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ALBANIAN BANKING SYSTEM: RISK BEHAVIOR AND CAPITAL REQUIREMENTS

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Abstract

With almost 20 years history, the Albanian banking system struggles from one side to ensure the economy safety and soundness and from the other side to comply with international requirements such as Basel II. In this crossroad, we attempt to investigate the regulator's effect on the monitoring and supervising the banking system and the banks behavior towards these requirements. This article finds a significant positive and simultaneous relationship between risk and capital for the Albanian banking sector which relies on previous theoretical and empirical approaches.

Key words:

Risk behavior; Capital requirements; Banking system; Albania.

INTRODUCTION

Albanian banking system roots date just 20 years before in 1998, when the first private banks started their activity in the local market economy, which had some years changed from communism into the capitalistic system. The private banks started their activity in a primitive market place, where the concepts of financial intermediation and banking were almost unknown. Mostly foreign bank groups from Greece and Italy started to open their branches in order to fulfill the foreign business's needs, until the privatization of the savings banks and commercial banks (two of the most powerful state banks) from the well-known Austrian and Turkish groups created leaders in the banking market place. Local banks started as well to perform activities and here we are in 2015 with 16 banks working in Albania, under the regulation of the central Bank of Albania.

It is understandable that such a flourish in the banking system would require at least regulation and monitoring from the authorities, in order to keep the system and the

economy safe. Bank of Albania had to deal with a lot of circumstances where fast and relevant regulation had to be prepared and rule the banks so as to keep control and ensure soundness. One of the oldest regulations of the Bank of Albania was that referring to the capital requirement in 1999. Even though the urge to comply with international requirements of Basel, not until the end of 2014, this regulation has been reviewed and adopted some of the standards of Basel II. The challenge of the local banking system in adopting these requirements is part of another research paper. This paper will mainly concentrate on the banks behavior towards risk trying to identify the relationship between risk and capital.

Using a data set of six years from the last quarter of 2008 until the last quarter of 2014, this research proves the positive relationship between risk and capital, as defined also in previous literature from a theoretical and practical prospective. The two stages least square model adopted from Shrives and Dahl (1992) was used in this data to prove that the behavior of Albanian banking sector towards risk is affected positively from the requirements of capital that the authorities apply and on the other hand also the capital changes are affected from the risk behavior that banks decide to follow. This gives a strong ally on the authorities, which are actually doing a good job in the monitoring and supervision of the banking system. It also supports the fact that the regulator reacts promptly and seriously on the crisis matters, as well as on the international developments of the banking system, even though the local system is actually "protected" in terms of not being exposed to external crisis factors.

The paper follows with a review on different models that have tried to present the relationship between risk and capital. It follows with the explanation of data and methodology. Finally results and conclusions complete this attempt. It is of big interest to review the behavior of banks in the following years, since more requirements with the international standards will affect their capital requirements and their activity.

LITERATURE REVIEW

As stated in earlier and recent literature the regulation of capital in banks is very important. The reasons behind this importance rely upon certain arguments: the systemic risk argument and the depositors' representative argument. The capital requirements are proved to be necessary in terms of controlling the risk appetite of the banks, the banks solvency and the amount of deposits. The regulators have to find the proper optimal solution between the risk of default and the deposits and they have to represent the depositors' inability to monitor the banks.

The literature has presented many theories regarding the way that capital and risk are affecting each other, using different financial models. These financial models should be discussed regarding the economic rationale of the relationship capital –risk,

whether this relationship has a positive or a negative sign and how this relationship is influenced from the changes in regulatory framework.

The option pricing model adopted by earlier literature (Merton, 1977; Black et al, 1978; Kareken & Wallace, 1978; Dothan & Williams, 1980; Marcus & Shaked, 1984; Diamond & Dybvig, 1986; Benston et al, 1986) introduces the idea that the maximization of the stockholders' equity value implies maximization of the option value of the deposit insurance increasing leverage and asset risk. This means that banks can increase their deposit liability without paying for a default risk premium and the marginal effect from this action increases as asset risk increases. At the same time, the marginal benefit of the increasing asset risk increases as leverage increases (equity capital decreases). Although the increases in leverage and risk are proved to be profitable, they imply certain costs that do not permit an infinite increase. According to the banks' behavior dominance towards increasing insurance deposits or increasing risk appetite then we would observe a negative relationship between capital and risk in the first case and a positive relationship capital and risk in the second case.

