Advances in Business-Related Scientific Research Journal (ABSRJ)
Volume 3 (2012), Number 2

ISSN 1855-931X

PROCYCLICALITY OF LOAN LOSS PROVISIONS – THE CASE OF POLAND

Małgorzata Olszak

University of Warsaw, Faculty of Management

Poland

molszak@mail.wz.uw.edu.pl

Abstract

The recent debate over the role of prudential regulations in amplifying the cyclicality of bank lending focuses on two fundamental sources of it: capital adequacy regulations and loan loss provisioning system. Previous research shows that loan loss provisioning system can amplify the business cycle fluctuations, and its impact on it is even stronger than that of capital regulations. A dynamic model based on quarterly aggregated commercial banks data for the period 1998–2009 is used to determine if banks' behavior, induced by the loan loss provisioning system in Poland, may amplify credit cycle fluctuations. The paper finds that provisioning in Poland is substantially higher when GDP growth is lower, which leads to the conclusion that Polish loan loss provisioning system is procyclical. This impact is mitigated slightly by earnings management.

Key words: income smoothing, earnings management, procyclicality

JEL classification: E32, E44, G21

INTRODUCTION

In the aftermath of the last financial crisis the Basel Committee on Banking Supervision and the European Commission have decided to introduce regulations aimed at curbing procyclicality of bank lending (BIS, 2008; BCBS, 2009, 2010). These regulatory changes are focused mainly on new, more stringent capital regulations. Only a limited guidance is given in the area of bank loan loss provisions. In the literature, however, it has been proved that loan loss provisioning scheme is of great importance for the effectiveness of capital regulations (Nier and Zicchino, 2006; Beatty and Liao, 2009).

Both capital and loan loss provisions are recognized as two distinct categories of shock absorbers. Loan loss reserves (especially general loan loss provisions) are intended to cope with expected losses, that is losses which occur on average and can be measured by the mean value of the frequency distribution of loan losses. Bank regulatory capital, instead,

should absorb unexpected losses, that is losses which are large but rare and that therefore can be located far in the tail of the frequency distribution of loan losses. Although in reality the distinction may be seen as artificial – it is very important. Banks that have loan loss provisions properly measured to cover expected losses, e.g. have forward-looking provisioning framework in place – should be less influenced by business cycle fluctuations. Evidence of this provide Beatty and Liao (2009), who building on capital crunch[1] research in the US, find that banks who have prudent loan loss provisioning are less affected by capital crunch during recessions.

The new regulatory changes proposed by the Basel Committee and the European Commission will have to be introduced in Poland too. Thus far Polish banking sector has not suffered strongly from the effects of international financial crisis. Therefore, it seems reasonable to answer the question whether Polish banks loan loss provisioning scheme is procyclical. The problem will be resolved by testing hypothesis that loan loss provisions are negatively associated with GDP growth in Poland. Following previous research we will also test whether the possible procyclicality of loan loss provisions is mitigated by income smoothing, by capital management and by sound credit risk management practices reflected in recognizing the increase of credit risk during business cycle expansions.

The empirical analyses of these hypotheses indicate that Polish commercial banks loan loss provisioning system is deeply procyclical. It is mitigated slightly by income smoothing and by sound risk management practices.

The remainder of this paper is organized as follows. In theory part we present sources of procyclicality in bank lending as well as empirical evidence on loan loss provisions procyclicality. The data and methodology section shows sources and characteristics of data employed and the model used to test the hypotheses put forward in this paper. The findings part comprises OLS regression results of our model. In the discussion we indicate the contributions of this paper. The final section comprises main conclusions of the paper and its implications for the practice.

THEORY

Sources of procyclicality in banking

The term procyclicality2 is referred to describe the mutually reinforcing mechanisms through which the financial system can amplify business cycle fluctuations and possibly cause or exacerbate financial instability (BIS, 2008). These feedback mechanisms are particularly disruptive during an economic downturn or when the financial system is facing strains – e.g.

