

COMPETITION IN THE ALBANIAN BANKING SYSTEM

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SOFIKA NOTE*



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ABSTRACT

This paper applies the Panzar-Rosse methodology to measure the competition degree in the Albanian banking system. The results suggest that Albanian banks operate in monopolistic competition conditions; banks differentiate in the market by targeting different market segments and/or providing differentiated products. According to this methodology, the competition is at average levels, and not low, as implied by market concentration indices. From the comparison with other countries in the region and in the EU, it results that this degree of competition may be considered as satisfactory, considering the development stage of the Albanian economy. Furthermore, the comparison also provides support to the empirical evidence that a high concentration in the system does not necessarily mean a lower degree of competition.

1. INTRODUCTION

Competition is important for the banking sector because, as in every other market, it affects the efficiency and the quality of services offered. Furthermore, competition in banking has also implications for other sectors of the economy. So, higher competition in the banking sector is found to be associated with a faster growth of other sectors of the economy that rely on external financing (Claessens and Laeven, 2005). In addition, Deidda and Fattouh (2002) find that high concentration in banking is negatively related to industrial growth in low-income countries but not in high-income ones, suggesting that emerging economies need a relatively more competitive banking sector in order to promote growth.

On the other hand, it is generally believed that there is a trade-off between high competition and stability in the banking sector. Banking is a fragile industry, with a significant failure probability, and a high social cost if these failures occur. Furthermore, because of the governments' interest to bail out banks in failure, so as to prevent a possible domino effect in the banking system, banks also suffer from a serious moral-hazard problem. Taking these factors into account, Vives (2001) argues that higher competition in banking might lead to an excessive risk-taking by banks, increasing the probability of defaults. This trade-off is even more evident in emerging economies; while the developed countries can keep a highly competitive banking system under control, this is more difficult for developing economies, for which a moderate competition level in the banking system would be more appropriate.

Overall, it can be argued that the optimal level of competition for a banking system is not unique but it depends on the economic and institutional development of one country. For a developing economy like Albania, while a highly competitive banking sector would be desirable to enhance the economic growth, at the same time it may also become a source of instability for the financial system. It is therefore important to closely follow the competition developments in banking so as to take adequate measures if necessary.

The Albanian banking system is characterized by a high foreign bank participation and continuous growth. The environment has become very dynamic, especially after the privatization of the Savings Bank. This has been shown in the increase of the range of the products provided by banks, in their geographic expansion, and in the boost of the lending activities. These developments have been associated by a steady decrease in the market concentration, which, however, remains the highest compared to other countries in the region.

Triggered by the recent developments, this study carries out an assessment of the competition degree in the Albanian banking system. The aim is to provide a better understanding of the competitive patterns beyond the traditional concentration analysis. This is done by applying the PR methodology, a widely followed approach in the literature on banking competition. The results suggest that the nature of the competition in the Albanian banking is monopolistic, implying that there is a degree of differentiation in the system, with banks operating either in different market segments, or providing different products, or both. From the comparisons with EU and other countries in the region, the competition level in our banking system seems to be at satisfactory levels for a developing country as Albania.

The paper is organized as follows: the general theoretical background of competition in banking and the methodological framework of measuring competition are discussed in the second section. The third section follows, describing first some features of the market structure of the Albanian banking system and proceeding further with the empirical application in the Albanian banking. Finally, the fourth section concludes.

2. THEORETICAL AND METHODOLOGICAL FRAMEWORK

The methodologies of assessing competition in the banking sector are considered within the same frameworks as the investigation of competition in every other industry. This section begins with

an overview of the fundamental theories about competition, and proceeds further with the detailed description of the methodology that will be applied to measure the competition degree of the Albanian banking system.

2.1 THE GENERAL THEORETICAL BACKGROUND OF COMPETITION

Described as “*the rivalry between suppliers providing goods or services for a market*” (A Dictionary of Business, 2002), competition is an inevitable phenomenon in the operating environment of firms and businesses. Banks are not different from other types of firms; they compete with each other for the products they sell, loans, which are the means of generating profits and guaranteeing the survival in the market. However, banking is one of the most competitive industries with respect to “inputs” too, as expressed in general business language. Put in banking terms, banks have also to struggle with each other to collect deposits from the public, with the same intensity as for market share in loans. This is because it is the quantity and magnitude of deposits and other funds that determine the banks’ lending capacities, and therefore their continued existence in business.

Several theories about the competition and the factors that determine it have been developed so far. One of the earliest is the Structure-Conduct-Performance (SCP) theory, originated by Mason (1939) and further popularized by Bain in his paper series during 1948 – 1951. It postulates that the market structure affects the behavior of the firms in the market, and hence their performance. If there are many firms in the industry and there do not exist big differences in their market shares, the firms set the prices competitively and each of them cannot make higher profits than the others. If instead few firms own most of the market (the concentration is high), then they exert greater market power, which makes them able to generate excess returns with respect to others (Bain, 1951). Therefore, the SCP theory implies that the market concentration increases the market power, which, on the other hand, weakens the competition in the market.

The SCP paradigm was dominant in the competitive analysis until Demsetz (1973) brought out the Efficient Structure (ES) theory.

He argued that the positive relationship between the market concentration and profitability does not hold because of market power, but instead it is a consequence of the greater efficiency that the firms with the largest market shares have. The argument used by this theory is that the most efficient firms (that own high technological and managerial skills), are able to lower costs and therefore prices, which makes them earn more market share and at the same time be more profitable than the other firms in the market. Put in other words, it is the performance (efficiency, lower costs) that drives the competition (conduct), which determines the degree of market concentration (structure).

The SCP and the ES theories have served as the ground where the structural models¹ are based on. These models examine the relationship between market power, measured by profitability indicators, market structure, measured by market concentration, and efficiency. As far as competition is concerned, these models are more a test whether these theories hold in practice than a pure measure of competition, because, although they have different views about the factors that affect the market structure (market power or efficiency), they both advocate that a high concentration leads to a low level of competition. This negative relation between concentration and competition has been widely investigated, and the empirical results have shown that these variables are not necessarily linked together².

