weak (Table 1).[8]

The estimation results for the fixed and random effects model estimated by the TSLS are presented in Table 1.[9] Given the high p-values of the Hausman test (Hausman 1978), both fixed effects and random effects produce consistent estimators, but fixed effects are less efficient. We accept the hypothesis of no autocorrelation in the residuals, with high probabilities and low Q-statistics.

4.4 Empirical results and discussion

A positive cash flow under the heading of derivative financial instruments adds to the growth of the loan volume. The sign of the derivatives variable indicates that an increase on a bank hedge prompts the bank to increase its market share. Banks that employ several derivative financial instruments with hedging and speculation thus diversified the risk with the parent bank. Likewise, as the rule of law index increases, bank increases the credit supply and gains more of a market share, according to our empirical analysis.

An increase in a bank's investments reduces its credit supply, as banks shift funds away from loans to other sources of revenue. Non-performing loans (to assets) indicate that banks retrench their lending operations when its non-performing loans increase. Irrespective of ownership, banks will reduce their lending activity by means of a necessary balance sheet and capital adequacy amendments, especially during the crisis.

The crisis variable suggests that the financial crisis caused the growth in the bank credit to slow (with a low coefficient of -0.025/-0.027) as a consequence of the deleveraging process of all economic subjects and deterioration of the loan portfolio quality. At the same time, the ownership structure does affect the stability of the credit supply in the NMS host economies (with a relatively low coefficient of -0.034/-0.037). The impact of the ownership structure in an economic crisis is statistically significant, but relatively weak. In fact, the negative sign suggests that foreign banks have actually decreased their market share of loans during the period of the crisis: the higher the share of foreign banks subsidiaries in the host economies banking sector, the less stable the credit supply during

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7   In the paragraphs of Section 4, Theoretical background, we discussed the economic reasoning behind the correlations between the proposed (instrumental) variables and the used explanatory variables (suffering from endogeneity).

8   Research by Kleibergen and Paap (2006) led to the development of a robust version of the weak instrument test statistic that solves the previously mentioned problems and, additionally, does not require i.i.d. errors (see also Kleibergen and Schaffer, 2007).

9   All the calculations were performed using E-views 6.0 and Stata 10.

the financial crisis. Foreign bank owners suffered a stronger impact from the global financial crisis and are more strongly inclined to a cross-border shock import. The loan supply of foreign banks in a host economy has proven to be less stable according to our results. More specifically, foreign banks have lower exit costs, they are more vulnerable to shocks manifested in the host country and can, in the case of a crisis, simply leave their market shares, even at a loss, and leave the host country.

Table 1 | Panel Regression Results for the NMS Countries

Dependent Variable: d(Market share of foreign bank loans as a proxy for the stability of the loan supply), Cross-sections included: 10 (the first quarter of 1999 - the second quarter of 2010), n=420		
Variable	**TSLS fixed effects**	**TSLS random effects**
C	0.2481 (2.2720) (0.0255)**	0.2893 (2.5540) (0.0123)**
d(Non-performing loans)$_{(-3, -1)}$	-0.1099 (-3.1181) (0.0025)***	-0.1303 (-3.5234) (0.0007)***
d(Loan to deposit ratio)$_{(-2, -4)}$	0.1743 (2.0415) (0.0442)**	0.1764 (2.0325) (0.0450)**
d(Derivatives)$_{(-2, -3)}$	0.6691 (3.2978) (0.0014)***	0.6654 (3.2389) (0.0017)***
d(Investment to assets)$_{(-3, -2)}$	-0.1984 (-3.0951) (0.0026)***	-0.2227 (-3.3079) (0.0013)***
d(Income level to cycle)$_{(-4, -1)}$	0.0220 (3.1551) (0.0022)***	0.0207 (2.8974) (0.0047)***
d(Stock exchange index)$_{(-4, -2)}$	-0.0649 (-2.1185) (0.0369)**	-0.0729 (-2.3273) (0.0222)**
d(Ownership)$_{(-2, -1)}$	-0.0340 (-2.6794) (0.0088)***	-0.0370 (-2.8833) (0.0049)***
Crisis	-0.0253 (-2.4499) (0.0162)**	-0.0272 (-2.5777) (0.0116)**
d(Rule of law)$_{(-1, 0)}$	0.2395 (2.5618) (0.0121)**	0.2575 (2.6907) (0.0085)***

