

ANALYZING THE STRUCTURE OF THE BANKING INDUSTRY IN JORDAN

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Abstract: *This paper aims to analyze the structure of the banking industry in Jordan during the period 2000–2013. Additionally, some important determinants for the banking industry in Jordan are examined.*

According to the Jordanian banking industry structure, there was a noticeable decline in the market share of the three largest banks, which improved the level of competition between the operating banks in the Jordanian market. However, the level of concentration in the banking sector in Jordan is still high.

This paper shows that the concentration ratio by total assets have not experienced large or sudden changes during the study period, where Arab Bank acquires the largest market share, while the second and the third places were alternately occupied by the Housing Bank, the Islamic Bank and Ahli Bank. Furthermore, the Rosse Panzar index reveals that the banking industry in Jordan can be considered as oligopoly market.

Keywords: *Banking industry, market share, market structure, concentration, Rosse Panzar*

1. INTRODUCTION

The banking sector in Jordan witnessed remarkable progress over the last few decades. This sector is considered one of the pillars of the Jordanian services sector with a large contribution to the GDP and a major employer in the private sector.

This study aims to answer the following questions: do banks in the banking industry in Jordan have a satisfactory level of competition or do some banks dominate the market with large market power? How the level of competition developed over time? What are the main characteristics of the structure of the banking industry?

Accordingly, the following research hypothesis will be tested:

- (a) The level of competition in the Jordanian banking industry has decreased over time.
- (b) The banking industry structure is monopolistic competition.

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In light of this, the objective of this paper is to investigate and analyze Jordan's banking industry. The historical development of the banking industry in Jordan will be briefly covered in the next section. This is followed by an analysis of the determinants of the banking industry in Jordan. Afterward, the structure of the Jordanian banking industry is examined with respect to the level of concentration and entry barriers in this industry. The final section provides overall conclusions and recommendations.

2. LITERATURE REVIEW

Numerous studies have examined the competitive structure of the banking industry in various countries by employing the Panzar and Rosse (1987) approach. Shaffer (1982) applied this methodology on the banking firms in New York and found that competitive conduct of banks cannot be characterized as monopolistic or perfectly competitive in the long run. The analysis of Aktan and Masood (2010) for the banking industry in Turkey, and Hamza (2011) for the Tunisian banking industry, revealed that banking markets are best described as monopolistically competitive in both countries.

Al Jarrah (2010) evaluated the level of competition and contestability in the Jordanian banking industry for the period 2001–2005. The study methodology involves the estimation of revenue function and the Panzar and Rosse (1987) "H statistic". The study results revealed that the Jordanian banking market cannot be characterized by either perfect competition or a monopoly over the study period.

The purpose of Alsmadi *et al.* (2013) was to analyze the competition among commercial banks operating in Jordan and, in particular, to assess the capacity of local banks in meeting competitive challenges with foreign banks operating in Jordan. The study used the Panzar-Rosse H-statistic to assess the level of competition. The findings revealed that all banks operating in Jordan were subject to monopolistic competition conditions and that foreign banks were posing a competitive threat to local banks.

Hamdan (2016) aimed at testing market power theories and their role in explaining Islamic banks performance in Gulf Cooperation Council GCC based on data for 22 Islamic banks during the period (2008-2013). The results showed that there is no evidence for monopoly practices within Islamic banks market that would affect its performance. In fact, the Islamic banks sector is characterized by the presence of high competition and diffused market shares.

3. THE HISTORICAL DEVELOPMENT OF THE BANKING INDUSTRY IN JORDAN

The first commercial bank in Jordan, Ottoman Bank, was established in Amman in 1925. This bank worked as an agent for the government alongside the usual

commercial banks activities at that time. The Ottoman Bank continued to act alone until 1935 when the Arab Bank opened its first branch in Amman, and opened its second branch in the city of Irbid in 1943 (Al-Nabulsi, 1994). In 1949, the British Bank of the Middle East registered its first branch in Jordan. Additionally, in 1951, the Bank of the Nation and Barclays Bank established their first branches in Jordan. In 1956, Jordan national Bank, which was considered the second national commercial bank after the Arab Bank, started its work. In 1957, the Rafidain Bank opened its first branch, followed by the establishment of both Jordan Bank and Cairo Amman Bank in 1960. Successively, many banks entered to approach twenty-six banks by the end of 2013; divided into sixteen Jordanian banks-including three Islamic banks, and ten foreign banks including one Islamic bank (Central Bank of Jordan, 2013).