The structural models were applied to real data since the 1930s and have been very popular until another theory about competitive behavior was brought forth, the Contestable Markets Theory, (CMT). Developed by Baumol, Panzar, and Willig (1982), this theory represents a new theoretical approach to the definition of competition, which was replaced by the notion of contestability. Baumol (1982) defines a contestable market as *"one into which entry is absolutely free and exit is absolutely costless"*. In such a market new entrants have all the information and technology as the firms already in the market and are not prevented to take customers away from them. The theory implies that even perfect monopolies, oligopolies, or monopolistic competitive³ markets can be perfectly competitive if the markets are perfectly contestable, i.e., there do

not exist entry and exit barriers. The vice versa scenario is also possible: Friedman (1971) shows that even if the market is not concentrated, it still might not be competitive if the contestability level is low.

It should be noted that the “perfect competition” and the “perfect contestable market” are both ideal market models that can be hardly found in practice. However, the “perfect contestability” approach to industrial organization is more broad and realistic, as it accounts also for the potential competitors and not just for the existing companies in the market, which makes it a more applicable benchmark than the “perfect competition” (Baumol 1982).

The Contestable Market theory has served as the foundation of the non-structural models. They are contestability tests that employ the analysis of cost and income structure of the banking industry to infer the competitive behavior of banks in the market. Differently from the structural models, the non-structural ones do not observe the competition, but try to measure it. Two such methodologies are found in the literature: the first one is due to Bresnahan (1982) and Lau (1982), as further expanded in Bresnahan (1989), whereas the second is developed by Panzar and Rosse in a series of papers⁴ and is known as the PR methodology. Both these methods are found in the banking competition research work, however, the PR methodology is more commonly used and is going to be applied also in the Albanian banking case. The following part of this section explains in details its theoretical background and methodological framework.

2.2 THE PR METHODOLOGY

The proposition underlying the PR methodology is that, depending on the competition level of the market, banks exhibit different pricing behavior in response to changes in their costs. It examines the relationship between the revenues earned by banks and the costs used to generate these revenues in order to infer the competition that these banks face. This is done by estimating a reduced form of revenue equation, where the revenues, R , are

expressed as a function of costs and other bank specific factors that affect revenues, such as size, risk undertaken, geographic spread, ownership, etc. The general mathematical representation of this function, for the i^{th} bank at time t is:

$$R_{it} = F(W_{it}, O_{it}) \quad (1)$$

where:

i index for banks;

t time index;

R_{it} Revenue of bank i at time t ;

W_{it} Cost variables of bank i at time t ;

O_{it} Other bank specific variables of bank i at time t .

The most used form of regression to estimate the reduced revenue function is the logarithmic form: all the variables are expressed in the natural logarithm. Some authors, such as Bikker and Groeneveld (2000), and De Bandt and Davis (2000), use other more complicated forms, but there are not significant differences in the results obtained (Hempell, 2002). The equation to be estimated is therefore:

$$\ln R_{it} = a + \sum_{m=1}^M b_m \ln W_{itm} + \sum_{n=1}^N c_n \ln O_{itn} + e_{it} \quad (2)$$

where:

i, t index of banks and the time index, respectively;

M, N the number of Input prices and Other variables in the equation, respectively;

m, n the index for Input prices and Other variables, respectively;

a the constant term;

b_m the coefficient before the m^{th} Input price;

c_n the coefficient before the n^{th} Other variable;

e_{it} the error term.

As the function to be estimated is in logarithmic form, every coefficient before an input price variable represents the elasticity of revenues with respect to that input price. In a perfectly competitive market the elasticity of revenues with respect to cost is unity, or

equal to 1, meaning that an increase/decrease (in %) in costs will lead to the same increase/decrease (in %) in revenues. In the case of monopoly or collusive monopoly, the long run equilibrium condition states that revenues are reduced by the increase in the costs.

The statistics used in the PR model to test for the nature of competitiveness in the industry, called H -statistic, is calculated as the sum of the coefficients before the input prices. Therefore, algebraically:

$$H = \sum_{m=1}^M b_m \quad (3)$$

Given the characteristics of competition in different markets, the H -statistic is used to assess the competition degree as follows:

$H=1$ evidence for *perfect competition*, in the case when banks are operating in their long-run equilibrium; an increase in factor prices increases both the marginal cost and the average cost, and the demand adjusts in the long run so that the revenues rise by the same amount. Shaffer (1982) shows that the H -statistic is also unity for a natural monopoly operating in a perfectly contestable market.

$H \leq 0$ *monopoly or collusive monopoly*; the increase of input prices increases the marginal costs and reduces the equilibrium output, leading to a decrease or no change in the revenues.

$0 < H < 1$ *monopolistic competition*; the revenues change in the same direction as costs, but less than proportionally.

Following Bikker and Haaf (2002), the H -statistic may be considered as a continuous variable, meaning that higher values imply higher competitiveness and vice versa. This has two positive implications. First, it provides a numeric measure for the competition and not just a qualitative one (perfect, monopoly or monopolistic), making the H -statistic a good proxy to represent the competition degree as a variable

in other regressions. Second, it allows for comparative analysis of competition among different countries or for historical analysis of competition in the same market, especially when the results suggest monopolistic competition in the market, ($0 < H < 1$).

Every theoretical model applied to real data is valid under specific assumptions. For the PR model to hold, several assumptions need to be made. First, the banks should be single-product firms, an assumption that is consistent with the “intermediation approach” to the banking activity⁵.

The second assumption requires that higher input prices should not be correlated with higher quality services from products, because higher revenues would reflect higher prices due to both, an increase in costs and an increase in the quality of services provided. In this case, the H -statistic would be biased. However, Molyneux et al. (1996) shows that this bias is not too large if the hypothesis of competitive market is rejected, meaning that H is statistically different from 1.

