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## Some Empirical Evidence of Loan Loss Provisions for Albanian Banks

**Abstract:** In this paper we used a panel of Albanian banks for the period 2004–2014 to examine the main determinants of loan loss provisions. In addition, we tested how the latest crisis has affected provisioning behaviour of the banks. We find that loan loss provisions of banks are driven by non-discretionary components and economic fluctuations. Furthermore, we find a positive and significant result between earnings before interest, taxes and provisions and loan loss provisions, thus confirming the income smoothing hypothesis. Our estimated results do not support the capital management and signalling hypotheses. We also find that the global crisis has contributed significantly to the procyclicality of loan loss provisioning in Albania and banks continued to do income smoothing during the crisis.

**Key words:** Loan loss provisions, Procyclicality, Income Smoothing, Albanian banks, Dynamic GMM

**Jel Classification:** G21, C33, C36

### I. Introduction

The global financial crisis has led to a renewed debate about the nature and effectiveness of financial regulation, and the extent to which central bank should consider more explicitly the financial stability objective in the conduct of monetary policy. Thus, the key issue has been the design of macroprudential policies and macroprudential instruments that help mitigate the procyclicality of the financial system. Most of the literature concerns about the factors that explained the fluctuations in bank lending, since such factor could exacerbate the business cycle, causing financial instability and misallocation of lending resources (Bouvatier and Lepetit, 2008).

Despite bank lending channel, (Bernanke and Gertler, 1995) emphasize the role of imperfections in the market for bank debt and bank capital channel (imperfection in the market for bank capital) is another factor that can amplify the cyclicity of bank lending is the provisioning system.

Provisioning rules and capital management are linked through the coverage of credit risk, where expected losses have to be covered by loan loss provisions (LLP), while unexpected losses have to be covered by bank capital. Therefore, it is important for banks to properly manage LLP to ensure that sufficient amounts are allocated to counterbalance non-performing loans (NPL) mainly throughout financial turmoil. So the main function of LLP is to cover expected losses but LLP is an important tool to pursue other objectives that drive managerial discretionary behaviour such as income smoothing, signalling, and capital management. These factors, together with non-discretionary components and economic fluctuation, determine the provisioning policy of banks.

During the recent financial crisis, the Albanian economy experienced a significant slowdown from 6% to 2% that was accompanied by the shrinking of bank lending, a higher NPL ratio that reached the highest level in the SEE region of around 22%, a reduction of revenues, and a higher level of LLP which both led to further revenue losses. Thus investigation of the main determinants of loan loss provisions is an important issue for stability of the financial system in Albania and for the policymakers to determine the most appropriate provisioning system.

In this paper, we used a panel of 15 banks for the period 2004-2014 to examine the main determinants of LLP in Albania. In addition, we tested how the latest crisis has affected provisioning behaviour of the banks. Based on our best knowledge, this study investigates the provisioning policy of the banks in Albania and contributes by filling the gap in the empirical evidence for this SEE country.

Our empirical results support the hypothesis that the provisioning for loan losses in the Albanian 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. Also non-discretionary components drive the LLP behaviour of the Albanian banks. Furthermore, we find a positive and significant result between earnings before interest, taxes and provisions and LLP confirming the income smoothing hypothesis. Our estimated results do not support capital management and signalling hypotheses. We also check whether the global crisis has changed the provisioning policy of banks in Albania. We find that the global crisis has contributed significantly to

the procyclicality of loan loss provisioning in Albania and the banks continued to do income smoothing during the crisis.

The structure of the paper is as follows: Section 2 presents a brief literature overview and the existing empirical results. Section 3 describes the methodology and data. In section 4 we demonstrate the empirical results and Section 5 concludes.

## II. Literature Review

The latest financial crisis has shown the important relationship between credit growth, banks' income, capital adequacy ratio and provisioning practices (FSF, 2009). Loan loss provisioning policies are critical in assessing financial system stability and they are vital policies that influence earnings of banks, their capital position and, therefore, the credit supply (Beaty and Liao, 2009).

Basically, loan loss provisioning should reflect the confidence of bank managers about their loan portfolio quality, which means that provisions should cover the entire spectrum of expected credit losses in case they really believe that loan loss provisioning is the best indicator of true credit risk (Dugan, 2009).

