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Determinants of the credit growth in CESEE countries[3]

Summary

Although the issue of determinants of the credit growth is not new in the literature, we re-examine this issue, taking into account some novel variables, such as the crisis dummy, the financial safety net (FSN) index and the ruling party dummies. In this study we analyse the credit growth in 20 countries from Central, Eastern and South-Eastern Europe (CESEE) with a special focus on the ownership structure of banks (state-owned, owned by international development banks, foreign-owned and domestic private-owned). We apply panel data regression to bank-level data, combined with country-specific data for the period from 1995 to 2014 (more than 3.500 observations). We find that banks owned by development banks are the least expansive, while state-owned banks are the most expansive in the growth of credit. Moreover, the credit growth was the highest when the ruling party is marked as 'centrist'. The crisis does not have a negative impact on the credit growth, however, there have been not too many crisis events in CESEE countries.

Keywords: banks, credit growth, ownership structure

1. Introduction

Although the issue of determinants of the credit growth is not new in the literature, we re-examine this issue taking into account some novel variables, such as a crisis dummy, financial safety net (FSN) index and the ruling party dummies. In this study we analyse the credit growth in 20 countries from Central, Eastern and South-Eastern Europe (CESEE), with a special focus on the ownership structure of banks (state-owned, owned by international development

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banks, foreign-owned and domestic private-owned). Our goal is to assess how important the ownership structure for the credit growth in CESEE countries was. We apply panel data regression to bank-level data combined with country-specific data for the period from 1995 to 2014 (more than 3.500 observations).

2. Literature review

The literature devoted to the credit growth focuses either on the country-level or bank-level approach. In this paper we analyse the behaviour of banks in the credit growth, depending on their ownership structures and we apply the bank-level approach. Usually three types of banks are differentiated: state-owned, domestic private-owned and foreign-owned banks. Important conclusions are related to the so-called parent-subsidiary nexus[4], within which the impact of the parent company and its home country situation on the subsidiaries' credit growth is analyzed. However, in this study we do not explore the parent-subsidiary nexus. For example, de Haas and van Lelyveld[5] analysed 250 banks from CEE (domestic banks and subsidiaries, which were divided into "greenfields" and "take-overs") for 1993–2000. The differentiation between those two groups of banks was very important at an earlier stage, when foreign banks started to enter the countries in transition. At the current stage, however, we find it not so much important, especially because of many ownership changes during the global financial crisis (GFC).

The impact of foreign ownership was regarded as an advantage before the outbreak of the global financial crisis, because foreign investors from industrialized countries were treated as a source of stability for their local subsidiaries. It was the case in, e.g. de Haas and van Lelyveld[6]. After 2008, foreign ownership of banks showed a different face. Foreign-owned banks reduced their credit growth more than domestic-owned and state-owned banks. It was analysed by

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[4] E.g. R. Cull, M.S. Martínez Pería, *Bank ownership and lending patterns during the 2008–2009 financial crisis: Evidence from Latin America and Eastern Europe*, "Journal of Banking and Finance" 2013, vol. 37(12), pp. 4861–4878; F. Allen, K. Jackowicz, O. Kowalewski, Ł. Kozłowski, *Bank lending, crises, and changing ownership structure in Central and Eastern European countries*, "Journal of Corporate Finance" 2015, doi: 10.1016/j.jcorpfin.2015.05.001 (article in press).

[5] R. De Haas, I. van Lelyveld, *Foreign banks and credit stability in Central and Eastern Europe. A panel data analysis*, "Journal of Banking and Finance" 2006, vol. 30(7), pp. 1927–1952.

[6] Ibidem.

Cull and Martínez Pería[7], De Haas and van Lelyveld[8] and Allen et al.[9]. Moreover, Iwanicz-Drozdowska and Witkowski[10] indicated that foreign ownership should not be treated as a monolith, because e.g. subsidiaries owned by global systemically important banks (G-SIBs) were more influenced by their parents than subsidiaries owned by other banks. The issue of G-SIBs became extremely important on the political agenda after the outbreak of the GFC. The state ownership in the banking sector was quite often criticized in transitioning countries, however state-owned banks proved to be a stable source of financing, especially during the GFC[11].