Third, for the H -statistic to be meaningful, banks should be operating in their long-run equilibrium during the period of observation. According to Shaffer (1982) and Molyneux et al. (1996) this assumption implies that input prices should not be significantly correlated with the bank’s rate of returns. If instead the market is in disequilibrium, an increase/decrease in factor prices would lead to a temporary decline/increase in the rate of return. This assumption is especially important in the cases of perfect competition and monopolistic competition (Shaffer, 1994). To test whether this assumption holds, another equation is estimated. The independent variables remain the same as the ones in the reduced form of revenue function, described previously. The only difference is in the dependent variable, which in this case is a measure of profitability. Authors use ROA or ROE, as both of them are satisfactory measures of return for banks. Furthermore, as ROA or ROE is negative in some periods if some banks experience losses, Claessens and Laeven (2005) propose the use of $\ln(1 + ROA)$, to avoid the logarithm of zero and of negative numbers. The equation to be estimated is therefore:

$$\ln(1 + ROA_{it}) = a + \sum_{m=1}^M b_m \ln W_{itm} + \sum_{n=1}^N c_n \ln O_{itm} + e_{it} \quad (4)$$

or,

$$\ln(1 + ROE_{it}) = a + \sum_{m=1}^M b_m \ln W_{itm} + \sum_{n=1}^N c_n \ln O_{itm} + e_{it} \quad (5)$$

The equilibrium test is performed using the E -statistic, which, similarly as in the PR reduced form of the equation, is defined as the sum of the coefficients before the input prices:

$$E = \sum_{m=1}^M b_m \quad (6)$$

Following the equilibrium condition that there should be no correlation between the input prices and profitability, E should be equal to 0 if banks are observed in their long run equilibrium, and negative otherwise.

The PR methodology is the most used methodology in banking competition analysis. There are several reasons why this approach is more appropriate in measuring competition in the banking sector. The first is related to the availability of the data used in applying the PR methodology. All the variables are easily available in the central banks database, obtained from the monthly reports of the second-tier banks. Another advantage comes from the fact that output prices need not be involved in the equation, hence there is no need to account for differences in the quality of the products offered by banks (Philippatos and Yildirim, 2002). Furthermore, it is not necessary to specify a geographic dimension of the market, because the behavior of individual banks itself gives an indication of their market power (Shaffer 1994). Not having to specify a geographic market for the banking system avoids the biases caused by miss specifying market boundaries and makes the collection of data and the model specification even simpler. Finally, the PR methodology allows for examining differences among different types of banks, such as commercial, savings or investment banks.

3. COMPETITION PATTERNS OF THE ALBANIAN BANKING SYSTEM

Following the discussion on the theoretical background of competition in banking, this section continues further with the empirical assessment of the competitive behavior of Albanian banks. Before jumping to the estimation of the H -statistic, the market structure patterns of the banking system in Albania, compared also with other countries, are analyzed first.

3.1 THE MARKET STRUCTURE OF THE ALBANIAN BANKING SYSTEM

The market structure analysis, which has its foundation in the Structure-Conduct-Performance theory, has long been the most common approach to infer competition in the banking market. Despite their weak power in explaining competition, as suggested by the empirical evidence, and the development of more direct approaches, market structure indicators are still used as complementary tools in competition analysis.

The Albanian banking system is characterized by a continuous growth, in terms of banks operating in the market, as well as in the expansion of the banking activity. The latter has been more evident the recent years, which have been associated by a high credit growth and introduction of new products. These developments have had a strong impact in the market concentration, as shown in Table 1, which presents the concentration ratios CR3 and CR5, and the Hirshman Herfindahl Index (HHI)⁶, calculated for assets, deposits, and loans.

Table 1 Concentration indices for the Albanian banking sector, 1999-2006

Concentration indices		1999	2000	2001	2002	2003	2004	2005	2006*
Assets	CR3	86	80	75	72	70	69	64	62
	CR5	92	89	87	86	85	83	78	76
	HHI	4,795	4,382	3,757	3,226	3,016	2,736	2,110	1,949

Loans	CR3	90	78	69	62	54	46	43	43
	CR5	95	91	86	83	79	69	63	64
	HHI	3,316	2,727	2,011	1,729	1,459	1,150	1,035	1,035
Deposits	CR3	89	84	80	77	75	73	68	65
	CR5	95	92	90	88	87	85	81	79
	HHI	5,719	4,966	4,282	3,676	3,487	3,107	2,391	2,105

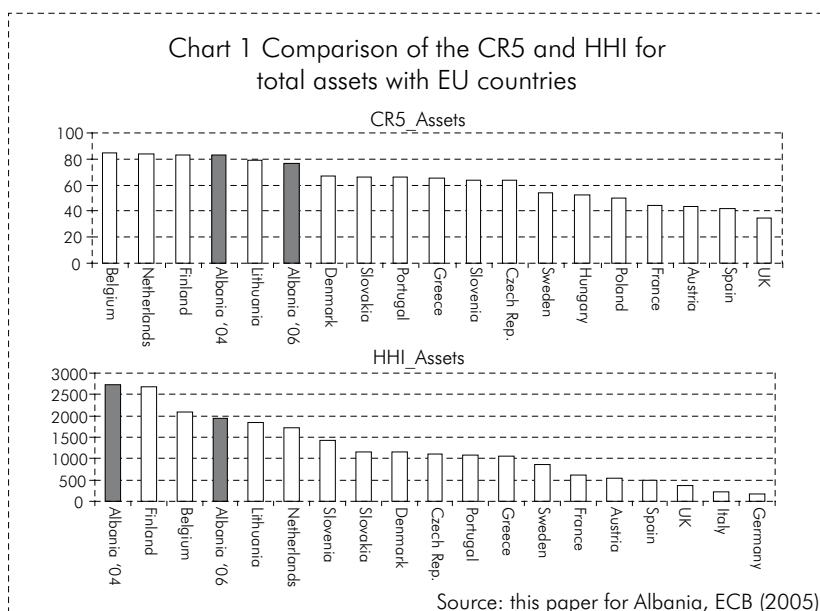
Source: Bank of Albania, own calculations

*July 2006

Based on the interpretation rule for the HHI provided by the US Department of Justice⁷, the Albanian banking market can be classified as highly concentrated in terms of both assets and deposits. The highest concentration ratios are found in the deposit market. Furthermore, the three largest banks in terms of assets also own the largest share of deposits. Lending is the least concentrated activity, exhibiting the most declining trend in concentration. Following the same interpretation rule of the HHI, the lending activity for the period 2002 – 2006 can be defined as moderately concentrated. However, the HHI value of 1035 in 2005 and 2006 is very close to the upper boundary of 1000 for a competitive market.

