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COMPETITIVENESS AND MARKET CONTESTABILITY: AN EMPIRICAL ASSESSMENT OF THE BANKING INDUSTRY IN KUWAIT

Key Words

Monopolistic competition; Financial liberalization; Regulatory environment; Fixed-effects

Abstract

On the basis of the non-structural Panzar-Rosse (PR) approach and computing the robust H-statistic, this paper examines the degree of competition within the Kuwaiti banking industry. Employing panel data on banks covering the period 2000-2007, three different regression methods (i.e., pooled OLS, GLS, and fixed-effects) are used to estimate a reduced-form revenue equation model. The results obtained show that the banking market in Kuwait is contestable, and that during the period 2000-2007 the Kuwaiti banks earned their revenues as if operating under conditions of monopolistic competition. In contrast to evidence found in an earlier study, the paper finds no evidence to support that the Kuwaiti banking industry operates under perfect competition. In light of the current results, it is presumed that the desire to obtain economies of scale and scope is the driving force behind the preference for larger sized banks.

Introduction

Following developments in the financial sector around the globe, during the first several years of the 21st century, the banking industry in the Gulf Cooperation Council (GCC)[1] countries has undergone major changes. These changes have been the result of restructuring and

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(1) The GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).

financial liberalization, which aim to conform to requirements of the World Trade Organization (WTO) agreement and the anticipated GCC monetary union. Being the backbone of any economy, the importance of the banking industry for GCC countries is even higher given its role in the diversification of economies. To ensure that the banking industry continues to provide the necessary impetus to the GCC economies, it is important to examine a host of issues that are related to the banking industry. First and foremost among these issues, is the market structure within which the banking industry operates and its relationship with competitive conditions within the industry. Indeed, the competitive behavior of banks has important implications for capital allocation, firm-level efficiency and growth, economic development, and consumer welfare. While the issues related to the banking industry, including competitive behavior, have been examined for a large number of countries, few studies have comprehensively examined the issues for the GCC economies in specific.(2)

In the context of ongoing and anticipated developments in the banking industry, this study seeks to investigate the relationship between market structure and competitive conditions for the Kuwaiti banking industry. Given the similarities in resource endowment, economic structure, economic policies, and nature of banking markets and regulations, the results are expected to be relevant for the entire GCC banking industry. In fact, this consideration is being supported by concentrated efforts to coordinate a number of monetary and fiscal criteria including the inflation rate, the interest rate, the foreign exchange reserves, the fiscal deficit, the public debt, and the exchange rate in anticipation of the GCC monetary union.

To test the relationship, the paper adopts a non-structural approach, which involves estimation of a reduced-form revenue equation model and banking industry's competitive condition (or monopoly power) through the so-called Panzar-Rosse (PR) *H*-statistic.(3) Be-

(2) The few exceptions are Al-Muharrami *et al.* (2006), Mahmood *et al.* (2004), and Limam (2001).

(3) The seminal work by Rosse and Panzar (1977) was developed for the field of Industrial Organization. They used linear regression to estimate the competitive condition *H*-statistic for the news paper industry. Contrary to the casual observation that seemed to show the newspaper firms earning oligopoly profits, their results indicated that the news paper industry behaved as if it were competitive.

cause of the small number of banks operating in the Kuwaiti market, the estimation is carried out by employing a panel data on banks using three regression methods; namely pooled OLS, GLS with cross-section weights, and fixed-effects. The approach, which no other studies have followed, allows for the examination of the industry's competitive condition under various operational assumptions by relaxing constraints implied on the model's residual structure, and permits for robust inferences compared to models reporting cross-sectional results only.

The paper is structured as follows; section 2 motivates the analysis by presenting the structural characteristics of the banking industry in Kuwait and the regulatory environment within which it operates. Section 3 provides a detailed review of the analytical framework including a description of the model. Section 4 discusses the banking data, the procedures employed for estimation and the main empirical results, and finally section 5 draws conclusions and provides policy suggestions.

Structure of the Banking Industry in Kuwait

Structural Characteristics

The Kuwaiti banking industry is relatively young, with the oldest bank having been established no earlier than 1952. Because of the country's massive oil reserves and generated wealth, the government played a major role in forming the early structure of the banking system. This was accomplished through equity participation in several conventional and Islamic banks, and through the establishment of specialized development banks and credit institutions that provide financing to individuals and private-sector enterprises at subsidized rates.(4) As a result of government policy and encouragement, the major components of the Kuwaiti banking system, including the Central Bank of Kuwait (CBK), were established between the years 1960 and 1977. During the period 1978- 2003 the banking industry in Kuwait remained stagnant

(4) The government of Kuwait has set up three such institutions: the Credit and Savings Bank (CSB) established in 1960, the Kuwait Real Estate Bank (KREB) established in 1973, and the Industrial Bank of Kuwait (IBK) established in 1973. The KREB and IBK operate under the supervision and control of the CBK, and are mainly financed by the government as development-finance institutions. The former operates as a provider of soft real estate loans, while the latter provides industrial loans on a preferential basis. The CSB, in contrast, is a special credit institution, which no longer accepts any public deposits (savings) and operates under the supervision of the Minister of State for Housing Affairs, and solely financed by the government in order to provide interest-free housing loans to Kuwaiti nationals.

with no entry or establishment of new banks.[5] By mid-2003, however, regulators began recommending a series of reforms in order to liberalize and restructure the local banking industry in response to Kuwait's international and regional commitments and in anticipation of changes to the banking industry in general due to the globalization of the capital markets.