Practically, as it is also emphasized by Borio and Lowe (2001), Bikker and Hu (2002), and Leaven and Majnoni (2003) that loan loss provisioning has a historical procyclical nature, which relates to the assets' quality. Another factor that affects the provisions' procyclicality is the business cycle and its developments. Difficulties in determining the business cycle behaviour can lead to a lack of coordination between the credit risk assessment and the time of introducing loan loss provisioning. Meanwhile, also referring to the methodology of calculating loan losses, loan loss provisioning takes into account only losses incurred from loans but not expected credit losses (Li, 2009).

Loan loss provisioning policies are estimated to vary from one country to another and they are influenced by accounting practices, regulatory and tax policies of the country. There are two main approaches to provisioning: specific provisioning and general provisioning (Cortovaria et al., 2000). The specific provisioning is determined based on the specific accounting rules and depends on recognized credit losses, which increase the specific reserve for loan losses and are deducted from total assets. The general provisioning needs to cover expected credit losses and is added to the overall reserve for loan losses, on the liability side (banks' balance sheet liabilities). According to Bouvatier and Lepetit (2008), banks do not strictly implement any statistical method to calculate total provisioning, which

depends partly on the total credit growth and can be affected easily by discretionary behaviour of bank managers.

Based on the literature review, two components that compose loan loss provisions are: the non-discretionary component and the discretionary component (Bouvatier and Lepetit, 2008).

The non-discretionary component is made to cover expected credit losses in a bank's loan portfolio (Perez et al, 2006). Thus provisioning practices of banks depend on the assessment banks have for expected credit risk, which is linked to default risk, macroeconomic risk, interest rate risk, exchange rate risk, etc. This nature of provisioning is said to be backward-looking since banks mainly relate non-discretionary provisions to identified credit losses. During economic upswings, the number of credit losses is minor, which implies that banks make lower provisions, while during the economic downturns, loan loss provisions increase due to higher risk of loans default. Hence, nondiscretionary component strengthens the cyclicity nature of loan loss provisioning and lead to a mis-evaluation of expected credit losses (Bouvatier and Lepetit, 2008). The expected credit risk appears as soon as a loan is granted and not only during the downturn when losses are finally recognized. The cyclicity of loan loss provisions affects banks' profits and banks' capital that could influence banks' incentive to grant new loans.

The discretionary component takes into consideration the used of loan loss provisions for management objectives, which are: income smoothing, capital management and signalling (Liu et al, Ahmed et al, 1999, Lobo and Yand, 2001).

Through *income smoothing* banks tend to minimize the variance of reported earnings, which implies increasing loan loss provisions during an expansionary phase and decreasing during a recession phase. As a result, income smoothing may have a positive impact on bank lending.

*Capital management* refers to the use of loan loss provision to achieve regulatory capital targets when bank faces capital constraints. General and specific provisions reduce Tier 1 capital through their effect on earnings. Since loan loss provisions are a part of Tier 1 capital and deduct from risk-weighted asset, an increase of general provision can increase regulatory capital, especially if the increase of Tier 2 is higher than the decrease of Tier 1. The capital management hypothesis implies a negative relationship between capital and provisions. According to Perez et al, 2006, Fonseca and Gonzales, 2008, the relationship between capital and provisions is not very clear for banks that operate under Basel I, it depends

on the level of capital put in Tier 1 and Tier 2, and loan loss reserves are not included in Tier 1 capital.

*Signalling behaviour* refers to an increase of loan loss provisions to signal financial strength of banks to indicate that they are enough robust to absorb future potential losses by increasing the current loan loss provisions.

The work of Greenawalt and Sinkey (1988) is among the first research studies that have analysed the loan loss provisioning policy of banks focusing more from on the account perspective on whether provisions were used by bank to smooth earnings. While another strand of research is focused on the procyclicality of loans loss provisions over the business cycles. Borio et al (2001) in their early work reported a negative significant relationship between loan loss provisions of banks in 10 OECD countries over the business cycle. Other studies that have investigated this relationship are those of Cavallo and Majnoni, 2001; Bikker and Hu, 2002; Leaven and Majnoni, 2003; Bikker and Metzmakers, 2003, 2004; Bouvatier and Lepetit, 2008; Perez et al 2008; Skala, 2014.

