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Impact of concentration on banking stability in Albania

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Abstract— The article examines the empirical nature of relationship between bank concentration and banking stability using unique datasets of Albanian banking sector. Test of banking stability is attaining through linear and probit models to reflect the effect of banking concentration. Empirical results prove the trade – off between concentration and non – performing loans and the probability of bank crisis. These results support the concentration – banking stability view and the significance of structural features of banking sector to determine its stability. Albanian empirical results rely on several theoretical and empirical results which they showed that the banking crises would occur probably in a weak macroeconomic environment characterized by slow GDP growth.

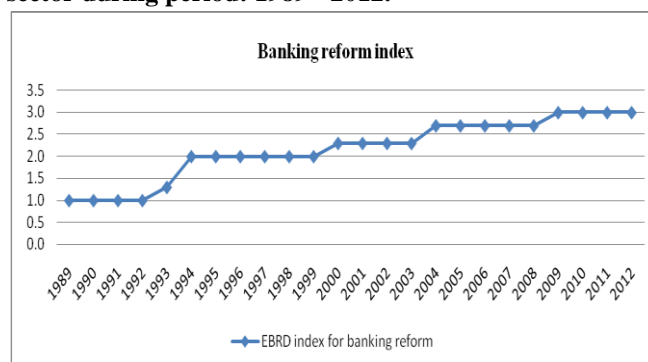*Keywords- Bank Concentration ratios, Probability of crisis, Non – performing loans*

JEL Classification: C 51, G 33, D 53

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1. The slight view on structural changes of Albanian banking sector

The development of Albanian banking sector was associated with fluctuations consistency to economic, political and historical development during decades.
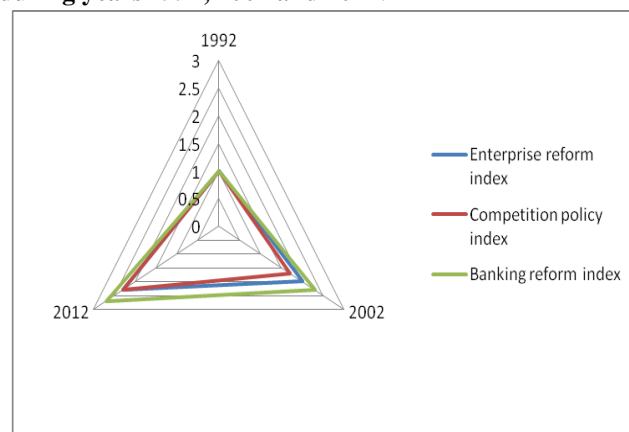
Due to estimate the progress of structural reforms in transition countries, EBRD (European Bank for Reconstruction and Development) has made up a numerical system of evaluation. The estimation of transition indicators varies from 1 to 4^+. This can confirm practically no evident difference between former centralized economies and industrialized market economies standards. We can refer to the index of banking reform due to reflect the progress of structural reforms in banking sector. The figure 1 shows the dynamic of banking reform index during the period 1989 – 2012, where it indicates a positive almost linear trend of banking reform index demonstrating structural progress in banking sector, but still not on market economies parameters. The figure 2 shows a static comparison of banking reform index, enterprises reform index and competition policies index on years 1992, 2002 and 2012. It confirmed that structural reforms on banking sector have scored the highest progress compared to other reform in our country.

Figure 1 Dynamics of structural reform in banking sector during period: 1989 - 2012.

Source: EBRD.

Figure 2 Progress of structural reforms in Albania during years 1992, 2002 and 2012.

Source: EBRD.

Also the progress evaluation of transition indicators on South-East European countries in 2012 according to banking reform, price liberalization and competition policy presented

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by table 1. Referring to table it confirms that only price liberalization has scored 4^+ in almost South-East countries indicating the maximum value of progress. Meanwhile banking reform varies in the segment [3^-, 3] showing the lower progress than the developed countries. Whereas the competition policy in South-East European countries indicates lower level compared to the above reforms. The evaluation varies from 2^+, where Albania has scored, until 3^+ of Romania stressing the enhancement of structural progress related to competition policy in these countries.