Theories that imply a positive relationship between capital and risk due to a margin in the combination of leverage and risk rely on the regulatory costs (Buser at al, 1981), effects of minimum capital requirements (Merton, 1972; Kahane, 1977; Koehn & Santomero, 1980; Kim & Santomero, 1988), bankruptcy cost avoidance (Orgler & Taggart, 1983) and managerial risk aversion (Saunders at al, 1990).

Shrieves and Dahl (1991) have explained and reviewed the theory and through their research they developed a model trying to explain and estimate the changes in the relationship between capital and risk. Their results show that capital and risk are simultaneously related and a bank tends to increase its asset risk in case of an increase in capital imposed by regulators. This is more obvious in banks that have low level of capital. The results are consistent with the leverage and risk related cost avoidance and managerial risk aversion theories of capital structure and risk-taking behavior on commercial banks. So the effectiveness of the capital standards is subject to the reflection of true risk exposure of the banks.

Calem and Rob (1996) discuss the impact of the capital-based regulation on the bank risk-taking behavior through a dynamic portfolio model using empirical data from the US market from 1984-1993 with the aim of defining the capital regulations effects on the risk of the institutions. Their results suggest of a relationship between risk and capital, where increased capital requirements induce in greater risk-taking of well-capitalized banks, whereas they also induce in increased risk of under-capitalized banks, if the regulations are not stringent enough, consisting in some unintended results.

Ediz et al, (1998) have studied the implication of capital requirements in the UK banks' behavior and they prove that U.K. banks behavior is affected from capital requirement over and above their own capital targets. In case an increase in the capital is required, this is assured from the market other than from increasing assets.

Blum (1999) has introduced a new model for capital and risk taking into consideration the dynamic banking environment. The main point of his study evaluates that under binding regulatory requirements on capital an additional unit of equity tomorrow is more valuable to the bank, so the only possibility to increase the equity tomorrow, is to increase the risk today. This means that more stringent capital requirements today will increase the bank's risk.

In the research work of Rime (2000) through empirical evidence from Swiss banks regarding capital requirements and bank's behavior using a modified model from Shrieves and Dahl (1991) it is found that banks close to regulatory minimum tend to increase their ratio of capital to risk-weighted assets. Moreover the regulatory impact is evident to the ratio of capital to asset, but not to the bank's risk taking. Also he finds a significant relation between changes in risk and changes in the ratio of capital to total assets, but not a significant relation between changes in risk and changes in the ratio of capital to risk-weighted assets.

Lindquist (2003) uses an empirical model to measure the effect of the buffer capital in relation with credit risk in Norway bank. He divides the data into commercial and savings banks for a period from 1995 until 2001 and tests the issues of buffer capital being affected from credit risk, it acts as an insurance for not falling below minimum capital requirements, it is used as a signal i.e. competition parameter, it depends on economic growth and finally if as a measurement of supervision it really matters for banks. The results for capital and credit risk show a negative relationship for saving banks measured by the variance of profits of previous years considered as a "broad risk measure". This actually counter-argues previous results of literature, but it is explained by the author as an attempt from banks to act in various ways towards risk.

Cuoco and Liu (2005) come with a different fully dynamic optimal portfolio model to assess the relationship between capital requirements and VaR as determined by the Internal Model Approach introduced in Basel II. The value at risk measure VaR which defines the maximum losses of financial institutions varies according to the capital requirements that the regulator imposes to the banks and is adjusted by re-balancing the bank's portfolio. This specific "re-balancing trading strategy" followed by banks implies that VaR may be over or underreported according to the risk appetite banks select for the specific time period. In general self-reported VaR defined by IMA suggest that more stringent capital requirements induce a portfolio selection with higher return assets, which also have higher risks in relation to the regulation weights suggesting also a higher probability of default for those institutions.

Godlewksi (2006) investigated the effects of the regulatory framework in the banks behavior in emerging markets and proved a significant relationship between them that could even degenerate into excessive risk taking and increase in the banks' probability of default. He notes though that the results need further investigation that would include internal corporate governance factor and external ones concerning market discipline.

A positive relationship between risk and capital has been also found by Altunbas et al, (2007), when they examined the European banks on the behavior on the relationship between the capital, risk and efficiency. Through empirical evidence from 1992 until 2000 on a sample of European banks the authors have not found a positive relationship between risk and efficiency as proved empirical studies in the US, but they have introduced a positive relationship between risk and capital in commercial and savings banks and a negative one in co-operating banks.

