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MACROECONOMIC DETERMINANTS OF BAD LOANS IN BALTIC COUNTRIES AND ROMANIA

Empirical study

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Abstract

The 2008–09 global crisis raised debates concerning the determinants of financial vulnerability. Among these, bad loans have been identified as significantly influencing financial imbalances. After a decade in which borrowing has constantly grown mainly because of the deregulation of financial markets, the crisis highlighted the importance of an effective credit risk management.
The purpose of the paper is to study the evolution of bad loans ratio in relation with selected macroeconomic indicators in the Baltic countries (Estonia, Latvia and Lithuania) and Romania.

1. INTRODUCTION

The globalization that shapes financial flows inducing contagion effects and vulnerabilities on financial markets, triggering crises, need a rethinking of the traditional monetary policy framework aiming to ensure long term financial stability.

The general consensus is that a stable and effective banking system is a key factor for economic growth and development, contributing to the efficient allocation of resources as well as a lever for asset management and capital accumulation. From this perspective, the banking system stability is approached considering the ability of banks to mitigate shocks and vulnerabilities they are exposed to, based on *appropriate policies and regulations.*

It is widely accepted that moral hazard and asymmetric information are at the root of the crises and were strongly highlighted by the recent vulnerabilities in the banking systems. *The present crisis, started in 2007-2008, has revealed the fragility of banking systems*, mainly induced by the lack of capital adequacy and inadequate liquidity, as well as hazardous state intervention, incomplete transparency of bail out measures, concentration on the bank market.

Over the past decade, the credit quality of loan portfolios across most countries in the world remained relatively stable until the financial crises hit the global economy in 2007-2008. Since then, average bank asset quality deteriorated sharply due to the global economic recession. Yet the deterioration of loan performance was very uneven across countries.

The purpose of the paper is to study the evolution of bad loans ratio in relation with selected macroeconomic indicators like GDP grows rate, unemployment rate, inflation rate and lending interest rate and to identify which of the determinants have a major impact on the deterioration of bank asset.

The paper explains how the quality of bank assets deteriorated sharply because of the global economic recession in most of the countries, outlining that the quality of loans is tightly linked to the economic cycle. To explain the trend of bad loans, the study identifies the GDP, the inflation rate and the unemployment rate as main determinants of bad loans in the Baltic countries and Romania. Further, the extent to which these variables influence the level of bad loans and the differences regarding the results in these economies, are identified.

The Baltic countries were chosen for the purpose of the study given their historical, cultural and economic similarities. Neighbouring Romania is considered for comparison purposes.

The paper concludes that consistent and coordinated policies are able to offer the necessary tools to restore the financial stability and resume an upward trend for economic growth.

2. DETERMINANTS OF BAD LOANS

The concept of bad loans or depreciated loans often refers to *problem loans* (Berger & De Young, 1997). *Largo sensu*, this group include the interest and the principal that are paid and reimbursed with considerable delay and do not obey the terms and specifications of the lending contract. According to literature, there are countries that use quantitative criteria in determining the amount of bad loans, i.e. the time lag until the entire amount is reimbursed, while others have a qualitative approach, i.e. information considering the financial effectiveness of the debtor and the management of financial flows (Bloem & Gorter, 2001).

Fofack (2005) considers as bad loans the amounts for which the interest and the principal are reimbursed with a delay that exceeds 90 days. The same approach is used by the International Monetary Fund (IMF) when describing the financial stability indicators. The European Union (EU) did not agree on a common definition of bad loans and therefore countries prefer to use the 90 days delay as the criteria in determining bad loans.

Nevertheless, authors have endeavoured to depict and understand the major determinants of bad loans as prerequisites of financial vulnerability and eventually instability as the crisis that have occurred during the last decades show. In most of the failing economies, the credit risk and bad loans triggered the financial crisis. Caprio (1998) considers that inappropriate or insufficient regulation as well as the inadequate prudential supervision may explain to a certain extent the connection between deregulation and the financial crisis. Kaminsky and Reinhart (1999) explain the financial crisis by using the increasing amount of domestic loans during the crisis as a proxy for financial liberalisation.

Prior to the current financial crises, the macroeconomic environment led to favourable conditions that intensified the lending process and a low level of bad loans. Starting with 2008-2009 as the global economic environment worsened, the level of bad loans grew sharply, banks being forced to slow down the lending process under the fear that the amounts would not be repaid. Figure1 shows the main stages in the development of a crisis.