Our contribution to the literature is as follows. In comparison with previous studies we expand the timeframe of the analysis (until 2014) and the number of CESEE countries (including all Balkan states, Ukraine and Belarus). We also introduce novel variables, namely a crisis dummy, financial safety net (FSN) index[12] and the ruling party dummies. Additionally, we differentiated between the credit growth measured in the local currency and the credit growth measured in euro in order to find out whether there any differences.

3. Methodology and data

Based on an extensive literature review and a selection of novel variables, the following variables were selected as potential regressors (see Table 1).

Bank financial data (taken from Bankscope) may be presented both in the national (local) currency and in a foreign currency (e.g., USD or EUR). According

[7]   R. Cull, M.S. Martínez Pería, op.cit.

[8]   R. De Haas, I. van Lelyveld, *Multinational banks and the global financial crisis: Weathering the perfect storm?*, "Journal of Money, Credit and Banking" 2014, vol. 46(1), pp. 333–364.

[9]   F. Allen, K. Jackowicz, O. Kowalewski, Ł. Kozłowski, op.cit.

[10]   M. Iwanicz-Drozdowska, B. Witkowski, *Credit growth in Central, Eastern, and South-Eastern Europe: The case of foreign bank subsidiaries*, "International Review of Financial Analysis" 2016, vol. 43, pp. 146–158

[11]   E.g. A. Micco, U. Panizza, *Bank ownership and lending behavior*, IDB Working Paper no. 431, 2004; A.C. Bertay, A. Demirgüç-Kunt, H. Huizinga, *Bank ownership and credit over the business cycle: Is lending by state banks less procyclical?*, "Journal of Banking and Finance" 2015, vol. 50(1), pp. 326–339.

[12]   Methodology of FSN index was presented in: M. Iwanicz-Drozdowska. *Sieć bezpieczeństwa finansowego. Gdzie szukać liderów?*, in: *Przełamywanie dysonansów poznawczych jako czynnik stymulowania rozwoju nauk o finansach*, eds A. Karmańska, J. Ostaszewski, Oficyna Wydawnicza SGH, Warszawa 2016.

to our knowledge, so far researchers have not differentiated between estimation of the credit growth in the local currency and in euro (or US dollar). The results obtained based on the local currency neglect any changes in the foreign exchange rate (except profits/losses on FX operations as a part of the pre-tax profit) for all items denominated in the local currency, while in the case of e.g. euro – take into account the impact of changes in the foreign exchange rate on the banks' size, credit volume etc. Given it is important in the case of a cross-country analysis, we consider both cases.

Table 1. Selected variables

Notation	Definition	Expected sign	Source of data
GDP_growth	Real GDP relative annual change, $(GDP_t - GDP_{t-1})/ GDP_{t-1}$	+	WB database
NIR_change	Nominal interest rate relative annual change, $(NIR_t - NIR_{t-1})/ NIR_{t-1}$	–	WB database and central banks websites
OWNER	Type of the ownership: development banks (1), domestic private (2), foreign (3), state (4)	+/–	Annual statements and websites, Bankscope, enquires
CRISIS	Dummy variable (1 if crisis occurred)	–	IMF, own
FSN_index	Compound index for financial safety net	+/–	own
PARTY	Ruling party dummy: C (central), CL (central-left), CR (central-right), L (left), R (right)	+/–	own
ROE	Profit after tax to average equity	+/–	Bankscope
D_L	Deposits from customers to loans to customers	+	Bankscope
CAP	Capital ratio defined as equity to assets	+	Bankscope
NIM	Net interest margin	+	Bankscope
IMPAIR_ASSETS	Impairment charges to assets	–	Bankscope
EQUITY_growth	Annual real equity capital growth; in national currency and in EUR	+	Bankscope and WB database for inflation
LOAN_growth	Annual real loans growth (gross); in national currency and in EUR	Dependent variable	Bankscope and WB database for inflation