Table 1 Estimations of transition indicators for countries in South – Eastern Europe in 2012.

Countries	Banking sector	Price liberalisation	Competition policy
Albania	3^-	4^+	2^+
Bosnia and Herzegovina	3^-	4	2^+
Bulgaria	3	4^+	3
FYR Macedonia	3^-	4^+	3^-
Montenegro	3^-	4	2
Romania	3	4^+	3^+
Serbia	3^-	4	2^+

Source: EBRD, 2012.

Banking sector has increased the degree of banking sector intermediation in the economy and the contribution of lending, like an expression of growth of total assets and credit to GDP, during 2002 – 2012. Albanian banking sector dominated the financial system as the main fragment of it where its assets shared approximately 93.6% of total assets of financial system in the end of 2012[1].

Table 2 Share of total assets and loan portfolio of banking sector to GDP

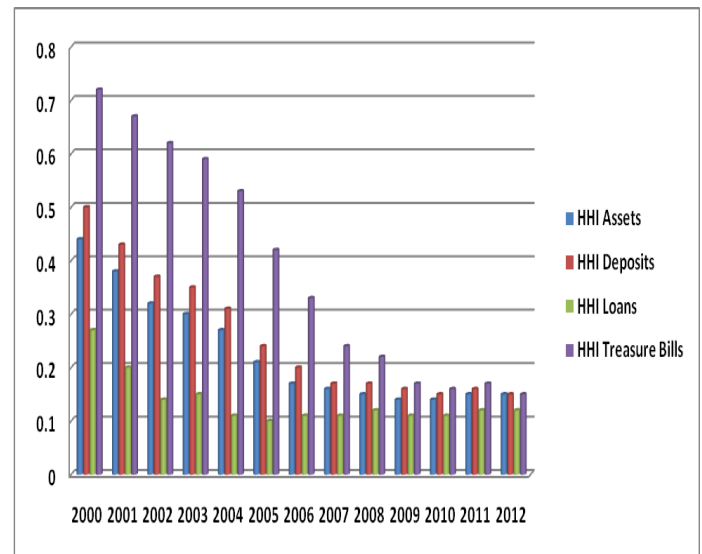| Indicator	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Assets/GDP (in %)	54.5	53.8	56.8	60.9	70.8	76.8	76.7	77.5	81.0	86.1	87.9
Total Credit/GDP (in %)	6.3	7.3	9.3	15.7	22.4	30.2	36.5	39.3	40.1	40.0	42.7

Source: Bank of Albania.

After 1997 crisis, the macroeconomic environment led to important changes in Albanian banking sector which was involved in liquidation, restructuring, privatization and acquisition activities of some banks. Albanian banking sector has been recently characterized by important structural developments. The most important of them are: (i) the enlarged number of banks; (ii) restructuring and privatization of state-owned banks; (iii) establishment of domestic capital banks; (iv) entrance of powerful foreign banks through acquisitions of the existing ones; which have changed the Albanian banking sector into a dynamic environment. There are more and more efforts made by banks to be better positioned in the market.

These developments have had major impact on market concentration. Empirical data emphasize that market of assets, deposits and treasure bills in Albania have high concentration ratios, according to Herfindahl – Hirschman index showed by figure 3. The loan activity is one the less concentrated among other activities in banking sector.
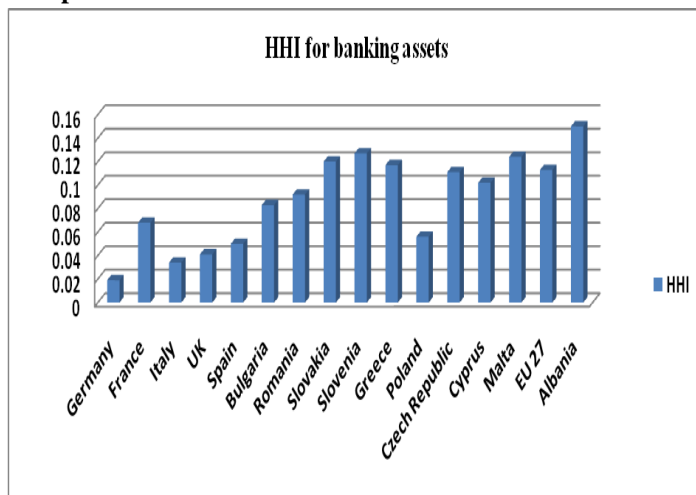
Figure 3 HHI for different banking products during 2000 – 2012.