It is worth mentioning that some mergers have taken place in the Jordanian banking sector; a merger of the Business Bank with the National Bank on January 17, 1997, and a merger of Bank of Philadelphia with the Jordan National Bank on June 5, 2005.

Indeed, the number of branches of banks operating in Jordan increased from 22 branches in 1964 to 739 branches in 2013 (Central Bank of Jordan, 2013), which reveals a continuous increase for the demand for banking services. The increase in the demand for banking services can be considered as one of the main reasons for the expansion of the existing banks and the entry of new banks into the market. With the increase in economic activity, the demand for various banks services increases, particularly for credit facilities. The actual statistics revealed that total credit facilities extended by operating banks in Jordan increased from JD2.7 billion in 1993 to JD18.3 billion at the end of 2013 (Central Bank of Jordan, 2013).

The Central Bank of Jordan constitutes the authority for licensing banks, and imposing various measures and requirements to maintain healthy and reputable financial sector. On December 16, 2010 the Central Bank raised the minimum capital requirements by Jordanian banks to JD100 million and by foreign banks to JD50 million.

4. ANALYSIS FOR THE STRUCTURE OF THE BANKING INDUSTRY IN JORDAN

4.1. Measures for industrial concentration

Industrial concentration is the most important dimension of the industry structure. The most commonly used measures for concentration and competition are:

4.1.1. Concentration Curve

This curve depicts the cumulative market share produced by firms in the industry after arranging them from the largest to the smallest, as illustrated in figure (1).

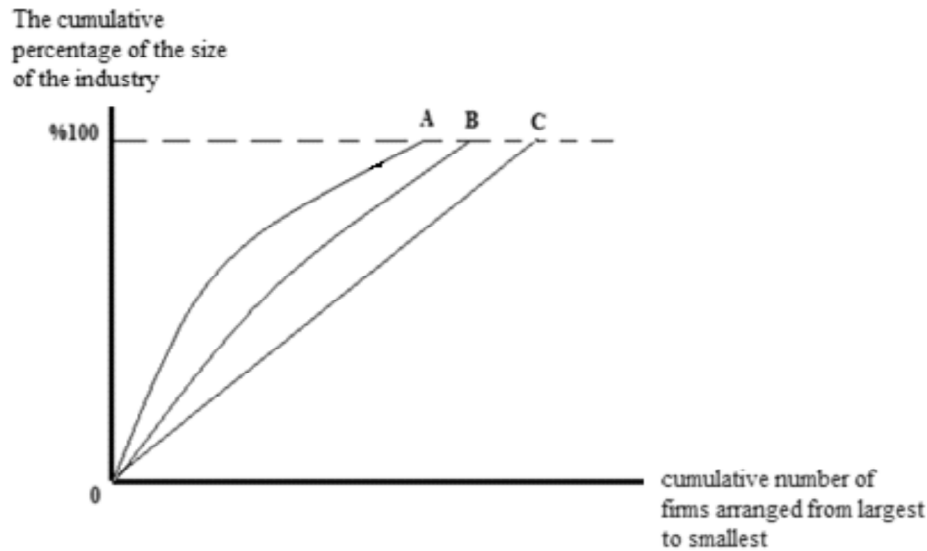


Figure 1: Concentration Curve for Three Industries A, B, C

According to the definition of market concentration, the industry with the highest concentration curve is the most concentrated one compared to other industries. In Figure (1), it can be said that industry A has the highest concentration among the three industries (Alomari and Saqfalhait, 2015).

4.1.2. Concentration Ratio (CR_k)

This measure provides the market share of the largest k firms in the industry. That is:

$$CR_k = \sum_{i=1}^k S_i \quad (1)$$

4.1.3. Hirschman-Herfindahl Index

This index is calculated by summing up the squares of the market shares for all firms in the industry. It takes the following form:

$$HHI = \sum_{i=1}^n S_i^2 \quad (2)$$

Where n refers to the number of all firms in the industry, if the concentration ratio using the HHI index is less than 10%, then it is referred to be low concentration, indicating the presence of competition among firms that are operating in the industry. However, if the value of this index is greater than 18%, then it is referred to as high concentration in the industry, which indicates the presence of some monopolistic power in the industry.

