

## **Competition and Market Power in the Romanian Banking Sector**

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**Abstract:** The current paper analyses the competition degree among Romanian banks during 2005-2015. We determine the bank-level competition for loans and deposits using efficiency-adjusted Lerner index, while Boone indicator shows how competitive these two markets are. Marginal costs (MC) are estimated with a Fourier flexible form cost function with two bank products, that generate the largest portion of revenues, (i.e. loans and deposits) and three input prices (i.e. labour, funds and physical capital). We use DFA for efficiency-improved Lerner index and Generalized Method of Moments with one-, two- or three-year lagged values of marginal costs as instrumental variables for Boone indicator. The results are compared to the values of HHI and C5, provided by European Central Bank. Overall, bank competition in Romania improves as a direct result of decreasing market power and concentration. On the loan market, we can notice that starting with 2014 banks have changed their behaviour by focusing more on optimizing their portfolios through a complex process of balance sheet cleaning, instead of acquiring additional market share and be more competitive.

**Keywords:** bank competition; adjusted-Lerner index; financial regulation; Boone indicator

**JEL Classification:** G2; D40; D4

### **1. Introduction**

During the last years, Romanian banking market has continuously changed. The most recent financial crisis has brought about difficult challenges but Romanian banks have been able to overcome them, as they have been well capitalized and solvable. Lately there is a slight decline in the number of credit institutions mainly due to mergers, along with a focus on selling of the non-performing loans portfolios

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and restructuring the financial institutions by closing several branches and lowering the total costs.

This topic is relevant for both researchers and practitioners. The banking system represents one of the most important sectors for the Romanian economy since it provides 90% of the funding and herewith it determines the overall competitiveness, economic growth and prosperity. Romanian banking market has been subject to structural adjustments due to changes in external environment, caused mainly by financial crisis, regulatory framework and new ample projects. From 2008 to 2013, the personnel costs have dropped by 13%, one of the highest cost cutting rates from the region, along with a decline in the number of employees and bank outlets. Moreover, the implementation of European directives and regulations on lending, payments, saving and dispute resolution has caused greater expenses and stimulated credit institutions to consolidate their activities.

Competition plays an essential role in the Romanian economy since it fosters efficiency through better allocation of resources, improves the quality of goods and services, stimulates innovations and boosts international competitiveness. In the banking sector, higher efficiency translates into lower costs that are passed onto bank customers, in the form of lower charges, higher deposit rates and reduced lending costs.

From a policy point of view, it is difficult to know what impact these structural developments are likely to have on the competitive environment and how they may influence the efficiency and stability of banking markets. On the one hand, increased concentration is expected to intensify market power and therefore hinder both competition and efficiency. Hence, it might be argued that if bank mergers and acquisitions are driven by economies of scale, then increased concentration may foster efficiency improvements.

This paper marks its contribution to the literature in three ways. First, competition is measured at bank-level for each of the two markets: loans and deposits. The extant researches assess the overall Romanian banking competition. Our approach provides more accurate results in terms of costs and profits, and better competition measures since we take into account the competition faced by each bank and admit that even if the credit institutions operate in the same market, they deal with various competitiveness degrees. The average measures of competition for a certain market delivers incomplete information about the competitive position of each individual bank.

Moreover, adjusted Lerner index and Boone indicator represent the most recent indices on the market power of financial entities from Romania and they offer different perspectives on the degree of competition in the markets and for the banks under observation.

Finally, the extended timeframe provides valuable outcomes on the impact of European Union accession, financial crisis and new banking regulations. These three representative events have not been in-depth analysed yet, even if they have influenced the behaviour of the banks.

The paper is structured in several parts. Section 2 reviews the extant literature on the measures used to account for bank competition. The next section presents the data and the methodology followed. Afterwards, the main results and several conclusions come.

## **2. Literature Review**

Bank competition has gained increasing interest in the last years due to the role it plays in the economy through the access to finance and capital allocation and its impact on overall financial stability and development. Academics, practitioners and regulatory authorities have constantly aimed at developing the most accurate measure of competition, determining the optimal level of market competitiveness and implementing the appropriate regulations to maintain it.

