

A Comparative Approach of Competitiveness of Iranian Banking Sector

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Abstract

The aim of this paper is present a comparative approach of competitiveness condition in the banking system of Iran by use of two different New Empirical Industrial Organization (NEIO) approaches (Panzar-Rosse and Hall-Roeger models) over the years 2003-2011 for P-R model, and 2007-2011 for other one. The result of calculated H-statistics shows that, the Iranian banking sector's market structure has a monopolistic situation. In the case of Hall-Roeger model we calculate the Lerner Index for 18 banks, The results for Lerner index show that for 15 banks are $P > MC$ and for rest of them is $P < MC$. For comparative purposes the obtained results between the Panzar-Rosse model and Hall-Roeger model, is that it seems that the degree of competition in Hall-Roeger model seems to be intensive than other model. However, these result are similar both of them show that the Iranian banking industry market is non-competitive.

1. Introduction

The financial and monetary system of any country has a key role in, stability and efficiency of economy environment, keeping the stability of general price level, supporting the production affairs and facilitating the development of economy. Moreover, the efficiency and stability of the financial and monetary system can support and boost the real economy sector (Namazi and Salehi, 2010). Thus, analyzing the banks performance and active institutes in this system is because of their importance of the economy. in addition, it can encourage investors to invest financial resources in an efficient and optimal way. In fact, the fundamental importance of banks causes to appear some empirical researches in the term of relationship between financial system with economic growth (see King and Levin, 1993) and (Levine, 1997). Thus, the impress of financial development on economic growth is one of economic issues that via saving and accoutrements of capital resources and increase of efficiency will predispose of the economic growth and prosperity. The literature on measuring of competition can be divided to two sections: the Structural and Non-Structural approaches.

The Structural models contain the Structure-Conduct-Performance(SCP) paradigm and the efficiency hypothesis, as well as a number of formal approaches with roots in Industrial Organization theory. And, as response to the theoretical and empirical deficiencies of the structural model, non-structural models of competitive behavior have been developed namely the Iwata model, the Bresnahan model, and the Panzar and Rosse (P-R) model. These New Empirical Industrial Organization approaches test competition and stress the analysis of the competitive conduct of banks without using explicit information about the structure of the market (Bikker and Haaf, 2000).Iranian banking sector has experienced a lot changes during the different stages. In particular, after 1979 revolution rigid controls and state ownership of the financial institutions make Iran as one of the few remaining examples of the financial repression and furthermore, banks are subject to interest rate ceiling for both deposits and loans and to direct controls on the allocation of loans among different sectors and to public enterprises according to the yearly budget laws and related notes. But in recent years after some deregulations in this sector this absolute monopoly situation has decreased and specially after coming back of private banks this process of reducing concentration have been rather.

Right now, in Iranian financial system, there are two types of firms, the first one is banks that have specific legal structure but the second is Non-Bank Financial Institutions that contain Trust, Companies & Foundations and Fiduciary Services. In recent years, we have seen a lot changes in regulation and then structure of Iranian financial system such as entrance of private banks, the trend of transformation of trust, companies & foundations and fiduciary services to bank

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and grant of state banks' stocks. Several commonly used indicators of concentration, namely, CR_2, CR_4 , as well as the Hirschman-Herfindal index (HHI) reported in table 1.

Table1. Market Structure Indicators based on Bank's Loan and Deposits

Loans	2003	2004	2005	2006	2007	2008	2009	2010	2011
CR_2	0.37	0.34	0.40	0.43	0.43	0.44	0.45	0.33	0.31
CR_4	0.65	0.61	0.63	0.65	0.58	0.55	0.56	0.55	0.55
HHI	0.1361	0.1243	0.1393	0.1562	0.1105	0.105	0.1045	0.1026	0.1014
Deposits	2003	2004	2005	2006	2007	2008	2009	2010	2011
CR_2	0.44	0.42	0.39	0.36	0.34	0.32	0.34	0.33	0.33
CR_4	0.71	0.68	0.63	0.59	0.58	0.56	0.57	0.56	0.55
HHI	0.1493	0.1406	0.1290	0.1159	0.1117	0.1062	0.1076	0.1058	0.1031

2. Overview of the Iranian banking sector

Since it has existed, the Iranian banking sector landscape has changed in different stages and in each period the environment that emerged gave impetus to establishment of specific kind of bank and none bank financial institutions. In Iran, although, banking activities come back to times past, but the modern banking doesn't have long precedent. According to history, banking returns to Hakhmaneshi era, but the modern banking commencement goes back to nineteenth century that during the extension of commercial transactions, two foreign banks branches established in Iran. In general, the Iranian modern banking system can be divided into 4 different stages.