Accordingly, the quality of loan portfolio was stable before the crises, but deteriorated abruptly showing a strong interdependence with the global recession and confirming the connection between bank assets' performance and economic cycles. Nevertheless, the outcome differs among countries according to the state and development of their financial systems and their ability to mitigate vulnerabilities.

Since September 2008, the crisis has spread all over the world, affecting mainly developing countries with weak financial systems that are more exposed to contagion. The banking sector recorded an unprecedented level of bad loans, mainly because of the negative impact of rising unemployment and decreasing living standard. Consequently, bad loans are an abnormal financial outcome that arises because of the inability of debtors to reimburse the principal and the interest according to the terms stated in the lending contract. Further, the negative impact of bad loans multiplies, severely affecting the efficiency of financial flows generating a vicious circle by disrupting the lending process.

Literature shows that economic growth is possible under the financial system stability, in which banks play the major part, and therefore an upward trend of bad loans may disturb the entire economy (Hou, 2007). In addition, mounting bad loans is an indicator of imminent financial and economic crises (Kaminski& Reinhart, 1999).The same conclusion was reached by Reinhart and Rogoff (2008) supporting the reasoning that under inadequate measures to curtail the determinants of bad loans the phenomenon persists in time.

The literature identifies two main sets of determinants that explain the persistence of bad loans in time: exogenous and endogenous determinants. The exogenous ones are linked to the general macroeconomic environment that impact on the ability of debtors to reimburse the loans, while the endogenous determinants are specific for the banking activity.

2.1. EXOGENOUS DETERMINANTS OF BAD LOANS

Macroeconomic indicators are often regarded as exogenous determinants that are closely related to bad loans, empirical studies proving their countercyclical behaviour. Statistics show that an increase of the GDP in real terms translates in an increase of income and profit thus improving the ability of individuals and businesses to borrow. On the other hand, a slowdown of economic growth leads to an upward trend of bad loans because of higher unemployment rate, a drop of income and profit that negatively affect the reimbursement of contracted loans. (Salas & Saurina, 2002; Jimenez & Saurina, 2005).

Other macroeconomic variables that negatively affect the quality of bank assets are the *exchange rate, the interest rate, the inflation rate, the market price of financial assets*. The negative impact of the foreign exchange is felt mainly in economies with large exposure to foreign exchange risk, while debts submitted to variable interest rate are most affected.

Messai and Jouini (2013) as well as Fofack (2005) argue that there is a strictly positive impact of the inflation rate on the amount of bad loans, because a higher inflation rate erodes the purchasing power that leads to delays in the reimbursement of loans. Others (Klein, 2013), on the contrary, argue that the inflation rate may have a reverse effect by reducing the real value of the debt easing the ability to reimburse the residual amount. Nevertheless this reasoning is debatable since the real income is equally affected by the inflation rate.

The market price of financial assets has a greater impact in economies where the volume of the financial transactions has a greater share in the GDP. Thus, a decrease of financial assets market price increases the debt servicing by inducing the wealth effect and decreasing the value of the collateral.

The current crises emphasize the connection between the evolution of macroeconomic variables and the state of the banking system. The main objective of macroeconomic stress tests is to identify the structural vulnerabilities of the financial system, assessing its ability to face shocks.

2.2. ENDOGENOUS DETERMINANTS OF BAD LOANS

Endogenous determinants of bad loans are specific for the banking activity including the quality of management, the inadequate level of the capital (Keeton & Morris, 1987), excessive lending (Salas & Saurina, 2002), low efficiency (Berger & DeYoung, 1997).

Berger and DeYoung (1997), studied the connection between bad loans, cost effectiveness and capitalization of American commercial banks during 1985-1994, identifying a double perception: while the connection *bad loans - cost effectiveness* was treated as *bad luck* caused mainly by the deterioration of the macroeconomic indicators, the connection between *cost effectiveness- bad loans* was treated as *bad management*. Basically, this view supports the idea of an inadequate management, i.e. bad loans are the result of an insufficient monitoring (Klein, 2013).

In addition, the determinants of risk taking behaviour were subject of debate, since they are induced by the moral hazard, ownership, regulatory framework, etc.

The moral hazard hypothesis studied by Keeton and Morris (1987) argues that banks with an inadequate capital respond to moral hazard stimuli leading to a higher volume of bad loans in the long run. Banks that tend to assume higher risks also tend to grant more loans subject to significant losses. The conclusion was validated by the studies of Salas and Saurina (2002) and Jimenez and Saurina (2005) respectively.