Nevertheless, assessing the competition degree is not an easy task, since one cannot measure it directly. Therefore, in the extant literature, the researchers make use of either structural (Structure-Conduct-Performance paradigm (SCP) and efficiency theory) or non-structural approaches (New Empirical Industrial Organization (NEIO)). Both categories of models help at analysing whether a more concentrated market translates into collusive conduct of the major banks and better performance or only the efficiency of the larger banks causes superior financial results.

The structural approaches make a connection between competition and concentration, whereas their counterparties do not take into account concentration and aim at correcting the empirical and theoretical drawbacks of SCP and efficiency theory. The structural measures belong to two schools of thought: formal (number of firms, concentration ratios and Herfindahl-Hirschman index) and non-formal (SCP and efficiency theory). The number of companies on the market is the simplest competition indicator to compute since the data needed are easily available. Though, this measure does not take into account the distribution of the firms and is consequently less used. A better index that requires additional input on the market shares of the business units is concentration ratio (CR) that is more frequently calculated in the researches. The major flaw of CR is the focus on several companies (three, five or ten) and does not consider the distribution of the remaining market players. Researchers and regulatory agents prefer Herfindahl-Hirschman indicator (Hirschman (1964)) that equals to the sum of the squares of the market shares of the total number of companies (N). According to U.S. Antitrust Agencies Issue New Merger Guidelines of 2010, banking industry is competitive when HHI is below

1,500, concentrated if it ranges between 1,500 and 2,500, and very concentrated when the value of Herfindahl-Hirschman indicator goes above 2,500. In the computation of this index, larger companies receive a higher weight than the smaller firms, highlighting their importance. Mason (1939) and Bain (1957) develop the SCP theory and state that the structure of the industries and markets where companies operate determine the firm conduct and performance. The number of business entities, their absolute and relative size, entry and exit conditions, product differentiation and vertical integration describe the structure of a market or industry. The business conduct refers to price setting, collusion and other types of strategic behaviour such as product quality, expenditure on advertising, research, development and innovation. The performance of a company is a function of profit, annual growth, market share, technological progress and efficiency. The main take-aways from this theory are that the probability of collusion is a positively impacted by the market power and a more concentrated industry encourages firms to behave uncompetitively. Gilbert (1984), Reid (1987), Vesala (1995) and Bos (2002) note that all the researches based on SCP paradigm do not take into account the conduct of the bank.

The efficiency theory proposed by Demsetz (1973) and Peltzmann (1977) challenges the rationale behind the SCP paradigm by stating that once a bank is the most efficient its profit maximizing behaviour facilitates the increase in the market share by cutting down the costs. Banks' performance shapes the market share and concentration is the output of the leading banks.

The Lerner index is still currently the most widely and frequently used and it is known as a measure of market power and the intensity of competition. As a matter of fact, Lerner (1934) describes his indicator as "index of the degree of monopoly power" and defines it mathematically as

$$Lerner_i = \frac{P_i - mc_i}{P_i} \quad (1)$$

where  $P_i$  represents firm  $i$ 's price whereas  $mc_i$  refers to marginal cost. The values of the index range between zero and one, with zero reflecting perfect competition and increasing values showing a higher market power. The spread usage of Lerner index stems from fewer data constraints, easy interpretation and simplicity. Basically, Lerner indicator shows the extent to which a bank can charge prices higher than the marginal cost. Consequently, there are only two data requirements.

Koetter et al., (2012) propose a new measure for market power, based on the fact that Lerner index makes two major assumptions. The former is the companies choose the prices that maximize the profits (profit efficiency). The latter refers to obtaining the inputs at the most appropriate cost (cost efficiency). Thus, the estimated price-cost margins do not accurately reflect the real market power of the business entities. As a matter of fact, Lerner (1934) focuses on actual or exercised market power,

whereas Koetter et al., (2012) are concerned only with potential market power. Therefore, Lerner index is altered for efficiency and becomes adjusted Lerner index. The mathematical equation is

$$\text{adjusted Lerner}_i = \frac{\pi_i + tc_i - mc_i \cdot q_i}{\pi_i + tc_i} \quad (2)$$

with the bank profit being  $\pi_i$ , total cost  $tc_i$ , marginal cost  $mc_i$  and total output  $q_i$ . The adjusted Lerner index can take values between 0 and 1, higher results reflecting stronger market power.