[1] Capital crunch is a reduction in lending by banks constrained by capital. Peek and Rosengren (1995b: 625), Wagster (1996), Jackson et al. (1999) show that during the early 1990-ties US recession banks decreased lending to achieve higher capital requirements or to maintain existing requirements (see also Haubrich and Wachtel, 1993)). Capital crunch may result in a credit crunch, however for this to happen, loan supply must fall faster than loan demand. Evidence of credit crunch arising from capital crunch is provided by Peek and Rosengren (1997, 2000) who found that binding risk-based capital requirements associated with the Japanese stock market decline resulted in a decrease in lending by Japanese banks in the United States that was both economically and statistically significant (see also Gibbon, 1995 and Owualah, 1999). Chiuri, Ferri and Majnoni (2002) suggest that the supervisors enforcement of capital requirements – according to the 1988 Basel Accord – significantly curtailed credit supply, particularly at less-well-capitalized banks in emerging economies.

[2] The subject of procyclicality is not new. The first formal theories of business cycles were written by Ludwig von Mises in 1916 (the so called Austrian business cycle theory) and then developed by Hayek in 1931 (see Khoury (2009) for a short presentation of the theory).

during financial crisis. The reasons of procyclicality can be explained by theory of behavioral finance, which addresses the psychological aspects and their impact on financial markets. As Borio et al. (2001) state misperceptions of risk or inappropriate responses to it are at the roots of procyclicality in banking. They examine two sets of factors that can result in either misperceptions of risk or wrong reactions to it.

Formation of persistent misperceptions of risk can arise from two types of well-documented cognitive biases: disaster myopia and cognitive dissonance (including institutional memory deterioration). Disaster myopia (Guttentag and Herring, 1984) emphasizes that banks tend over time to underestimate the likelihood of high-loss low-probability events. Such events might be the change in the economic conditions, a change in the regulatory framework or a natural or man-made disaster. If bank managers cannot envisage the effects of a future negative event, e.g. recession, then they may be prone to credit expansion, and when the recession sets in (i.e. the negative event happens), they may dramatically cut down lending. Cognitive dissonance refers to the tendency to interpret information in a biased way, so that it reinforces the belief entertained by the economic agent (Borio et al., 2001). Berger and Udell (2004) have developed institutional memory hypothesis to explain why banks tend to misevaluate risk, particularly during expansions. They test the hypothesis that the deterioration in the ability of loan officers over the bank's lending cycle resulting in an easing of credit standards is one of reasons of bank procyclical behavior. Their empirical analysis supports the hypothesis.

Wrong responses to risk may arise from the fact that economic agents take actions which may be reasonable when seen from the perspective of an individual, however when taken as a group they result in procyclicality. For example, during boom it may be reasonable for an individual bank to loosen lending standards. Other banks, when faced with similar situation, considering competitive pressures (see Rajan, 1994; Jiménez and Saurina, 2006), would have incentive to do likewise. The result might be a widespread increase in the availability of banking funds, even to negative net present value projects, that normally would have been rejected by bank loan officers. Eventually this leads to overextension and credit crunch or even banking crisis. Herding behavior – where agents conform their behavior to that of their peers, is another phenomenon that may bring about procyclicality. The most common reason behind this phenomenon is reward structures that limit blame in the case of collective, as opposed to individual, failure. For instance, banks' managers may not be blamed for the failure of their bank if failures are widespread (see Jain and Gupta, 1987).

Misperceptions and inappropriate responses to risk may be a result of wrong risk measurement methodologies. Most of currently used methodologies have difficulty in measuring the systematic component of risk associated with financial and business cycle (see Borio et al., 2001:19-24). For instance, the contemporary credit risk models which are employed by banks focus on relatively short time horizons and have a "point-in-time" nature. While external credit rating agencies attempt to rate borrowers "through the cycle" – so that the ratings are less likely to move over the course of the business cycle and with the borrowers being assessed on their probability of defaulting in a constant hypothetical downside scenario, this approach does not guarantee that the ratings will be countercyclical. Bank supervisors also spend considerable amount of time on evaluation of a bank's risk. There is no standardized approach in this respect. It should be stressed, however, that supervisory risk assessment methodologies (e.g. Supervisory Review and Evaluation Process, SREP in the EU; CAMELS in the US; BION in Poland) have one feature in common. All of them include a method of identifying risky financial institutions by peer group analysis

focused on information coming from a one year horizon. This approach, by definition, has limited ability to identify changes in risk over time.