Source: Bank of Albania, authors' calculations.

Referring to comparative statics related to the concentration ratio of banking assets in our country and some countries of Europe confirmed the highest concentration according to Albanian banking sector presented by figure 4. Comparative statics analyses the assets' HHI during 2008 and shows the higher concentration in our country compare to some Europe's countries as Germany, Italy, United Kingdom, but it converges to Balkan countries as Slovakia, Slovenia and Greece with no great difference.
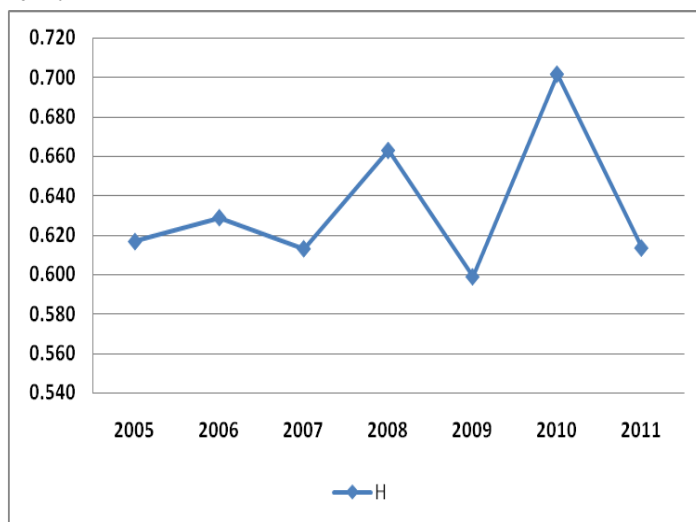
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[1] Source: Bank of Albania.

Figure 4 HHI for banking assets in some countries of Europe and Albania in 2008.

Source: Weill (2011), authors calculations.

Referring to Panzar-Rosse model, we conclude that the Albanian banking sector operates actually in monopolistic competition market during years 2005 – 2011, showed by figure 5.

Figure 5 Dynamics of H statistics during years 2005 - 2011.

Source: Authors calculations.

2. Literature review

Banking stability has taken into considerations of the theoretical and empirical analysis in global financial system particularly due to global financial crisis of 2008. That's one more reason to be more careful about the concerning banking sector in nowadays. Meanwhile the relation concentration – banking stability has been continued the more contested in theoretical and empirical literature of banking industry. The analysis will pursue the investigation of theoretical and empirical views attaining in banking sector.

Matutes and Vives (1996) emphasized that the competition was not the responsible to fragile nature of banking sector. The asymmetry of information related to *adverse selection* (the higher interest rate charging by bank attracted the applicants with higher risk) and *moral hazard* (the borrowers select the project with higher risk due to higher interest rate) has the important role in the banking sector. The rigid policies of regulations and bank supervision reduce the moral hazard in banking sector.

Agoraki et al. (2009) proved the relation between reforms, competition and bank risk in countries of Central and Eastern Europe during transition period 1994 – 2005. They did not find the strong positive relation involving the banking reforms and banking competition using static and dynamic models. Also the dynamic models appreciated the transition features of sector and economy according to it.

Agoraki et al. (2009) have continued on this analysis referring to regulations, competition and bank risk in transition countries. Regulations focused on three directions: capital requirements, restrictions of activities and supervision supremacy by official authorities. Impact of regulations' dimensions analysing by static and dynamic models has showed the unrevealed effects or suspicious in some cases. Empirical results put emphasis on the effect of institutional dimensions to these countries.

Jimenez et al. (2007) emphasized that the increasing role of banking supervision combining to the large activities restrictions and increasing market power reduced considerately the hazard of banking failure. These results confirmed that banking regulations affected the banking operational environment and the banking behaviour simultaneously.