Based on the empirical literature, the main explanatory variables that are used to explain the behaviour of loan loss provisioning are presented below:

*Credit quality measures* are important determinants of loan loss provisions, given that provision are established to cover credit losses. Thus the main variables that are used in literature to measure credit quality are: the non-performing loan ratio, a change of the non-performing loan ratio, and the loan to assets ratio. We expected a positive relationship between these three variables and loan loss provisioning, so an increase of credit risk implies higher provisioning. These results are found in almost all studies [e.g. see Cavallo and Majnoni (2001); Bikker and Metzmakers (2005); Bouvatier and Lepetit (2008); Perez et al (2008)].

Another variable that is used as a proxy of credit quality is the loan growth, where higher levels of loan growth may reflect higher credit risk. However, in some studies, such as Cavallo and Majnoni, (2002) Leaven and Majnoni (2003), Packer and Zhu (2012), and Skala (2014) the authors find a negative relationship between loan growths and provisioning, which reflect the fact the provisions decline when new loans surge. A positive relationship between loan growth and provisioning is found in the research work of Bikker and Metzmakers (2005) and Fonseca and Gonzales (2008).

*Earnings before interest, taxes and provisioning* are another factor that determines the procyclicality behaviour of loan loss provisioning. We expect a positive relationship between earnings if banks use provisions to smooth earnings,

thus supporting income smoothing behaviours. Bank managers may seek to reduce earnings variability to signal lower business risk, decrease funding costs, and diminish tax expense or to improve management rewards (Fonseca and Gonzales, 2008). Empirical evidence found in the work of Cavallo and Majnoni, (2002); Leaven and Majnoni, (2003) Bikker and Metzmakers (2005), Bouvatier and Lepetit (2008) confirmed a positive relationship between earnings and provisions, thus supporting the income smoothing hypothesis.

*The capital to assets ratio* is used as explanatory variable to test the capital management hypothesis. A negative relationship between the capital to assets ratio and loan loss provisions implies that banks make higher provisions when capital is low. This is consistent with capital reduction being correlated with the efforts to build up greater reserve cushion. Similar results are found in the work of Bikker and Metzmakers (2005), Fonseca and Gonzales, (2008). Bikker and Metzmakers (2005) state that this negative relationship reflects the fact that some banks sustain higher risk compare to the others, thus creating higher losses and a lower capital ratio.

*Real GDP growth* is used in the literature to proxy the business cycle. Most of the studies find a negative relationship between loan loss provisions and real GDP, confirming thereby that provisioning are procyclical. Banks tend to increase provisions during the period of economic downturns and to decrease them during economic upswing [Leaven and Majnoni, (2002), Bikker and Hu (2002)]. An additional approach explained by Borio et al (2001), state that provisioning behaviour of banks is countercyclical. So a positive relationship of provisioning with the business cycle implies that banks make higher provisions during the period of economic upturns and decrease them during the period of economic downturns. This counter cyclical behaviour of banks implies that they are forward-looking in estimating their risk.

In the case of Albania, this empirical paper represents the first attempt using bank level data to assess the determinants of loan loss provisioning behaviour of the banks. Investigation of this link is important for policymakers not only by assessing the impact that provisions have in credit risk but also for more prudential financial stability policies.

### III. Methodology and Data

The key objective of this paper is to empirically test the determinants of LLP for the Albanian banking sector. Theoretical and empirical literature suggests that

the following two are the main component which could explain the loan loss provisioning behaviour: non-discretionary component and discretionary component, and also economic cycle. As mentioned above, the non-discretionary component is related to the covering of expected losses and credit risk of bank portfolio. This factor, together with economic cycle, could be strongly cyclical. The main variables that we consider to take into account the non-discretionary component are: the ratio of non-performing loans to total loans ( $NPL_{i,t}$ ) and the first differences of non-performing loans ratio ( $DNPL_{i,t}$ )<sup>1</sup> as measures of credit risk. We include also the ratio of loans to total assets,  $Loan\_rate_{i,t}$  which serves as a proxy for expected loan losses and we expect a positive relationship between these variables and loan loss provisioning.

The discretionary component of LLP results from three different management objective, which are: income smoothing behaviour, capital management behaviour, and signalling behaviour. Based on the income smoothing theory, banks tend to increase (decrease) LLP when earnings are expected to be high (low). A positive relationship between earnings and LLP indicate that banks use provisions to smooth earning, while a negative relationship between these variables indicates procyclicality. The ratio of earnings before interest, taxes and loan loss provision over total assets ( $EBTP_{i,t}$ ) is used as a variable to test the income smoothing hypothesis.

