Does Bank Prudential Behaviour Affect Their Solvency Condition?

by
GERTI SHIJAKU

Bank of Albania
Research Department

December 6 – 7, 2018

12th South-Eastern European Economic Research Workshop

Introduction

- The recent financial crises raises fundamental issues about the role of banks' capital, particular from the standpoint of bank safety and survival, or of what we define in this paper as the solvency condition of a bank.

- Key reforms have been adopted, mostly capital-based [Kok, *et al.*, (2014)], which as BIS (2017) reveals seek to:
  - Develop a more resilient banking sector to macro-financial shocks;
  - Restore credibility in the calculations of risk-weighted assets;
  - Improve the comparability of bank's capital ratios;

- From an empirical point of view, research on the determinants of capital ratios has attracted wide interest:
  - Most of them focus on large developing market, e.g. US and European markets to less extent to other large emerging markets, e.g. China and Brazil, **BUT**, relatively little is known among other small emerging markets, e.g. Albania.
  - Some issues are not dealt sufficiently, in particular selection of variables lacking internal consistency, e.g. traditional indicators used proxy of prudential behaviour such CAR, LLP, etc., which do not capture properly the other sort of prudential policies or attitude.
  - Little is known about the relationship between prudential behaviour and their solvency condition, in particular for banks operating in Albanian banking sector.

- **The purpose – Whether and how banks' solvency condition responses to changes in their prudential behaviours for a sample of 16 banks operating in the Albanian banking sector.**

Literature Review

- Bank solvency condition in particular is assessed through the CAMEL criterion and how capital meets bank size and business activities by assets classification and capital adequacy ratio (henceforth CAR) based on Basel standards [Mishkin (2000)].

- Subsequent theories of capital structure, since the famous Miller and Modigliani (1963) theorem, relaxing on market imperfections have been introduced. Harris and Raviv (1991) categorise them, as:

  - **Agency Cost Theory** – relaxes the assumption of no agency costs *i.e. conflicts of interest among managers and shareholders, rising due to information asymmetry, such as divergences in risk preferences, objectives, and aims to maximise their self-benefits* [Shrieves and Dahl (1992); Octavia and Brown (2009)];

  - **Picking Order Theory** – relies on information asymmetry between managers who are better informed, and outside investors who are worse informed, e.g. in need of more capital banks prefer internal sources, such as profit, to external finance, e.g. debt and then equity [Frank and Goyal (2005); Fauzi, *et al*., (2013)];

  - **Trade-Off Theory** – explains the fact that corporations usually are financed partly with debt and partly with equity, e.g. banks optimise this ratio by weighing tax shield benefits against the bankruptcy costs or/and financial distress among other things [Frank and Goyal (2005); and Kim and Berger (2008)];

  - **Market Timing Theory** – considers the effects of information asymmetry problems on capital structure decisions and the rational behaviour of agents, who decide to finance their investment with equity or debts based on market timing conditions [Baker and Wurgler, (2002)];

Methodology...(1)

- Two important definition with regards to:

  - **Bank Solvency Condition** (**BSC**) - broadly construed by Aldasoro and Park (2018)[1], it is portrayed as a crucial conventional "safety and soundness" position in which a bank is able to ensure the survival of business enterprises by providing an adequate level of bank's core capital, which would serve as a buffer or cushion for absorbing unexpected financial losses related to risk exposure, e.g. credit risk, market risk, interest risk and exchange rate risk.

  - **Bank prudential behaviour** (**BPB**) – as portrayed by Dale (1984), Flannery (1995), Jatanti, *et al*., (1996), and Crockett (2000), it as an un-observable distortionary and non-distortionary policy cap attitude that guard banking sector to behave and operate in a safe and prudent way, so that to be able to reduce the likelihood that one of them will fail, loosely speaking limiting the idiosyncratic risks, e.g. credit risk, market risk, interest risk and exchange rate risk, etc. This means that BPB should reflect:

    - Rule-based limitations imposed by supervisory regulations (e.g. restrictions on capital and liquidity requirements, imprudently large exposure, gap maturities, net open position), which are defined as 'prudential' in this paper.

    - Non-rule-based limitations that is a function of the beliefs of banks' management on the quality of asset and liability portfolio they have and their attitude and self-perception on the limitations imposed by supervision authority.