A similar study on 263 Japanese co-operative banks regarding the relationship between risk, capital and efficiency for the period 2003-2006 was performed by Deelchand and Padgett (2009). Adopting the simultaneous equations of Shrieves and Dahl etc. regarding capital, risk and efficiency the empirical data show an important negative relationship between risk and capital as well as inefficient banks maintaining more capital, which actually support the moral-hazard theory. The authors suggest that more it is needed a closer monitoring from the supervisory authorities regarding loan expansions, bank efficiency and capital adequacy requirements for Japanese banks.

All the above literature represents the relationship between capital and risk under different conditions, taking into account various factors and explaining based on theories the impact of changes in the capital adequacy requirements to the bank's behavior towards risk.

As per Albanian banking sector, it lacks such studies in terms of identifying the banks' behavior and the regulator's influence. This is what we try to perform in this study: discuss the relationship between capital requirements imposed by the Bank of Albania and the behavior of Albanian banking sector towards risk for a six-years period 2008:Q4-2014:Q4.

HYPOTHESES, MODEL AND DATA

Based on the above empirical researches we state below the basic hypotheses tested in this research:

> *Hypothesis 0:* In a regulated environment capital and risk of banks are not interrelated and affected by each other.

Hypothesis 1: In a regulated environment, where capital requirements increase, the risk of the bank decreases due to the dominance of the deposit insurance subsidy, which defines the marginal benefits and costs of asset risk and leverage. This means that the capital will have a negative relationship with the risk.

Hypothesis 2: In a regulated environment where capital requirements increase, compensation on the risk weighted assets of the bank will take place so as to increase the ratio of capital to total assets in order to maintain their default probability at an accepted level. This means that the capital will have a positive relationship with the risk.

Hypothesis 4: In a regulated environment capital and risk are simultaneously related with each other.

Model specifications

We are based on the simultaneous model initially described by Shrives and Dahl (1991) and consequently by Rime (2001), as well as other authors described above. In this equation the capital and risk are simultaneously affecting each other, which may include as we mentioned above a negative or appositive relationship according to different approaches.

The basic equations are presented below and carried out by two stage least squares model (TSLS):

$$\Delta CAP\ j,t = a0 + a1REGj,t\text{-}1 + a2ROAj,t + a3SIZE + a4\ \Delta RISK\ j,t - a5\ CAPj,\ t\text{-}1 + \varepsilon j,t\ ;$$

$$\Delta RISK\ j,t = a0 + a1REGj,t\text{-}1 + a2LLossj,t + a3SIZE + a4\ \Delta CAP\ j,t - a5\ RISKj,\ t\text{-}1 + \nu j,t\ ;$$

Due to the fact that $\Delta CAP\ j,t$ and $\Delta RISK\ j,t$ are simultaneously affecting each other, we had to run the two stages least square model, where instrumental variables for a regression at step one are defined and the predicted values saved from first step are then used for the second regression at step two. Specifically, at the first step, we regressed the independent variables needing instrumental variables on the instrumental variables and other independent variables not needing instrumental variables. Then, we saved the predicted values to form some new variables. At the second step, we regressed the dependent variable on these new variables and other independent variables not needing instrumental variables. The whole process was performed in SPSS, where for each equation we selected the dependent variable then selected the instrumental variables and the other independent variables not needing instrumental variables and finally defined all independent variables (not instrumental) as explanatory to the model.

The variables include the following:

$\Delta CAP\ j,t$ represents the change in capital. Considering the fact that banks may not be able to adjust their desired capital ratio instantly, the variable is defined as the difference between the capital of two consecutive quarters:

$\Delta CAP_{j,t} = a(CAP_{j,t} - CAP_{j,t-1}) + E_{j,t}$

This is defined as a ratio of equity over total assets, where equity includes common stocks, preferred stocks, capital surplus, undivided profits, capital reserves and foreign currency translation adjustments. It is the dependent variable of the first equation. We actually expect that capital will be positively affected by the risk banks undertake.

$\Delta RISK_{j,t}$ represents the change in risk level of the bank. Again considering the fact that banks may not be able to adjust their desired risk ratio instantly, the variable is defined as the difference between the risk of two consecutive quarters:

$\Delta RISK_{j,t} = b\ (RISK_{j,t} - RISK_{j,t-1}) + S_{j,t}$

Risk is defined as the ratio of risk –weighted assets over total assets. Risk-weighted assets are defined according to the Bank of Albania regulation by imposing different weights to certain categories. Risk is the dependent variable of the second equation and we expect a positive relationship between risk and capital.