4.1.4. Alba-Garcia Index

This indicator is calculated according to the following formula:

$$ID = \sum_{i=1}^n (hi)^2 \quad (3)$$

$$hi = Si^2 (100) / HHI \quad (4)$$

Where (ID): Alba-Garcia Index;

(Si): the market share of firm i; (HHI): Hirschman coefficient. According to this indicator, the market is considered as low concentrated when the value of this index is less than 2,500 points (Leon, 2009).

4.1.5. Rosse and Panzar Index

This measure examines the deviation between the marginal cost and price. It estimates the relationship between the change in the input prices and revenue (Rosse & Panzar, 1987).

The overall total revenue function is expressed as follows:

$$R_i = f (P_i, Z_i, Y_i) \quad (5)$$

where:

Ri: total revenues

Pi: input producer prices

Zi: variables that shift the cost curve

Yi: variables that shift the demand curve

In light of this, the H-Statistic is calculated as:

$$H = \sum \frac{\partial R_i}{\partial P_i} \frac{P_i}{R_i} \quad (6)$$

To calculate the elasticities of total revenues with respect to input prices in the banking sector, the following regression function is estimated:

$$\ln R = C + a_1 \times \ln P_i + a_2 \times \ln P_k + a_3 \times \ln P_d \quad (7)$$

Where:

- I. The dependent variable can be measured using total income/total assets, or net income/total assets, or interest income/total assets.
- II. C: is the intercept.
- III. Production input prices:
 - Operating cost (P_i): expresses the ratio of operating expenses to total deposits; this ratio measures the efficiency of the bank in controlling the operating costs.

- Fixed capital cost (P_k): refers to the ratio of depreciation and amortization to net fixed assets owned by the bank.
 - Financing cost (P_d): is a percentage of the interest expenses to total deposits.
- According to this equation, the parameters (a_1, a_2, a_3) express the elasticities.

Table 1
Interpretation of Rosse-Panzar Model

Monopoly or Oligopoly	$H < 0$
Monopolistic Competition	$1 > H > 0$
Perfect Competition	$H = 1$

Reference: Panzar-Rosse, 1987.

The estimated value for H -Statistic ranges between ($-\infty$ and 1). So, as the value of H increases, the degree of competition increases too.

4.2. Measuring the level of concentration in the Jordanian banking market

This paper measures the industrial concentration for the banking industry in Jordan for the years 2000 and 2013. The industrial concentration is calculated based on each bank's market share of total assets using the concentration indicators mentioned previously: HHI, CR_2 , CR_3 , the Alba Garcia indicator and the Rosse Panzer H-statistics.

Table (2) shows the total assets of banks operating in Jordan during the years 2000 and 2013. After arranging banks from the largest to the smallest, market shares were calculated.

To calculate the concentration CR_2 index for Jordanian banks in 2000, the proportion of the total assets for the two largest banks in the industry is calculated, namely for the Arab Bank and the Housing Bank. This can be expressed as: $CR_2 = 0.3200 + 0.1437 = 0.4637$

This indicates that the two largest banks controlled about half of the Jordanian banking sector. With respect to all banks operating in Jordan, CR_2 was equal to 40.57%. This reveals the existence of monopoly power in this sector.

In 2013, the concentration index CR_2 decreased to 40.88% for Jordanian banking sector, and to 36.08% for all banks operating in Jordan. Thus, while a lower concentration ratio can be observed from 2000 to 2013, the Arab Bank and the Housing Bank retained in the same rank.

As for the concentration index CR_3 , in 2000 it was 56.85% for Jordanian banks and 49.74% for all banks operating in Jordan, which was relatively high. That is, the three largest banks controlled about half of the market: the Arab Bank, the Housing Bank, and the National Bank. Obviously, high monopoly power existed

Table 2
The Value of Total Assets for All Banks Operating in Jordan during 2000 and 2013

Bank	2000		2013	
	Assets (millions JD)	*Proportion to total assets for each sector %	Assets (millions JD)	*Proportion to total assets for each sector %
Arab Bank	3615.40	32.00	8,624.00	23.97
Housing Bank	1,623.25	14.37	6,082.00	16.91
Ahli Bank	1,184.11	10.48	3,522.40	9.79
Amman-Cairo	884.60	7.83	2,484.20	6.91
Jordan Bank	678.26	6.00	1,971.00	5.48
Islamic Bank	658.89	5.83	1,912.59	5.32
Jordan Kuwait	545.35	4.83	1,774.00	4.93
Investment Bank	348.09	3.08	1,729.60	4.81
Commercial Bank	344.55	3.05	1,594.44	4.43
Arab Jordan Investment	299.92	2.65	1,348.24	3.75
Union Bank	266.00	2.35	1,060.00	2.95
Arab Bank Corporation	259.18	2.29	991.52	2.76
Arab Islamic	197.04	1.74	939.00	2.61
Capital Bank	195.34	1.73	768.56	2.14
Dubai Islamic	132.34	1.17	642.00	1.78
Societe Generale	67.57	0.60	529.00	1.47
Total Assets	11,299.89	100	35,972.55	100