Source: own

Table 2. Descriptive statistics

Variables	In local currency				In euro			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
LOAN_growth	0.221544	0.398814	−0.88966	3.570269	0.194565	0.368688	−0.892	3.09399
GDP_growth	0.026026	0.041032	−0.1435	0.109016	0.026024	0.040938	−0.1435	0.109016
NIR_change	0.002107	1.450007	−0.91687	20.81818	0.002178	1.451604	−0.91687	20.81818
crisis	exists in 6.54% cases				exists in 6.54% cases			
FSN_index	1.920061	0.614448	0	3.75	1.920925	0.614308	0	3.75
ROE	0.028576	0.350158	−7.6627	5.7017	0.028222	0.349913	−7.6627	5.7017
D_L	1.203823	1.810901	0	89.66666	1.205329	1.812451	0	89.66666
CAP	0.159103	0.158407	−4.4621	1.0000	0.159103	0.158407	−4.4621	1.0000
NIM	0.048897	0.033782	−0.2071	0.4067	0.048888	0.033795	−0.2071	0.4067
IMPAIR_ASSETS	0.012304	0.024518	−0.225	0.549719	0.012317	0.02454	−0.225	0.549719
EQUITY_growth	0.181381	0.601894	−8.60654	17.08253	0.159996	0.588873	−8.25673	17.08253

Source: own. Based on WB database, Bankscope, central bank websites, bank annual statements, IMF and hand-collected data.

The general specification of the model can be written as:

$$Loan\_growth_{it} = x'_{it}\beta + \varepsilon_{it}, \tag{1}$$

where the dependent variable is the real relative growth of the total values of loans granted by the i-th bank in year t compared with year $t-1$, x'_{it} represents the characteristics of the bank and selected macroeconomic variables of the country where the bank is located, β stands for the vector of parameters and ε_{it} represents the error term. Two separate models are considered. In model 1 the dependent variable and equity capital real growth are expressed in the local currency. In model 2 those variables are expressed in euro. Descriptive statistics are presented in tables 2 and 3.

Table 3. Descriptive statistics for dummy variables

Variable	In local currency		In euro	
	Frequency	Percent	Frequency	Percent
OWNER:				
develop	77	2.13%	77	2.14%
domestic private	1036	28.71%	1035	28.74%
foreign	2180	60.40%	2174	60.37%
state	316	8.76%	315	8.75%
PARTY:				
C	303	8.40%	299	8.30%
CL	1173	32.50%	1173	32.57%
CR	1466	40.62%	1463	40.63%
L	342	9.48%	341	9.47%
R	325	9.01%	325	9.03%

Source: own. Based on Bankscope, bank annual statements, and hand-collected data.

Given the panel character of the data set, numerous approaches are possible. Those include one of the specifications with individual effects (which would require expanding the above specification by their inclusion), as well as a number of possible assumptions regarding the error term. In this paper we use the specification without individual effects, however, allow for heteroscedasticity, as well as bank-specific first order autocorrelation. There are a few reasons to adopt this particular approach. Firstly, it is doubtful whether there should be any systematic autonomic (in the sense of not being caused by the variables included as regressors) characteristic drifts of banks' credit growth as it is the

