

## Bank Provisioning Behavior, Procyclicality and Capital Management in South-Eastern Europe<sup>1</sup>

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### Abstract

*Regulators and policymakers pay an increasing attention to the possible procyclical nature of banks' behavior in provisioning. Loan-loss provisioning practices of banks are perceived as one of the sources of this procyclicality. The main objective of this study is to provide the evidence on procyclical behavior and capital management of banks through loan-loss provisions in South-Eastern European countries for the period 2004 – 2015. Our results show that loan-loss provisions of banks are procyclical; however, there is no evidence to indicate a relationship between loan-loss provisions and capital management. The findings suggest that a dynamic provisioning system would be beneficial if it is implemented in South-Eastern Europe. The results also show an empirical evidence that loan-loss provisions are not used for income smoothing in banks in South-Eastern Europe.*

**Keywords:** banks, procyclicality, capital management, income smoothing, South-Eastern Europe

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### Introduction

The aim of this paper is to analyze what is the impact of GDP growth, equity ratio and earnings before tax and provisions (EBTP) on loan loss provisions (LLPs). The economic growth recorded in all the South-Eastern Europe (SEE) countries in the period 2004 – 2015, the financial stability, the improved performance in the

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corporate sector, the increasing disposable income and the expansion of consumer credit, provide a dynamic banking environment with favorable conditions for the operation of banks. The importance of analyzing procyclicality of LLPs in banks has been repetitively mentioned in recent literature and re-emerges even stronger in the post-crisis environment. Therefore, this paper considers also the impact of the global financial crisis. A high or increasing ratio of non-performing loans (NPLs) in the banking sector may threaten financial stability, impedes the financial intermediation, possibly impeding investments with implications for the long-term growth prospects.

Banks as suppliers of credit can play an important role in the business cycle, if during a cyclical downswing their lending policy becomes more conservative (Bikker and Hu, 2002). Loan-loss provisions (LLPs) are usually one of the most important quantitative indicator of deteriorating credit quality and, at the same time, an important contributor to the banking profit fluctuations and capital. However, according to Bikker and Metzmakers (2005) provisioning leaves space for subjective judgments as to what extent losses are inherent of the loan portfolio in the balance sheet data. This holds in particular for general provisions meant to cover expected losses, which neither have become evident nor are related to individually identified loan losses, while specific provisions reflect the known and identified loan impairment.

A number of recent studies investigated provisioning behavior and procyclicality. These studies tend to focus on certain aspects of provisioning such as their impact on lending behavior, the extent to which delayed expected loss recognition, i.e. the delayed build-up of LLPs, causes reduced lending in cyclical downturns, etc. (Bouvatier, Lepetit and Strobel, 2014; Norden and Stoian, 2013; Caporale et al., 2018). The findings suggested from the recent literature on loan-loss dependence on economic cycle are that banks tend to make fewer LLPs during an economic upturn (when economic conditions are favorable and the perceived probability of business defaults is relatively low), but increase in an economic downturn (when economic conditions deteriorate and observed loan defaults increase). Consequently, bank provisioning is said to be procyclical.

Another important issue in the recent literature is whether banks use LLPs to manage regulatory capital requirements. Capital management via LLPs hypothesis is based on the idea that bank managers use provisions to avoid the costs associated with the violation of capital adequacy requirements. Because bank regulators require banks to keep minimum regulatory capital for the risk they take, bank managers have some incentive to influence LLPs in a way that allow them to meet minimum regulatory capital requirements, given that LLPs are included in the computation of minimum regulatory capital ratios (Ahmed, Takeda and Thomas, 1999).

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This paper addresses three important questions. First, it investigates the procyclical behavior of banks in SEE countries in terms of LLPs. This is also the most important contribution of this paper as there is a large gap in the empirical literature on procyclicality of banks for SEE countries. Second, whether banks in SEE apply the capital management through LLPs is assessed. Third, this paper investigates the use of LLPs for income smoothing.

The period under review is of particular importance given that it includes the years in the aftermath of the global financial crisis. The paper is organized as follows. Section 1 presents a brief literature review and previous empirical findings. Data and methodology are discussed in Section 2. The findings of the research are presented in Section 3. The final section concludes.