$REG_{j,t-1}$ represents the binary variable for regulation changes affecting the bank's capital and risk. This is a dummy variable, which actually takes the value 0 to display no changes in the regulatory framework and 1 otherwise. Even though the Bank of Albania has not made any changes in the regulatory framework, it has imposed different capital requirements for Greek banks operating in Albania in the last quarter of 2011. This due to the increased risk of the Greek banking sector and the collapse in 2011 and the high probability of default these banks actually involved. So instead of a capital requirement of 12% for the whole sector, Bank of Albania imposed a 15% capital requirement for these banks. This actually leaded into an increased necessity for capital from the Greek banks. We expect to have a positive relation between capital and regulation and a negative relationship between risk and regulation.

$ROA_{j,t}$ represents the return on assets as a measure of profitability of the bank. It is included in the capital equation and it is expected to have a positive relationship with capital. Well-capitalized banks may use their profits to increase capital, rather than requiring additional capital from their mother companies (this because issuing capital in Albanian market is not applicable).

$LLoss_{j,t}$ represents the current loan losses and is included in the risk equation. It is measured as a ratio of the difference in the provisions over two consecutive periods over total assets. New provisions are actually considered to represent the current loan losses of the bank, which decrease the risk-weighted assets and as such affect the ratio of risk-weighted assets to total assets. Consequently we expect a positive relation between the loan losses and the risk of the bank.

SIZE is calculated as the natural logarithm of total assets as a measure to be included in both capital and risk equation. This is based on the assumption that size may affect target risk and capital because of its relation with diversification, investment opportunities and access to equity capital.

Under the models represented above the bank independently chooses capital and risk, as such both variables are included as independent variables to each of the equations.

Data

The sample used in this research includes the 16 banks of the local banking sector, for a period of 2008Q4 until 2014Q4. The collection includes the basic reporting of banks to the Bank of Albania according to local regulation on a quarterly basis. During this period there were in total 352 observations for the first equation and 287 observations for the second equation.

RESULTS AND DISCUSSION

From the results of the simultaneous equations run in the two stages least square regression model, seem important; in the first equation the independent variable is explained at a level of 50% by the dependent variables, while in the first equation the independent variable is explained at a level of 30% as detected from the multiple R. The R-square for the first equation makes the model more explanatory at a level of 25%. The reliability of the models though is significant according to the F-statistics and its level of confidence 0.00 presented in the appendix, showing a linear relationship between capital and risk simultaneously.

The first equation's results show that the capital is dependent on the risk level that banks undertake, having a positive relationship and t-value at a significance level of less than 0.05, accepting our third and fourth hypothesis at the same level of confidence. Capital and risk are positively related to each other for the Albanian banking sector based on the theory of keeping its default probability at the same level.

As per other explanatory variables, regulation and return on assets have a positive relationship in explaining capital changes, though not proved as significant from the model. On the other hand size is negatively affecting capital, though without a significant affection. None of the variables is highly correlated on a positive or negative way with the other.

The second equation shows that risk is dependent on the capital level that a bank retains. Their relationship once again is positive and the t-value at a significance level of less than 0.05, accepting our third and fourth hypothesis at the same level of confidence. Risk and capital are positively related to each other for the Albanian banking based on the theory of keeping its default probability at the same level.

Regulation and size are negatively affecting the risk, although their coefficients do not show any high significance. We have noted though that the explanatory variable of

losses has a significant positive relationship with the risk. We have defined this variable as the difference of provisions of two consecutive years over total assets of the bank. As we expected this relationship is actually proved significant through the equation. This variable is also highly correlated with the change in capital at a correlation coefficient level of 0.89, as well as with the risk at a correlation coefficient level of 0.63, identifying the high importance effect and direct relationship that the variable has with both capital and risk. This is also due to the method of defining the regulatory capital and risk weighted assets according to the current regulation of the Bank of Albania.

The actual model of this research proved the simultaneous relationship between risk and capital and justified the acceptance of hypothesis 4 and the rejection of hypothesis 0. The relationship between risk and capital is simultaneously proved as significant and positive, as such accepting hypothesis 3 and rejecting hypothesis 2.

The size effects even though negatively related with both risk and capital are proven not to be significant in the bank's behavior towards risk; this means that in the current market banks are well-capitalized and just by being a larger bank does not justify excessive risk. Bank's efficiency in terms of profitability (ROA) does not affect the capital that it retains. This is due initially to the fact that the regulatory capital is defined according to specific weights and not using other methods implied in Basel II.

The provisions as a measure of banks' losses are actually positively and significantly related with the risk, showing once again how application of the provisions regulation affects the regulatory capital and the risk simultaneously. The results of this specific measurement though are controversial from the hypotheses we made for it.