change (and not the level) of loans that is modelled. Furthermore, using the relative instead of absolute value of the change of credit volume wipes out the differences due to the bank size only. Secondly, the dataset used in the process of estimation contains numerous items and consists of closed population of banks in the observed 20 countries over the 1995–2014 period (yet the observations from 1995 are only used to compute the difference in the value of loan over the 1995–1996 period). The fact that the dataset consists of a complete, closed population suggests that the individual effects – if they were to be included in the model – should rather be of fixed than of random character. However, the parameters in β would then be identified using the within-bank basis only. Thirdly, the generalized least squares (GLS) approach that is used to estimate the above specification allows for the use of the total within-bank and between-bank information, as well as for the heteroscedasticity and bank-specific first order autocorrelation, which are suggested by the use of proper tests. Given the fact that there is a total of 525 banks in the sample, this requires estimating over 1.000 parameters in the first step of the feasible GLS procedure, however, the total number of observations used for the estimation purposes equals 3.553 (the minimum number of a single bank time-series = 2, the maximum number of a single bank time-series = 15 while the average number of a single bank time series = 6.77) for the model based on the national currency data and 3545 (minimum number of a single bank time-series = 2, maximum number of a single bank time-series = 15 while the average number of a single bank time series = 6.75) for the model based on the data expressed in euro, which should be viewed as sufficient to properly capture the covariance structure of the error term. The slight difference in the sample sizes stems from the fact that some observations were dropped in the estimation process. This was done for two reasons. Firstly, the observations on mergers in the year of the merger were eliminated due to the fact that in the year of the merger they might have a significant impact on the credit growth and, as such, did not really reflect *the same bank's* credit growth. A similar approach was applied by De Haas and van Lelyveld[13]. Apart from the technical difficulties, the bank after merging should also not be treated as the same bank and the time series of the observations on – theoretically – the same bank do not indeed reflect the data on *the same* statistical unit. Secondly, 1% of the observations with the highest increase in the credit value were eliminated. These were basically two types of banks: (1) the above described mergers, (2) very small banks which recorded low changes of the credit volume in absolute terms,

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[13] R. De Haas, I. van Lelyveld, *Multinational banks…*, op.cit.

yet a huge one in relative terms (consider a bank for which the value of loans granted equals 1.000 USD in year t and 10.000 USD in year $t + 1$ – although the change is not palpable in absolute terms, the relative nominal change is merely 1.000% p.a., which would be only slightly reduced in real terms due to inflation for most of the countries). The banks with unnaturally high increase of the loan value are thus treated as outliers (with the 14.800% p.a. increase being the top absolute real change as opposed to the median of about 15.91% in local currencies and 13.05% in euro) and eliminated not to affect the estimates of the model. Depending on the currency used, a few of the mergers did or did not fall into these top 1% observations, which brings about the minor difference in the number of observations in both structures. It should be emphasized that while the results are robust to the tested estimation approaches (fixed effects, random effects, pooled OLS, GLS with general first order autocorrelation with or without heteroscedasticity) which provided similar results, failing to omit the above described outliers results in mostly inconclusive estimates.

4. Empirical results

Tables 4 and 5 present results of estimations for the local currency (model 1) and for euro (model 2). The reason to present both of them is to verify robustness of the results. In both models almost all considered factors are found significant (assuming $p < 0,05$ hereafter). However model 1 does not provide confirmation of the relevance of the capital ratio. One more variable which raises doubts is annual growth of equity capital, whose impact is found to be positive in one case, while negative in the other case. Apart from these two, all the other results are consistent between the two models.

The credit growth in the local currency is strongly determined by the net interest margin (NIM), GDP growth (positively) and impairment charges (negatively). These results show that the overall economic situation in a given country matters for banks' decisions to grant credits. The net interest margin is the leading indicator for traditional banks focused on deposits and loans, while impairment charges show the scale of 'bad loans' in credit portfolios. Those ratios maybe regarded as "stick and carrot" (NIM – carrot, impairment charges – stick) driving banks' credit growth. Other variables have far lower impact, with the growth of equity capital being the most doubtful.

Table 4. Credit growth in local currency

Variables	Coef.	Std. Err.	z	P > z
GDP_growth	2.47565	0.05270	46.98	<0.001
NIR_change	–0.00437	0.00097	–4.49	<0.001
OWNER:				
domestic private	0.06674	0.03791	1.76	0.078
foreign	0.10503	0.03791	2.77	0.006
state	0.08066	0.03800	2.12	0.034
CRISIS	0.06005	0.00907	6.62	<0.001
FSN_index	–0.09158	0.00309	–29.59	<0.001
PARTY:				
CL	–0.08230	0.00341	–24.17	<0.001
CR	–0.06738	0.00442	–15.25	<0.001
L	–0.06087	0.01575	–3.86	<0.001
R	–0.07302	0.01014	–7.20	<0.001
ROE	0.06250	0.00691	9.04	<0.001
D_L	–0.00135	0.00034	–3.95	<0.001
CAP	–0.03085	0.03372	–0.92	0.360
NIM	1.49536	0.06000	24.92	<0.001
IMPAIR_ASSETS	–0.47836	0.08431	–5.67	<0.001
EQUITY_growth	–0.00353	0.00082	–4.28	<0.001
_cons	0.25256	0.03902	6.47	<0.001

Source: own. Based on WB database, Bankscope, central bank websites, bank annual statements, IMF and hand-collected data.