As a consequence of moral hazard induced by safety nets, such as deposit guaranteeing, banks tend to assume higher risks by granting excessive loans, but such behaviour can be curtailed by a more effective supervision and strict market

regulation. Debates concerning the governmental intervention on banks behaviour uncover other facets of the recent crisis.
Other specific elements of the banking system may impact on bad loans, but are rated as less important, such as the classification of bad loans. For example, the grouping of loans according to their quality influences the reported volume of bad loans. The same implications regard the quality of the collateral, i.e. a loan is considered as being bad or good according to the possibility to liquidate the collateral.

3. METHODOLOGY AND DATA

The hypothesis of the study is that under an economic downturn, the level of bad loans is likely to grow, a higher impact being induced by a lower GDP, raising inflation, unemployment and higher interest rates. The hypothesis is consistent with Figure 1 which describes the crisis cycle, beginning from the economic boom followed by credit expansion driven by irrational exuberance, overconfidence and lax lending policies and ending with the economic recession characterized by deterioration of bank assets, decreasing of investments value and a sharp decline in the GDP.
The methodology consists in analysing the interdependence between macroeconomic indicators (GDP growth rate, inflation rate, unemployment and lending interest rates), as independent variables, and bad loans ratio, as dependent variable. The equation is:

$$NPL = \beta_0 GDP + \beta_1 Infl + \beta_2 Lend + \beta_3 Unempl + \varepsilon(1)$$

Where: - *NPL* – bank bad loans rate (annual% of total loans);*GDP* - growth rate of GDP (%); *Infl* - the annual rate of inflation (%); *Uempl* - the annual rate of unemployment (%); *Lend* - the annual lending interest rate (%).
Applying quantitative analysis is based on data of Baltic countries, Estonia, Latvia and Lithuania, using econometric models as like purpose of processing the data, respectively multiple linear regression and Pearson correlation coefficient, and for Romania qualitative analysis of data represented into graphs.
The sample of countries (including Estonia Lithuania, Latvia) was chosen given their economic, cultural and historical similarities. The Baltic States are small, open economies with strong economic links to the Scandinavian and each other, and constantly increasing foreign investment inflows. The banking sector is dominated by Scandinavian headquartered banks, following similar policy approaches like the parent banks.
The main domestic risk is labour market overheating: as the increase of real wages tends to exceed the increase of productivity it could negatively affect competitiveness and export growth.
Romania, an emerging economy, was chosen for comparative reasons. It is a rather big economy that went through considerable reforms but structural imbalances still need to be addressed. The main policy objective is the real convergence towards the EU average to close the significant gap of the GDP/capita, and to catch up on productivity. Unemployment is rather low (7%), but emigration is significant.
The selected countries are catching up economies, having previously experienced a transition period from planned to market economy. The analysis highlights the trend of bad loans under the influence of macroeconomic variables in similar economic circumstances.
As a result of irrelevance data on bad loans prior to the 2000s, the range sample data satisfactory, covers the period 2000-2013, the one used in this work. The data sources are: the World Bank, International Monetary Fund (Financial Soundness Indicators - FSI) and statistics of central banks.
Table 1 shows that a NPL variation has a significant negative correlation with GDP growth in all the four countries (the most significant correlation occurring in the Lithuania, -0.74504, followed by Latvia, Estonia and Romania). The inflation rate exhibits a negative correlation with the NPL in all countries except Lithuania. The lending interest rate is positively correlated with the NPL in all countries except Romania, while the unemployment has a positive correlation with the NPL in each of the four countries.

4. RESULTS

The results are broken down for each country as follows.

- **Estonia**

In Estonia, the NPL has proved to be strongly influenced by the unemployment rate. There is a positive correlation between the two variables, i.e. increasing unemployment rate determines the increase of NPLs ratio, lower incomes hindering reimbursement.
Estonia has a very flexible labour market, but structural unemployment remains higher than in countries with similar labour market policies, because workforce skills and education do not provide the qualification required by employers, maintaining unemployment high even under economic growth.
As for the influence of the other determinants, a significant, but negative influence has the decreasing growth rate of the GDP that is impacting on the banking sector by increasing NPLs ratio.
The financial crisis of 2008 has had a severe effect on the Estonian economy, primarily as a result of an investment and consumption slump that followed the bursting of the real estate market bubble that had been building up prior to the crises.

