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Macroeconomic and Institutional Determinants of Non-performing Loans

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Abstract: This paper aims to analyse macroeconomic and institutional empirical determinants of growth of NPL ratios. Research is focused on selected CEEC and SEE countries in the period 2006-2013. For our analysis we use static panel model approach with the logarithm of share of NPLs to total loans as a dependent variable. As independent variables we used a combination of country-specific macroeconomic and financial indicators which are commonly used in reference literature, as well as relevant institutional variables. Our results show that there is a negative relationship between increases in GDP and rise of the NPL ratio. Along with GDP, foreign currency loans ratio and level of exchange rate are positively related with the increase of NPL ratio. This confirms the expectation that countries where domestic currency is not the main medium of credit placements will have larger problems with the level of NPLs, which is even more pronounced in periods of domestic currency depreciation. In the presented models, the inflation rate is reported as statistically insignificant for sample countries. In the group of institutional variables, only financial market level of development is reported as statistically significant in relation to the level of NPL - with a more developed financial market the level of NPLs should be lower.

Keywords: Non-performing loans (NPLs), CESEE, financial stability, credit risk

JEL classification: G20, G28, G32, F34

Introduction and Literature Overview

After the initial fall in the early 2000s, the share of non-performing loans (NPLs) to total gross loans has been relatively stable across most countries in the world. However, after the financial crisis hit the global economy in 2007-2008, NPL shares rose considerably. Growth of NPL shares varied significantly across different groups of countries (Figure1).

Figure 1: Bank non-performing loans to total gross loans (%) in selected groups of countries, 1998-2014
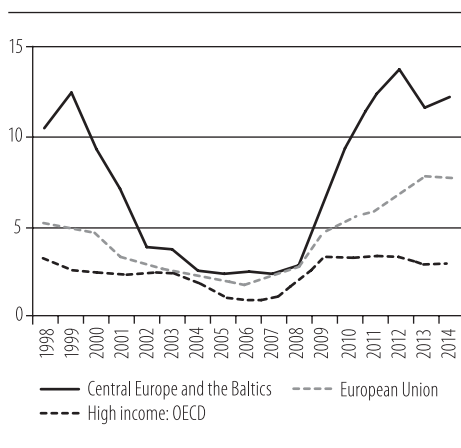
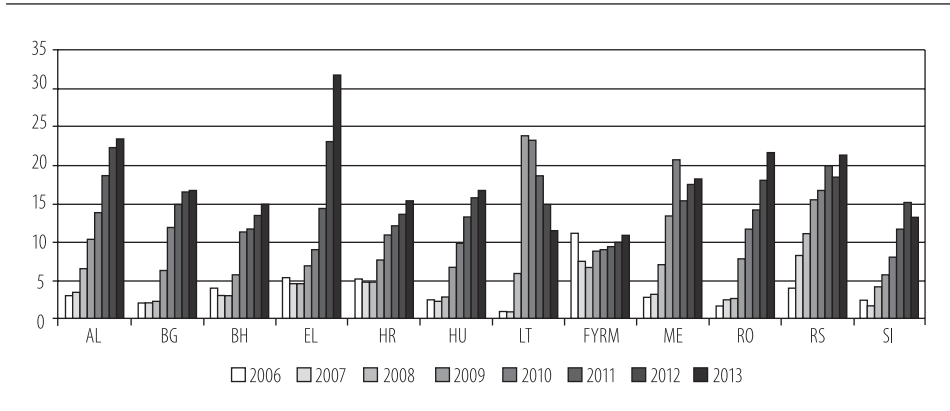Source: World Development Indicators (country groups according to the World Bank classification)

In Central Europe and the Baltics, NPL began to increase after the onset of the economic crisis in 2008 and 2009. Growth rate of NPL ratios was much higher compared to EU as a whole or compared to high-income OECD countries. High and rising shares of NPLs continue to exert strong pressure on many Central and Eastern and South-Eastern Europe (CESEE) economies, with credit risk as one of the main risks for financial stability in this region.