Theoretical and empirical results provide the diverse results according to banking concentration -stability relation. Beck et al. (2006) analyzed the theoretical and empirical background of the relation between concentration and banking stability distinguishing into views: concentration – stability and concentration – fragility due to controversial views on this relation. The first one suggests that a banking sector with lots of small banks and low concentration level is more inclined to financial crisis than concentrated banking sector with a few large banks. The converse view argues that more concentrated banking sectors are more fragile.

Allen and Gale (2000, 2004) highlighted that banking sectors with low concentration and a large number of banks are more prone to financial crisis than banking sectors with high concentration and a few number of banks. At first, these circumstances explained by banks that enhanced

market power and their profits in the concentrated banking sectors, which they provided the amortization of shocks, shrinkage of banking shareholders and managers incentives to take more excessive risks, reduction of banking systemic risks (Hellmann, Murdoch, Stiglitz, 2000; Besanko and Thakor, 1993; Boot and Greenbaum, 1993, Matutes and Vives, 2000). The second related to the ease and effectiveness of banking controls and banking supervision in the concentrated banking sector compare to less concentrated banking sector due to the number of banks in market.

Allen and Gale (2000) supported the concentration – stability view in USA with a large number of banks in market due to the historic of more numerous banking fragilities than United Kingdom or Canada where the banking sector dominated by a few number of large banks. They argued that the small banks have more incentives to take into risky behaviour. Banking sectors with a large number of small banks in market envisage with coordination and monitoring problems, meanwhile large banks are more stable due to the huge opportunities to distribute risks. Also they are a fewer prone to external shocks within banking sector.

Beck et al. (2006) investigated 47 crisis cases in 69 countries during 1980 – 1997 and supported the concentration – stability view. Except the relation between systemic banking crisis and banking concentration, also they analyzed the international changes in banking capital regulation, restrictions on banks entrance, regulating restrictions on banks activities and institutional and macroeconomic environment which they are related to banking stability. They rely on Demirgüç-Kunt and Detragiache (1998, 2002) and use logit model of probability without affected by heteroskedasticity to test the effects of concentration on banking fragility.

Farias (2006) concluded in the negative relation between concentration and banking crisis through deposits interest rate to 24 crisis cases using the probit model with the panel data of 54 countries during 1990 – 2003. Also she found that the relation between probability of bank crisis and concentration was not linear relation.

Tabak et al. (2007) investigated the relation between concentration and banking stability in Brazilian banking sector using the unbalanced panel data with dynamic specification. They used the non – performing loans (NPL) like financial fragility indicator, while the each bank market shares in loans market and Herfindahl – Hirschman index used like the concentration indicators. Empirical results confirmed the converse relation between NPL and concentration indicators supporting the concentration – stability view. Higher stability implies the reduction of NPL which it related to the diversification and better performance of banks portfolio.

Meanwhile, Boyd and De Nicolo (2005) supported the concentration – fragility view related to the market power which it converged toward the high banking profits, thus banks were inattentive on banking stability due to the potential influence of banks in market on firm's behaviour. They dealt with the high interest rate that it induced firms to undertake the investment with higher risk. Authors found out the positive relation between the concentration and banking fragility through models, and also the possibility of systemic risks.

Caminal and Matutes (2002) illustrated that the lower competition induced the small restriction on loans, large value of loans and more likelihood to fail if the loans influenced by multiple uncertainty. Another argument that supported this view linked to a few number of banks in market and the distress of policymakers about banking failures when the market consist of a few numbers of banks. Relying on these assumptions banks that operate in concentrated banking sector, will attempt to practise the large subsidies and to induce the moral hazard problem through "too big to fail" policy. This behaviour induces to undertake more risks and to increase the fragility degree of banking sector (Mishkin, 1999).

Referring to the theoretical and empirical results, they confirm the lack of unique convergence to relation among concentration and banking stability. Passing on the empirical results according to the "concentration – stability" view versus "concentration – fragility" view are more ambiguous.