## 1. Review of Literature

The existing literature suggests that LLPs can be affected by at least three types of factors, i.e. the economic cycle, discretionary and non-discretionary behavior of bank managers (Caporale et al., 2018; Bouvatier and Lepetit, 2008; Bouvatier, Lepetit and Strobel, 2014, etc.). The non-discretionary component is related to credit risk and its aim is to cover expected future credit losses on loans (Wahlen, 1994; Beaver and Engel, 1996). The possible discretionary components may reflect motives regarding capital management, income smoothing and signaling financial strength (Bonin and Kosak, 2013; Caporale et al., 2018). For most banks, loans represent one of the most important items of bank assets, and as a result, the LLPs are one of the largest accruals (Kwak, Lee and Eldridge, 2009).

According to Bikker and Metzmakers (2005) an important aspect of provisioning is its timing with respect to the business cycle and the related issue of procyclicality. According to Olszak (2012) if banks behave procyclically, the rate of economic growth will be negatively correlated with provisioning, because an economic downturn is usually followed by growth in the volume of provisions.

Existing studies also highlight that LLPs are associated with capital management. Capital management hypothesis states that bank managers use LLPs to reduce expected regulatory costs associated with violating capital requirements (Fonseca and Gonzales, 2008; Ahmed, Takeda and Thomas, 1999). The capital management hypothesis predicts that the capital ratio is negatively related to LLPs, because managers in banks with low capital ratios can increase them by charging more LLPs to reduce regulatory costs imposed by capital adequacy ratio regulations (Lobo and Yang, 2001). Ahmed, Takeda and Thomas (1999) argue that, because bank regulators require banks to keep minimum regulatory capital for the risk they take, bank managers have some incentive to influence

the level of LLPs in a way that allow them to meet minimum regulatory capital requirements, if LLPs are included in the computation of minimum regulatory capital ratios. Beatty, Chamberlain and Magliolo (1995) concluded that, while managers' accrual decisions are complicated by other capital raising activities, LLPs are used as mechanisms of capital management.

Arpa et al. (2001) investigate the impact of the business cycle on LLPs of Austrian banks. They focus more on the influence of macroeconomic developments in explaining bank income and provisions for future credit losses over the period 1990 – 1999. The authors have demonstrated that Austrian banks make more provisions for credit risk as GDP growth figures decline (with a procyclical effect) and as net income rises (with a countercyclical effect).

Olszak (2012) studies aggregate quarterly data for Poland from 1998 to 2009 (a cycle plus the financial crisis). The growth rate of real GDP is used in the equation to proxy the business cycle. The study provides evidence on the procyclicality of LLPs in Polish commercial banks, as LLPs are negatively related to GDP. No statistically significant relationship is found between LLPs and the capital adequacy measure, so the study suggests the rejection of capital management hypothesis through LLPs. According to Olszak (2012) this may be a result of very favorable capital positioning of Polish commercial banks.

Caporale et al. (2018) analyzed a panel data of 400 Italian banks to examine the key determinants of LLPs for the period 2001 – 2015. Also, there is ample evidence of countercyclical loan loss provisioning by Italian banks. Caporale et al. (2018) find evidence that there is a negative association between the capital to total assets (CAP/TA) and LLPs.

The Bank of Spain has been a pioneer in this area, with its early adoption in 2003 of countercyclical (or dynamic) provisions (Saurina and Trucharte, 2017). As shown in Jiménez et al. (2017) the dynamic provisioning policy works mostly by supporting credit in bad times, with important effects on employment as well.

Cavallo and Majnoni (2001) find procyclical side effects in macroeconomic patterns for both G10 and non-G10 countries, but a more differentiated evidence for earnings management i.e. a positive relation between earnings and LLPs for G10 countries and the reverse for non-G10 countries. Since a lot of cyclical effects are 'hidden' in this variable, they conclude that procyclical effects are much more prevalent in less developed countries.

Also, Laeven and Majnoni (2003) find empirical evidence that many banks delay provisioning for bad loans until it is too late, when cyclical downturns have already set in, thereby magnifying the impact of the economic cycle on banks' income and capital. According to Laeven and Majnoni (2003) bankers on average create too little provisions in good times and then forced to increase

them during the downturns. The results show a negative relationship between GDP growth and LLPs, suggesting that banks provision during and not before economic recessions.