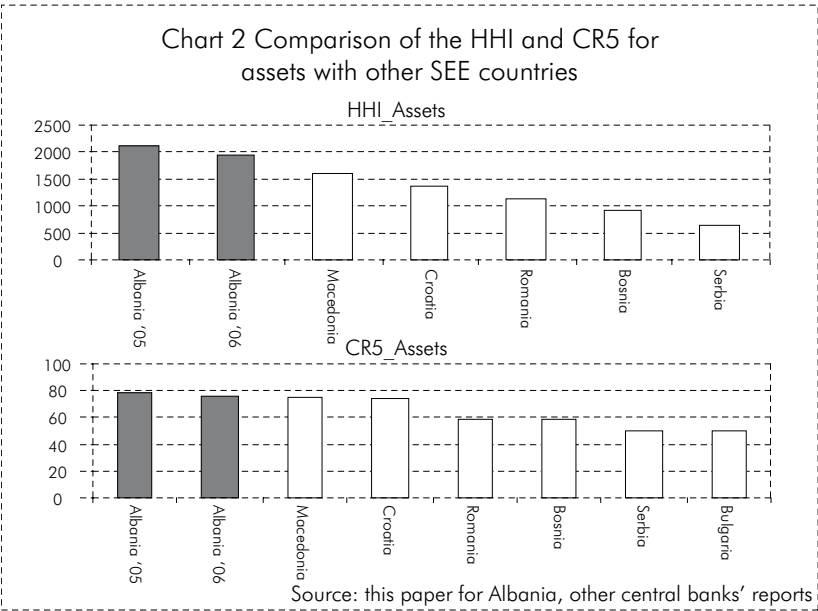
Another phenomena observed during the calculation of the concentration indices is the fact that the banks that own the largest share of deposits have not been always the most engaged in lending activities, meaning that the highest concentration in assets and deposits has not been fully transmitted in the lending market. This may have resulted as a combination of two factors: some banks have not mobilized all the deposits in the lending activity, and some others, not having enough deposits, have used high levels of capital. Despite the fact that concentration in the lending activity is at satisfactory levels, the high concentration in terms of deposits remains a concern, because, accounting for more than 88 per cent of funds available to lend, deposits are one of the most important factors that determine the lending capacity of banks. This suggests that, without a further decrease in the concentration of deposits, it is less likely to observe a further decline in the concentration of the lending activity without excessive risk undertaking by small and medium banks.

Because there are no reference values for the other concentration indices except for the HHI, the consideration of the Albanian banking system as “highly” or “lowly” concentrated is a relative concept. Therefore, a comparison with other countries, especially the ones with similar characteristics as Albania, provides a beneficial contribution to drawing more accurate conclusions. Chart 1 presents the CR5 and HHI, computed for total assets, for EU countries in 2004 and for Albania in 2004 and 2006.



Both concentration indices show that the Albanian banking market is more concentrated than most of the ones in EU countries, despite the consolidation process that has characterized these banking systems during the unification process. However, this higher concentration is justified by the short life of the banking system in Albania and the development level compared to EU countries. It is therefore more appropriate to compare the Albanian banking system with other countries with similar characteristics. Figure 2 shows the CR5 and HHI, calculated for deposits, for some of the Southern and Eastern European (SEE) countries in 2005 and for Albania in 2005 and 2006. From the charts it is evident that the

banking system in Albania is also the most concentrated of the SEE countries taken in consideration.



Under the traditional view of competition, the high concentration in the Albanian banking system would suggest that the competition degree in the banking market is low and it remains as such despite the decreasing trend over the years. However, the lack of decisive empirical evidence that the concentration measures describe the whole picture of competitive conditions entails the necessity to use more sophisticated techniques. This is what the following part of this section deals with by applying the PR methodology to the Albanian banking system.

3.2 THE COMPETITION LEVEL OF THE ALBANIAN BANKING SYSTEM

Although the PR model was developed since the late '80s, its specification has not changed significantly considering the large number of applications in 25 years. The only important difference found among applications is related to the proxies used for the

variables, mainly to better suit the model to individual countries or to the available data. In the application of the PR methodology in the case of Albania, the variables are chosen based on the most used practice of other studies, data availability, as well as on other specific features of the Albanian banking.

There are several specifications for the dependent variable. Initially, the model developed by Rosse and Panzar (1977) and Panzar and Rosse (1982, 1987) used the interest revenue as the endogenous variable. Later studies have used the total revenue instead, as the importance of non-interest revenues, such as commissions and other revenues in banking increased. In the case of Albania, the non-interest revenue accounts for 20-30 per cent of the total revenues. Considering this weight as non-negligible, the dependent variable in our model is chosen to be the total revenues. Furthermore, two equations are going to be estimated, one using total revenues, and another one using total revenues to total assets.

The unit price of labor is proxied by the ratio of personnel expenses to total assets, where personnel expenses consist of every category that banks pay to and for their employees, such as salaries, social security payments, etc. It would have been more appropriate to use the ratio of personnel expenses per number of full time employees, but there were no data available to calculate this variable.

The cost of funds is usually approximated by several proxies, such as the ratio of interest expenses to total loanable funds, to total deposits, to total liabilities that cause interest expenses, etc. In this paper the latter specification, referred to as the funding rate, will be used as the price of capital. The ratio is calculated as the total interest expenses to the average liabilities that cause interest expenses, and it is therefore called the average funding rate.

The third factor of production, physical capital, will be represented by the ratio of other expenses to total assets⁸. Other expenses include all overhead expenses except personnel ones, which are already accounted for by the first variable.

The coefficients before the prices of the production factors can be negative or positive. However, they could not be greater than 1, because it is unlikely that an increase in costs leads to a higher increase in revenues. Therefore, if the estimated coefficients for input prices will be greater than 1, then there is a lack of or misspecification of the variables in the equation.