The aim of this paper is to analyse macroeconomic and institutional empirical determinants of growth of NPL ratios. Research focuses on selected CEEC and SEE countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Lithuania, Montenegro, FYR Macedonia, Romania, Serbia and Slovenia) in the period 2006-2013. The upward trend of NPL shares started after the outbreak of the crisis in 2008, but the loan performance deterioration was rather uneven across the countries (Figure 2). Before the onset of the crisis, in 2006, an average (unweighted) share of NPLs in selected countries was 3.83%, growing in 2013 to 18.1% of total gross loans. Among the selected countries, at the beginning of the crisis, the greatest rise of the NPL ratio was recorded in Lithuania. Nevertheless, while Lithuania's NPL shares recorded continuous fall between 2010 and 2013, all other countries in the sample recorded steady growth of NPL shares over the same period [1]. After 2010, Greece had the largest growth

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[1] With several exceptions: Montenegro in 2011, Serbia in 2012, and Slovenia in 2013.

rates of NPL ratios and the highest share of NPL (31.9% of total gross loans) at the end of the observed period.

Figure 2: Bank nonperforming loans to total gross loans (%) for selected countries 2006-2013.
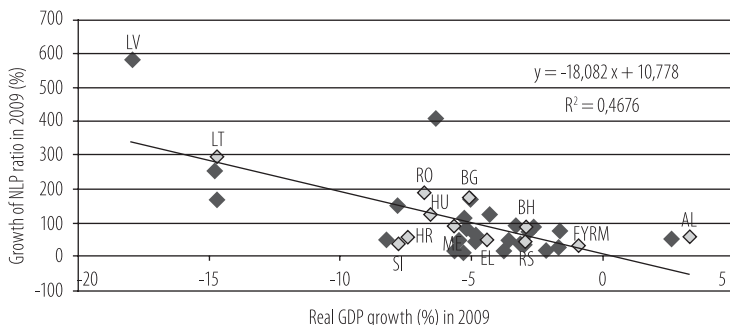

Source: World Development Indicators

Many empirical studies confirm that the share of nonperforming loans is linked to economic cycles. A simple analysis based on presumption that GDP is the only determinant of NPL growth shows that growth of NPL ratio was very uneven across countries in 2009 when controlled for the effect of GDP change (Figure 3)[2]. Obviously, a lot of other factors play a significant role in explaining cross-country differences. Simple cross-country regression shows that in 2009, NPLs in Latvia grew much faster than it was predicted by the regression line[3]. A similar situation yet not so severe was in Bulgaria, Albania and Romania. On the other hand, NPL ratio growth rates in Slovenia and Croatia were lower than one would expect according to the regression line.

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[2] Regression is performed for 38 countries (EU countries, non-EU CESEE countries included into analysis in this paper, USA, Switzerland, Norway, Russian Federation, Turkey and Ukraine). Lighter coloured markers refer to the countries from the sample used in this paper.
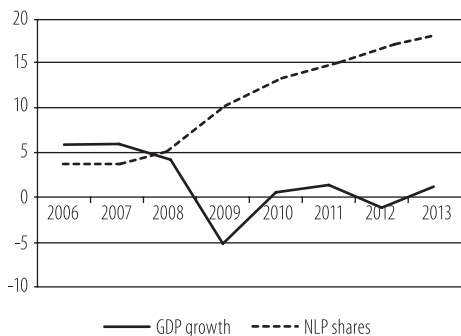
[3] Similar conclusion was reached by Beck et al. (2013) whose dataset was considerably larger.

Figure 3: Growth of NPL ratio and real GDP growth in 2009

Data: World Development Indicators

Figure 4: Average real GDP growth and NPL shares in selected countries, 2006-2013.

Data: Eurostat, World Development Indicators

Nevertheless, although the highest average growth of NPL ratios in all selected countries was recorded in 2009, together with the main strike of the crisis, the rise of NPL ratios continued even when deterioration of macroeconomic indicators ended (Figure 4).

Determinants of NPL growth can be divided into three main groups: macroeconomic factors, institutional factors and bank-level factors.