These aspects are reflected by the decreasing trend of GDP and as a consequence in the increasing level of bad loans, given the negative correlation between these two indicators.

Figure 2 shows an upward trend of bad loans, mainly during 2007-2010, peaking in 2009. This trend is determined most significantly by the unemployment rate, followed by the drop of the GDP.

A positive correlation between the lending interest rates and NPLs is noticeable, its increase having a negative impact on borrowers' debt service and hence on NPLs ratio.

On the contrary, the influence of the inflation rate on NPLs is not significant but, a slight negative correlation is identifiable.

Nevertheless, during recession, the capital adequacy in the Estonian banking system remains high at 20 % of risk-weighted assets at end 2013, bad loans dropping to 1, 5% of the portfolio. With the loan-to-deposit ratio now just close to one, the banking system appears to have reached a sustainable balance.

According with IMF Staff Report (IMF, 2014), the economic recovery in Estonia continued in 2013 but at a slower pace. Private consumption provided the main support for growth, while net exports made a negative contribution. Inflation declined gradually to 3.5% (average) in 2013, but remains above the euro average. Some of the slowdown is due to one-off factors, and there are unexplained anomalies in the national accounts data (e.g., a large deflator and unusual changes in implied taxes and subsidies). These anomalies and other indicators from tax revenue and labour market data have led most of the official and private analysts in Estonia to believe that the actual 2013 growth rate was higher than the current official figure.

The average unemployment rate dropped 1.4 points to 8.6% in 2013 (Figure 2) with the number of registered unemployed persons falling by a similar proportion. The unemployment rate is now roughly half of the 2010 peak. In contrast to many other advanced economies, this has taken place against a backdrop of a rising participation rate since the boom, encouraged in part by enhanced benefits for the unemployed.

Wage growth accelerated and outstripped productivity growth as labour market conditions tightened. Nominal wage growth accelerated to 7,6% in 2013, resulting in an increase of the real unit labour costs of 2.5% relative to 2012. (IMF, 2014)

- **Latvia**

Latvia exhibits a somewhat similar situation to that of Estonia's showing an increased rate of bad loans. In this case, the drop of the GDP had a significant impact, followed by the unemployment rate.

After 2010, the economy began to recover and Latvia joined the Euro zone maintaining a flat trend of growth. The trend was stabilised at 4.1% in 2013, after reaching a peak at 5.4% during 2011-2012.

Unemployment also impacted on bad loans. By end of 2013, the unemployment rate had dropped to 14 %, as compared to 16.2 % at end of 2011 and 19% in 2010. The improvement is underpinned by strong job creation. Tightening labour market conditions are reflected in rising wages: real wages increased by 4.2 % in 2013, a significant acceleration from the slow pace in earlier wages' increase (1.3 % in 2012). This is in line with staff analysis suggesting that the cyclical component of unemployment has largely been eliminated at this juncture; remaining unemployment is mainly of structural in nature.

Figures 3 as well as the statistical results show the influence of each determinant on the NPL. A strong, negative correlation between the inflation rate and the NPL during 2009-2012 is identified, as a result of developments arising from the crisis. Regarding the lending interest rate, results shows a positive correlation, but not as significant as for the other determinants.

Recent results show that Latvia's bank balance sheets continued to strengthen. Profitability increased and the ratio of bad loans declined for both the household and corporate sector, but the large size of N non-resident deposits in the banking system is a source of vulnerability being subject to stricter prudential requirements. Liquidity stress test results show that each Latvian bank would be able to withstand an outflow of up to 60 % of its non-resident deposits without recourse to other sources of financing to replenish the outflows.

Latvia's economy continues to recover strongly as it joins the euro area. The output gap is now largely closed, and labour market conditions are tightening despite still high unemployment. Growth has moderated from an average of 5.3% in 2011–2012 to 4.1% in 2013 (*Figure 3*).The current account is close to balance, while inflation has fallen to near zero due mainly to declining energy prices. Bank balance sheets are improving but credit continues to contract. (IMF, 2014). The country has taken rapid strides since the crisis, undertaking large internal devaluation and addressing severe macroeconomic imbalances. Over the last three years Latvia has achieved strong economic growth and a substantial fall in unemployment.

Nevertheless, there are risks to this broadly favourable outlook. A prolonged slowdown in European partner countries would dampen Latvia's recovery and increase its current account deficit, while a surge in global financial volatility could affect bank funding.