3. Empirical results

Empirical analysis used the dissimilar indicator like: the volume of non – performing loans (NPLs), Z - index and equity to total assets (E/TA) for the bank's capitalization level to proxy for banking stability within financial stability. The Z - index is an inverse proxy for the bank's probability of failure. It combines profitability, leverage, and return volatility in a single measure. It is given by the ratio:
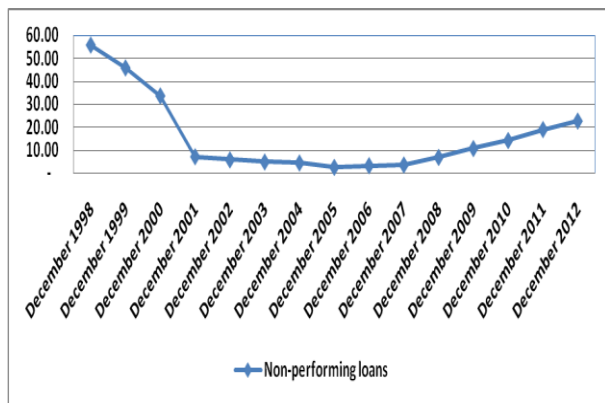
$$Zi = \frac{ROA_i + E/TA_i}{\sigma_{ROAi}}$$

where ROA_i is the period-average return on assets for bank i, E/TA represents the period-average equity to total assets ratio for bank i, and σ_{ROAi} is the standard deviation of return on assets over the period under study.

Albanian banking sector has maintained its stability excluding occasional shocks due to effects of global

financial crisis. The banking vigour referred to the lower rate of non-performing loans, which they have shown the upward trend taking to the contagious signal in banking sector. Figure 6 shows the dynamics of non-performing loans rate during 1998 to 2012, which noted the descending propensity until 2005. The largest decline refers to 1998 until 2001 due to the loan restructuring and banking capitalization after the pyramid scheme crisis of 1997. Subsequent to 2005 the rate of non-performing loans converges to the rising trend, which it reaches 22.47 percent in 2012.

Figure 6 Non – performing loans (%) during 1998 – 2012.

Source: Bank of Albania, authors calculations.

The effect of banking concentration on banking stability estimated to the linear model by least squares method using the relationship between rate of non-performing loans *(NPL)*, like an indicator of bank fragility, and *HHI* of banking assets like an indicator of banking concentration. Furthermore we are including the banking indicators related to return on assets *(ROA)*, like an indicator of profitability and macroeconomic indicators such as inflation rate *(π)* measured by the consumer price index on the annual basis of 2001; and also the level of deposits in banking sector *(LND)*. The empirical analysis is referring on the quarterly data basis during 2002-2012. The linear model and its variables are significant. Empirical data *(table 3)* show the negative relationship between concentration and rate of non-performing loans. The explanation of this relationship linked to the banks' facilitation to supervise their loans and to avoid the problems of asymmetric information associated with moral hazard and adverse selection, due to the high level of concentration. This result supports the concentration – stability view to Albanian banking sector and the significance of structural features of banking sector to determine its stability. Also ROA and π demonstrate the negative relation between them and NPLs due to the increasing profitability and decreasing the real costs

according to borrowers. Meanwhile the deposits have the positive effect related to NPLs because they induce banks to grow up the loans and the risk of loans.

Table 3 Estimation of banking stability model.

Dependent variable: non-performing loans (NPL).

Variable	Coefficient	Std. Error
HHI	-0.346 *	0.059
ROA	-7.577 *	0.762
INF	-0.471 *	0.057
LND	0.020 *	0.001
Adjusted R²	0.879	

Note * shows the significance level relatively < 0.01 %.
Source: Authors estimations.