Key macroeconomic variables that influence growth in NPL share are: GDP growth, (un)employment rate, exchange rate, inflation, interest rate, stock prices and house prices. There is vast and significant empirical evidence that confirm countercyclical behaviour of the NPLs. A slowdown in the economy is likely to decrease employment rates, available income decreases, and borrowers have greater difficulties in servicing their debts. Large strand of the literature has been devoted to analysing key macroeconomic determinants of NPLs. Reinhart & Rogoff (2010) point out that NPLs can be used to mark the onset of a banking crisis. The literature and evidence from the recent financial crisis suggest that credit risks have become more responsive to deteriorating economic conditions during crisis times (Drehmann

and Manning, 2004; Virolainen, 2004; Alves, 2004; Pesaran et al., 2006; Peura and Jokivuolle, 2004; Bangia et al., 2002)[4]. Rinaldi & Sanchis-Arellano (2006) analyse household NPLs for a panel of European countries and provide empirical evidence that disposable income, unemployment, and monetary conditions have a strong impact on NPLs. Berge & Boye (2007) find that problem loans were highly sensitive to the real interest rates and unemployment for the Nordic banking system over the period 1993–2005. According to Espinoza & Prasad (2010), who estimated a dynamic panel over 1995–2008 on a sample of around 80 banks of the Gulf Cooperation Council region, NPL ratio rises as economic growth becomes lower and interest rates increase. In their paper on macroprudential stress testing of credit risk, Buncic & Melecky (2012) obtained estimates of the elasticities of NPLs to the four macroeconomic variables of interest by means of a dynamic panel data regression, using a panel of 54 high- and middle-income countries and controlling for the degree of development, financial deepening, and dollarization (euroization) in the period from 1994 to 2004. Explanatory variables were real GDP growth, CPI inflation, the (ex post) real interest rate, and the change in the nominal U.S. dollar exchange rate for each country, while the vector of control variables comprises the log of GDP per capita, the credit-to-GDP ratio and the share of foreign currency loans in total loans. Buncic & Melecky (2012) find the exchange rate changes and control variables not to be statistically significant. They explain statistical insignificance of the exchange rate by the two opposing effects of depreciation: a positive income effect and the negative balance sheet effect. In normal times, local currency depreciation has a positive income effect through increase in net exports, and thereby also the repayment capacity of borrowers in an open economy. During times of financial crisis, the local currency value of FX denominated debt and its servicing cost can increase considerably (Buncic & Melecky, 2012, p. 26.). Increases in lending rates and inflation are expected to lead to an increase in NPLs. Nkusu (2011) investigates the macroeconomic determinants of the NPL ratio in panel regressions for 26 advanced economies in the period from 1998 to 2009 and her results confirm that adverse macroeconomic developments, in particular a contraction of real GDP, a higher unemployment rate, higher interest rates, a fall in house prices and a fall in equity prices are associated with rising NPLs. De Bock & Demyanets (2012) performed dynamic panel regressions on the basis of annual data that include the lagged dependent variable and unobserved country effects in order to determine the factors driving bank assets quality in 25 emerging market countries during 1996-2010. They also used the structural panel Vector Auto Regressions to quantify effects of credit contraction or NPL ratio increases on the real economy. Results of this study show that real GDP contraction, currency depreciation, and weaker terms

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[4]   See Buncic & Melecky (2012), p. 29.

of trade are independently associated with higher NPL levels. Similar results are reached by Beck, Jakubík & Piloiu (2013). They used a data panel set covering 75 advanced and emerging economies over ten years (2000-2010). Dynamic panel estimates showed that real GDP growth, share prices, the nominal effective exchange rate of the local currency, and the bank lending interest rate significantly affect changes in the NPL ratios. Louzis, Vouldis & Metaxas (2011) use dynamic panel data methods to examine the determinants of NPLs in the Greek banking sector. Their results show that macroeconomic variables, specifically the real GDP growth rate, the unemployment rate, the lending rates, and the public debt have a strong effect on the level of NPLs. Messai & Jouini (2013) analyzed the determinants of non-performing loans on a sample of 85 banks in three countries (Italy, Greece, and Spain) for the period of 2004-2008, using the method of panel data. They found the problem loans varied negatively with the growth rate of GDP and positively with the unemployment rate and the real interest rate. Makri, Tsaganos & Bellas (2014) applied the difference GMM estimation to analyse the determinants of the NPL rate in Euro area's banking systems for the period 2000-2008. Their findings reveal strong correlations between NPL and various macroeconomic factors (public debt, unemployment, annual percentage growth rate of gross domestic product) and bank-specific factors (capital adequacy ratio, rate of nonperforming loans of the previous year, and return on equity).