Empirical evidence on loan loss provisions procyclicality

There are several papers dealing with the issue of procyclicality of bank provisions (Cavallo and Majnoni, 2001; Bikker and Hu, 2002; Leaven and Majnoni, 2003; Bikker and Metzemakers, 2003, 2004; Bouvatier and Lepetit, 2008; Perez et al, 2008). All of the papers have one feature in common – they use the model traditionally employed, mainly by US researchers (Greenawalt and Sinkey,1988; Collins et al., 1995; Liu and Ryan, 1995; Beatty et al., 2002; Kanagaretnam et al., 2003; Liu and Ryan, 2006), to test income smoothing[3] hypothesis[4]. The model of income smoothing used for testing procyclicality of loan loss provision is modified by inclusion of macroeconomic variables, as indicators of economic conditions. A very distinct feature of papers examining the problem of procyclicality is time span of analysis. The research is designed to capture variations in loan loans provisions over the whole business cycle – so the timeline must comprise at least ten years of observations.

One of the conclusions following from the current research on loan loss dependence on economic cycle is that banks tend to make fewer provisions for loan-losses during an economic upturn (when economic conditions are favorable and the perceived probability of business defaults is relatively low), but increase them in an economic downturn (when economic conditions deteriorate and observed loan defaults increase). Consequently, bank provisioning is said to be pro-cyclical, as it tends to re-enforce current developments in the business cycle. When analyzing findings of previous papers one should bear in mind the fact that they differ in research methodology. For instance, the analysis by Leaven and Majnoni (2003) and the research conducted by Bikker and Metzemakers (2005) only seemingly produce similar results, as there are differences in specification of dependent and independent variables as well as in the samples examined.

DATA AND METHODOLOGY

The data sources

We use aggregated time series Polish commercial banks data over a 10-year period from 1999 to 2009. This episode covers a full business cycle for Poland. The cycle develops from a through around 1999-2001, an economic boom in mid 2000 (2004-2007) to a financial crisis slowdown in 2008-2009. All the bank specific data were taken from Polish Banking Supervisory Authority and Polish Financial Supervisory Authority quarterly reports published in years 1998 – 2010. Macroeconomic variables – Gross Domestic Product and inflation measured by Consumer Price Index come from Chief Statistical Authority (GUS, Główny Urząd Statystyczny) web page.

Unlike the analyses mentioned above (see Cavallo and Majnoni, 2001; Bikker and Hu, 2002; Leaven and Majnoni, 2003; Bikker and Metzemakers, 2003, 2004; Bouvatier and Lepetit,

[3] Income smoothing is an example of earnings management used to reduce volatility of banks profits. A very accessible overview of definitions of earnings management present Dechow and Skinner (2000). Healy and Whalen (1999) summarize the major motivations to manage earnings, whereas Wall and Koch (2000) analyze possible consequences of this strategy.

[4] There is now a huge literature that has tested the income smoothing hypotheses. Some studies find a positive relationship between loan-loss provisions and bank earnings (Greenawalt and Sinkey, 1988; Kanagaretnam et al., 2003), while others have found no relationship (Ahmed et al. 1999).

(2008), we focus on one country, so we do not include in our model country specific variables.

The model for loan loss provisioning

The variables chosen as possibly explanatory of LLP are variables traditionally used for the income smoothing hypothesis (see Greenawalt and Sinkey, 1988; Beatty et al., 2002; Liu and Ryan, 2006) modified by inclusion of GDP growth (as in Laeven and Majnoni, 2003; Bikker and Metzemakers, 2005). The basic model we employ to verify hypothesis of loan loss dependence on business cycle as well as to test the hypothesis of income smoothing and earnings management reads as:

$$LLP = c + a_1*GDP + a_2*L + a_3*NPL + a_4*P + a_5*CAP + \varepsilon$$

The dependent variable (LLP) is the quarterly real rate of growth of loan loss provision of a bank. The explanatory variables in the equation can be divided into two sets. The first one is macroeconomic variables –measured by the growth rate of real GDP. The other is bank specific (i.e. micro variables) and comprises: L – the real loan growth; NPL – the real growth of nonperforming loans; P – the real growth rate of profits (before taxes and before provisions); CAP – the real rate of growth of bank capital. The c is constant, while ε is white-noise error term.

The growth rate of real GDP is used in the equation to proxy the business cycle. 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. In our model, economic growth is regarded as the main indicator of demand for banking services (including loans) and is thus a direct determinant of banks' earnings.