Regulation on the other hand affects neither the capital nor the risk of the bank, although it has a positive relationship with them. Even though there has been only a change in the requirement of the regulatory capital in the last quarter of 2011 and only for Greek banks, this did not affect our model. That actually guides to the conclusion of having a well-capitalized banks, which can afford any regulatory pressure by not actually affecting their capital and their behavior towards risk.

In general we can refer that our results were in consistency with two of our main hypotheses at a confidence level higher than 99%. All results appear in the appendix.

CONCLUSION

Risk and capital have a positive significant and simultaneous relationship between them for the Albanian banking system. Neither the profitability nor the size of a bank affects its' regulatory capital suggesting strong monitoring from the regulator. The system is well supervised in such way that no undercapitalized banks are present in the sector. The efficiency of the regulator is considered high, but also the compliance

of the active in the marketplace banks is considered on a high level. It is of major interest to further research on the banks behavior towards risk in the following years, when banks will have to comply with the new regulation, closed to the Basel requirements.

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APPENDIX

Two-stage Least Squares Analysis

Table 1. Model Description: MOD_5

Equation 1	ΔCAPjt	Dependent
	a1REGjt1	predictor & instrumental
	a2ROAjt	predictor & instrumental
	a3SIZE	predictor & instrumental
	a5CAPjt1	predictor & instrumental
	ΔRISKjt	Predictor
	a2LLossjt	Instrumental
	a5RISKjt1	instrumental

Table 2. Model Summary

Equation 1	Multiple R	.500
	R Square	.250
	Adjusted R Square	.236
	Std. Error of the Estimate	.009

Table 3. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Equation 1	Regression	.007	5	.001	18.766	.000
	Residual	.022	282	.000		
	Total	.029	287			

Table 4. Coefficients

		Unstandardized Coefficients		Beta	t	Sig.
Equation 1	(Constant)	.000	.007		-.029	.977
	a1REGjt1	.001	.002	.018	.619	.536
	a2ROAjt	.000	.000	.024	.713	.476
	a3SIZE	-3.591E-05	.001	-.003	-.065	.948
	a5CAPjt1	-.006	.006	-.044	-1.030	.304
	ΔRISKjt	.068	.008	.660	8.315	.000

Table 5. Coefficient Correlations

			a1REGjt1	a2ROAjt	a3SIZE	a5CAPjt1	ΔRISKjt
Equation 1	Correlations	a1REGjt1	1.000	-.145	.134	-.041	.016
		a2ROAjt	-.145	1.000	-.184	.231	-.115
		a3SIZE	.134	-.184	1.000	.606	-.006
		a5CAPjt1	-.041	.231	.606	1.000	.181
		ΔRISKjt	.016	-.115	-.006	.181	1.000

Table 6. Model Description: MOD_6

		Type of Variable
Equation 1	ΔRISKjt	dependent
	ΔCAPjt	predictor
	a1REGjt1	predictor & instrumental
	a3SIZE	predictor & instrumental
	a2LLossjt	predictor & instrumental
	a5RISKjt1	predictor & instrumental
	a2ROAjt	instrumental
	a5CAPjt1	instrumental

Table 7. Model Summary

Equation 1	Multiple R	.276
	R Square	.076
	Adjusted R Square	.060
	Std. Error of the Estimate	.223

Table 8. ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Equation 1	Regression	1.162	5	.232	4.657	.000
	Residual	14.070	282	.050		
	Total	15.231	287			

Table 9. Coefficients

		Unstandardized Coefficients		Beta	t	Sig.
Equation 1	(Constant)	.061	.165		.369	.713
	ΔCAPjt	21.012	5.803	2.178	3.621	.000
	a1REGjt1	-.021	.044	-.037	-.482	.630
	a3SIZE	-.007	.014	-.057	-.526	.599
	a2LLossjt	7.279	3.418	.366	2.130	.034
	a5RISKjt1	.022	.020	.150	1.098	.273

Table 10. Coefficient Correlations

			ΔCAPjt	a1REGjt1	a3SIZE	a2LLossjt	a5RISKjt1
Equation 1	Correlations	ΔCAPjt	1.000	-.121	-.143	.896	.631
		a1REGjt1	-.121	1.000	.119	-.096	-.088
		a3SIZE	-.143	.119	1.000	-.159	.442
		a2LLossjt	.896	-.096	-.159	1.000	.566
		a5RISKjt1	.631	-.088	.442	.566	1.000