The ownership structure dummies have been included in the model with the ownership by the development banks treated as a reference category. The banks owned by any other parents (foreign capital, state, domestic private capital) represented *ceteris paribus* higher credit growth, yet the difference between these three is mere and not consistently confirmed between the two models. As a consequence, it can be concluded that the development banks are trailing behind the others. Another set of dummies was introduced to control for the political option that rules the country with the centrally oriented government being the reference category. In the case of all non-central parties there was a *ceteris paribus* average slower credit growth. The credit growth was decreased by a well-developed financial safety net (denoted by the FSN index), while in the crisis period the credit growth was faster than otherwise. The reason for the above might be that on the one hand, the well-developed financial safety net requires banks to usually pay more contributions for its tasks, but on the other hand, it may

exercise a more restrictive policy. If the crisis occurred in CESEE countries its positive impact may be associated with extensive credit growth of banks owned by foreign capital. This conclusion is in line with Allen et. al.[14]

Table 5. Credit growth in euro

Variables	Coef.	Std. Err.	z	P>z
GDP_growth	2.34267	0.05074	46.17	<0.001
NIR_change	–0.00452	0.00079	–5.73	<0.001
OWNER:				
domestic private	0.08302	0.03203	2.59	0.010
foreign	0.07872	0.03206	2.46	0.014
state	0.05200	0.03240	1.60	0.109
CRISIS	0.04057	0.00604	6.71	<0.001
FSN_index	–0.07159	0.00344	–20.81	<0.001
PARTY:				
CL	–0.05423	0.00371	–14.60	<0.001
CR	–0.02070	0.00379	–5.47	<0.001
L	–0.06678	0.00728	–9.17	<0.001
R	–0.04310	0.00737	–5.85	<0.001
ROE	0.04517	0.00504	8.97	<0.001
D_L	–0.00099	0.00040	–2.49	0.013
CAP	–0.08052	0.01022	–7.88	<0.001
NIM	1.37537	0.03001	45.83	<0.001
IMPAIR_ASSETS	–0.42614	0.07896	–5.40	<0.001
EQUITY_growth	0.10039	0.00424	23.70	<0.001
_cons	0.16435	0.03324	4.94	<0.001

Source: own. Based on WB database, Bankscope, central bank websites, bank annual statements, IMF and hand-collected data.

Although the conclusions that can be drawn from both models are not identical, the crucial ones are almost the same and the results can be viewed as highly robust.

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[14] F. Allen, K. Jackowicz, O. Kowalewski, Ł. Kozłowski, op.cit.

5. Discussion and conclusions

We find no fundamental differences in the results of the models estimated with the use of financial data in the local currency (model 1) and in euro (model 2). On the one hand, we can conclude that the type of the currency plays no significant role in modelling. On the other hand, there still are *some* differences in the results. In our models differences appeared for the growth of equity and the capital ratio. Thus, we call for further research in that respect. We find it very important in the case of strong depreciation of the local currency (it was the case of Hungary in 2008 and the following years).

We find that GDP growth and the net interest margin (NIM) play a significant role for the credit growth, while the impact of other variables is mostly less important. GDP growth shows an overall macroeconomic situation and stimulates (or destimulates during economic downturn) the economic activity. The banks operating in CESEE countries are traditional banks, so the special attention is paid to NIM. Attractive NIM encourages managers to expand banks' activities.

Our novel variables, namely the crisis dummy, the financial safety net index and political dummies are statistically significant but their impacts vary. A well-developed financial safety net curtailed the credit growth, as well as other ruling parties than 'centrist', assuring political moderation. The financial crisis in CESEE countries did not have any negative impact on the overall credit growth, which is not in line with expectations. This may be explained by the fact that in most of the countries, the banking sector is dominated by foreign capital (except Belarus, Hungary, Moldova, Slovenia and Ukraine) and foreign-owned banks strived to treat the crisis events as an opportunity to increase their market shares in comparison with other banks. The use and impact of all those variables require further research.