Loan growth and nonperforming loans are included in order to capture credit risk. The real growth rate of loans is thought to be positively associated with bank risk, given that rapid growth of bank lending is generally associated with lower monitoring efforts and a deterioration of the quality of loan portfolios (see Rajan, 1994; Borio et al., 2001; Berger and Udell, 2004). Banks who behave prudently should therefore show a positive relationship between loan loss provisions and the growth rate of their portfolios (as posited by Leaven and Majnoni, 2003; Bikker and Matzemakers, 2004, Bouvatier and Lepetit, 2008; Perez et al, 2008). However, in case of unsound provisioning practices, this relationship might as well be negative – as evidenced by Frait and Komárková (2010). The nonperforming loans variable is a good indicator of the risk of default on banks' loans. Bouvatier and Lepetit (2008) suggest that this relationship should be positive, indicating bank awareness of credit risk.

Profits (P) and capital (CAP) have been included in the model to control for income smoothing and capital management[5]. Banks who manage their earnings by the practice of income smoothing may be regarded as prudent (see Borio et al, 2001; Leaven and Majnoni, 2003). In case of prudent bank behavior in this area, the association between loan loss provisions and profits should be positive. As is evidenced mainly for the US, banks use loan

[5]. Traditional capital management hypothesis states that bank managers use LLP to reduce expected regulatory costs associated with violating capital requirements, a negative relationship being predicted between capital ratios and loan loss provisions for the US (Beatty at al., 1995; Ahmed et al., 1999; Galai et al., 2003). We argue that banks prefer to have a steadily increasing amount of capital, as it is a nominator of capital adequacy ratio, and with the expansion of their credit activity it helps them keep stable level of capital adequacy ratio. A stable capital adequacy ratio should make banks lending activity less sensitive to recessions and less procyclical.

loss provisions not only for income smoothing, but also for capital management purposes (Beatty at al., 1995; Ahmed et al., 1999; Galai et al., 2003). It should be stressed here that, in contrast to the US loan loss allowances accounting, in Poland loan loss provisions cannot be included in regulatory capital, so the relationship between the two variables could be positive, instead of the negative relationship predicted for the US banks (see also Pérez et al, 2008 for the Spanish banking sector).

We use real growth rates of the variables to counteract potential nonstationarity of aggregate variables included in the model. All rates are calculated as natural logarithms of real dynamics[6].

Data characteristics

Table 1 provides some descriptive statistics about the variables in our estimation sample. The real growth rate of LLP equals 0,16 on average (with a standard deviation of 0,65). The average GDP growth rate is 0,039 with a standard deviation of 0,02. The mean level of nonperforming loans growth is 0,07 (standard deviation of 0,26). Loan growth average is equal to 0,11 (with a standard deviation on 0,15). Profits growth rate was 0,05 on average with a standard deviation of 0,15. CAP growth rate equals 0,09 on average with 0,08 standard deviation.

Table 1: Summary descriptive statistics of key regression variables

Statistics:	Variables:					
	LLP	GDP	NPL	L	P	CAP
Mean	0,162	0,039	0,070	0,108	0,047	0,085
Median	0,183	0,041	0,121	0,077	0,084	0,092
Maximum	1,443	0,072	0,619	0,311	0,279	0,273
Minimum	-1,738	0,005	-0,368	-0,032	-0,290	-0,107
Standard deviation	0,645	0,020	0,255	0,102	0,146	0,079
No of observations:	43	43	43	43	43	43

Considering the fact that the variables included in the model are aggregates that may be prone to nonstationarity we have decided to examine their stationarity by Augmented Dickey Fuller test. Results of the test applied to all variables are presented in table 2. The analysis shows that all variables are stationary.

Table 2: Stationarity tests of key regression variables

	Variables:					
	LLP	GDP	NPL	L	P	CAP
Augmented Dickey-Fuller test statistic	-2,72	-2,75	-1,75	-1,99	-2,51	-1,66
Probability*	0,01	0,07	0,08	0,05	0,01	0,09

*MacKinnon (1996) one-sided p-values.

[6] We use such a measure considering the fact that the relationship between rate at moment t (r_t) and dynamics of dependent and independent variables, e.g. loan loss provisions(LLP), may be expressed as follows : $r_t = \ln(LLP_t/LLP_{t-1}) = (\Delta LLP_t/LLP_{t-1})$

Table 3 presents correlation matrix of all the regression variables. The results in the table indicate significant correlations between loan loss provisions and each of the explanatory variables. The correlation between loan loss provisions and GDP is around -26 percent, suggesting that banks provision too late, when negative conditions set in. The correlation between loans and nonperforming loans is positive, and at a level of around 50 percent – relatively strong, indicating that banks tend to provision more when credit risk is build up. The correlation between loan loss provisions and profits is around 4 percent suggesting imprudent behavior by the average bank. The correlation between loan loss provisions and capital is 63 percent, suggesting capital management under Polish accounting standards.