Boone indicator is a new approach to measure competition used by van Leuvensteijn et al. (2007) for the first time in an empirical study. The index replaces relative profit differences, a theoretical construct difficult to be implemented in practice and proposed by Boone (2008). As a matter of fact, Boone, Griffith and Harrison (2005) recommend profit elasticity (PE) or Boone indicator as empirical analogue of relative profit differences (RPD). Boone indicator expresses the elasticity of profits to marginal costs

$$\text{profit elasticity}_i = \frac{\partial \ln \pi_i}{\partial \ln mc_i} \quad (3)$$

where  $\pi_i$  shows the firm  $i$ 's total profits and  $mc_i$  equals the marginal costs. Profit elasticity is expected to take negative values due to the inverse relationship between profits and marginal costs.

The current studies have investigated the overall Romanian banking competitiveness using Lerner-index (Andrieş and Căpraru, 2011; Căpraru and Andrieş, 2012; Coccoresse, 2014; Lapteacru, 2014; Clerides et al., 2015) HHI (Andrieş and Căpraru, 2011; Lapteacru, 2014); C5 (Andrieş and Căpraru, 2011); H-statistic (Bikker and Spierdijk, 2008; Andrieş and Căpraru, 2011; Căpraru and Andrieş, 2012; Lapteacru, 2014), adjusted-Lerner index (Clerides et al., 2015) and Boone indicator (Clerides et al., 2015).

### 3. Data and Methodology

The timeframe under analysis is 2005-2015. The sample consists in Romanian commercial banks. The database that provides the input for the computation of competition measures is Bankscope/ Orbis Bank Focus.

Marginal costs (MC) are estimated with a Fourier flexible form cost function with two bank products, that generate the largest portion of revenues, (i.e. loans and deposits) and three input prices (i.e. labour, funds and physical capital). We use DFA for efficiency-improved Lerner index and Generalized Method of Moments with one-, two- or three-year lagged values of marginal costs as instrumental variables for Boone indicator. The price of labour is equal to the ratio between the personnel

expenditures and total assets of the banks, since the number of employees and branches is most of the time unavailable. The division of the costs represents the price of physical capital with premises by the value of fixed assets. The ratio between the interest rate on deposits and total deposits represents the cost of deposits.

The values for HHI and C5 are taken from the ECB.

#### **4. Results and Discussions**

A structural analysis of market competition for the period 2005 – 2015 highlights a decline in concentration for the Romanian banking sector in the case of both Herfindhal-Hirschman index (HHI) and the concentration of the first five banks (CR5). These results are depicted by the first two figures from the appendix. Therefore, we can state that from a structural point of view, competition is fiercer since starting with 2008 HHI lowers and remains constantly around the value 1,000, proving a high competition. Though, for the timeframe under analysis, the first five banks from the Romanian banking sector control more than half of the entire system. The number of credit institutions has ranged from a minimum of 36 in 2015 to 43 in 2008. Thus, after the global financial crisis we can notice the beginning of a continuous process of consolidation through either national or international M&As. For year 2015, we can notice an increase in concentration for both indices due to a drop in the number of financial institutions because of the mergers between Transilvania Bank and Volksbank and OTP Bank and Millennium Bank, and the exit of The Royal Bank of Scotland Plc, Edinburgh – Romanian branch.

Turning to the non-structural indicators, we can state that there is a tendency towards increasing competition in the Romanian banking sector. Therefore, we can conclude that there is a decline in the market power, along with higher profitability ratios because of a relocation of market share from the least to the most efficient banks, given the fierce competition.