Furthermore, as Biker and Metzmakers, (2002), Bouvatier and Lepetit, (2008) indicated, we have included the capital to asset ratio to test the capital management hypothesis in the case of banks in Albania. Banks with a lower level of capital can use provisions to test the build-up of a greater reserve buffer. To test the capital management hypothesis, we have included the deviation of the capital adequacy ratio with respect to 12 per cent, divided by 12 per cent  $CAP_{i,t}$ . A negative relationship between capital to asset ratio and loan loss provisions supports the capital management hypothesis: more provisioning when the capital ratio is relatively low. This negative link reflects also that some banks hold a greater share of risky loans and have a lower capital ratio (Ahmed et al, 1999).

Loan loss provisions could also be used to signal financial strength, and so as Bouvatier and Lepetit, (2008) we have used the one-year-ahead percentage change of earnings before interest, taxes and provisions to test signalling behaviour of the banks  $SIGN_{i,t}$ <sup>2</sup>. A positive relationship between this variable and LLP confirm that banks use LLP to signal their financial strength.

<sup>1</sup> Where  $(DNPL_{i,t}) = NPL_{i,t} - NPL_{i,t-4}$

<sup>2</sup> Where  $SIGN_{i,t} = (EBTP_{i,t+4} - EBTP_{i,t}) / EBTP_{i,t}$



$GDP\_g_{i,t}$  is a proxy of business cycle conditions measured through real GDP growth, which is used to capture the procyclicality of loan loss provisions. A positive relationship between loan loss provisions and real GDP reflect the counter cycle behaviour of banks, so they profit from better economic conditions to expand their reserve buffers (Leaven and Majnoni, 2003), while a negative link between these two variables indicates that banks create additional provisions as a result of economic downturn following a more pro-cyclical behaviour.

In order to investigate the determinants of loan loss provisions of banks in Albania we use a similar approach proposed by Bouvatier and Lepetit (2008) and Packer and Zhu (2012). Equations (1) model the link between total LLP and the explanatory variables as follows:

$$LLP_{i,t} = \alpha_0 + \alpha_1 LLP_{i,t-1} + \alpha_2 EBP_{i,t} + \alpha_3 NPL_{i,t} + \alpha_4 DNPL_{i,t} + \alpha_5 Loan\_rate_{i,t} + \alpha_6 CAP_{i,t} + \alpha_7 SIGN_{i,t} + \alpha_8 GDP\_g_{i,t} + u_{i,t} \quad \text{Eq. (1)}$$

Where subscripts  $I$  and  $t$ , denote respectively banks and quarterly, and  $u_{i,t}$  is the error term. Our dependent variable is  $LLP_{i,t}$ , which show the level of loan loss provisions (specific provisions plus general provisions) for banks  $i$  at in the quarterly  $t$ , scaled by total assets. To take to account the dynamic adjustment of  $LLP_{i,t}$ , we introduce the lagged dependent variable as explanatory variables. Thus if banks adjust their provisions slowly to recognize potential losses against loans following a default event, then provisions could be systematically related to each period. We have used dynamic panel data analysis, especially Arellano Bond, First Difference Generalized Method of Moments Estimator. GMM technique is more efficient than other techniques in the presence of heteroscedasticity and to overcome the problem of serial correlation.

In order to investigate the main determinants of loans loss provision in Albania, we used quarterly data for 15 banks in Albania from 2004-2014, while macro-economic variables were obtained from Instat (Albanian Institute of Statistics). Our panel includes 15 banks, 13 foreign banks and 2 domestic banks. During this period, the Albanian banking sector experienced important improvements and it accounted for some 90% of the country's financial system. Same as many countries, Albania was also hit by the recent financial crisis which shrank economic growth from 6% to 2% in terms of real GDP growth. In the banking sector, we evidenced lower credit growth from 40% to around 0% growth and a rapid increase of NPL ratio from 4% to 22%, the highest level in the SEE region. In the aftermath of the latest financial crisis, the Bank of Albania (see Table 7 in Appendix) has tightened its prudential supervision to ensure that banks establish reserves proportional to the level of risk in loan portfolios.

In Table 1 we show some descriptive statistics of the main variables that we have considered in our model.