The first stage (1887-1949), starts when The New East bank established two branches in Tehran. Then, in 1888 the Imperial bank of Iran established via using the British grant of "Barron Jullio Roiter". Then, Bank-e-Esteghrazi, Osmani Bank and Iran and Russia bank established, among others. The first bank with Iranian capital (Pahlavi e Ghoshon bank) was established in 1925, also the first Iranian Private bank (Bazargany Bank) established in 1949.

In second stage (1950-1978), some of other banks with private, governmental and mixed ownership established, that in threshold of Islamic revolution the number of banks reaches to 36 (8 governmental, 14 private and 13 mixed banks). Also banking rules were revised in 1953. In third stage, after the revolution of 1979 and therefore the incidence of various factors such as lapse of public confidence, considerable withdrawals and increase in non-performing loans of banks, the operation of most private banks stopped in spite of Central Bank aids. In such circumstances, "the Bill of Nationalization of Banks, Credit and Insurance institutions" was passed by Islamic Revolution Council of Iran in 1979, transferring the ownership of all private banks to Government. Thus, the number of banks reduced from thirty six to nine. Then in 1983, the "Law for Non-Usury Banking Operation" was passed. From that time on, facilities are extended in form of 14 Islamic contracts. Furthermore, interest rate is replaced by banking fee and assured fixed profit. (Mojtahed and Mehrabi, 2008). During this period, the governmental structure of banks allowed policy makers to take advantage of bank's monetary fund in favor of their macro/micro priorities. (Goodarzi and Shafiee, 2009). Governmental structure lasted till 1998, for fourth stage (1998-2013), The "Law for Authorizing the Establishment of Private Banks" was passed. Therefore a number of monetary and financial institutions began their operation, except for opening demand deposit accounts. Then, private banks were established and until 2012 twenty two private banks and more than six thousand Gharz-Alhasan Funds, among others, entered to this market. It is now expected that banking market in Iran is on way of getting more competitive (Ghandinejad, 2006).

Table 2: Summary of important events on Iranian banking evolution

Year	Bank	Explanatory Points
1887	New East	The first modern bank in Iran which belongs to England.
1888	Imperial	For 60 years had the oligopoly right of editing bill.
1890	Esteghrazi	Belong to Russia and had the oligopoly right of public auction.
1925	Pahlavi Ghoshon	The first Iranian bank, now active as Sepah.
1928	Melli	By having the oligopoly right of editing bill in fact was Iranian Central Bank till 1960.
1955		Approving of first monetary and banking regulation in 38 principles.
1960	Central Bank	It establish to setting the Currency volume and presidency on banking system.

1949-1972		The establishing banks prosperity period, which in threshold of revolution, 36 banks were on.
1973		Reviewing of Monetary and Banking Regulation and increase of Central Bank's authority.
1980		Nationalization of all banks and merging them together by approval of Revolution Council.
1983		Approving of Non Usury Banking System in Islamic Parliament Council.
1991		Increasing of Non Banking Institutions according to 44 th principle of constitution.
2000		Adjustments on Principle 44 th and entrance of private banks.
2004		Approving of Non Banking Monetary Market's Regulation to control them.
2005 up to now		Supplying the stock of Mellat, Tejarat and Saderat in Stock Market and make over of Reffah to Social Secure Organization.