Table 3. Correlation matrix of key regression variables

	LLP	GDP	L	NPL	P	CAP
LLP	1,000					
GDP	-0,255	1,000				
L	0,486	0,434	1,000			
NPL	0,548	-0,538	-0,088	1,000		
P	0,035	0,451	0,292	-0,610	1,000	
CAP	0,628	-0,474	0,425	0,342	0,083	1,000

FINDINGS

Table 4 presents OLS estimation results for our sample. We analyze two models. Model 1 includes the capital variable (CAP) as well as its first lag. Model 2 omits the CAP variable due to its statistical insignificance in model 1.

The estimation results indicate normality of residual series distribution (tested by Jarque – Berra statistics). The value of the Durbin-Watson statistic reported in table 4 is indicative of no presence of serial correlation in the residuals of the estimated equation. A more general Breusch-Godfrey test for serial correlation in the residuals leads to the same conclusion.

All explanatory variables, except the capital, have statistically significant effects on loan loss provisions. In line with expectations, the GDP growth coefficient is significantly negative, indicating that provisions indeed rise when the business cycle falls (see Leaven and Majnoni, 2003; Bikker and Metzemakers, 2005; Bouvatier and Lepetit, 2008; Pérez et al., 2008).

Loans growth and nonperforming loans as a proxy of increased credit risk appear to be significantly positive determinant of provisioning, suggesting bank awareness of risk build up during boom periods (see also Bikker and Metzemakers, 2005; Bouvatier and Lepetit, 2008; Pérez et al., 2008). This countercyclical outcome is dominated, however, by the overall procyclical provisioning behavior as indicated by the very strong GDP effect.

The procyclical behavior as reflected by the level of coefficient of GDP might be also mitigated somewhat by the impact of banks' earnings on provisions, as banks in Poland do provision considerably more when earnings are high and vice versa. This behavior may contribute to financial soundness of banks and possibly reduces the degree of procyclicality, which would have been stronger if it were not for this forward-looking provisioning (see Borio et al., 2001).

In case of Polish banks the capital management hypothesis has not been verified and must be rejected. Considering the fact that loan loss provision (general provision) is not included in the capital, the relationship between LLP and CAP should be positive to be indicative of capital management (as predicted for Spain by Pérez et al., 2008). In model 1 the CAP variable is statistically insignificant, but its first lag has significant impact on loan loss provisions. In model 2, estimated after exclusion of CAP, coefficient of lagged capital is statistically significant. However, in both models its sing is negative, whereas it should be positive. So our results suggest that loan loss provisions in Poland are not employed for capital management purposes.

Table 4. Regression results

Dependent Variable: LLP				
		Model 1		
Independent variables:	Coefficient	Std. Error	t-Statistic	Probability
C	0,309	0,252	1,224	0,229
GDP	-17,137	5,819	-2,945	0,006
L	4,810	0,983	4,891	0,000
NPL	2,016	0,304	6,624	0,000
P	2,188	0,533	4,103	0,000
CAP	-0,277	1,504	-0,184	0,855
CAP(-1)	-2,444	1,158	-2,110	0,042
R-squared	0,781			
Adjusted R-squared	0,744			
F-statistic	21,382	Probability (F-statistic)		0,000
Durbin-Watson stat	2,051			
Residuals normality test:				
Jarque – Berra	1,883	Probability	0,390	
Breusch-Godfrey Serial Correlation LM test:				
F-statistic	0,155	Prob. F(2,35)		0,857
Obs*R-squared	0,389	Prob. Chi-Square(2)		0,823
Dependent Variable: LLP				
		Model 2		
Independent variables:	Coefficient	Std. Error	t-Statistic	Probability
C	0,278	0,185	1,499	0,142
GDP	-16,400	4,171	-3,932	0,000
L	4,695	0,753	6,238	0,000
NPL	2,010	0,299	6,731	0,000
P	2,140	0,459	4,662	0,000
CAP(-1)	-2,520	1,067	-2,362	0,024
R-squared	0,781			
Adjusted R-squared	0,751			

F-statistic	26,339	Probability (F-statistic)	0,000
Durbin-Watson stat	2,056		
Residuals normality test:			
Jarque – Berra	1,816	Probability 0,403	
Breusch-Godfrey Serial Correlation LM test:			
F-statistic	0,152	Prob. F(2,35)	0,860
Obs*R-squared	0,370	Prob. Chi-Square(2)	0,831

DISCUSSION

The findings of the analyses presented above indicate strong procyclicality of loan loss provisions in Poland which is mitigated somewhat by income smoothing and prudent credit risk management approach employed by commercial banks. To the best of our knowledge this is the first study to investigate this phenomenon in Poland.