**Table 1: Descriptive statistic of main variables (in percentage)**

Variables	Definition	Nr.	Mean	Std. Dev	Min.	Maks.
LLP	Loan loss provision as a ratio of total assets	660	0.00561	0.01092	-0.03453	0.06086
LLR	Loan loss reserve as a ratio of total assets	660	0.03448	0.04617	0	0.23061
EBTP	Earnings before taxes and loan loss provisions as a ratio of total assets	660	0.00616	0.01535	-0.07209	0.18050
SIGN	One-year-ahead percentage change of earnings before interest, taxes and provisions	600	0.30231	7.66683	-27.2946	159.074
NPL	Nonperforming loan as a ratio of total loans	658	0.11664	0.13183	0	1
DNPL	First differences of nonperforming loans ratio	598	0.02048	0.09714	-0.9999	1
Loan_rate	Loan to asset ratio	660	0.45369	0.20537	0	0.9615
CAP	Total capital (Tier I+Tier II) as a ratio of total assets	660	0.32297	0.31464	0.04417	1.53144
Car_ratio	Total capital as a ratio of risk weighted asset	660	0.36667	0.54157	0.0414	3.951
GDP_g	Annual growth rate of real GDP	660	0.04113	0.03354	-0.03	0.11

Source: Bank of Albania, Instat, author's calculations

Most of the variables are expressed as the ratio of total assets despite the annual growth rate of real lending and real economic growth. The data show that lending is an important activity of banks in Albania, with a mean of around 45.6% as the ratio of total assets, while the annual growth rate of real lending averages 47%. Loan loss provisions as a ratio of total assets have a mean of 1.06% and the maximum of 5.53%, while loan loss reserves average 3.13% of total assets with the maximum of around 18.3%.

The correlation matrix (Table 2) gives an overview of some interesting linkages between our main variables. We find a positive correlation between loan loss provisions and earnings before taxes and provisions, non-performing loans and loan rate and a negative correlation between loan loss provisions and real loans growth, capital ratio and real GDP growth.

**Table 2: Correlation matrix**

Correlation	LLP	GDP_G	Loan_rate	EBTP	SIGN	CAP	NPL	DNPL	Loan_g
LLP	1.000								
GDP_G	-0.1662	1.000							
Loan_rate	0.4779	-0.1262	1.000						
EBTP	0.3220	0.0535	0.2463	1.000					
SIGN	-0.0590	0.0427	-0.1118	-0.0215	1.000				
CAP	-0.1841	0.0162	-0.5123	-0.4871	0.0964	1.000			
NPL	0.1982	-0.3294	0.1411	-0.0759	-0.0482	-0.0891	1.000		
DNPL	0.1350	-0.0373	0.2878	0.1449	-0.0220	-0.2646	-0.355	1.000	
Loan_g	-0.002	0.0504	-0.0314	-0.268	-0.009	0.0321	-0.093	-0.012	1.000

Source: Bank of Albania, Instat, author's calculations

In order to obtain robust and unbiased result, we did some preliminary tests. In addition, we ran unit root tests for the whole banking series of our sample. The literature provides a variety of tests for unit roots or stationary in panel datasets such as the following: Levin–Lin–Chu, LLC(2002); Harris–Tzavalis, HT (1999); Breitung (2000); Breitung and Das (2005); Im–Pesaran–Shin, IPSH (2003), and Fisher-type (Choi 2001). These tests have as the null hypothesis that all the panels contain a unit root, while the Hadri (2000) Lagrange multiplier (LM) test has as the null hypothesis that all the panels are (trend) stationary. The majority of the tests assume that we have a balanced panel dataset, but the Im–Pesaran–Shin and Fisher-type tests allow for unbalanced panels. So in our case we have considered these two tests. After performing the unit root tests, we reject the null hypothesis for all the series that we consider in our model confirming that all data are stationary.

**Table 3: Unit root test result**

	Fisher-type based on ADF test Ho: all panel contain a unit root	Fisher-type based on PP test Ho: all panel contain a unit root	Im-Pasaran-Shin test Ho: all panel contain a unit root
LLP	218.56***(0.000)	131.18***(0.000)	-7.82***(0.000)
EBTP	155.71***(0.000)	147.39***(0.000)	-10.95***(0.000)
NPL	80.63***(0.000)	41.33***(0.000)	-3.54***(0.000)
Loan_rate	100.4***(0.000)	33.06 (0.42)	-2.71***(0.000)
DNPL	497.85***(0.000)	546.02***(0.000)	-14.48***(0.000)
Loan_growth	263.3***(0.000)	151.93***(0.000)	-9.3***(0.000)
Cap_ratio	191.18***(0.000)	224.71***(0.000)	-7.99***(0.000)
Car_gap	294.07***(0.000)	266.05***(0.000)	-7.31***(0.000)
GDG_g	163.9***(0.000)	241.47***(0.000)	-11.05***(0.000)
SIGN		628.05	-16.98***(0.000)