[1] See among others Barrios and Blanco. (2003); Biker and Metzemakers, (2005); Bouvatier and Lepetit, (2008); Kleff and Weber, (2008); and Hafez and El-Ansary, (2015); Thoa and Anh, (2017).

Methodology...(2)

- With regards to **BSC**, authors have used different indicators, such as the:
  - Interest coverage ratio – operating income over interest expense [Welch, (2004)];
  - Debt-to-asset ratio – bank debt borrowing to asset ratio [Camara (2012), Faulkender, *et al*., (2012)];
  - Asset (Liquidity) coverage ratio – assets (liquidity) over short-term debt obligations [BIS (2013)];
  - Leverage ratio – equity over asset [Octavia and Brown (2009), Gropp and Heider, (2010)];

- However, as in Schmitz, *et al*., (2017) and Aldasoro and Park (2018), BSC is proxy by the ratio of **CAPITAL ADEQUACY RATIO**, known as CAR. The advantages this indicator is that it:
  - The best barometer that show the amount of bank's capital in relation to the amount of its credit risk exposures [Mishkin (2000)].
  - Takes into account what Ahmad, *et al*., (2008) states "…*in an unregulated environment (no government guarantees or capital regulation), banks would still hold capital beyond the minimum required level because markets require them to do so*…", which Berger and Herring (1995) define this as the "market" capital requirement.
  - Homogenous across banks and underpins the regulatory capital requirements in international standards and is always in the top concerns of managers, as well as supervision authority [Aldasoro and Park (2018)].

Methodology...(3)

Table 1. Indicators used to estimate a BPB index for each bank based on Holló, *et al.*, (2012), Chatterjee, (2017) and Dahlhaus and Lam (2018).

	Category	Description of the indicator	Symbols		Methodology
1.	*Liquidity ratio indicators (LIQ)*	Active liquids / assets	X_{LIQ_1}	Z^*_{LIQ}	Principal Components Analysis Approach
		Liquids / bank deposit with a maturity of less than 12months	X_{LIQ_2}		
		Cash coverage ratio	X_{LIQ_3}		
		Net loan / average deposits	X_{LIQ_4}		
		Liquidity Management Quality Ratio	X_{LIQ_5}		
		Deposit Concentration Ratio	X_{LIQ_6}		
2.	Capital ratio indicators (CAP)	Capital Adequacy Ratio	X_{CAR_1}	Z^*_{CAP}	
		Discretionary Capital Adequacy Ratio	X_{CAR_2}		
		Asset Coverage Ratio	X_{CAR_3}		
		Leverage ratio	X_{CAR_4}		
		Tier 1 capital	X_{CAR_5}		
3.	Net Open Foreign Position / assets (NOFP)		Z^*_{NOFP}		
4.	Gap to maturity / assets (GAP)		Z^*_{GAP}		
5.	Loan concentration ratio (CR)	Structure	X_{CR_1}	Z^*_{CR}	
		Maturity	X_{CR_2}		
		Sectors	X_{CR_3}		
		Purpose	X_{CR_4}		
		Economic activity	X_{CR_5}		
6.	Bank Provisional Indicators (BP)	Provisional coverage ratio	X_{BP_1}	Z^*_{BP}	
		Loan loss reserve / excessive loan (Gross)	X_{BP_2}		
		Loan loss provisions / risk-weighted assets	X_{BP_3}		
		Loan loss reserve expenditure / assets	X_{BP_4}		
		Loan loss reserve expenditure / Net Operating Income	X_{BP_5}		
		Off-balance sheet activities / assets	X_{BP_6}		

Source: Bank of Albania, Author's calculations.

Methodology...(4)

- The model specification follows pervious empirical work e.g. Glopp and Heider (2009); Camara (2012); Aktas, *et al*., (2015); Hafez and El-Ansary, (2015), and the baseline equation is:

$$lnCAR_{i_t} = \beta_0 + \beta_1 * \Delta lnGDP_{i_{t-1}} + \beta_2 * \Delta RISK_{i_{t-1}} + \beta_3 * \Delta lnBOONE_{i_{t-1}} + \beta_4 * lnEFFICIENCY'_{i\,t-1} + \beta_5 * lnBPI'_{i\,t-1} + \varepsilon'_{i_t} \quad (1)$$