The strong procyclicality of Polish loan loss provisioning scheme has not resulted in a banking sector problems during the last financial crisis. So what might be the reasons of this? Following the arguments presented by Leaven and Majnoni (2003) and Bikker and Metzemakers (2005), we posit that a possible explanation of the lack of serious banking problems in Poland is very strong capital position of Polish commercial banks. The average capital adequacy ratio of Polish commercial banks in years 1999-2009 ranged from 11,1% (in 2008) to 15,5% (in 2004). In 2009 commercial banks had a tier 1 capital of 82,7 bln zlotys (78 bln zlotys after deductions) which made up 93,3% of total bank capital being a numerator of capital adequacy ratio.

The good capital position of Polish commercial banks may also explain why banks in Poland do not manage their capital by loan loss provisions. They simply do not need to use this strategy.

The Polish banks procyclical loan loss provisioning system could have brought about a reduction in bank lending. But considering the fact that, as of the end of 2009, the credit to GDP ratio in Poland was 45%[7], the reduction in bank lending might have resulted in only a slight reduction of output in Poland. The strong dependence of bank loan loss provision on the business cycle might, however, cause problems to the Polish banking sector and to the real economy in the future, as the value loan portfolio starts exceeding the amount of Polish gross domestic product[8].

CONCLUSIONS AND IMPLICATIONS

The study provides evidence on the procyclicality of loan loss provisions in Polish commercial banks, as loan loss provisions are negatively related to GDP. The procyclical effect is mitigated slightly by the impact of the banks' earnings on provisions, as banks provision more as their income increases. The study suggests rejection of capital management through loan loss provisions. This may be a result of very favorable capital position of Polish commercial banks. Finally, procyclicality is mitigated somewhat by positive effect of loan

[7] The credit to GDP ratio is calculated by dividing amount of credit granted in a given year by the amount of this year's Gross Domestic Product. In 2009 banks in Poland had a loan portfolio of 612,1 bln zlotys, whereas the gross domestic product was 1343,7 bln zlotys.
[8] The credit to GDP ratio exceeding 100% is not uncommon to developed economies.

growth and nonperforming loans on loan loss provisions. This suggests prudent approach of Polish commercial banks to credit risk management.

The research contributes to the empirical literature on loan loss provisioning by verifying the hypothesis of LLP procyclicality for Poland. To the best of the author's knowledge this is the first study for Polish commercial banks. The findings are based on contemporary data – opposite to the analyses mentioned in this paper.

This study is of theoretical significance, as it shows that procyclicality of loan loss provisions in a given country does not have to bring about banking crisis and financial sector instability. The research stresses that country specific factors, such as the level of banking sector capital during the recession period as well as the level of financial sector development, measured e.g. by credit to GDP ratio should be considered in this respect. As has been shown in this paper, although Polish commercial banks loan loss provisioning is procyclical, it has not resulted in serious banking sector problems in the last years.

The findings of this research have at least one implication for practice. Although currently the problem of loan loss provisions procyclicality seems not to be so important for the Polish economy, because of the low level of credit to GDP ratio, in the future it may be troublesome, as is evidenced in case of developed economies. That's why it advisable that Polish regulators and banking supervisory authorities should gradually introduce changes in loan loss provisioning framework to counteract the possible negative side effects of strong procyclicality in the future. These new regulations should promote more forward –looking provisioning.

The empirical part of this paper has two limitations. The first one, is the type of data employed. The significance of the findings presented in this paper would increase with inclusion of a panel data model, instead of aggregates. The other, is omission of cooperative banks from the analysis. Such an analysis would create opportunity for comparisons between commercial and cooperative banks categories. Therefore, the future research should be based on data collected for individual commercial and cooperative banks operating in Poland. The research should aim to find out whether there are differences between specified types of banks (e.g. between publicly traded, privately held and cooperative banks, large versus small, etc.) in the association between loan loss provisions and GDP, and if so, what are the determinants of these potential differences.