Several other control variables are included in the model to account for bank specific factors. One such factor is size, represented by the total assets and expected to have a positive and significant effect on revenues. The specific riskiness of the banks is represented in the model by loans to total assets, as a measure of the share of risky assets in the banks' balance sheet. This variable is expected to positively affect the revenues, because of the positive relation of risk and price. Finally, as the investment in T-bills is a large part of the assets for some banks, and not for some others, the ratio of T-bills investments to total assets is included in the model to account to a certain extent for differences in business mix, and at the same time it is also expected to be a powerful explanatory variable that positively affects the generation of revenues.

As mentioned in the methodology chapter, all the variables are expressed in natural logarithm form. Therefore, the two basic reduced forms of revenue equations that are going to be estimated are:

$$\ln TR_{it} = a + b_1 \ln PEtoTA_{it} + b_2 \ln IEtoLI_{it} + b_3 \ln OEtoTA_{it} + c_1 \ln TA_{it} + c_2 \ln TLtoTA_{it} + c_3 \ln TBtoTA_{it} + e_{it} \quad (7)$$

and

$$\ln TRtoTA_{it} = a + b_1 \ln PEtoTA_{it} + b_2 \ln IEtoLI_{it} + b_3 \ln OEtoTA_{it} + c_1 \ln TLtoTA_{it} + c_2 \ln TBtoTA_{it} + e_{it} \quad (8)$$

where:

\ln the natural logarithm
 TR Total Revenues
 $TRtoTA$ Total Revenues to Total Assets

$PEtoTA$ Personnel Expenses to Total Assets
 $IEtoLI$ Interest Expenses to Liabilities that cause Interest Expenses
 $OEtoTA$ Other Expenses to Total Assets
 TA Total Assets
 $TLtoTA$ Total Loans to Total Assets
 $TBtoTA$ Treasury bills to Total Assets
 e_{it} the error term

The H -statistic obtained in each equation is the sum of the coefficients before the input prices, calculated as in Equation 3, page 12. The two hypotheses related to the H -statistic that are tested for every equation are:

$$H_0: H = 0 \quad \text{and} \quad H_0: H = 1$$

If the first hypothesis can be rejected, but the second one cannot, then the Albanian banking market is characterized by perfect competition. If the second one can be rejected, but not the first, then there is evidence for collusive monopoly. If both these hypotheses are rejected, while the H -statistic is positive, then the competition in the Albanian banking market can be considered as monopolistic.

As discussed previously in the methodology chapter, the PR methodology requires that the banks taken in consideration operate in their long-run equilibrium, an assumption especially important to be fulfilled if the H -statistic shows evidence for perfect or monopolistic competition. To test for long run equilibrium, two equations are estimated, one for every revenue equation, respectively. The equations are:

$$\ln(1 + ROA)_{it} = a + b_1 \ln PEtoTA_{it} + b_2 \ln IEtoLI_{it} + b_3 \ln OEtoTA_{it} + c_1 \ln TA_{it} + c_2 \ln TLtoTA_{it} + c_3 \ln TBtoTA_{it} + e_{it} \quad (9)$$

and

$$\ln(1 + ROA)_{it} = a + b_1 \ln PEtoTA_{it} + b_2 \ln IEtoLI_{it} + b_3 \ln OEtoTA_{it} + c_1 \ln TLtoTA_{it} + c_2 \ln TBtoTA_{it} + e_{it} \quad (10)$$

where ROA is the Return on Assets, measured as the Net Profit after taxes to the Average Assets for the period. The other variables are the same as in the reduced form revenue equations. The E -statistic used to test the assumption of long-run equilibrium is the sum of the three coefficients before the unit prices and is calculated as in Equation 6, page 14. The hypothesis to be tested for every equation is:

$$H_0: E=0$$

If we can reject this hypothesis, we reject that banks are operating in their long run equilibrium and the H -statistic is not robust.

The sample consists of the 10 largest banks that have been operating in Albania during the whole period 2000 – 2005⁹. Their assets account for 94 - 98 percent of the assets of the system, therefore these banks can be considered as fair representatives of the banking system in Albania. The data is quarterly and is taken from the banks' balance sheets and income statements.

There are three estimations for each of the two equations: Fixed Effects, Random Effects and Fixed Effects with time dummies ($TD2001$, $TD2002$, $TD2003$, $TD2004$ and $TD2005$, respectively for the years 2001, 2002, 2003, 2004 and 2005). All the estimations have *White Heteroscedasticity-Consistent Standard Errors & Covariance*, to obtain accurate standard errors even in the presence of heteroscedasticity.

Before continuing with the estimation of the H -statistic, we check first whether the assumption of the long run equilibrium is satisfied. The estimation results of equations 9 and 10 are shown in Table 2.

Table 2 Estimation results for the equilibrium test

Independent Variables	Coefficients					
	Equation 9			Equation 10		
	Fixed Effects + time dummies	Fixed Effects	Random Effects	Fixed Effects + time dummies	Fixed Effects	Random Effects
Input Prices						
lnPEtoTA	-0.0024	-0.0020	-0.0025**	-0.0025*	-0.0019	-0.0019
lnIEtoLI	-0.0006	0.0008	0.0013	-0.0005	0.0014	0.0011
lnOEtoTA	-0.0031***	-0.0027**	-0.0024***	-0.0031***	-0.0026**	-0.0022***
Other Variables						
lnTA	0.0009	-0.0009	-0.0002	---	---	---
lnTLtoTA	0.0015***	0.0016***	0.0018***	0.0015***	0.0016***	0.0017***
lnTBtoTA	0.0039**	0.0031**	0.0029***	0.0038***	0.0013**	0.0027***
Time Dummies						
TD2001	-0.0009	---	---	-0.0005	---	---
TD2002	-0.0025	---	---	-0.0020	---	---
TD2003	-0.0043	---	---	-0.0036	---	---
TD2004	-0.0035	---	---	-0.0027	---	---
TD2005	-0.0027	---	---	-0.0017	---	---
E-statistic	-0.0060	-0.0039	-0.0040	-0.0062	-0.0031	-0.0029
H ₀ : E=0, Wald F-test	5.3429	2.3115	0.5646	5.3417	2.0678	0.5803
P(F-test)	0.0217	0.1298	0.4524	0.0217	0.1504	0.4470
Adjusted R ²	0.2903	0.2749	0.2829	0.2922	0.2757	0.3004
F-statistic	11.5300	20.6684		12.8002	25.6755	
P(F-statistic)	0.0000	0.0000		0.0000	0.0000	
No. of observations	234	234	234	234	234	234