Jordanian Bank Sector

contd. table

Bank	2000		2013	
	Assets (millions JD)	*Proportion to total assets for each sector %	Assets (millions JD)	*Proportion to total assets for each sector %
HSBC			881.00	18.40
Egyptian Arab Land			808.00	16.90
City Bank			745.92	15.60
Rafidain Bank			513.52	10.70
			485.89	10.20
			346.87	7.30
			294.95	6.20
			288.90	6.00
			284.30	5.90
			132.00	2.80
Total Assets	1,613.61	12.5	4,781.34	100
Total Assets for All Banks Operating in Jordan	12,913.5	100	40,753.89	100

*calculated by researchers

in the banking sector. In 2013, CR_3 was 50.67% for Jordanian banks and 44.72% for banks operating in Jordan respectively. Clearly it is lower compared with 2000, but it is still high.

By calculating the cumulative market shares for Jordanian banks in 2000 and 2013, the **concentration curves** were drawn, as shown in Figures (2) and (3).

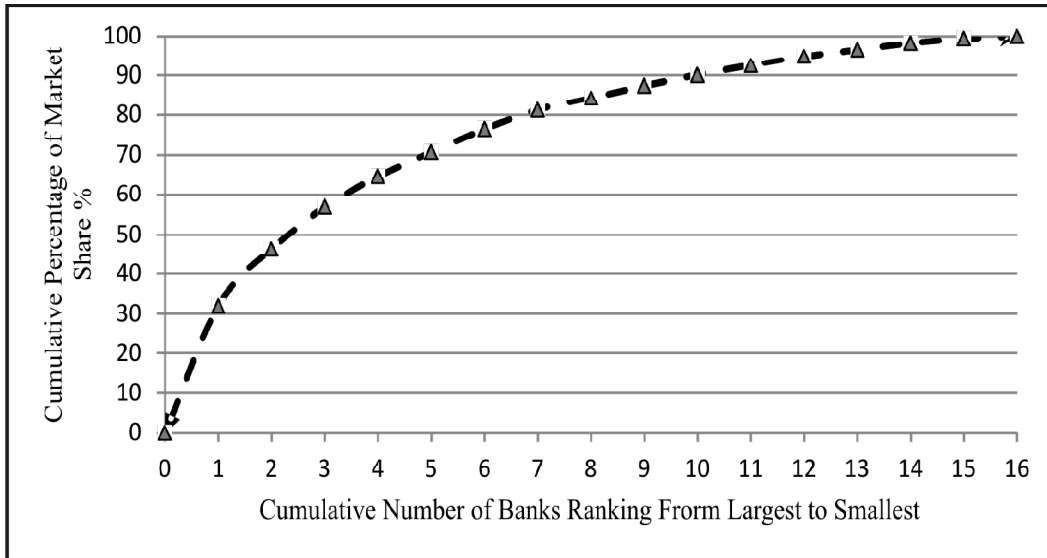


Figure 2: Concentration Curve for Jordanian Banks in 2000

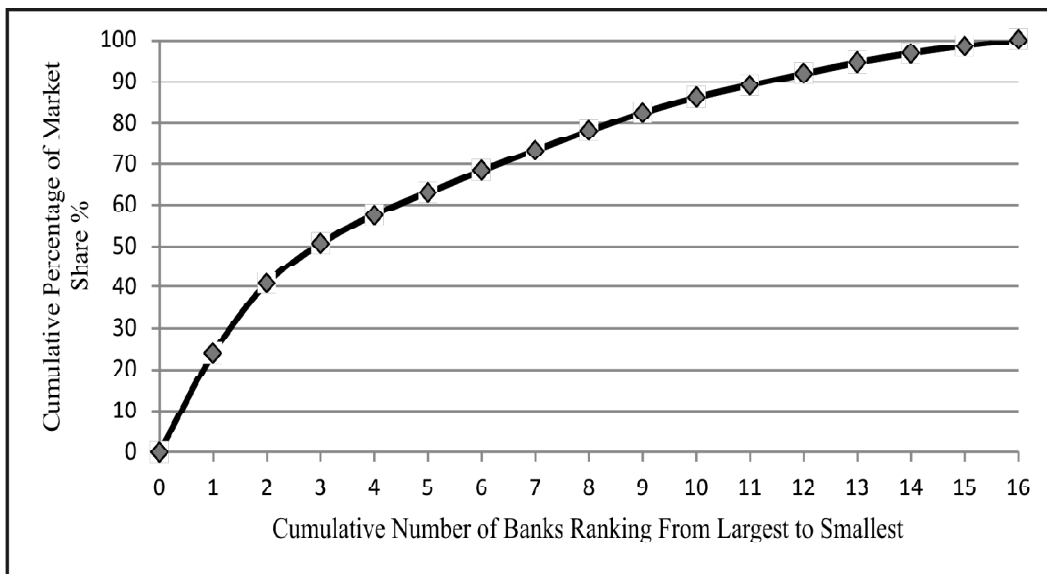


Figure 3: Concentration Curve for Jordanian Banks in 2013

In the year 2000, **Alba Garcia index** registered a value of 4935 points for Jordanian banks and 3001 points for all banks operating in Jordan. In 2013, the value of this index declined significantly to 