REFERENCES

Ahmed, A., Takeda, C. & Thomas, S. (1999). Bank Loan Loss Provisions: A Re-examination of Capital Management, Earnings Management and Signaling Effects. Journal of Accounting and Economics 28, 1-25.

Bank for International Settlements (BIS) (2008) Addressing financial system procyclicality: a possible framework. Note for the FSF Working Group on Market and Institutional Resilience, Basel: Bank for International Settlements.

Basel Committee on Banking Supervision (BCBS) (2009) Strengthening the resilience of the banking sector. Consultative Document, Basel: Bank For International Settlements.

Basel Committee on Banking Supervision (BCBS) (2010) Basel III: a global regulatory framework for more resilient banks and banking systems. Basel: Bank For International Settlements.

Beatty, A., Chamberlain, S. L. & Magliolo, J. (1995). Managing Financial Reports of Commercial.
Banks: The Influence of Taxes, Regulatory Capital and Earnings, Journal of Accounting Research, 33 (2), 231-261.
Beatty, A. L., Ke, B. & Petroni, K. R. (2002). Earnings Management to Avoid Earnings Declines across Publicly and Privately Held Banks. The Accounting Review, 77 (3), 547-570.
Beatty, A. & Liao, S. (2009). Regulatory Capital Ratios, Loan Loss Provisioning and Pro-cyclicality, Working Paper for seminar at Indiana University and University of Missouri
Berger, A. N. & Udell, G. F. (2004). The institutional memory hypothesis and the procyclicality of bank lending behavior. Journal of Financial Intermediation 13, 458-495.
Bikker, J. A. & Hu, H. (2002). Cyclical Patterns in Profits, Provisioning and Lending of Banks. DNB Staff Reports n. 86, Amsterdam.
Bikker, J. A. & Metzemakers, P. A. J. (2005). Bank provisioning behaviour and procyclicality. Journal of International Financial Markets, Institutions and Money, 15, 141–157.
Borio, C., Furfine, C. & Lowe, P. (2001). Procyclicality of the financial system and financial stability: issues and policy options. BIS Papers 1, Basel: Bank for International Settlements.
Bouvatier, V. & Lepetit, L. (2008). Banks' procyclical behavior: does provisioning matter? Journal of International Financial Markets, Institutions and Money 18, 513-526.
Brinkmann, E. & Horvitz, P. (1995). Risk-based capital standards and the credit crunch. Journal of Money, Credit, and Banking 27, 848–863.
Cavallo, M. & Majnoni, G. (2001). Do Banks Provision for Bad Loans in Good Times? Empirical Evidence and Policy Implications, Working Paper.
Chiurri, M. C., Ferri, G. & Majnoni, G. (2002). The macroeconomic impact of bank capital requirements in emerging economies: Past evidence to assess the future. Journal of Banking and Finance 26, 881-904.
Collins, J., Shackelford, D. & Wahlen, J. (1995). Bank differences in the coordination of regulatory capital, earnings, and taxes. Journal of Accounting Research 33, 263-291.
Dechow, P. M. & Skinner, D. J. (2000). Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. Accounting Review, 14 (2), 235-250.
Financial Stability Forum (2009). Report of the Financial Stability Forum on Addressing Procyclicality in the Financial System. Financial Stability Forum, 2 April 2009
Frait, J. & Komárková, Z. (2010). Instruments for curbing fluctuations in lending over the business cycle. Financial Stability Report 2008/2009, Prague: Czech National Bank, 72-78.
Galai, D., Sulganik, E. & Wiener, Z. (2003). Accounting Values versus Market Values and Earnings Management in Banks. Working Paper, The Hebrew University of Jerusalem, Israel.
Gibbon, M. S. (1995). Can Bank Health Affect Investment? Evidence from Japan. The Journal of Business 3, 281 – 308.
Greenawalt, M. B. & Sinkey, J. F. (1988). Bank Loan-Loss Provisions and the Income-Smoothing Hypothesis: An Empirical Analysis, 1976-1984. Journal of Financial Services Research 1, 301-318.
Guttentag, J. M. & Herring, R. J. (1984). Credit Rationing and Financial Disorder. Journal of Finance 39 (5), 1359-1382.

Hancock, D. & Wilcox J. A. (1994a). Bank Capital and the Credit Crunch: The Roles of Risk-Weighted and Unweighted Capital Regulation. Journal of the American Real Estate and Urban Economics Association, 22, 59-94.