***, **, and * show significance at 1%, 5%, and 10% level, respectively.

The hypothesis that E equals 0 is tested using the Wald test. The F -test cannot reject the null hypothesis in each of the equation estimations at 1% significance level, suggesting that the banks operate around the point of their long run equilibrium. This means that the H -statistic that will be obtained from the estimations of the revenue equations can be used as a measure of competition in the Albanian banking case.

After investigating the fulfillment of the long run equilibrium assumption, the analysis continues with the estimation of the H -statistic. Table 3 summarizes the results for the reduced form of the revenue equations (equations 7 and 8, page 20).

Table 3 Estimation results for the reduced form of the revenue equations

Independent Variables	Coefficients					
	Dependent variable: $\ln TR$			Dependent variable: $\ln TR_{toTA}$		
	Fixed Effects + time dummies	Fixed Effects	Random Effects	Fixed Effects + time dummies	Fixed Effects	Random Effects
Input Prices						
$\ln PE_{toTA}$	-0.0044	0.0109	0.0384	-0.0166	0.0047	0.0143
$\ln E_{toL}$	0.2934***	0.3229***	0.3018***	0.2951***	0.2889***	0.2848***
$\ln OE_{toTA}$	0.2394***	0.2542**	0.2508***	0.2340**	0.2438**	0.2401***
Other Variables						
$\ln TA$	1.081***	1.0541***	1.0359***	---	---	---
$\ln TL_{toTA}$	0.0760***	0.0792***	0.0834***	0.0785***	0.0833***	0.0835***
$\ln TB_{toTA}$	0.2147***	0.2108***	0.1968***	0.2007***	0.2146***	0.2112***
Time Dummies						
TD2001	0.0361	---	---	0.0350	---	---
TD2002	-0.0695	---	---	-0.0893	---	---
TD2003	-0.0623	---	---	-0.0974	---	---
TD2004	-0.0372	---	---	-0.0772	---	---
TD2005	-0.0335	---	---	-0.0523	---	---
H -statistics	0.5283	0.5880	0.5910	0.5126	0.5374	0.5076
$H_0: H=0$, Wald F-test	17.7196	23.0369	35.8758	17.5447	30.0673	43.4786
P(F-test)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
$H_0: H=1$, Wald F-test	14.1242	11.3122	16.0567	15.8709	22.2885	17.3669
P(F-test)	0.0002	0.0009	0.0001	0.0000	0.0000	0.0000
Adjusted R^2	0.9662	0.9663	0.9661	0.4931	0.4945	0.5136
F-statistic	668.550	1340.442		27.286	60.481	
P(F-statistic)	0.0000	0.0000		0.0000	0.0000	
No. of observations	234	234	234	234	234	234

***, **, and * show significance at 1%, 5%, and 10% level, respectively.

We see that the coefficient before the price of labor is sometimes negative and sometimes positive, and insignificant in

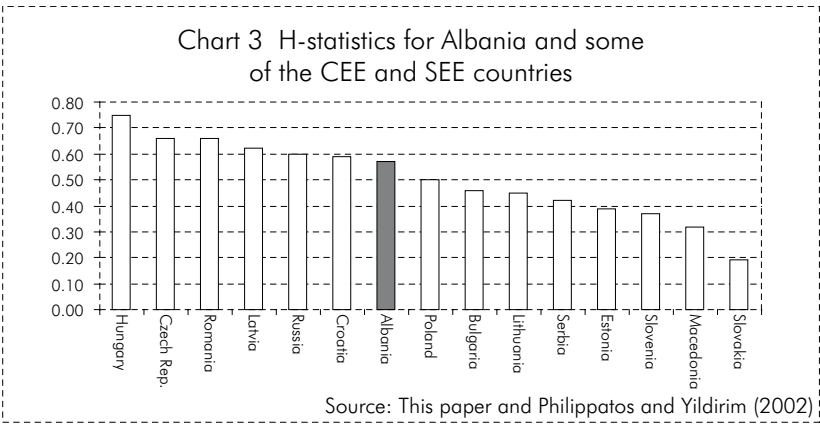
both equations. This means that banks do not change their prices (interests and commissions) in response to changes in labor cost. This insignificance may also come from the fact that the proxy used for this input price might not be very appropriate in the case of Albania. We used the total assets as a scaling factor instead of the number of the employees, and it might be the case that the number of employees has increased less or more than assets during these years. Therefore, the ratio that we have used may not incorporate the real information about the changes in the price of labor. The coefficients of the other two input prices are positive and significant in every equation and every estimation method. Besides, they are relatively stable, especially within the same estimation method, and do not exhibit big changes from one equation to the other. Among the control variables, total loans, treasury bills, and total assets are highly significant and positively related to revenues.

The H -statistic varies from 0.5076 to 0.5910 through all the equations. Its average value from all the estimations is 0.5442, whereas the averages for the two main equations are 0.5691 and 0.5192, respectively. To test whether the value of H -statistic is statistically different from 0 and 1, the Wald test is used. Both the null hypotheses that H is equal to 0 and H is equal to 1 are rejected, suggesting that the banks in Albania behave as if under monopolistic competition. This result is also the most frequently found by the empirical studies of other countries that employ this methodology in banking. As Allen and Gale (2001) argue, banking competition is generally monopolistic, because banks do not offer completely homogeneous products, but differentiate in product characteristics, geographical expansion, type of customers, etc. Even though the differences among the products offered by banks might not be real, if they are perceived as such by the customers, then they are ready to pay higher prices for what they believe are better or more useful products. Therefore, perfect competition in banking is impossible to be found in practice. Instead, what best matches the competitive behavior of banks is the monopolistic competition.