- **Lithuania**

In Lithuania, there are certain similarities as well as differences compared to Estonia and Latvia. There is a negative correlation between the unemployment rate and NPL, and also between the NPL and the GDP growth rate.

Figure 4 shows the decrease of the GDP growth rate, dropping to negative values in 2009, while the NPL reaches its maximum level. On the other hand there is a lag between the peak of the NPL, unemployment and inflation rate, respectively. As for the lending interest rate, it did not exert a significant influence on the level of NPL.

Despite good progress in reducing bad loans, private sector credit has yet to return decisively to positive growth, likely reflecting engrained post-crisis risk aversion on the part of potential borrowers and banks, as well as debt overhang in many households.

Capital adequacy rose further to a comfortable 17.2 % at end of 2013 and liquidity indicators are well ahead of requirements. While some smaller banks would benefit from bigger capital buffers—especially as the regulatory bar will rise with the implementation of global and European reforms—and credit unions are in need of reform, they do not pose material risk to overall financial stability because of their small size (IMF, 2014).

The economy has entered a broadly favourable trajectory of healthy and balanced growth, thanks to a multi-year reform effort. Output should surpass its pre-crisis peak of 2008 for the first time, in 2014 but now in a sustainable manner. Largely driven by domestic demand, real GDP expanded by 3.3%, as rising real wages boosted private consumption and investment rebounded on the back of high capacity utilization, more public investment, and a recovery in construction. Export growth slowed in the second half of the year, reflecting a softening of trading partner demand. Similar prospects for 2014 will put real GDP above 2008 levels, but this time the current account is in slight surplus, inflationary pressures are absent, and the banking system's loan-to-deposit ratio is contained at not much above 100 percent.

- **Romania**

The study refers to Romania, as a catching up economy, as are the Baltic countries. Romania has a larger economy, following a different reformation path. Despite the economic turmoil the NPL in Romania follows a moderately increasing slope.

Statistical analysis wasn't relevant in the case of Rumania and the impact of selected macroeconomic determinants on NPL and will be analysed only through graphic correlation.

Figure 5 reflects the impact of the decreasing GDP growth rate on NPLs. The interest rates during 2000 – 2007 fuelled lending, increasing indebtedness. As a consequence, a delay effect is noticeable, the NPL reaching 18.2% in 2013, despite economic growth.

There is no sizeable influence of the inflation rate and unemployment on the NPLs ratio.

Under the present circumstances, the quality of loan portfolio is of concern for central bankers, leading to rather sever requirements concerning the provisioning of bad loans and prudential supervision. (NBR, 2013).

IMF forecast shows that Romania's economy will return in 2014 to the pre-crisis GDP level, but its recovery is slower than in other countries which were hit by the economic crisis. This is due to drawbacks in the absorption of EU funds, infrastructure, state companies, but with opportunities in areas such as energy and exports. Romania's economy increased by 3.5% in 2013 (Figure 5), and a 2.2-2.5% increase is forecasted for 2014. (IMF, 2014)

It is important to notice that Romania's economic performance depends too much on factors such as the weather, which influences the agriculture, a sector that contributes 6% to the GDP.

5. CONCLUDING REMARKS

The financial crisis has shown that poor business models lines and regulatory reforms are in constant change. Still, there is a need for adjustments in order to restructure and strengthen banks' balance sheets and establish a foundation for an more stable and solid banking sector.

Moreover, significant uncertainties in the market are induced by widely differing national approaches and practices within EU banks to respond to concerns about the quality of assets and debt tolerance. Lack of comparability of asset quality among EU banks causes an additional challenge because of different approaches of key aggregates e.g. the definition of bad loans.

The current crisis is subject to high rates of bad loans that are having a strong impact on bank stability and on the economy worldwide. The problems generated by bank bad loans represent raise concern among theoreticians and practitioners.

As expected, a rise in real GDP growth leads to a decline in bad loan ratios. This finding is robust across all considered specifications and in line with existing research and the results of Glen and Mondragón-Vélez (2011) as well as Nkusu (2011). Lagged GDP growth also significantly affects NPL growth but with a positive sign. This finding lends support to the notion that bank asset quality deteriorates with a lag in response to positive growth due to loose credit standards applied during the boom period.

Our econometric analysis suggests that real GDP growth was the main driver of bad loan ratios during the past decade. Therefore, a drop in global

economic activity remains the most important risk for bank asset quality.