Bikker and Metzmakers (2005) investigate how bank provisioning behavior is related to the business cycle, using banks from 29 OECD countries over an 11-year period from 1991 to 2001. The results show that provisioning appears to depend significantly on the business cycle, as evidenced by the direct negative relation between GDP growth and provisioning. According to Bikker and Metzmakers (2005), this strong cyclical effect implies that banks' provisioning behavior may be procyclical, as their buffers need to grow (fast) during downturns, less profits are available to supplement the need for more capital, possibly forcing banks to reduce lending. Bikker and Metzmakers (2005) emphasize that as far as general provisions also count as regulatory capital, they may be used to manage the capital ratio. The capital-to-assets ratio is negatively correlated with provisions, which supports the capital management hypotheses predicting higher provisioning when the capital ratio is relatively low.

Bikker and Hu (2002) analyzed the cyclical interaction of business cycle and bank behavior for the period 1979 – 1999 for 26 OECD countries. The results show that LLPs depend on the business cycle, considering that real GDP growth rates and inflation showed a negative correlation, while the unemployment coefficient is positive, implying that provisions increase during cyclical downturns.

Bouvatier and Lepetit (2008) have taken into the consideration 186 banks in 15 European countries from 1992 to 2004. The authors find that provisioning is negatively related to GDP growth. According to Bouvatier and Lepetit (2008) the significant and negative coefficient for GDP growth indicates that the macroeconomic situation is relevant, which strengthens the cyclical behavior of LLPs. Banks delay provisioning for bad loans until economic downturns have already begun, amplifying the impact of the economic cycle on banks' income and capital. The business downturns influence financial strength of firms and households and therefore are closely related to problem loans. This implies not only an increase in specific provisions according to backward-looking rules, but also an increase in the general provisions as the GDP growth modifies the credit exposure of banks (Bouvatier and Lepetit, 2008).

Packer and Zhu (2012) studies data from 240 banks in the twelve Asian countries from 2000 to 2009. The authors explain two coefficients (GDP growth and earnings) that could reflect two different forms of cyclicity of the provisioning practices. One form of countercyclical provisioning is contingent on bank-specific accounting results, in particular bank earnings. A positive coefficient (earnings before tax and provisions as a percentage of total assets) implies that banks put

aside extra provisions when profits are high. The other form of countercyclical provisioning is related to the state of macroeconomic conditions. A positive coefficient (GDP growth) implies that banks accumulate provisions during economic upturns, which will be used in economic downturns. The authors find that LLPs are negatively related to GDP growth but the coefficient is not statistically significant. They find the coefficient for loan growth to be negative and statistically significant. Packer and Zhu (2012) also suggest that banks with a strong capital base may have less incentive to manage capital through LLPs because provisions and bank capital can be viewed as two substitutable forms of protection. The authors also find evidence on capital management hypothesis (negative and significant coefficient for the capital ratio).

Skala (2015) analyses income smoothing and cyclicity of LLPs for 179 commercial banks in 11 Central European countries over the period 2004 – 2012. According to the author a positive link between GDP growth and LLPs would confirm that provisions are countercyclical, with banks drawing from economic boosts to expand their reserve buffers. Conversely, a negative link between LLPs and GDP growth would indicate that additional provisions are created during economic downturns. She provides empirical evidence that Central European banks' provisioning behavior is procyclical with respect to national business cycles. According to Skala (2015) countercyclical measures, such as the dynamic provisioning system introduced by the Bank of Spain, could encourage 'saving for a rainy day' behavior and thus alleviate the existing pressure on provisions and capital during downward phases of earnings and business cycles.

To sum up, previous empirical research shows that GDP is negatively related to LLPs. In contrast, a positive relationship between LLPs and GDP would suggest the counter-cyclicity of LLPs. Also, prior studies provide mixed evidence regarding capital management via the LLPs.

## 2. Model and Data

We conducted a panel data analysis using a fixed effects model to demonstrate the impact of GDP growth on LLPs, in which we included variables usually applied in other studies (e.g. Laeven and Majnoni, 2003; Fonseca and Gonzalez, 2008; Bikker and Metzmakers, 2005; Perez, Salas-Fumas and Saurina, 2008):

$$\begin{aligned} \left( \frac{LLP_{it}}{TA_{i,t-1}} \right) = & \beta_0 + \beta_1(\Delta GDP) + \beta_2 \left( \frac{CAPITAL_{i,t-1}}{TA_{i,t}} \right) + \beta_3 \left( \frac{LOANS_{i,t}}{TA_{i,t}} \right) + \\ & + \beta_4 \left( \frac{EBTP_{i,t}}{TA_{i,t}} \right) + \beta_5 Size_{it} + \beta_6 Inflation + \beta_7 \left( \frac{NPL_{i,t-1}}{LOANS_{i,t}} \right) + \varepsilon \end{aligned} \quad (1)$$