Table 1 | Continuation

Weighted Statistics		
R-squared (Adjust.)	0.5236 (0.4433)	0.5073 (0.4369)
S.E. of regression	6.6759	6.7142
F-statistic	4.4061	5.7019
Prob(F-statistic)	0.0000	0.0000
Random and Fixed Effects Tests (Prob.)		
Hausman Random Effects Test	-	(0.7794)
Redundant Fixed Effects Test	(0.0175)	-
Kleibergen-Paap Test	(0.00417)	(0.00000)
Hansen-Sargan Test	(0.6781)	(0.7548)

Variables:
Market share of loans: expressed as credits of foreign banks to total banking sector credits in the NMSs as a proxy for the stability of the loan supply; Non-performing loans: expressed as loans over 90 days past due relative to bank's assets; Loan to deposit ratio: expressed as loans to the private sector as a share of a bank's deposits; Derivatives: cash flow hedges as returns or losses on derivative positions relative to bank's loans; Investment to bank assets: expressed as the ratio of bank investments to bank's assets; Income level to cycle: the interaction effect between the income level (as average income per employee) and the business cycle (expressed as low, middle and high); Stock exchange index returns; Ownership: the share of foreign ownership in host economies as the sum of foreign bank's balance sheet liabilities plus equity capital relative to the same item of the entire banking sector in the NMSs; Crisis: the time dummy as the timing of the financial crisis; Rule of law: expressed as index.

Instrumental variables:
MC: market concentration (proxied by the assets of foreign banks relative to total banking sector assets), FSD: financial sector depth (proxied by the deposits of the analysed banks relative to GDP), CA: capital adequacy (measured as capital to risk weighted assets of the parent bank), RR: reserve ratio (as minimum reserves, provisioning and secondary liquidity reserves relative to deposits of the analysed banks), DR: deposit rates (proxied by interest expenses to the deposits of the analysed banks), GE: government effectiveness index, NIM: net interest margin (measured as a bank`s net interest revenues as a share of interest bearing – total earnings – assets of the analysed banks in the NMS countries).

Notes:
d(x) denotes the difference of the variable as a percentage change (measured in percentage points). In the first part of the table, the t-statistics are given in brackets below the coefficients and the p-values are in brackets below the t-statistics. Significance levels are denoted as: *** significant at 1%; ** significant at 5%; * significant at 10%. The time lag of the variable is given in subscripts: lags of the first and the second model are in brackets subscripted in the variable column.

* The constants of the individual NMS in the first model panel analysis are on an interval from -0.7498 to +0.1754.

It can be stated that there is a positive correlation between the business cycle of the host country and the loan supply of foreign banks in this environment. The results prove that foreign banks contribute to the increase of credit cycle dynamics in relation to the

business cycles of the local economy. Therefore, entering a host country - especially through foreign bank subsidiaries - provides no assurance of loan supply stability.[10]

It is expected that in the case of shocks, foreign banks can promptly leave the host country, thus reducing their operations in the local market due to more possibilities when it comes to portfolio diversification.

Liquidity restrictions reduced both cross-border lending and the number of foreign bank affiliates in host economies. After the shock, international banks reduced bank-to-bank lending in the host economies. These results suggest that bank-to-bank lending establishes an international transmission channel for shocks and that foreign bank ownership mitigates, rather than amplifies, transmission through this channel.

The reaction of foreign banks is depending on the health of the parent bank. The credit tightening of foreign banks, in the relatively early stages of the crisis, was caused by the low equity ratio, low Tier 1 capital ratio and losses in the financial assets of the parent bank.

The international operations of foreign banks (subsidiaries) do not correlate substantially with the business cycle specificities of the host countries. The demand responsiveness of foreign banks to the specificities of the host-country environment decreases by increasing the aggregate exposure of the host country.

If there is a slowdown of economic growth in the local economy, the first thing to be reduced is the lending activity of foreign bank affiliates and their subsidiaries. Lending will be redirected in favour of other regions, where the economic dynamics are more favourable. Therefore, the correlation between lending operations of foreign banks (subsidiaries) in the host country and the cycles of the local economy is positive. This relationship intensifies with the weakening of the parent bank.

5. Conclusions

Foreign banks entering a host country through foreign bank subsidiaries provide no assurance of loan supply stability. The financial crisis leads to a retrenchment of credits by foreign banks in the NMS-10 countries, while foreign bank owners were more likely to feel a stronger impact from the global financial crisis and were also more strongly inclined to feel cross-border shocks. The loan supply of foreign banks (subsidiaries) is substantially pro-cyclical in relation to the cycles of the host country.