The paper identifies a common aspect of the Baltic countries and Romania, i.e. the strong impact of the GDP downward trend on NPL that proves to be much sharper during the recession. Another common issue identified in the three Baltic countries is the positive correlation between the unemployment rate and the NPL, largely because of high unemployment rates in these countries, which were amplified during 2009-2011.

The global financial crisis exposed vulnerabilities that had built up in the Baltic states, but the post-crisis recovery revealed inherent strengths as well. After very deep recessions in 2009, they began to bounce back and already in 2011 had the fastest GDP growth rates in the EU.

The present challenges of these countries relate to the ability to sustain economic growth, especially as members (or prospective members) of the Euro zone. Significant progress has been made since the crisis in improving the resilience of the Baltics' financial systems, but they are not yet providing credit to support the ongoing recovery. Credit is still declining in Latvia and Lithuania in spite of the recovery, while it is weak in Estonia—in other words, the Baltics are experiencing a recovery not supported by bank credit. Reviving credit will be essential to sustain growth and, in the longer term, foster convergence.

Romania, on the other hand, has mitigated risks, by using extended monetary macro prudential policies, inflation targeting and fiscal consolidation. The GDP follows an upward trend, but measures should be considered in order to revive the lending process that would induce a lever effect and support growth. Unemployment was maintained at sustainable levels, but labour force emigration is still significant.

New directions of research regarding bad loans will be made by taking into account the situation of all Central and Eastern European Countries and will be interesting to observe the structure of loans: for households and firms. Also the research may be completed by including others macroeconomic determinants (e.g. stock prices, exchange rate) as well as analysing the correlation between bank specific factors and bad loans.

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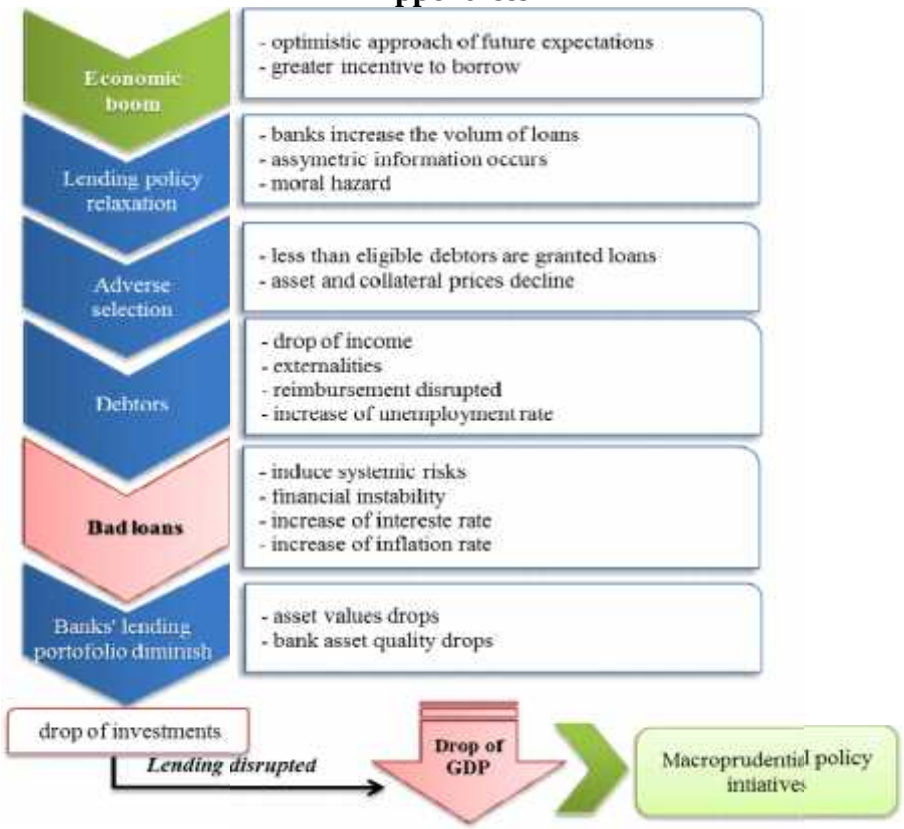
Appendices