To test the effect of unemployment in LLPs, we will also add the unemployment variable by modifying the model above with Bikker and Metzmakers (2005):

$$\begin{aligned} \left( \frac{LLP_{it}}{TA_{i,t-1}} \right) = & \beta_0 + \beta_1(\Delta GDP) + \beta_2 \left( \frac{CAPITAL_{i,t-1}}{TA_{i,t}} \right) + \beta_3 \left( \frac{LOANS_{i,t}}{TA_{i,t}} \right) + \\ & + \beta_4 \left( \frac{EBTP_{i,t}}{TA_{i,t}} \right) + \beta_5 Size_{it} + \beta_6 Inflation + \beta_7 Unemp + \beta_8 \left( \frac{NPL_{i,t-1}}{LOANS_{i,t}} \right) + \varepsilon \end{aligned} \quad (2)$$

In the next model we will also test the possibility of the effect of the financial crisis on provisions based on the models above and that of Skala (2015) where it was tested for the effect of the financial crisis on LLPs:

$$\begin{aligned} \left( \frac{LLP_{it}}{TA_{i,t-1}} \right) = & \beta_0 + \beta_1 \left( \frac{Inc_{it}}{TA_{it-1}} \right) + \beta_2 \left( \frac{NPL_{it-1}}{Loans_{it}} \right) + \beta_3 \left( \frac{Loans_{it}}{TA_{it}} \right) + \\ & + \beta_4 \left( \frac{Capital_{it-1}}{TA_{it-1}} \right) + \beta_5 Size_{it} + \beta_{(6)} Crisis + \beta_{(7)} Inflation + \beta_8 (\Delta GDP) + \varepsilon \end{aligned} \quad (3)$$

The years of the crisis are supposed to be 2008, 2009 and 2010 and they are included as dummy variables (model 3). Year dummies are supposed to pick the impact of the crisis on the level of provisions.

The real GDP growth rate is used in the equation as a measure for the business cycle. LLPs are said to be procyclical when the relationship between LLPs and GDP is negative. The dependent variable is LLPs of banks divided by this bank's average total assets (TA). The independent variables commonly used are macroeconomic indicators and the level of loans in the banking sector. We expect that the association between LLPs and GDP growth to be negative, thus indicating procyclicality of LLPs.

Many researchers have tested the hypothesis if LLPs are also used for capital management. The capital management hypothesis emphasizes the role of provisions in capital ratio variation. Ratio of capital-to-total assets (CAP/TA) in many studies is introduced as a variable to test the capital management hypothesis. Many studies have shown a negative coefficient of CAP (e.g. Ahmed, Takeda and Thomas, 1999; Bikker and Metzmakers, 2005, etc.), which means that LLPs are used for capital management. Conversely, other studies have found that LLPs are not used for capital management (e.g. Bouvatier and Lepetit, 2008) meaning that they find significantly positive coefficients between CAP and LLPs.

The ratio of earnings before tax and provisions over total assets (EBTP<sub>*i,t*</sub>) is used as a variable to test the income smoothing hypothesis. Provisioning can also rely on earnings, as believed in the so-called income-smoothing hypothesis, according to Bikker and Metzmakers (2005). An alternative explanation of

income-smoothing is that during good years, prudent banks will operate farsightedly and provide for bad years. Also, the authors mention that the discretionary use of provisioning is also connected with earnings management practice. Banks may increase reserves in good years as a cushion for bad ones. According to Frait and Komárková (2013), bank managers will smooth their income with a view to (i) positively influence the bank's risk expectations by decreasing earnings uncertainty (ii) maximizing tax expenditure (iii) minimizing the likelihood of getting fired (iv) following managerial self-interest, especially if their compensation packages are related to income stability, etc. According to Saurina and Trucharte (2017) income smoothing is usually explained as the intended result of business managers' efforts to maximize the likelihood that they will keep their jobs. The idea behind this is that in good times managers seek to build up assorted buffers that can then be used in bad times. According to Fonseca and Gonzales (2008), a positive coefficient would indicate income smoothing since it suggests that LLPs are high when earnings are high and low when bank earnings are low. Ahmed, Takeda and Thomas (1999) provide strong support for the hypothesis that LLPs are used for income smoothing and discovered that a positive relationship exists between earnings before taxes and loan loss provisions (EBTP) and LLPs. Meanwhile, Skala (2015) emphasizes that despite the recommendations of Basel III aimed at limiting procyclicality of capital requirements, the international prudential framework still lacks clear guidance regarding the phenomenon of persistent income smoothing in banks.