The impact of the ownership structure in an economic crisis is statistically significant, but relatively weak. In fact, the negative sign suggests that foreign banks (subsidiaries) decreased the credit supply and their market share of loans in the host NMS countries during the period of the crisis. This may be a consequence of the deleveraging process of all economic subjects, capital adequacy of the parent bank, growth prospects of host economy, leverage ratio of real sector and households, as well the exposure to host economies.

References

Agoraki, M. K., Delis, M. D., Pasiouras, F. (2009), "Regulations, Competition and Bank Risk Taking in Transition Countries." available at: [http://mpra.ub.uni-muenchen.de/16495/], (7 October 2010).

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10 The stability of the loan supply requires independent foreign banks in the host economies (see Ribnikar, 2010).

Arena, M., Reinhart, C., Vázquez, F. (2006), "The Lending Channel in Emerging Economies: Are Foreign Banks Different?" *NBER*, Working Paper, No. 12340.

Babihuga, R. (2007), "Macroeconomic and Financial Soundness Indicators: An Empirical Investigation." IMF Working Paper, No. 07/115, Washington.

Clarke, G., Cull, R., Martínez-Peria, M. S., Sánchez, S. M. (2003), "Foreign Bank Entry: Experience, Implications for Developing Economies and Agenda for Further Research." *The Worlds Bank Research Observer,* Vol. 18, No. 1, pp. 25–59.

Cull, R., Martínez-Peria, M. S. (2007), "Foreign Bank Participation and Crises in Developing Countries." World Bank Policy Research Working Paper, No. 4128. Washington: World Bank.

D'Avack, F., Levasseur, S. (2007), "The Determinants of Capital Buffers in CEECs." Paris: OFCE Centre de recherche en économie, Working Paper, No. 28. Available at: [http://www.ofce.sciences-po.fr/pdf/dtravail/WP2007-28.pdf], (3 October 2010).

De Haas, R., Lelyveld, I. (2006), "Foreign Banks and Credit Stability in Central and Eastern Europe: A Panel Data Analysis." *Journal of Banking and Finance,* Vol. 30, No. 7, pp. 1927–1952.

Dell'Ariccia, G., Marquez, R. S. (2006), "Lending Booms and Lending Standards." *Journal of Finance,* Vol. 61, No. 5, pp. 1045–1066.

Ferreira, C. (2008), "The Banking Sector, Economic Growth and EU Integration." *Journal of Economic Studies,* Vol. 35, No. 6, pp. 512–527.

Festić, M., Kavkler, A., Repina, S. (2010), "The Macroeconomic Sources of Systematic Risk in the Banking Sectors of Five New EU Member States." *Journal of Banking and Finance,* Vol. 35, No. 2, pp. 310–322.

Fofack, H. (2005), "Non-Performing Loans in Sub-Saharan Africa: Causal Analysis and Macroeconomic Implications." Policy Research Working Paper, No. 3769, Washington: World Bank.

Galindo, A. J., Izquierdo, A., Rojas-Suárez, L. (2010), "Financial Integration and Foreign Banks in Latin America: How Do They Impact the Transmission of External Financial Shocks?" *Inter-American Development Bank*, IDP-WP, No. 116.

Galindo, A., Micco, A., Powell, A. (2003), "Loyal Lenders or Fickle Financiers: Foreign Banks in Latin America." Inter-American Development Bank, Research Department Working Paper, No. 529. Washington: DC.

Goldberg, L. (2002), "When Is Foreign Bank Lending to Emerging Markets Volatile?" In S. Edwards and J. Frankel (eds.), Preventing Currency Crises in Emerging Markets, NBER and University of Chicago Press.

Goldberg, L. (2005), "The International Exposure of United States Banks." NBER Working Paper, No. 11365. Cambridge and National Bureau of Economic Research.

Haddad, M., Hakim, S. (2009), "How Foreign Banks Contributed to the Spread of the Global Financial Crisis in Saudi Arabia?" Presented at the conference "Shocks, vulnerability and therapy" in Cairo. November, available at: [http://www.erf.org.eg/cms.php?id=conferences_details&conference_id=33], (7 September 2010).