Regarding the analysis of the competition on loan vs deposit market, we may see different sometimes opposite evolutions. As a matter of fact, adjusted Lerner index shows that the market power increases, indicating a decrease in competition opposite to deposit taking. Year 2008 can be considered a year of the extreme outcomes, given the strongest competition on loan market and the least for deposits. Practically, this year is the most effervescent after 1989, as it the year before the financial crisis when the highest volume of loans has been registered. A lower competition on deposit market might be due to important resources that the foreign banks from Romania obtained from their mother financial institutions.

On the other hand, Boone indicator displays similar trends for both markets, the only difference occurring in 2015. There has been an increasing competition for the deposits over the entire period, while the same situation occurs in the loan markets

until 2011, followed by a sustained decline until 2015. This is due to the nonperforming loans and the bank focus on reducing their amount via sales and a more precautious attitude towards granting new credits. Besides, another cause is represented by post-crisis effects, when the number of fundable projects and firms has diminished due to worse business environment and creditworthiness of companies and individuals.

## 5. Conclusions

The Romanian banking sector has been subject of a consolidation and restructuring process after the international financial crisis. Overall there is an increase in the competition level, due to a decline in market power and concentration. Though, at the end of the period analysed there is an increase in concentration and lower competition on loan market. Banking competition has caused several banks to exit the marketplace or to merge in order to optimize their activities. Given these facts, we recommend to the supervisory authorities to pay more attention to the risks the new entities may generate and to the trend towards consolidation that is expected to continue several years from now on. As for bankers, we advise them to be cautious when it comes to lending and be more flexible towards SMEs financing with a stronger potential growth and sustainable businesses on the long-term. In this way, there will be set the premises for Romanian economic growth and implicitly, for the future development of the banking sector. At the same time, banks should pursue the adjusting process through the optimization of their processes, as higher competition will resettle the market share to the most efficient credit institutions.

## 6. Acknowledgements

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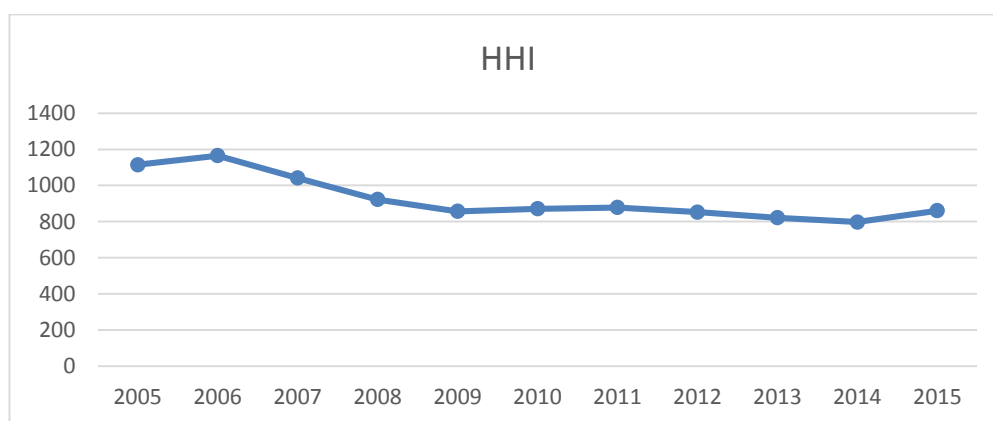
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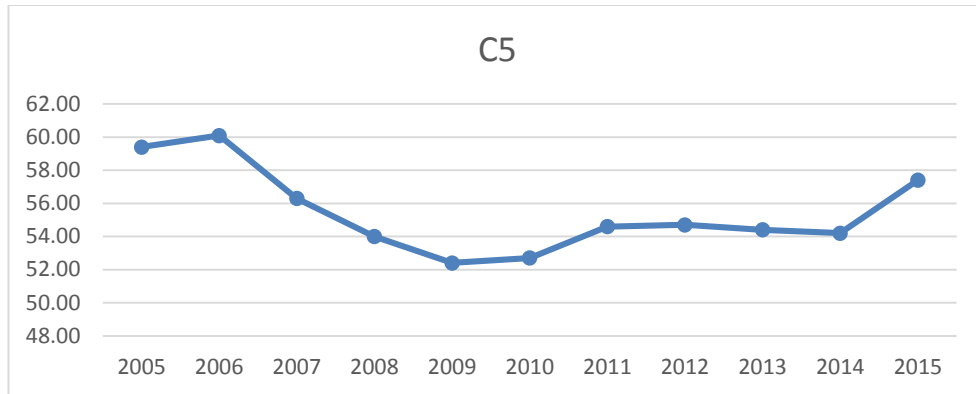
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## Appendix