The results of the competition test imply that banks in Albania differentiate by targeting different type of customers and/or by providing products with different characteristics. An example of

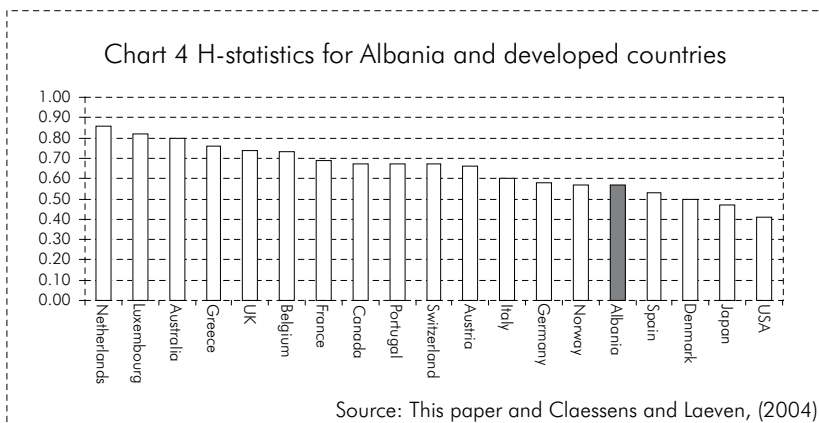
this is focusing in specific customers, such as SME-s, corporate, or households. Furthermore, banks may differentiate even more within these segments by providing different type of products, such as mortgage lending or short-term financing in the case of households. In the case of Albanian banks, further empirical investigation is however needed to identify the degree up to where this hypothesis holds.

Following Bikker and Haaf (2002), the H statistics may be interpreted as continuous under the strong assumption that the price elasticity of demand is constant across different countries. Although this assumption is hard to hold in practice, especially when industrialized and developing economies are contrasted, it is still useful to have a general idea about where the Albanian banking system stands compared to the ones in other economies. Chart 3 below shows the average H -statistics for Albania together with the H -values for some of the Central and Eastern European (CEE) countries and the SEE countries.



We see from the chart that the competition level of the Albanian banking market is quite comparable to the one for countries at similar stage of development. With the exception of Romania and Croatia, the Albanian banks seem to operate in higher competitive environment than the other SEE countries. Furthermore, the comparison with developed countries in Europe and the other part

of the world, shown in chart 4 below, also gives interesting insights. This ranking is quite satisfactory, considering the development stage of the Albanian banking system.



Finally, another conclusion can be drawn from the comparisons in charts 1 – 4; despite being more concentrated than some of the banking systems which it is compared to, the Albanian banking system is characterized by a higher degree of competition, as measured by the *H*-statistic. This simple observation adds to the empirical evidence gathered so far that concentration and competition are not necessarily linked together, and that market concentration indicators are not good measures of competition.

4. CONCLUSIONS

The banking market in Albania is characterized by a high concentration level, especially in terms of assets and deposits. Despite the strong decreasing trend over the years, as the number of banks established in Albania increased, concentration indices for deposits are higher than most of the other SEE and EU countries. The lending market has had the fastest decreasing concentration level and exhibits characteristics of moderate to low concentration, suggesting almost fair competition. Hence, it can be argued

that the unequal geographic distribution of banks and the high concentration of assets and deposits have not hampered the banks so far to compete with each other in their lending activity. However, if the high concentration in deposits continues as such in the future, it might affect the concentration in the lending market as well by restraining its declining trend in the coming years.

To measure the competition in the Albanian banking system, this study employed a more direct measure of competition, based on the PR methodology. The results suggest that the competition among banks in Albania is monopolistic, also the most encountered empirical result in other studies that use the same methodology. This implies that banks in Albania are differentiating; they focus on different market segments and/or provide products with different characteristics. Based on these results, the competition in the Albanian banking system is at average levels, acceptable for the development stage of Albania, and not low, as implied by the market concentration indices.

When compared to other countries, the Albanian banking system, though being more concentrated, has a higher competition degree. This is in line with the vast empirical evidence in the literature that concentration ratios are not good measures of competition and that higher concentration in the market does not necessarily lead to a lower level of competition. Therefore, we can conclude that the high concentration in the Albanian banking system should not be as concerning as the concentration indices would imply.

Furthermore, a certain degree of concentration in the banking system would be convenient for a developing country like Albania. As already argued in the beginning of this paper, each level of competition in the banking system involves trade-offs in terms of economic growth and systemic stability. From this point of view, a moderate level of concentration, which does not hamper competition among banks, is desirable not only for the stability of the banking system, but it also facilitates the supervision of banks in a dynamic environment. Moreover, further consolidations in the banking market, which improve the efficiency and increase the stability, would be desirable as long as they do not negatively affect the competitive conditions.

NOTES

* Sofika Note, specialist, Research Department, Bank of Albania.

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¹ The models are called *structural* because they use the structure of the market (concentration) as a measure of competition.

² See for example Claessens and Laeven (2004), Gelos and Roldos (2004), Hempell (2002).

³ Monopolistic competition occurs when there are many firms in the market, but each of them focuses in specific geographical segments or provides products with different characteristics. Therefore, it is possible for the firms to exercise market power to some extent and to earn higher than normal profits.

⁴ Rosse and Panzar (1977) and Panzar and Rosse (1982, 1987).

⁵ Colwell and Davis (1992) discuss two principal approaches to bank output specification, the “production approach” and the “intermediation approach”. In the “production approach” the bank is considered as a firm that employs physical capital and labor as inputs to produce two types of products: loans and deposit accounts. In this approach, operating costs without interest expenses is the relevant cost measure. The “intermediate approach” views the bank as a firm whose function is to provide financial intermediation services rather than as a producer of loans and deposits. The output is measured by the value of the loans and investments, and the factors of production are labor, physical capital, and funds collected by third parties. Therefore, the relevant cost measure is the operating expenses plus the interest expenses. Several empirical investigations have been carried out to determine whether deposits should be considered as inputs or outputs. One of the early studies is conducted by Hancock (1991) who finds that time deposits should be considered as inputs whereas demand deposits as outputs. However, Hughes and Mester (1993a, b) find

that also the demand deposits should be classified as inputs.