Let's see now the relation between banking crisis and concentration ratios through empirical estimation of Albanian case, particularly probability of banking crisis. Asli Demirguc – Kunt and Enrica Detragiache (1998) estimated the probability of a banking crisis probit model using a multivariate logit model. The probability that a crisis will occur at particular time in particular country was hypothesized to be a function of a vector of n explanatory variables $(X(i,t))$. $P(i,t)$ denote a *dymmy* variable that it takes the value of one when a banking crisis occurred in country i and time t and the value of zero otherwise. β is a vector of n unknown coefficients and $F(\beta'X(i,t))$ is the cumulative probability distribution function evaluated at $\beta'X(i,t)$. Then, the log – likelihood function of the model is:

$$LnL = \sum_{t=1}^{T} \sum_{i=1}^{n} \{P(i,t)ln[F(\beta'X(i,t)] + (1 - P(i,t))ln[1 - F(\beta'X(i,t)]\}$$

They used the logistic functional form in modelling of the probability distribution. In this case, it is important to emphasize that the estimated coefficients do not indicate the enhance in probability of a crisis specified the one unit increase in the corresponding explanatory variables. The coefficients reflect the effect of change in the explanatory variable on $\ln(P(i,t)/(1-P(i,t)))$. Relying on the theoretical and empirical methods analyzed the relation involving banking crises, particularly the probability of

banking crises, and banking concentration through empirical estimations to Albanian banking sector. It is used the *probit* model like the most appropriate form of analysis suggested to theoretical and empirical analysis. The model includes macroeconomic variables such as growth rates, *GDPg* (Growth rate of *GDP*), exchange rate (*ER*) in relation to the euro currency and structural variables such as the *HHI* for bank assets. It based on quarterly data during 2002 – 2012 and took the form:

$$Probit\ model\ of\ banking\ crisis\ estimation = \alpha + \beta_1 HHI_t + \beta_2 GDP_t + \beta_3 ER_t + \varepsilon_t$$

The dependent variable in the model is the probability of banking crisis, a qualitative variable (dummy) that takes the value one if the crisis is systemic and zero otherwise. These values are specified by authors relying on internal and external shocks on banking sector and the rate of non-performing loans. Empirical results *(Table 4)* show the negative relationship between banking concentration and banking crisis probability hence supporting concentration – stability view with reference to other empirical studies.

Also the economic growth shows the negative sign of its coefficient confirming the negative relation to probability of banking crisis, based on theoretical and empirical analysis. This result emphasizes that banking fragilities are more sensitive to volatile macroeconomic environment characterized by low rates of economic growth and high inflation rates, particularly in developing countries.

Whereas the relation between probability of banking crisis and exchange rate results a positive correlation confirming by the positive signs of its coefficient. This result explained by increasing of loans' cost for borrowers due to rising of exchange rate. Therefore it increases the potential risk of bank loans and spreads the "banking shock" through exchange rate fluctuations.

There is no consensus related to the banking concentration and banking stability. Theoretical and empirical results are ambiguous predictions.

Albanian banking sector has characterized by important structural developments and has reflected the progress of structural reforms in banking sector. Empirical results on banking concentration confirm the high concentration in banking sector; meanwhile it should emphasize the downward trend of banking concentration to converge to moderate concentration. Albanian banking sector operates actually in monopolistic competition market associated with moderate banking concentration. The market concentrations have linked to banks consolidation.

Meanwhile, Albanian banking sector is characterized by increasing non – performing loans ratio, showing that financial institutions have not been attentive, taking excessive risk. Thus, analysis of risk taking depends on structural components of banking market and other significant variables, macroeconomic and financial variables. Albanian empirical results rely on several theoretical and empirical results which they showed that the banking crises would occur probably in a weak macroeconomic environment characterized by slow GDP growth.

Test of banking stability is attaining through linear and probit models to reflect the effect of banking concentration. Empirical results prove the trade – off among concentration and non – performing loans and the probability of bank crisis. These results support the concentration – banking stability view and the significance of structural features of banking sector to determine its stability. Otherwise, banking stability in Albania has been consistent, but it should be monitor in future due to the rate of non-performing loans converges towards an upward trend with increasing rates actually.

Table 4 Estimation of banking crisis model.

Dependent: Probability of banking crisis.

Variable	Coefficient	Std. Error
HHI	-12.540 *	3.279
GDPg	-14.957 **	7.023
ER	0.025 *	0.006

Note * and ** show the significance level relatively < 0.01 % and <5%.
Source: Authors estimations.

4. Concluding remarks

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