3. The Panzar-Rosse model

The PR model for measuring market power relies on the premise that each bank will employ a different pricing strategy in response to a change in input costs, depending on the market structure in which this bank operates. (Panzar and Rosse, 1987). Thus, this model investigates the extent to which a change in factor prices (i.e. the price of funds, capital and labour) is reflected in equilibrium revenues earned by a specific bank. PR model has a sound theoretical basis and there are some important assumptions underpinning this model. The assumptions of the Panzar-Rosse model include (i) profit maximization at bank and industry level, (ii) equilibrium in the industry, (iii) conventional cost and demand structures, (iv) that banks are single-products firms, i.e. the intermediation approach is applied to bank modeling (De Bandt and Davis, 2000). Panzar and Rosse for numerical assessment of degree of competition define H-statistic that calculated from the reduced-form revenue equation and it can serve as a evaluate of competitive behavior of firms under above assumptions. This test is derived from general banking market model, which determines equilibrium output and the equilibrium number of banks, by maximizing profit at both the bank level and the industry level (Bikker and Haaf (2002). In general, the H-statistics take the following form:

$$H = \sum_{k=1}^m (\partial R_i^* / \partial W_{k_i})(W_{k_i} / R_i^*)$$

Where R_i is revenue, W_{k_i} is factor input prices and [*] represent the equilibrium values. The estimated value of H, take the range of $-\infty < H \leq 1$. For the interpretation purpose, if H is negative, it means that there is oligopoly situation in the market, if the H is a value between zero and unity, the market structure characterized by monopolistic competition and finally if we have unity, it is perfect competition case. Overall, the PR model is regarded as a important tool for investigating the market structure, since bank's revenues are more observable than output prices and quantities or actual costs, data availability is another reason for accept that this model has been more successfully applied than the other models. Indeed, the needed information is recorded in public accounting statements and readily available through several data sources. For empirical purposes, several specification have been presented in the burgeoning the literature, Here, we following from Gutierrez (2007) and Bikker and Haaf (2003), used the following empirical form:

$$\begin{aligned} \ln(NITA) = & \alpha_{ii} + \beta_{1i} \ln(PL_{ii}) + \beta_{2i} \ln(PLF_{ii}) + \beta_{3i} \ln(PCE_{ii}) + \\ & \delta_{1i} \ln(EQTA_{ii}) + \delta_{2i} \ln(LOATA_{ii}) + \delta_{3i} \ln(LFTA_{ii}) + \delta_{4i} \ln(LDTLD) + u_{ii} \end{aligned}$$

Where the dependent variable, NITA, is the ratio of Net Income to Total Assets, The set of explanatory variables embraces three factor input prices, namely PL (Price of Labour), PLF (Price of Loanable Funds), PCE (Price of Capital Expenditure), as well as four bank-specific variables: EQTA (Equity to Total Assets), LOANA (Loans to Total Assets), LFTA (Loanable Funds to Total Assets) and the scale factor LTLTD, Which represents the individual market share according to loans and deposits. Finally, u_{ii} is the disturbance term.

4. The Hall-Roeger model

In order to investigate the market structure of Iranian banking sector and for comparative purposes, here we also used from a model based on a method developed by Roeger (1995), which is an extension of the work of Hall (1988). Hall (1988) applied a new test for monopoly power in US industry. He criticized the Bresnahan-Lau approach for testing for market power as relying on specific functional form assumptions, instead favoring a nonstructural reduced-form approach. His basic realization is that the traditional Solow residual (SR) should be independent of variations in the log-change of output in the absence of monopoly power. The main contribution of Roeger (1995) is that he showed how the differences between the production-based (primal) SR and the cost-based (dual) SR can be used to eliminate the unobservable productivity shock in order to obtain an unbiased of market power. A possible disadvantage of the model is that it is based on an assumption of constant returns to scale. Thus, decreasing (increasing) returns to scale will bias the estimated when comparing the same industry along different periods, provided that the nature of economies of scale does not change over time. (Rezitis, 2009). Based on this model, the mark-up of banks is estimated in order to analyze the market power of the Iranian banking sector. Here for measurement the gap between price and marginal cost and evaluating the oligopoly intensity, we used the generalized Hall-Roeger approach to calculate the Lerner index, or degree of monopoly power, expresses market power as the difference between the output price and marginal cost in the profit maximum divided by the output price, as follow:

$$\begin{aligned} \frac{dY}{Y} + \frac{dP}{P} - \sum_i \theta_i \left(\frac{dX_i}{X_i} + \frac{dW_i}{W_i} \right) - (1 - \sum_i \theta_i) \left(\frac{dK}{K} + \frac{dW_k}{W_k} \right) & \quad X = [l, m] \\ = [\lambda (\beta - 1) + 1] \left[\left(\frac{dY}{Y} + \frac{dP}{P} \right) + \left(\frac{dK}{K} + \frac{dW_k}{W_k} \right) \right] & \quad W = [\omega, p^m] \\ & \quad W_k = r \end{aligned}$$

Where the X vector contains the Labour (L) and intermediate institutions and the W vector contain wage of Laburs. Also, R is price of capital.

5. Empirical Results

Here, we investigate the marker structure of Iranian banking sector and comparative the estimated degree of competition using of two different model to better understand of this market and consistency check or see is there any difference between these results or not. All data that we have used are available from individual bank’s annual report and other financial statements such as Iranian Annual Banking Performance Report published by Iranian Banking Institutes, among others. A list of surveyed banks presented in table results which are 18 private and governmental. Of the registered banks included in this study, some of the year’s annual reports and financial statements are not available or do not disclose all of the key variables, because of that we test the Hall-Roeger approach in years 2007-2011. And before 2007 there is no sufficient data to enable us to test this model in Iranian banking market. As we said before the H-statistics is summation of elasticities of the reduced-form revenues with respect to factor prices, thus, the result of calculated H-statistics reveals that, the Iranian banking sector is monopolistic in nature. In other word, in this period the estimated H-statistics is 0.45, which according to usual interpretation of Panzar and Rosse model; it means that Iranian banking is on stream in monopolistic competition condition. In the case of Hall-Roeger model we calculate the Lerner Index for all banks during 2007-2011. All test confirm that specified model fits the data (adjusted $R^2 = 0.72$) as the Hausman static suggests the fixed effects approach and F-test supports the join significance of majority of regressors. The results are presented in table3 and 4.

Table3. The empirical result for Hall-Roeger model

Independent Variables	Hall-Roeger equation: Coefficient
Observations	72
Adjusted R^2	0.72
F Statistics	7.52
Hausman Test	6.92
Lerner Index average in whole industry	0.46

The obtained results for Lerner index show that for 15 banks are $P > MC$. In particular, for 9 banks it is further than 0.50, but for 3 of them is $P < MC$ which can be justify as they have been loser in this period.

Table4. Frequency of bank's distribution in different range of Lerner index

Range of Lerner index	No. of banks	Relative frequency (%)	Cumulative frequency (%)
$-1 \leq L < 0.1$	3	16	16
$0.1 \leq L < 0.3$	2	11	27
$0.3 \leq L < 0.6$	4	22	49
$0.6 \leq L < 0.8$	5	28	77
$0.8 \leq L < 1$	4	22	100

6. Conclusions

The ongoing structural changes in the Iranian banking industry affect competition on this market. This paper seeks to assess competitive conditions in Iran's banking industry using the two structural and non-structural models that both of them are as part of New Empirical Industrial Organization (NEIO). As investigating the Panzar-Rosse model for years 2003-2011, we find the monopolistic competition condition in this market as the estimated H-statistic is 0.45. Also, The empirical results for the Hall-Roeger model indicate that during the period (2007-2011), provide evidence of presence of a non-competitive market structure in Iranian banking sector as by calculating the Lerner Index for total 18 Private and Public banks, We found that during this period the Lerner index for 15 banks has been fluctuated between 0.1 to 0.90, and for three remain banks it has been negative. Also according to our result, up to 0.80 of these banks have succeed to create a significant gap between their price and marginal costs, thus they gain market power. A possible explanation of the differences in the obtained result between the Panzar-Rosse model and Hall-Roeger model, is that it seems that the degree of competition in Hall-Roeger model seems to be intensive than other model. However, these result are similar both of them show that the Iranian banking industry market is non-competitive.

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