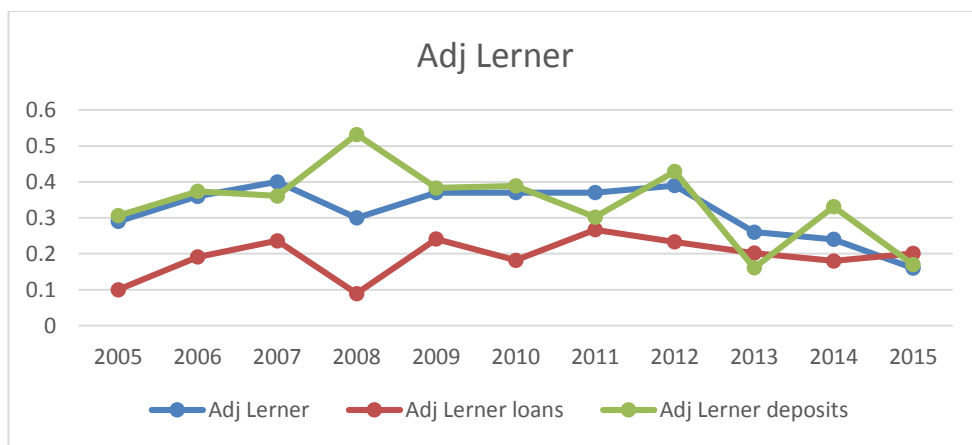


**Figure 1. Evolution of HHI**





**Figure 2. Evolution of C5**



**Figure 3. Evolution of adjusted Lerner index**

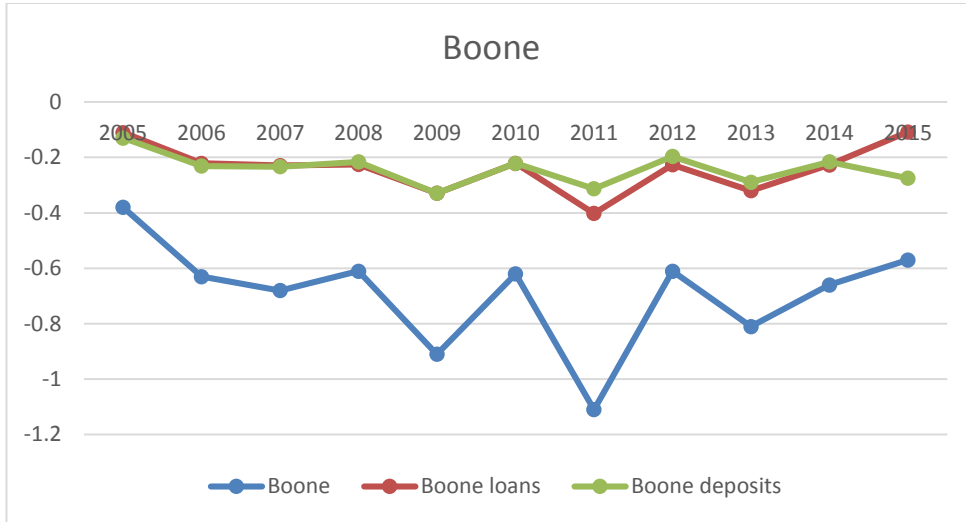


Figure 4. Evolution of Boone indicator