In this study we did not explore the parent-subsidiary nexus in order to present differences in the credit growth of banks with different owners. This problem also requires further research, especially for pre-crisis and crisis/post-crisis periods. The analysis of the situation of the parent companies and their home countries shall shed some new light on the determinants of foreign-owned banks' behaviour. In this respect, our study should be treated as an initial step.

References

Allen F., Jackowicz K., Kowalewski O., Kozłowski Ł., *Bank lending, crises, and changing ownership structure in Central and Eastern European countries*, "Journal of Corporate Finance" 2015, doi: 10.1016/j.jcorpfin.2015.05.001 (article in press).

Bertay A.C., Demirgüç-Kunt A., Huizinga H., *Bank ownership and credit over the business cycle: Is lending by state banks less procyclical?*, "Journal of Banking and Finance" 2015, vol. 50(1), pp. 326–339.

Cull R., Martínez Pería M.S., *Bank ownership and lending patterns during the 2008–2009 financial crisis: Evidence from Latin America and Eastern Europe*, "Journal of Banking and Finance" 2013, vol. 37(12), pp. 4861–4878.

De Haas R., van Lelyveld I., *Foreign banks and credit stability in Central and Eastern Europe. A panel data analysis*, "Journal of Banking and Finance" 2006, vol. 30(7), pp. 1927–1952.

De Haas R., van Lelyveld I., *Multinational banks and the global financial crisis: Weathering the perfect storm?*, "Journal of Money, Credit and Banking" 2014, vol. 46(1), pp. 333–364.

Iwanicz-Drozdowska M., *Sieć bezpieczeństwa finansowego. Gdzie szukać liderów?*, in: *Przełamywanie dysonansów poznawczych jako czynnik stymulowania rozwoju nauk o finansach*, eds A. Karmańska, J. Ostaszewski, Oficyna Wydawnicza SGH, Warszawa 2016.

Iwanicz-Drozdowska M., Witkowski B., *Credit growth in Central, Eastern, and South-Eastern Europe: The case of foreign bank subsidiaries*, "International Review of Financial Analysis" 2016, vol. 43, pp. 146–158

Micco A., Panizza U., *Bank ownership and lending behaviour*, IDB Working Paper no. 431, 2004.

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Czynniki wzrostu akcji kredytowej w krajach Europy Wschodniej, Środkowej i Południowej

Streszczenie

Niniejszy artykuł przedstawia czynniki wzrostu akcji kredytowej, których analiza nie jest nowa w literaturze, jednakże wykorzystano w niej nowe zmienne, takie jak zmienna sztuczna kryzysu, indeks sieci bezpieczeństwa finansowego (FSN) oraz zmienna sztuczna dotycząca formacji politycznych rządzących w danym kraju. Analizie poddano wzrost akcji kredytowej w 20 krajach Europy Wschodniej, Środkowej i Południowej (EWŚP) ze specjalnym uwzględnieniem typu własności (banki państwowe, banki będące własnością: międzynarodowych banków rozwoju, banków zagranicznych oraz krajowego kapitału prywatnego). Wykorzystano analizę danych

panelowych w kontekście danych banków połączonych z danymi makroekonomicz-nymi dla lat 1995–2014 (ponad 3500 obserwacji). Stwierdzono, że banki będące własnością banków rozwoju były najmniej ekspansywne w zakresie wzrostu akcji kredytowej. Ponadto, wzrost akcji kredytowej był najwyższy, jeżeli formacja rządząca reprezentowała „centrum". Kryzys nie miał negatywnego wpływu na wzrost akcji kre-dytowej, chociaż należy wziąć pod uwagę to, że w krajach EWŚP kryzysy bankowe występowały sporadycznie.

Słowa kluczowe: banki, wzrost akcji kredytowej, struktura własności

Zgodnie z oświadczeniami autorów, udział każdego z nich w tworzeniu artykułu jest równy.