In this paper, cyclical influence on the making of additions to provisions for credit losses is analyzed from GDP and other macroeconomic variables (unemployment and inflation). According to Bikker and Hu (2002) unemployment is a major cyclical indicator. If short-term unemployment is primarily a reflection of the business cycle, long-term unemployment especially indicates structural disequilibrium in the economy. In addition, unemployment is a measure of the current phase in the business cycle, whereas an indicator like GDP growth merely indicates the degree of change in the business cycle. This variable is also used by other authors (Bikker and Metzmakers, 2005, etc.). According to Asanović (2018) high level of non-performing loans is one of the key consequences of the crisis and represents one of the main challenges for monetary authorities in CEE countries in order to prevent stability and reliability of the banking system. He emphasized that this is one of the reasons why banks are mainly focused on managing NPLs and not on lending activity since they perceive credit risk as relatively high. The ratio of NPLs to gross loans at the end of the year  $t$  ( $NPLit$ ) is a good indicator of the risk of default on banks' loans (Bouvatier and Lepetit, 2008; Skala, 2015; Lobo and Yang, 2001; Kim and Kross, 1998).



Following Bikker and Metzmakers (2005) we use loans as a share of total asset (L) as a credit risk indicator. Banks that have higher credit risk exposure, in the sense that they hold greater amounts in (risky) loans on the balance sheet, tend to provision more (Bikker and Metzmakers, 2005). The natural logarithm of total assets is another control variable that measures the size of the bank. In general, larger banks may have higher levels of business and may be expected to have higher LLPs than smaller banks (see Anandarajan, Hasan and Lozano-Vivas, 2003; 2005). The inflation rate is a control variable used to capture cyclical movements as well as uncertainty in the economy and should negatively affect credit supply fluctuations (Bouvatier and Lepetit, 2008). Definitions of variables are presented in Table 1. The data set contains observations for 9 countries of the SEE region, from 2004 to 2015. This period covers a full business cycle for all the countries included. The resulting sample includes 9 countries (Albania, Bulgaria, Bosnia and Herzegovina, Croatia, Kosovo, Serbia, Montenegro, Macedonia, Romania and Slovenia) with a total of 336 bank-year observations. All of the bank financial data comes from the Bureau Van Dijk's Bankscope database. Macroeconomic information is from the IMF database.

Table 1  
Summary of the Variables

Variable	Predicted sign	Definition	Proxy
LLP/TA		Loan loss provisions over total bank assets for bank $i$ at time $t$	Dependent variable
$\Delta$ GDP	-	Real growth of gdp	Procyclical effect
CAPITAL/TA	-	Capital to total assets	Capital management
NPL/LOANS	+/-	Ratio of non-performing loans to total loans	Default risk
LOANS/TA	+/-	Loans divided by total assets	External financing
EBPT	+	Ratio of earnings before taxes and LLPs to total asset	Income smoothing
SIZE	+/-	Log of total assets	The effect of bank size
INFLATION	-	Consumer prices index	Business cycle
UNEMP	+	Unemployment rate	Cyclical indicator
CRISIS	-	Financial Crisis	

Note. Bank-level data are from the Bankscope database. GDP growth, inflation and unemployment data are from the IMF development indicators.

Source: Authors.

### 3. Estimation Results

In line with expectations, the GDP growth coefficient is significant and negative, indicating that provisions increase when the business cycle downturn (Table 2). This strong cyclical effect implies that banks' provisioning behavior is significantly procyclical (model 1 and 2). This result confirms the main hypothesis in this paper.