Source: Bank of Albania, Instat, author's calculations

## IV. Results

Based on the methodology presented above, we have analysed the determinants of loan loss provisions in Albania. The empirical analysis is based on the estimation of generalized method of moments (GMM) using first differences (Arellano and Bond, 1991). Variables are in difference to control for unobservable banks specific effects.

**Table 4: All-period determinants of loan loss provisions in Albanian banks**

Explanatory variables	Endogenous variable: $LLP_{i,t}$	
	(1) Arellano-Bond estimation- two step estimation	(2) Arellano-Bond estimation- two step estimation
$LLP_{i,t-1}$	0.39673*** (0.003)	0.4986*** (0.008)
$EBTP_{i,t}$	0.16159*** (0.000)	0.20792*** (0.000)
$NPL_{i,t}$	0.01563*** (0.000)	
$DNPL_{i,t}$	0.01109*** (0.000)	
$Loan\_rate_{i,t}$	0.01633** (0.010)	0.0140** (0.010)
$CAP_{i,t}$	0.00018 (0.720)	0.0004337 (0.425)
$SIGN$	-0.0000045 (0.828)	-0.0000191 (0.845)
$GDP\_g$	-0.01952** (0.016)	-0.02423*** (0.001)
$Loan\_g_{i,t}$		0.000068*** (0.000)
Number of obs.	540	523
Number of banks	15	15
Sargan test of over identifying restrictions, H0: over identifying restrictions are valid		
	Prob> chi2 = 1.0000	Prob> chi2 = 1.0000
Arellano-Bond test for zero autocorrelation in first-differenced errors, H0: no autocorrelation		
Order 1-p value	-2.5347*** (0.0113)	-2.0112** (0.0443)
Order 2-p value	0.63957 (0.5225)	-1.6605 (0.0986)

Note: p-value in bracket, \*, \*\* and \*\*\* represent statistical significance at 90 %, 95 % and 99 %, respectively. Lagged explanatory variables have been used as instruments for differenced equations estimations

Table 4 presents the estimation results of loan loss provisioning model for banks in Albania. Non-performing loans as a ratio of total loans is a measure of bank default probability and we expected a positive relationship between NPL, DNPL and LLP. In our case, we find a positive and significant relationship between two variables and loan loss provisions. So banks with higher irregular loan ratio are expected to make higher reserve to cover their expected credit risk. As we expected we find a positive and significant result between loan loss provisions and loan ratio, which is a measure of expected credit risks. So banks have showed some element of forward-looking by creating more provisions with a higher expected credit risk (Fonseca and Gonzales, 2008).

We find positive and significant coefficient between LLP and earnings before interest, taxes and provisioning, thus confirming the income smoothing hypothesis. So banks in Albania increase loan loss provisions when income is rising and contracting reserve making when profitability is under pressures. The Arellano-Bond estimation technique confirms a positive and insignificant relationship between the capital<sup>3</sup> (adequacy) ratio and loan loss provisions, which do not support the capital management hypothesis in case of Albania. Total LLP seems not to be affected by the signalling hypothesis; we find positive but insignificant results between the variable SIGN and LLP.

The coefficient of real GDP<sup>4</sup> growth is negative, indicating that provisions raise more when the business cycle falls confirming thus that banks provisioning behavior is pro-cyclical and backward looking. This result is in line with other empirical research work presented in the literature such as; Leaven and Majnoni, (2003), Bikker and Metzmakers, (2005), Fonseca and Gonzales, (2008), Skala, (2014). However, this procyclical behaviour is mitigated somewhat by the impact of banks earning on provisions, as banks do provision considerably when earnings are high and vice versa (Bikker and Metzmakers, 2005).