Hancock, D. & Wilcox, J. A. (1994b). Bank Capital, Loan Delinquencies, and Real Estate Lending. Journal of Housing Economics, 3, 121-146.

Hancock, D. & Wilcox J. A. (1997). Bank capital, Non-bank Finance, and Real Estate Activity. Journal of Housing Research, 8, 75-105.

Hancock, D. & Wilcox, J. A. (1998). The "Credit Crunch" and the Availability of Credit to Small Business. Journal of Banking and Finance 22 (6–8), 983–1014.

Haubrich, J. & Wachtel, P. (1993). Capital Requirements and Shifts in Commercial Bank Portfolios. Federal Reserve Bank of Cleveland Economic Review, 29, 2-15.

Healy, P. M. & Whalen, J. M. (1999). A Review of the Earnings Management Literature and its Implications for Standard Setting. Accounting Horizons, 13 (4), 365-383.

Jackson, P., Furfine, C., Groeneveld, H., Hancock, D., Jones, D., Perraudin, W., Radecki, L. & Yoneyama, M. (1999). Capital Requirements and Bank Behaviour: The Impact of The Basle Accord. Basle: Bank for International Settlements.

Jain, A. & Gupta, S. (1987). Some Evidence on "Herding" Behavior of U.S. Banks. Journal of Money, Credit and Banking, 19 (1), 78-89.

Jiménez, G. & Saurina, J. (2006). Credit cycles, credit risk, and prudential regulation. International Journal of Central Banking (2), 65-98.

Kanagaretnam, K., Lobo, G. J. & Mathieu, R. (2003). Managerial Incentives for Income Smoothing Through Bank Loan Loss Provisions. Review of Quantitative Finance and Accounting, 20, 63-80.

Khoury, G. E. (2009). Procyclicality of the banking system: the prudential and accounting framework of the procyclicality of bank balance sheet. Working paper, University of Liege.

Laeven, L. & Majnoni G. (2003). Loan loss provisioning and economic slowdowns: too much, too late?, Journal of Financial Intermediation 12 (2003), 178-197.

Liu, Ch.-Ch. & Ryan, G. S. (2006). Income Smoothing over the Business Cycle: Changes in Banks' Coordinated Management of Provisions for Loan Losses and Loan Charge-Offs from the Pre-1990 bust to the 1990s Boom. The Accounting Review, 81 (2), 421-441.

Nier, E. & Zicchino, L. (2006). Bank weakness, loan supply and monetary policy, Working paper, Bank of England.

Owualah, S. I. (1999). Banking Crisis, Reforms, and the Availability of Credit to Japanese Small and Medium Enterprises. Asian Survey (4), 656 – 667.

Peek, J. & Rosengren, E. (1994). Bank real estate lending and the New England capital crunch. Journal of American Real Estate and Urban Economics Association 22, 33-58

Peek, J. & Rosengren, E. (1995a). The capital crunch: Neither a borrower nor a lender be. Journal of Money, Credit, and Banking 27, 625–638.

Peek, J. & Rosengren, E. (1995b). Bank regulation and the credit crunch. Journal of Banking and Finance 19, 679–692.

Peek, J. & Rosengren, E. (1997). The International Transmission of Financial Shocks: The Case of Japan. American Economic Review, 87 (4), 495–505.

Peek, J. & Rosengren, E. (2000). Collateral Damage: Effects of the Japanese Banking Crisis on Real Activity in the United States. American Economic Review, 90 (1), 30–45.

Pérez, D., Salas, V. & Saurina, J. (2006). Earnings and Capital Management in alternative Loan Loss Provision Regulatory Regimes. Working Paper No. 614, Banco de España.

Pérez, D., Salas, V. & Saurina J. (2008). Earnings and Capital Management in alternative Loan Loss Provision Regulatory Regimes. European Accounting Review, 17 (3), 423-445.

Rajan, R. J. (1994). Why Bank Credit Policies Fluctuate: A Theory and some Evidence, Quarterly Journal of Economics, 109 (2), 399-411.

Wagster, J. D. (1996). Impact of the 1988 Basle Accord on International Banks. Journal of Finance, 51, 1321-1346.

Wall, L. D. & Koch, T. W. (2000). Bank loan-Loss Accounting: A Review of Theoretical and Empirical Evidence. Economic Review, Federal Reserve Bank of Atlanta.