There are several recent studies based on the macro approach using panel techniques that focus on CEEC and SEEC. Jakubik & Reininger (2013) analysis of determinants of NPLs is based on the panel data set for CESEE countries (Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Russia, Slovakia and Ukraine). Their results show that economic growth is the main driver that is negatively correlated with NPL development. Other important determinants of NPL change are also identified: past credit growth and exchange rate changes coupled with the share of foreign currency loans in total loans. Klein (2013) investigates NPLs in CESEE in the period of 1998–2011. NPLs were found to respond to macroeconomic conditions, such as GDP growth, unemployment, and inflation.

Other available studies focusing on CESEE countries using the macro approach are mostly country-specific. Erjavec, Cota & Jakšić (2012) studied the interaction between the banking sector and the macroeconomy using the VAR methodology. They found a strong sensitivity of the Croatian banking sector to macroeconomic shocks: effects are the strongest for contractionary monetary policy shocks, followed by negative demand shocks, while the effects of supply shocks turned out to be statistically insignificant. Fainstein & Novikov (2011) applied a vector error correction model to empirically investigate and compare the influence of macroeconomic and real estate market variables on the level of non-performing

loans in the three Baltic states. The results of this study show that the changes of the real GDP have the initial influence on the growth of NPL levels in Baltic countries. The other analyzed variables move with some time shift, following changes in the real GDP. The longer the variables' adjustment period, the higher the level of the NPLs. Mancka (2012) applied a multiple linear regression model and showed that instability of the national currency and the global financial crisis had a significant influence on the systemic credit risk in Albania. Otašević (2013) uses a panel data set comprising of 33 commercial banks and spans the period from 2008 Q3 to 2012 Q2 in Serbia and finds that a deteriorating business cycle and the exchange rate depreciation led to deterioration of quality of the banks` loan portfolio in Serbia. Also, his results suggest that higher inflation can make debt servicing easier by reducing the real value of outstanding loans, and thus lead to a decrease of the credit risk ratio in the short-run. Vogiazas & Nikolaidou (2011) findings indicate that macroeconomic variables, specifically the construction and investment expenditure, inflation, the unemployment rate, and the country's external debt to GDP and M2 coupled with the Greek crisis-specific variables influence credit risk in the Romanian banking system.

While GDP changes and changes in employment and unemployment rates have greater influence on NPLs at the beginning of the crisis, as the crisis continues, other factors also gain more importance. *Currency depreciation* can cause particularly unfavorable effects, especially if there is a large share of foreign currency loans in total loans. Beck et al. (2013) suggest that exchange rate depreciations might lead to an increase of non-performing loans in countries with a high degree of lending in foreign currencies to unhedged borrowers. In this case, currency depreciations increases the debt servicing costs in local currency terms for borrowers who have loans denominated in foreign currency. Since their incomes are typically in local currency, borrowers face more difficulties in paying their debts. On the other hand, in relatively open countries with no currency mismatches, depreciation could lead to an increase in export volumes and consequently improve the financial position in the corporate sector and reduce NPLs. Recent study (Jakubik & Reininger, 2013) focusing on CESEE economies also found that depreciation of a local currency can have a sizeable negative impact on the quality of the bank assets. *Interest rate hikes* can weaken the borrowers` repayment capacity, particularly in case of variable rate contracts. Increased debt burden caused by increased interest rates should lead to a higher number of NPLs. The impact of *inflation* is ambiguous. Higher inflation can make debt servicing easier by reducing the real value of loans, but it can also reduce the borrowers' real income when wages are sticky (Klein, 2013). In countries where loan rates are variable, higher inflation can also lead to higher interest rates resulting from the monetary policy actions to combat inflation (Nkusu, 2011). If high budget deficits

are financed by domestic banks, adverse macroeconomic influence on NPLs can be effectuated through potential *crowding out effect*. However, if domestic banks mobilize significant funds from abroad, this effect will be smaller. Also, if fiscal multipliers are relatively large, *fiscal consolidation* can also contribute to NPL growth through effects of restrictive measures like decreases of real wages and layoffs in public sector, cutting subventions or lowering public investments.