⁶ The n^{th} Concentration Ratio (CR $_n$) is calculated as the sum of the market shares of the n biggest firms in the market. The HHI index is calculated as: $HHI = \sum_{i=1}^n MS_i^2$ where MS_i is the market share of bank i and n is the total number of banks in the market.

⁷ Though the interpretation of the HHI might be somewhat arbitrary to the user, the US Department of Justice (1992) provides an interpretation rule for its value, which is widely followed by the authors. A market is considered to be:

- fairly competitive if the HHI value is less than 1,000;
- moderately concentrated if the HHI value is 1,000-1,800;
- highly concentrated if the HHI value is 1,800 or greater.

⁸ Other expenses/fixed assets is a better proxy for the unit price of physical capital, but in the case of Albania it could not be calculated as not all the banks owned fixed assets.

⁹ The sample includes also the Raiffeisen Bank (former Savings Bank). Because its interest rates were administered until September 2004, another sample was created, excluding this bank. However, the results did not change significantly compared to the results obtained including the RB in the sample.

REFERENCES

A Dictionary of Business, 3rd Edition, 2002. Market House Books.

Bain, J.S., 1956. *Barriers to New Competition*. Harvard University Press, Cambridge, MA.

Bain, J.S., 1951. Relation of profit rate to industry concentration: American manufacturing, 1936-1940. *Quarterly Journal of Economics* 3, 293-324.

Baumol, W.J., 1982. Contestable markets: an uprising in the theory of industry structure. *American Economic Review* 72, 1-15.

Baumol, W.J., Panzar, J.C., Willig, R.D., 1982. *Contestable Markets and the Theory of Industry Structure*. San Diego: Harcourt Brace Jovanovich

Bikker, J.A., Groeneveld, J.M., 2000. Competition and concentration in the EU banking Industry. *Kredit und Kapital* 33, 62-98.

Bikker, J.A., Haaf K., 2002. Competition, concentration and their relationship: an empirical analysis of the banking industry. *Journal of Banking & Finance* 26, 2191-2214.

Bresnahan, T.F., 1982. The oligopoly solution identified. *Economics Letters* 10, 19-27.

Bresnahan, T.F., 1989. Empirical studies of industries with market power. In *Handbook of Industrial Organization*, edited by R. Schmalensee and R.D. Willig, 1011-1057. Amsterdam: North Holland.

Claessens, S., Laeven, L., 2005. Financial dependence, banking sector competition, and economic growth. *Journal of the European Economic Association* 3(1), 179-207.

_____, _____, 2004. What drives banking

competition? Some international evidence. *Journal of Money, Credit, and Banking* 36, 563-583.

Colwell, R.J., Davis, E.P., 1992. Output and productivity in banking. *Scandinavian Journal of Economics* 94, Supplement, 111-129.

De Bandt, O., Davis, E.P., 2000. Competition, contestability and market structure in European banking sectors on the eve of EMU. *Journal of Banking & Finance* 24, 1045-1066.

Deidda, L., Fattouh, B., 2002. Concentration in the banking industry and economic growth. CRENoS Working Paper No. 02/02.

Demsetz, H., 1973. Industry structure, market rivalry, and public policy. *Journal of Law and Economics* 16, April, 1-9.

ECB, 2005. EU banking structures.

Friedman, J.W., 1971. A non-cooperative equilibrium for supergames. *Review of Economic Studies* 38, 1-12.

Gelos, R.G., Roldós, J., 2004. Consolidation and market structure in emerging market banking systems. *Emerging Markets Review* 5, 39-59.

Hancock, D. 1991. A theory of production of the financial firm. Norwell, Mass.: Kluwer Academic Publishers.

Hempell, H.S., 2002. Testing for competition among German banks. Deutsche Bundesbank Discussion Paper No. 04/02.

Hughes, J.P., Mester, L.J. 1993a. A quality and risk-adjusted cost function for banks: Evidence on the too-big-to-fail doctrine. *Journal of Productivity Analysis* 4/3, 293-315.

Hughes, J.P., Mester, L.J. 1993b. Accounting for the demand for financial capital and risk-taking in bank cost functions. Federal Reserve Bank of Philadelphia Working Paper No. 93-17.

Lau L.J., 1982. On identifying the degree of competitiveness from industry price and output data. *Economics Letters* 10, 93-99.

Mason, E.S., 1939. Price and production policies of large-scale enterprise. *American Economic Review* 29, 61-74.

Molyneux, P., Thornton, J., Lloyd-Williams, D.M., 1996. Competition and Market Contestability in Japanese Commercial Banking. *Journal of Economics and Business* 48, 33-45.

Panzar, J.C., Rosse, J.N., 1982. Structure, conduct, and comparative statistics. Bell Laboratories Economic Discussion Paper No. 248.

Panzar, J.C., Rosse, J.N., 1987. Testing for "monopoly" equilibrium. *Journal of Industrial Economics* 35, 443-456.

Philippatos, G.C., Yildirim H.S., 2002. Competition and Contestability in Central and Eastern European Banking Markets. University of Tennessee Working Paper, September.

Rosse, J.N., Panzar, J.C., 1977. Chamberlin vs Robinson: an empirical study for monopoly rents. Stanford University, Studies in Industry Economics No. 77.

Shaffer, S., 1994. Bank competition in concentrated markets. *Business Review* March/April, 3-16.

Shaffer, S., 1982. Non-Structural Test for Competition in Financial Markets. Bank Structure and Competition, Conference Proceedings, Federal Reserve Bank of Chicago, 225-243.

United States Department of Justice, Federal Trade Commission, 1992. Horizontal Merger Guidelines.

http://www.usdoj.gov/atr/public/guidelines/horiz_book/hmg1.html.

Vives, X., 2001. Competition in the changing world of banking. *Oxford Review of Economic Policy* 17, 535-547.

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