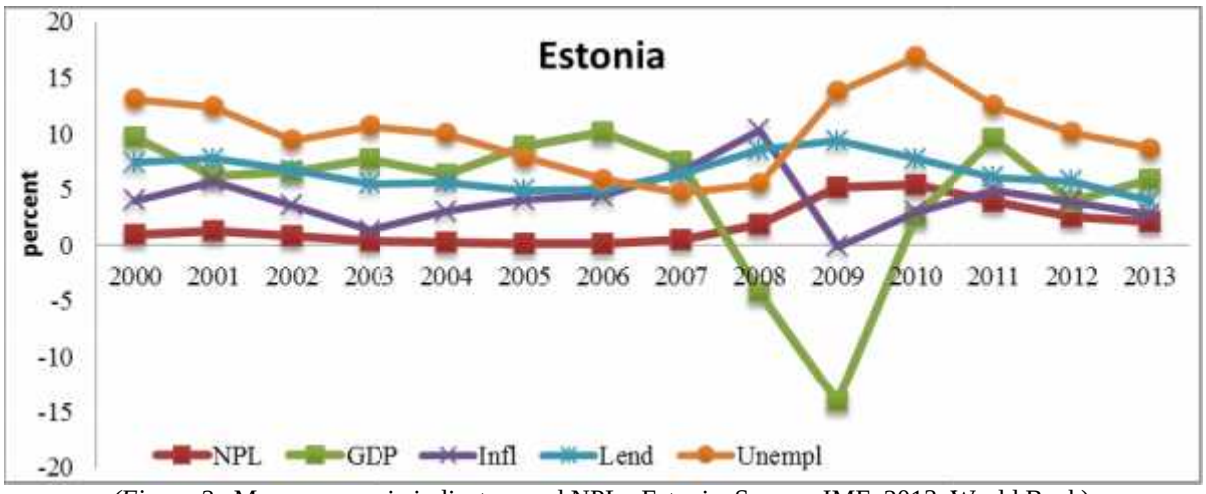


(Figure 1. The financial crisis development)

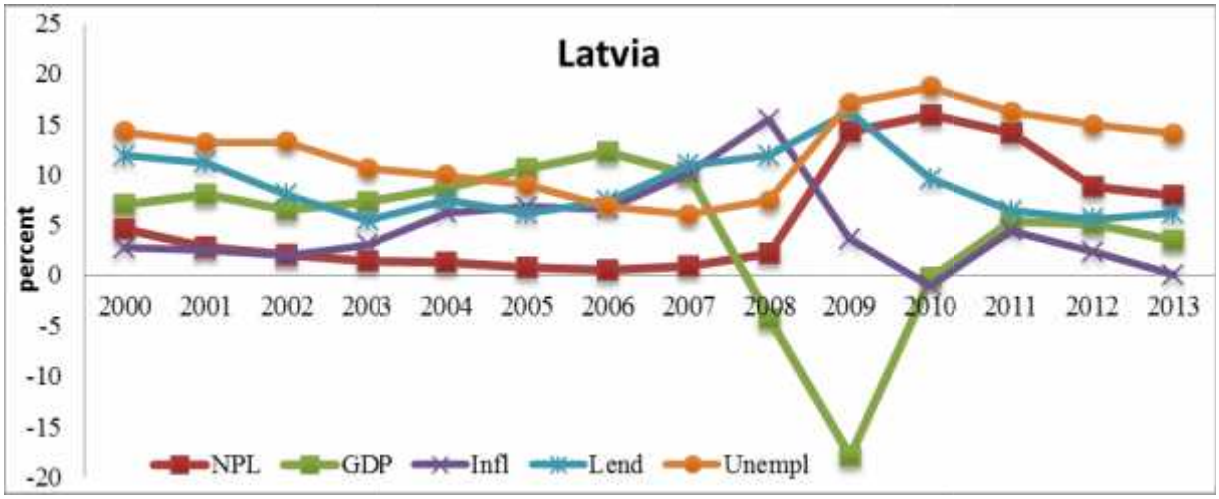
Table No.1
Correlation coefficient matrix

Correlation Coefficient		*GDP*	*Infl*	*Lend*	*Unempl*
Estonia	*NPL*	-0,60926	-0,25483	0,511262	0,674674
Latvia	*NPL*	-0,62374	-0,49444	0,212258	0,870410
Lithuania	*NPL*	-0,74504	0,010427	0,063394	0,658462
Romania	*NPL*	-0,41159	-0,50103	-0,53839	0,185897