Table 2  
**Models for Loan Loss Provisions (1 – 3)**

LLP/TA	(1)	(2)	(3)
<b>GDPgr</b>	-0.047** (-2.02)	-0.050** (-2.13)	-0.010** (-1.86)
<b>CAPITAL/TA</b>	0.057** (2.51)	0.057** (2.52)	0.055** (2.43)
<b>EBTP/TA</b>	2.088 (1.32)	2.091 (1.32)	0.182 (1.49)
<b>NPL/LOANS</b>	0.064*** (7.36)	0.061*** (6.58)	0.065*** (6.75)
<b>LOANS/TA</b>	0.009 (0.82)	0.008 (0.70)	0.009 (0.82)
<b>TA_log</b>	-0.748** (-1.97)	-0.746** (-1.96)	-0.874** (-2.15)
<b>INFLATION</b>	-0.010 (-0.33)	-0.003 (-0.12)	-0.010 (-0.34)
<b>UNEMP</b>	-	0.020 (0.76)	-
<b>_cons</b>	8.223 (1.54)	7.960 (1.49)	9.641** (1.75)
<b>CRISIS</b>	-	-	0.047 (0.30)
<b>No. of bank-year observations = 336</b>			

Note: t statistics in parentheses; \*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10%.

Source: Author's calculations.

Hence, we find evidence that, on average, banks tend to provision less in an economic expansion and increase LLPs during periods when GDP growth rates are low or even negative. Similar cyclical effects were found by Leaven and Manjoni (2003), Fonseca and Gonzalez (2008), Bikker and Metzmakers (2005), Perez, Salas-Fumas and Saurina (2008), etc. The common view is that an economic upswing and rising incomes indicate improving conditions for firms and reduce the likelihood of loan defaults, whereas a recession will have the opposite effect. Banks are expected to reflect this in their decisions by lowering provisions during an economic boom and increasing them during a downturn (Bikker and Metzmakers, 2005; Shawtari et al., 2015).

Another aim of this paper was to test the capital management hypothesis. According to Ahmed, Takeda and Thomas (1999) capital requirements constrain banks' ability to grow in the sense that if a bank's capital is at or below the minimum capital level, the bank cannot issue more deposits or invest in additional loans. Perez, Salas-Fumas and Saurina (2008) underline that banking regulators use capital buffers and provisions for future losses as instruments that can reinforce banks' solvency, contributing to their financial stability. Bonin and Kosak (2013) emphasize that bank managers may increase LLPs in order to compensate for weak capitalization and, conversely, banks may provision less if they are

well-capitalized and can rely on covering not only unexpected losses but also a portion of expected losses from bank capital. Also, Perez, Salas-Fumas and Saurina (2008) emphasizes that banks to meet their targets for regulatory capital or for a given dividend policy, can use LLPs to modify retained earnings, thereby managing their regulatory capital.

However, our results show that the coefficient for the capital ratio is positive and statistically significant, contrary to the predictions of the capital management hypothesis. Therefore, there is no statistical evidence to indicate that banks employ capital management through LLPs. This means that banks in SEE were well capitalized and have no need to use LLPs to manage their capital. These results are similar to those reported by Fonseca and Gonzalez (2008), Perez, Salas-Fumas and Saurina (2008).

The unemployment rate has a positive coefficient but not a significant one. These findings are consistent in line with Bikker and Metzmakers (2005), meaning that unemployment does not increase loan loss risk significantly. The coefficient of the inflation rate is negative but insignificant. The results are similar to those reported by Bouvatier and Lepetit (2008).

The last hypothesis was to test the use of LLPs for income smoothing. The coefficient for EBTP/TA is positive, but not significant. This does not support the income smoothing hypothesis. This indicates that LLPs has not been used for income smoothing by the sector in SEE countries. These results are similar to those reported by Bouvatier, Lepetit and Strobel (2014). The log of total assets, the proxy for size of a bank, has a negative and significant effect in all specifications.

This finding confirms the results of Perez, Salas-Fumas and Saurina (2008), Anandarajan, Hasan and Lozano-Vivas (2005), suggesting that larger banks are more involved in determining an appropriate amount of LLPs than smaller institutions. Also, they mention it would appear that as size increases, the importance of reducing earnings volatility, adhering to capital adequacy regulation and conveying signals of conservatism to clients become more important. But it seems, contrary to the theory, that inefficiency for smaller banks is more pronounced. The coefficient of the NPLs over total loans is positive and significant.

As Bouvatier and Lepetit (2008) argues, this result implies that the cyclical evolution of NPLs influences provisioning via the backward-looking rules. Bank profits are therefore also influenced by the cyclicity of identified credit losses via LLPs (Bouvatier and Lepetit, 2008). The results are similar to those reported by Lobo and Yang (2001), Bouvatier and Lepetit (2008), etc.