Hahn, J., Hausman, J. A. (2002), "A New Specification Test for the Validity Instrumental Variables." *Econometrica,* Vol. 70, No. 1, pp. 163–189, http://dx.doi.org/10.1111/1468-0262.00272

Hausman, J. A. (1978), "Specification Test in Econometrics." *Econometrica*, Vol. 46, No. 6, pp. 1251–1272, http://dx.doi.org/10.2307/1913827

Kamil, H., Rai, K. (2009), On the Eve of Retrenchment? The Effect of the Global Credit Crunch on Foreign Banks' Lending in Emerging Markets, Working Paper, No. 09/54. Washington: International Monetary Fund.

Kaufmann, D., Kraay, A., Mastruzzi, M. (2009), "Governance Matters VIII: Governance Indicators for 1996–2008." *World Bank Policy Research Paper*, No. 2195. Washington: WB.

Kleibergen, F., Paap, R. (2006), "Generalized Reduced Rank Tests Using the Singular Value Decomposition." *Journal of Econometrics,* Vol. 133, No. 1, pp. 97–126.

Kleibergen, F., Schaffer, M. E. (2007), "Ranktest: Stata Module for Testing the Rank of a Matrix Using the Kleibergen-Paap rk Statistic." Available at: [http://ideas.repec.org/c/boc/bocode/s456865.html] (15 February 2010).

Lütkepohl, H., Xu, F. (2009), "The Role of Log Transformation in Forecasting Economic Variables." CESifo Working Paper, No. 2591. München: Center for Economic Studies.

Männasoo, K., Mayes, D. G. (2009), "Explaining Bank Distress in Eastern European Transition Economies." *Journal of Banking and Finance,* Vol. 33, No. 2, pp. 244–253.

Megginson, W. (2005), "The Economics of Bank Privatization." *Journal of Banking and Finance,* Vol. 29, No. 4, pp. 2119–2154.

Morgan, D., Strahan, P. (2003), "Foreign Bank Entry and Business Volatility: Evidence from U.S. States and Other Countries." *NBER Working Paper*, No. 9710. Cambridge: National Bureau of Economic Research.

Murray, M. P. (2006), "Avoiding Invalid Instruments and Coping with Weak Instruments." *Journal of Economic Perspectives,* Vol. 20, No. 4, pp. 111–132, http://dx.doi.org/10.1257/jep.20.4.111

Navaretti, G. B., Calzolari, G., Pozzolo, A. F., Levi, M. (2010), "Multinational Banking in Europe: Financial Stability and Regulation Implications. Lessons from the Financial Crisis." CEPR Discussion Paper, Vol. 40, No. 2, pp. 1–44.

Podpiera, R. (2006), "Does Compliance with Basel Core Principles Bring Any Measurable Benefits*?" IMF Staff Papers,* Vol. 53, No. 2, pp. 306–325.

Popov, A., Udell, G. F. (2010), "Cross-Border Banking and the International Transmission of Financial Distress during the Financial Crisis of 2007–2008." ECB Working Paper Vol. 1203, No. 6, pp. 1–51.

Ribnikar, I. (2010), *Vloga tujih bank v državah gostiteljicah novih članicah EU (The role of foreign banks in host economies NMSs).* Gradivo za vlado Republike Slovenije (The material prepared for the government of the Republic of Slovenia).

Schnabl, P. (2010), "Financial Globalization and the Transmission of Bank Liquidity Shocks: Evidence from an Emerging Market." *Journal of Finance,* Vol. 67, No. 3, pp. 897–932.

Staiger, D., Stock, J. H. (1997), "Instrumental Variables Regression with Weak Instruments." *Econometrica*, Vol. 65, No. 3, pp. 557–586, http://dx.doi.org/10.2307/2171753

Stiglitz, J. (2002), *Globalization and Its Discontents*. New York: W.W. Norton & Company.

Takáts, E. (2010), "Was It Credit Supply? Cross-Border Bank Lending to Emerging Market Economies during the Financial Crisis." *BIS Quarterly Review*, Vol. 167, No. 6, pp. 40–56.

 Uhde, A., Heimeshoff, U. (2009), "Consolidation in Banking and Financial Stability in Europe: Empirical Evidence." *Journal of Banking and Finance,* Vol. 33, No. 2, pp. 1299–1311.

Weller, C. E. (2000), "Financial Liberalization, Multinational Banks and Credit Supply: The Case of Poland." *International Review of Applied Economics,* Vol. 14, No. 2, pp. 193–211.