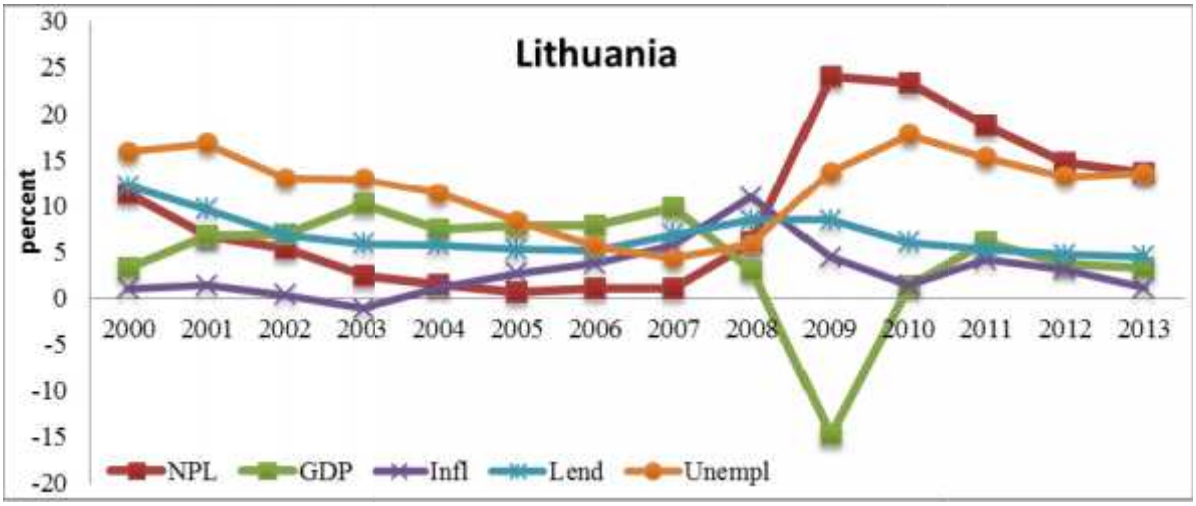
Source: authors'calculations using data from World Bank



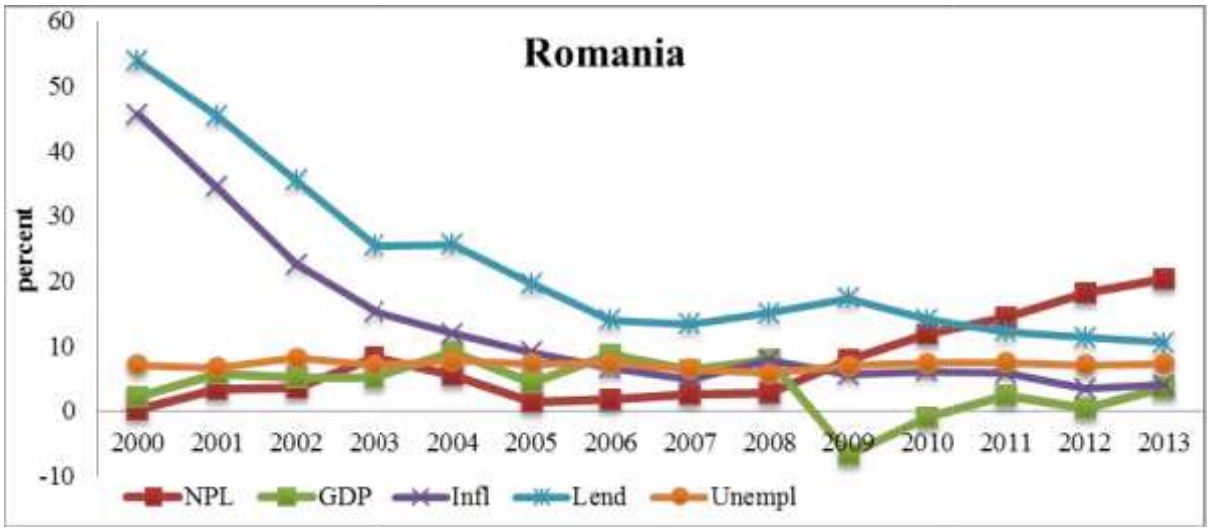
(Figure 2. Macroeconomic indicators and NPL –Estonia, Source: IMF, 2013, World Bank)



(Figure 3. Macroeconomic indicators and NPL –Latvia, Source: IMF,2013, World Bank)



(Figure 4. Macroeconomic indicators and NPL –Lithuania, Source: IMF,2013, World Bank)



(Figure 5. Macroeconomic indicators and NPL –Romania, Source: IMF,2013, World Bank)