The credit risk indicator, loans as a share of total assets, appears to be positive, reflecting the views of Borio, Furfine and Lowe (2001) that if risk increases as economic booms mature, provisions should increase even if loans are being

priced accurately. To study the possible effect of the financial crisis on the levels of LLPs, our equation is also extended by the crisis period variable (see model 3). The crisis years were assumed to be 2008, 2009 and 2010 and these were included as dummy variables (crisis\_period).

The variable for income smoothing, measured through EBTP, has remained relatively unchanged during the financial crisis (model 3). According to Bikker and Metzmakers (2005) provisions rise in times when earnings are higher, suggesting income smoothing, and loan growth is higher, indicating increased riskiness.

Also in model 3, the GDP growth coefficient is significant and negative, and the coefficient for the capital ratio is positive and statistically significant, contrary to the predictions of the capital management hypothesis. The addition of year dummies to pick the impact of the crisis did not affect the results. A weak positive relationship was found between the LLPs and the financial crisis variable, however it is not significant (model 3).

## **Conclusions**

This paper investigates how bank provisioning behavior is related to the business cycles, using 336 bank-year observations from nine SEE countries during the period 2004 – 2015. Another objective of this study was to test whether SEE banks use LLPs for capital management. The purpose of including variables in the regression model of provisioning, such as GDP growth, was to investigate cyclical behavior, then equity ratio to test the capital management hypotheses, and EBTP to test income-smoothing hypothesis. The most important variable in this study for examining whether provisioning practices may exacerbate the business cycle is real GDP growth. In line with expectations, GDP growth is significantly and negatively related to LLPs. Our empirical results support the hypothesis that the provisioning for loan losses in the SEE banking system is procyclical and that increasing the level of provisions during economic downturn can lead to a considerable reduction in credit supply, which can further amplify changes in the business cycle.

In other words, provisions increase when the economic growth is weak. The reason for this is that the business cycle affects the ability of firms and other borrowers to service their debt, which subsequently influences the credit risk exposure of banks. We suggest the use of dynamic provisioning system for banks in SEE to be more efficient during the business cycles. Finally, more transparency on provisioning might also help market discipline in order to enhance proper provisioning and to counter procyclicality.

As far as general provisions are accounted as regulatory capital, they may be used to manage the capital ratio. Banks assume that a certain percentage of credits will not be refunded or returned and they will become slow over a specified period of time. During an economic downturn there is a greater pressure on supervisors to introduce strong standards, to protect the depositors and the banking system. However, the CAP coefficient sign is positive and significant, indicating that LLPs are not used to manage capital in the period under review in SEE countries. This means that banks in SEE were well capitalized and have no need to use LLPs to manage their capital. Our results are similar to those reported by other authors (Fonseca and Gonzalez, 2008; Perez, Salas-Fumas and Saurina, 2008; Lobo and Yang, 2001, etc.).

In addition, we have also tested for the LLPs relationship with other variables such as: unemployment, non-performing loans, the size of banks. The unemployment rate has a positive but not a significant coefficient. The variable of NPLs has a positive and significant coefficient which showed that the growth of non-performing loans in SEE countries resulted in an increase in LLPs. A positive sign of the EBTP coefficient indicates that there is a direct relationship between the EBTP and the LLPs, but since this variable is not significant it does not support the income-smoothing hypothesis.

According to Skala (2015) these results indicate that this is possibly a bank-determined phenomenon and not a country-specific event, and on the other hand, the samples of countries are relatively small. The empirical evidence for income smoothing and procyclicality of LLPs in SEE banks presented here has important policy implications for banks in SEE. Countercyclical measures, such as the dynamic provisioning system introduced by the Bank of Spain, could facilitate the existing pressure on provisions and capital during economic downturns. The importance of provisions is also emphasized by accounting standards. The treatment of provisions against credit losses changes fundamentally under International Financial Reporting Standard 9 (IFRS 9) for financial instruments, which became effective on 1 January 2018. IFRS 9 replaces incurred loss (IL) models with a forward-looking, expected credit loss (ECL) model.

Therefore, under the IFRS 9 impairment model, the manner in which ECL provisions are measured varies dramatically as the credit risk of a financial instrument deteriorates. In the IFRS 9 impairment approach, certain loans will bear small provisions from the day of origination, while loans that have had significant reductions in credit quality will incur larger provisions (Gaffney and McCann, 2019). ECL model in credit provisioning was developed to tackle the issue of procyclicality. The risk of loan losses is dramatically rising in economic downturns.

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