2965 points for Jordanian banks, while it increased slightly to 3200 points for all banks operating in Jordan. Based on this index, the banking industry is classified as highly concentrated as its value exceeded 2500 points.

The value of **HHI index** reached 15% for the Jordanian banking sector in 2000, while it was 13% for all banks operating in Jordan, which can be classified as moderate concentration level. In 2013, the value of this indicator declined to 12% for the Jordanian banks, and to 9% for all banks operating in Jordan. Consequently, it can be inferred that the degree of concentration in the banking sector declined over time towards lower and more acceptable levels.

Figure (4) below depicts the **concentration curves** for Jordanian banks. This figure supports the numerical results calculated using various concentration measures. Obviously, the concentration curve for 2013 locates below that for 2000, reflecting the trend towards lower levels of concentration over time in the Jordanian banking industry.

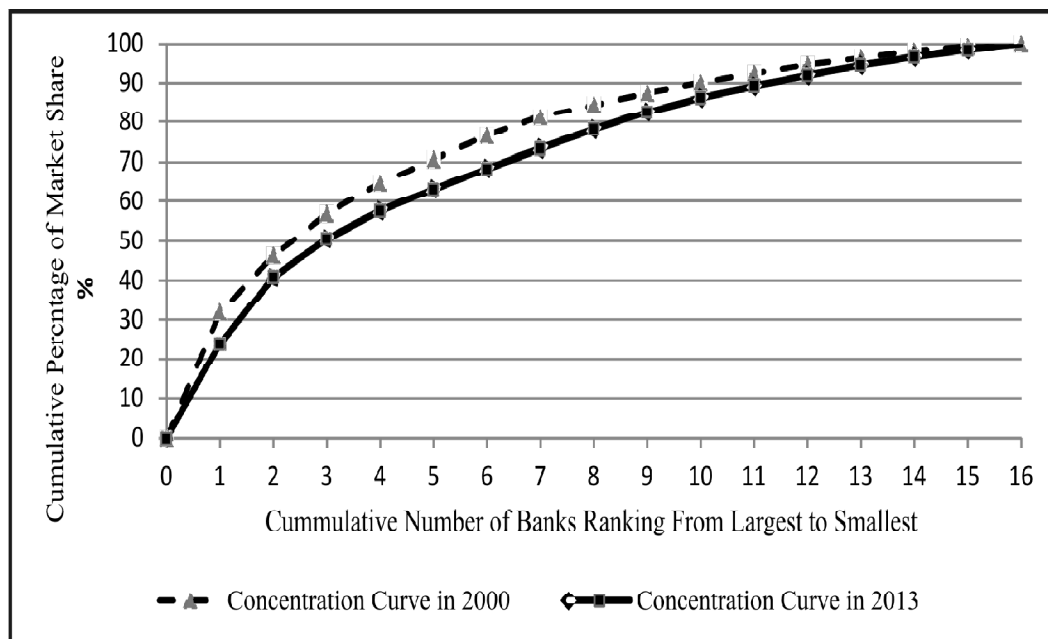


Figure 4: Concentration curve for Jordanian Banks in 2000 and 2013

Therefore, it can be said that the level of competition in the Jordanian banking industry has improved and increased from 2000 to 2013.