The literature offers significant evidence on the *feedback effects* from NPLs to the real economy. Nkusu (2011) investigates the feedback between NPL and its macroeconomic determinants in a panel vector autoregressive (PVAR) model. Results of this study confirm that a sharp increase in NPL weakens macroeconomic performance, activating a downward spiral. These results suggest that an increase in aggregate NPLs leads to an almost linear incremental response that continues into the fourth year after the initial shock. The confluence of adverse responses in GDP growth and unemployment leads to a vicious spiral in which banking system problems and fall in economic activity reinforce each other. De Bock & Demyanets (2012) used the structural VAR analysis and their results also indicate the presence of significant feedback effects from the financial sector on the real economy. Espinosa & Prasad (2010) find that there could be a strong, albeit short-lived adverse feedback effect from losses in banks' balance sheets on economic activity. Klein (2013) also indicates that there are strong feedback effects from the banking system to the real economy in CESEE countries, thus suggesting that the high NPLs currently adversely affect the pace of economic recovery in these economies.

The main channel of NPLs influence on economic activity is a credit-supply channel. With the rise of NPLs, the uncertainty about the true capitalization of a bank also rises. This will be reflected in a higher risk premium on banks' funding and reduced access to financing (Diawan & Rodrik, 1992). To the extent that it is passed through to banks' lending rates, credit supply declines. According to the European banking coordination "Vienna" initiative – EBCI (2012) there is a very clear positive association between NPLs and interest margins in Western Europe and CESEE countries which leads to higher lending rates and lower credit supply in case of NPLs growth. Also, rising NPLs require provisioning which reduces banks' income, which can lead to a decrease of bank capital and banks' capacity to lend. An empirical analysis for CESEE countries during 2009-11 finds that any 5 percentage point increase of the NPL ratio reduces credit growth by some 2 percentage points through credit supply effects (EBCI, 2012). There are also non-credit supply channels through which NPLs can weaken macroeconomic performance: companies with debt problems have little incentive to invest, households

are also more reluctant about consumption, which altogether reduces economic activity.

Bank-level factors are mainly associated with bad management, moral hazard and "skimping" (Klein, 2013). According to the bad management concept, low cost efficiency is a signal of poor management practices. As a result of poor loan underwriting, monitoring and control, NPLs are likely to increase. On the other hand, hypothesis based on "skimping" argues that high cost efficiency may reflect little resources allocated to monitor lending risks and thus lead to rise of NPLs. The "moral hazard" hypothesis argues that banks with relatively low capital respond to moral hazard incentives by increasing the riskiness of their loan portfolio, which in turn results in higher NPLs.

The third set of factors influencing NPLs are institutional factors. Besides macroeconomic conditions, institutional environment within which banking system is operating can also influence the level of NPLs share. Effects of institutional environment on NPLs have been to some extent analyzed in Breuer (2006) and Boudriga et al. (2010) in which authors reported statistically significant findings. The relationship between government quality and financial system was subject to analyses for a long time, but a more precise link between the quality of institutions and the quality of banks' loan portfolio can be found in some papers that are primarily oriented towards a single country. Economic logic of including institutional factors in analysis is based on assumption that inefficient audit and judicial system, as well as undeveloped supporting institutions, can influence market competitiveness and thus deteriorate condition of the debtors and lenders.

Data and Empirical Results

For our analysis we use the static panel model approach with logarithm of share of NPLs to total loans as a dependent variable. Due to limited availability of this data for the observed countries, only annual level data are available, so our number of observations is slightly under 100. As independent variables we used combination of country-specific macroeconomic and financial indicators which are commonly used in reference literature. In addition to this, we introduced institutional variables that could influence the level of NPLs due to earlier suggested effects of level of banks` discipline in lending and possible moral hazard in cases when government can influence credit placements through its property share in some banks. For institutional variables we used WEF data on institution quality which is obtained through the Executive Opinion Survey on an annual basis. The advantage of the panel data technique which we implemented is that it can

control for the biases generated by potential heterogeneity and omitted variable problems. Furthermore, it allows us to capture the country-specific effects along with unobservable differences between countries. On the start we test panel stationarity with a Fisher unit test for panel data. Advantage of this approach of unit root test is that it doesn't require a balanced panel data set. Our findings on Fisher unit root test suggests that null hypothesis of non-stationarity can be rejected for all variables that we used in our model.