In the second specification (Table 4, column 2), we have included loan growth to learn more about non-discretionary behaviour of the banks. We find positive and significant result between loan growth and loan loss provision, which reflect the fact that higher levels of loan growth may reflect higher credit risk. As in the first specification, we find the same results for other variables, thus confirming

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<sup>3</sup> We also used the capital adequacy ratio gap measured as the difference between capital adequacy and the median to check the robustness of our results. Estimation results confirm a positive and insignificant relationship between the capital adequacy ratio gap and loan loss provisions, which do not support the capital management hypotheses in Albania.

<sup>4</sup> We also obtained the same result by including the GDP gap, confirming the pro-cyclical behavior of banks in Albania.

income-smoothing behaviour of the banks and procyclicality between provisions and GDP growth. We do not find significant relationship between loan loss provisions, capital ratio, and SIGN, so we do not confirm the capital management hypothesis and signalling behaviour.

At the bottom of the table, we present the results of the Sargan test and the Arellano-Bond autocorrelation test. Our test result shows that our model is specified correctly, we cannot reject the null hypothesis of the Sargan test and the Arellano-Bond test shows that autocorrelation is not considered a major issue for our results.

Furthermore, we have investigated whether the global financial crisis has contributed to the cyclicity of banks provisioning behaviour. So, as Packer and Zhu (2012), we used a dummy variable, Dum\_cris to indicate the crisis period (2007-2009) and interacted this dummy with real GDP growth and earnings before taxes, interest and provisions. The estimated results from the Arellano-Bond techniques are showed in Table 5. We find that the global financial crisis has contributed significantly to the procyclicality of loan loss provisions in Albania, as confirmed by the negative and significant coefficient of interactive term between Dum\_cris and real GDP growth. Also, we confirm that during the crisis banks continued to make income smoothing, so we find positive and significant results between earning and loan loss provisions.

**Table 5: Determinants of bank loan loss provisions in Albania-after crisis**

Explanatory variables	Endogenous variable: $LLP_{i,t}$	
	(1)	
	Arellano-Bond estimation-two step estimation	
$LLP_{i,t-1}$	0.47917***	(0.006)
$EBTP_{i,t} * Dum_{cris}$	0.11669***	(0.0008)
$NPL_{i,t}$	0.01736***	(0.001)
$DNPL_{i,t}$	0.01377***	(0.000)
$Loan\_rate_{i,t}$	0.01485*	(0.082)
$CAP_{i,t}$	0.000301	(0.486)
$SIGN$	-0.000003	(0.832)
$GDP\_g * Dum_{cris}$	-0.02703***	(0.000)
Number of obs.	540	
Number of banks	15	
Sargan test of over identifying restrictions		
H0: over identifying restrictions are valid		
Prob> chi2 = 1.0000		
Arellano-Bond test for zero autocorrelation in first-differenced errors,		
H0: no autocorrelation		
Order 1-p value	-3.1409***	(0.0017)
Order 2-p value	-1.6874	(0.1002)

Note: p-value in bracket, \*, \*\* and \*\*\* represent statistical significance at 90 %, 95 % and 99 %, respectively.

Lagged explanatory variables have been used as instruments for differenced equations estimations

## V. Conclusions

The recent financial crisis has emphasized the need to limit the financial system procyclicality, which involves the use of prudential policies to offset this procyclicality in order to reduce the risk of financial instability. Currently, the more proactive prudential rules that have received a lot of attentions are: the adjustment of regulatory capital ratios in a countercyclical way and dynamic provisioning.

Dynamic provisioning involves ex-ante general provision to cover the risk associated with economic cycle in addition to microeconomic risk in specific sectors. Thus, in order to help policymakers to take a decision about the use of prudential policies, we investigated the cyclical nature of loan loss provisions of Albanian banking sector during 2004-2014, following the empirical work of Laeven and Majnoni (2003), Bikker and Metzmakers, (2005), Bouvatier, and Lepetit (2008).

Our empirical results based on the generalized method of moments (GMM) using first differences of Arellano and Bond, (1991) show that loan loss provisions of banks in Albania is driven by non-discretionary components and macroeconomic variables. Similarly to other studies, we support that banks have adopted a procyclical provisioning model towards macroeconomic cycles. We confirm that banks in Albania have used loan loss provisions to smooth income, and taking the advantages of higher profitability periods. Furthermore, our results do not support the capital management hypothesis and signalling behaviours.

We show evidence that loss provisioning model in banks in Albania is backward-looking in the sense that it requires that a loss event has occurred before a provision can be made. We suggest the use of systems of forward-looking provisioning for banks in Albania to be more effective in diminishing credit risk.



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