4.3. Classification of the structure of the Jordanian Banking Industry

This paper estimated the Rosse-Panzar index for Jordanian commercial banks during the period 2000–2013, as this indicator can be used to determine the nature of the market structure in this industry.

Before estimating model (7) mentioned previously, tests for stationarity and multicollinearity were applied. The stationarity test indicates that data are stable as shown in table (3). Additionally, the test results for variance inflation factor (VIF) presented in Table (4) indicates the absence of multicollinearity problem among the explanatory variables. The results for estimating Rosse-Panzar index are presented in Table (5) below.

Table 3
Stationary test

<i>Variables</i>	<i>Probability</i>	<i>Number of Lags</i>	<i>Stationary Degree</i>
Net Income / Total Assets	0.001	0	Level *
Cost of Capital	0.003	0	Level *
Financing Cost	0.002	0	Level *
Operation Cost	0.003	0	Level *

Table 4
Variance inflation factor (VIF)

<i>Variables</i>	<i>VIF</i>
Cost of Capital	1.521
Financing Cost	1.412
Operation Cost	2.339

Table 5
Model estimation results for Rosse-Panzar

<i>Variables</i>	<i>Coefficient</i>	<i>t statistics</i>	<i>Prob</i>
Intercept	-2.126	-2.302	0.022
Cost of Capital	0.379	2.661	0.008
Financing Cost	-0.481	-2.753	0.006
Operation Cost	-0.388	-1.973	0.050
R-squared		0.584	
Adjusted R-squared		0.542	
F-statistic		11.58	
Prob.(F-statistic)		0.000	
Durbin Watson		1.92	

By summing up the total costs parameters (0.379 - 0.481 - 0.388), H-statistics is equal to a value of (-0.49) which is less than zero, indicating that the Jordanian banking industry can be classified as oligopoly. This result can be explained by

the relatively high concentration ratios, were the few largest banks control the majority of the industry.

4.4. Entry barriers to the banking market

Entry barriers in the banking market constitute obstacles that prevent the entry of new banks. The most important entry barriers are mentioned below (Porter, 1998).

4.4.1. Legal barriers

In the Jordanian banking industry, in spite of imposing various measures by the Central Bank of Jordan aiming at preserving the strength and durability of the financial sector, banking market in Jordan witnessed an increasing trend in the number of working banks whether they are national or foreign. As can be inferred from table (2) above, entry and exit are common in this market.

4.4.2. Large scale of production necessary to take advantage of economies of scale

In the Jordanian banking industry, it can be noted that the largest banks that are dominating the industry have more capacity to provide banking services and credit facilities compared to smaller banks. It is worth mentioning that the law of the Central Bank of Jordan requires that the proportion of facilities granted to a single client should be below certain percentage of capital. Hence, small banks may not be able to meet the financing needs for large enterprises.

4.4.3. Advantage for already existing firms in the industry

Given the historical development of the Jordanian banking industry, when the first bank began working in Jordan in 1934; the industry has expanded dramatically during the past two decades. But at the same time, one can say that pioneer banks, such as the Arab Bank, were able to build strong reputation among the clients. They were also able to choose the best locations and geographical distribution for their branches. So, as in the literature, they have the first mover advantage, which make it harder for the new entrants to compete with them. Such circumstances may constitute barrier to entry for new potential competitors.

5. CONCLUSIONS AND RECOMMENDATIONS

Given the Jordanian banking industry structure, there was a noticeable decline in the market share of the three largest banks, which in turn improved the level of competition among operating banks in Jordan. Nevertheless, the level of concentration in the banking sector in Jordan is still high. Rosse-Panzar test results indicated that the Jordanian banking industry is closer to oligopoly.

It can also be said that there are no direct legal barriers for the entry of new banks into the Jordanian banking market, but high capital requirements and other

measures set by the Central Bank may constitute an obstacle to enter this market. Additionally, the domination of the fewest largest banks make it harder for smaller banks to enter and be able to compete.

Based on these results, it is recommended that the Central Bank develop more effective regulatory solutions that improve the performance levels of the banking industry. Given the main mission of the Central Bank in maintaining financial stability and avoiding bank failures, it is also required by the Central Bank to develop laws and regulations so as to reduce the level of concentration and to encourage competition among banks.

Note

1. Data are not available for foreign individual banks in 2000.

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