For macroeconomic factors affecting the level of NPLs we used data on the level of GDP, the ratio of foreign currency loans to total loans, the exchange rate level[5], an average lending rate for new loans, and annual inflation. The second set of variables should represent institutional factors that can explain the quality of legal framework in controlling the behavior of banks. For this purpose we used strength of auditing and reporting standards, the financial market developments, and soundness of the banking system. In order to achieve better interpretation of the coefficient results we use logarithm form for most of the variables. Summary statistics is presented in Table 1, where we can observe overall, between and within variation of our dependent and independent variables in the sample.

Table 1: Summary statistics of variables used in model sample countries 2006-2013

Variable		Mean	Std. Dev.	Min	Max	Observation
id	overall	6.5	3.470774	1	12	N= 96
	between		3.605551	1	12	n=12
	within		0	6.5	6.5	T=8
t	overall	2009.5	2.303316	2006	2013	N= 96
	between		0	2009.5	2009.5	n=12
	within		2.303316	2006	2013	T=8
NPL	overall	2.112186	0.7900463	0	3.462573	N= 96
	between		0.2225548	1.852287	2.565735	n=12
	within		0.7604552	0.085455	3.301929	T=8
GDP	overall	0.0541139	0.1262517	-0.2481034	0.33052	N= 96
	between		0.0260607	0.0006754	0.0841023	n=12
	within		0.1237351	-0.26618	0.3048748	T=8
FX_cred	overall	48.08687	28.87938	0	76.59	N= 96
	between		29.6558	0	72.31	n=12
	within		4.399459	34.08687	55.28688	T=8

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[5] Data on exchange rate is given in indirect notation so that increase of exchange rate represents depreciation of domestic currency.

ex_rate	overall	1.795123	2.027989	-0.3817368	5.416563	N= 96
	between		2.105606	-0.299441	5.310959	n=12
	within		0.0764668	1.555698	2.012329	T=8
intr_r	overall	9.604364	3.183936	4.94	18.2	N= 96
	between		3.040665	5.8875	15.66709	n=12
	within		1.254217	5.067276	13.42374	T=8
infl	overall	4.075276	2.805532	-0.9212719	12.41099	N= 96
	between		1.843151	2.509615	8.868533	n=12
	within		2.173505	-0.1933304	11.26535	T=8
audit	overall	1.491414	0.1125659	1.116392	1.690008	N=94
	between		0.104022	1.301414	1.655838	n=12
	within		0.0509434	1.306393	1.597496	T-bar=7.83
fin_mark	overall	1.384081	0.1044374	1.051601	1.612424	N= 96
	between		0.0700658	1.292006	1.545688	n=12
	within		0.081135	1.092678	1.550665	T-bar=7.83
sound_b	overall	1.576237	0.1566583	0.8303755	1.800859	N= 96
	between		0.0605025	1.47282	1.678341	n=12
	within		0.1454102	0.8805029	1.838511	T-bar=7.83

Source: Authors` calculation

In our static panel we implemented fixed effects estimation in order to account for the time-constant unobserved heterogeneity between countries. Alternative approach is to use the random effects method in order to check for unobserved heterogeneity problem. There is a possible problem when using the random effects approach in the case when orthogonality assumption between the unobserved country specifics and the determinants of independent variable is rejected. Our next step was to carry out the Hausman test which suggests that the null hypothesis of difference in coefficient not being systematic can be rejected. Due to this, we continue our analysis using fixed effect estimation and report our findings in Table 2 in three stages. The first model in column 1 presents only effects of macroeconomic indicators on level of NPLs. The second stage model in column 2 presents combined effects of macroeconomic and institutional indicators on NPL level, while in the column 3 we present a model with only explanatory variables that are statistically significant.