Where,

CAR – equity over risk-weighted assets;
GDP – real Gross Domestic Product;
RISK – annual growth rate of Albanian 12 months TBill rate less German 12 months Tbill;
BOONE – bank competition as estimated by Shijaku (2017);
EFFICIENCY – logarithm gross income versus gross expenditure;
BPI – bank prudential behaviour index;
ln – natural logarithm;
Δ – first difference;
β_0 – constant; β_i – elasticities;

Expected Sign
+/-
+/-
+/-
+/-
+/-

- $t-1$ - to account for possible time-lagged effects [Octavia and Brown (2009)];
- GMM approach as explained by Arellano and Bond, (1991); Arellano and Bover, (1995) and Blundell and Bond, (1998) using panel data for 16 banks operating in during 2002 – 2017;
- The instrumental variables constructed using lagged values of the explanatory variables used in the first equation.

Results...(1)

*Table 4. Results of robustness checks, statistical significant level 1% *, 5%**, and 10% ***.*

	[1]	[2]a	[3]	[4] a	[5]	[6]	[7]	[8]
$GDP_{(-1)}$	0.961*	-0.319	0.289	-0.152	1.359*	0.737***	0.940	0.534
$RISK_{(-1)}$	-0.036*	0.002**	-0.040*	0.00*	-0.059*	-0.052*	-0.045*	-0.065**
$BOONE_{(-1)}$	-0.043*	-0.019*	-0.032*	-0.015*	-0.037*	-0.009	-0.009	-0.020
$BPI_{(-1)}$	0.063*	-0.177**			0.101**	0.111	0.090	6.737*
$BPI_{(-1)}\text{^}2$								-0.740*
LLP			0.076***	0.212*				
$EFFICIENCY_{(-1)}$	0.095*	0.196*	0.272***	0.121*	0.009	0.168*	0.172*	0.073
$NPL_{(-1)}$					-0.056*	-0.050***	-0.054***	-0.088**
$REG_{(-1)}$						1.019*	1.114**	0.813
$CRISIS_{(-1)}$							-0.029	-0.056
No of observations	867	826	775	746	820	820	820	820
Instrument rank	16	16	16	16	16	16	16	16
J-statistic	8.9	9.3	14.3	11.2	15.3	11.4	11.0	7.3
Prob (J-statistic)	0.6	0.6	0.2	0.4	0.1	0.2	0.2	0.4
[a] The dependent variable is based on the natural log of bank core capital (EQUITY).								

Source: Author's estimations

Conclusions...(1)

- This paper:
  - Follows a consequent series of research topics on key issues linked to banking sectors in Albania
  - Analyses:
    - Patterns of banks' solvency condition, covering a crisis prone period, which is the best period to study the degree to which banks deter from taking excessive risk-taking;
    - Empirically the relationship between bank prudential behaviour and their solvency condition;
- The paper is advantageous for two main reasons:
  - Our indicator on BPB:
    - Identifies the most common factor representing the degree of BPB without much loss of information;
    - Provides us with a simple monthly-based supervision rating approach instrument;
    - allows analysing BPB as it develops and is also applicable for cross-section comparisons;
  - To the best of our knowledge no previous study has empirically investigated the relationship between capital ratio and their prudential behaviour.

Conclusions...(2)

- The main results demonstrate:
  - Supportive evidences in favour of policy that are oriented to enhance BPB as an appropriate tool to mitigate possible default risk;
  - **BUT**, the pass-through effect is relatively low;
  - A non-linear relationship between BPB and solvency condition;
- Other results support:
  - The effectiveness of capital regulation pressure and improving macroeconomic conditions;
  - The assumption of the picking-order theory;
  - The too-big-too-fail assumption in the case of Albanian banks;
  - Financial crisis did not affected solvency conditions of the bank in an important matter;

Future research

- Future aspects to improve:
  - CAR not the most appropriate indicator to judge bank's financial soundness, e.g. 12% ratio falls to recognise other sort of risks related to financial losses due to trading of foreign exchange, financial instruments and inadequate internal control systems.
  - Implement other forms of prudential behaviour as imposed by Macro-prudential policy guides imposed by the Bank of Albania.
  - How banks adjust their capital ratios, in particular during crisis versus normal times?
  - Do similar results prevails in the subsequent sample of low-capitalised banks versus high-capitalised banks, or/and small versus large banks, as well as before and after the financial crisis?
  - How does prudential behaviour of banks effect bank lending?

End

Thank you for your attention!!!

Gerti SHIJAKU

gshijaku@bankofalbania.org