Table 2: Determinants of NPLs with Fixed Effects estimation

Fixed Effects Estimation	Dependent Variable NPL		
	1	2	3
GDP	-2.409***	-1.459***	-1.799***
	(0.000)	(0.002)	(0.000)
FX_cred	0.058***	0.062***	0.057***
	(0.000)	(0.000)	(0.000)
ex_rate	1.609*	1.123*	1.254**
	(0.074)	(0.088)	(0.047)
intr_r	-0.146**	-0.071**	-0.076**
	(0.004)	(0.050)	(0.047)
infl	-0.034	0.001	
	(0.296)	(0.953)	
audit		3.814***	
		(0.000)	
fin_mark		-4.779***	-4.343***
		(0.000)	(0.000)
sound_b		-0.573	
		(0.381)	
Constant	-1.925	-0.329	3.93***
	(0.331)	(0.867)	(0.032)
No. of obs.	96	94	94
No. of groups	12	12	12
F-test for the significance of the whole regression	4.05	9.00	8.17
	(0.000)	(0.000)	(0.000)
R-squared	within	0.5453	0.7724	0.7220
	between	0.0474	0.0114	0.0255
	overall	0.0235	0.0363	0.0361

Notes: Coefficients and p-values in parentheses. Fixed Effects estimation with standard errors. ***, **, and * denote significance at 1%, 5%, and 10% levels, respectively.

Keeping in mind that our sample is relatively small in size, certain level of caution must be applied when interpreting the results. Bigger sample and larger time period would better cover relationship between our variables. Having in mind explained data limitation, our model is able explain to some extent connection of macroeconomic and institutional factors and level of NPLs in our sample countries. Coefficient of GDP is negative and statistically significant as expected, which suggests negative relationship between increases in GDP and a rise in the NPL ratio. Along with GDP, the foreign currency loans ratio and the level of exchange rate are positively related with the increase of NPL ratio and statistically significant in all three models. This confirms expectation that countries where domestic currency is not the main medium of credit placements will have big-

ger problems with the level of NPLs, which is even greater problem in the period of domestic currency depreciation. In the presented models, the inflation rate is reported as statistically insignificant for sample countries. In the group of institutional variables, only the financial market level of development is reported as statistically significant with the level of NPLs, which means that with a more developed financial market, the level of NPLs should be lower.

Conclusion

High and rising shares of NPLs continue to exert a strong pressure on many Central and Eastern and South-Eastern Europe (CESEE) economies, with credit risk as one of the main risks for financial stability in this region. The upward trend of NPL shares in selected countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Lithuania, Montenegro, FYR Macedonia, Romania, Serbia and Slovenia) started after the outbreak of the crisis in 2008, but the loan performance deterioration was very uneven across the countries. Many empirical studies confirm that the share of nonperforming loans is linked to various macroeconomic factors. Our analysis included the key macroeconomic determinants of NPL change which are commonly used in reference literature: level of GDP, ratio of foreign currency loans to total loans, exchange rate level, average lending rate for new loans, and annual inflation. We also included the second set of variables which refer to institutional factors that can account for the quality of legal framework in controlling the behavior of banks, especially concerning possible adverse influences on level of banks discipline when approving a credit, and potential moral hazard in cases when government can influence credit placements through its property share in some banks. For this purpose we used the strength of auditing and reporting standards, the financial market development, and soundness of the banking system. The analysis is based on static panel model approach with fixed effects estimation in order to account for the time-constant unobserved heterogeneity between countries. Having in mind certain data and methodology limitations, our model is able to explain to some extent the connection of macroeconomic and institutional factors and the level of NPLs.

Our results suggest a negative relationship between increases in GDP and a rise in the NPL ratio. The foreign currency loans ratio and the level of exchange rate are positively related with the increase of NPL ratio and they are statistically significant in all models. This confirms the expectation that countries with a high level of euroisation will have more problems with the level of NPLs, which is even more pronounced in periods of domestic currency depreciation. In the presented models, the inflation rate is reported as statistically insignificant for sample

countries, which is not surprising given that theoretical impact of inflation is ambiguous. In the group of institutional variables, only the financial market level of development is reported as statistically significant, which means that with a more developed financial market the level of NPLs should be lower.

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