In the late 1990s, the government of Kuwait began implementing a slow-paced privatization program through which it sold, by means of a public offering, its major equity holdings in local banks to the private sector. Although some minor equity holdings by the government remains, the conventional and Islamic banking industry in Kuwait is predominantly privately owned, with the major ownerships being concentrated among a few shareholders. The recent public disclosure of bank ownership, at or in excess of 5% of its capital, shows wider private participation. However, the share distribution has not reached the level at which banks can be considered in serious threat of takeovers and corporate control.

At the end of 2007, the banking industry in Kuwait consisted of six conventional commercial banks, three Islamic banks operating according to the provisions of Islamic Sharia', one specialized development bank,[6] and six branches of foreign banks.[7] For the purpose of structural analysis, this paper focuses on privately held and domestically owned banks that are homogeneous, provide similar services, use similar resources, and licensed as either conventional commercial or Islamic.[8] Table 1 shows that during the period 2000-2007 the size of the banking industry, as defined by total bank assets, grew annually at a high rate

(5) The only exception was the entry of the foreign branch of Bank of Bahrain and Kuwait (BBK) in 1978 as a result of incorporation of the bank in Bahrain in 1971. Nine local banks and investments companies were among the original shareholders, which owned 50% of the banks outstanding shares. The remaining 50% were owned by the general public and quasi-government institutions in Bahrain.

(6) Earlier in the year, CBK had approved the conversion of KREB to operate under the provisions of Islamic Sharia' with a new post conversion name of Kuwait International Bank (KIB). This conversion left IBK as the only specialized development bank.

(7) The CBK registered one branch each for the BBK, BNP Paribas, HSBC Middle East Limited, National Bank of Abu Dhabi, Citibank, and Qatar National Bank.

(8) Based on this key assumption, the specialized development banks are excluded from the analysis since they are not characterized as deposit-accepting institutions, and by the virtue of their mandate, they cannot be considered as profit-maximizing institutions. Furthermore, up to the time this analysis was performed, no data were available for the local operations of the six foreign branches.

Table 1

Asset Size and Concentration Trends in the Deposit Market in the Kuwaiti Banking Industry 2000-2007

Year	Banks[a]	Size of Banking Sector Assets (KD million)	Concentration Measures in the Deposit Market					
			2-Banks[b]	3-Banks[b]	Islamic[c]	2-B-ALL[d]	3-B-ALL[d]	HHI[e]
2000	7	12,637.56	0.47	0.58	0.15	0.49	0.62	1900
2001	7	14,167.57	0.46	0.58	0.16	0.48	0.62	1869
2002	7	16,155.16	0.46	0.57	0.15	0.49	0.61	1925
2003	7	18,057.81	0.45	0.56	0.17	0.49	0.62	1853
2004	7	18,341.02	0.44	0.54	0.19	0.51	0.62	1872
2005	8	21670.229	0.41	0.51	0.21	0.49	0.61	1825
2006	8	28,257.72	0.43	0.52	0.22	0.48	0.63	1785
2007	9	39,450.58	0.43	0.54	0.24	0.50	0.63	1760

a. At the end of 2007, the privately held and domestically owned conventional and Islamic banks operating in Kuwait were the National Bank of Kuwait (NBK), the Commercial Bank of Kuwait (CBoK), The Gulf Bank (GB), Al-Ahli Bank of Kuwait (ABK), the Bank of Kuwait and the Middle East (BKME), Burgan Bank (BB), Kuwait Finance House (KFH), Boubyan Bank (BOUBYAN) and the Kuwait International Bank (KIB).

b. The measures are calculated for the group of conventional commercial banks only, which are the same as specified above excluding KFH, BOUBYAN, and KIB. The two-largest banks, in descending order, were consistently NBK followed by GB. The third order, however, was contested among CBoK (2000-2001, and 2005-2007), BB (2002-2003), and BKME (2004).

c. Until 2005, KFH was the only Islamic bank operating in Kuwait. By mid-2005 and the beginning 2007 BOUBYAN and KIB had commenced operation as Islamic banks respectively.

d. The measures are calculated for all banks; both conventional commercial as well as Islamic banks. The three-largest banks, in descending order, were consistently NBK, KFH, and GB.

e. The Herfindahl-Hirschman Index.

of 17.7%. In absolute terms, it grew from Kuwaiti dinar (KD) 12,637.56 million (109% of GDP) in 2000 to KD 39,450.58 million (121% of GDP) in 2007. Relative to total bank deposits, the standard concentration measures show that the two- and three-largest banks remained in control of a sizeable share of the deposit market. Their collective shares in deposits in 2000, were 49% and 62%, respectively, rising a single percentage point each to the mark of 50% and 63%, respectively, by 2007. This result is interesting given the fact that Kuwait was pursuing a liberal financial policy during the period, while the banking industry continued to experience further concentration. The rise in the two concentration ratios was mainly due to the large increase in market share of the Islamic banks, which gained on the account of the shrinking market

share of the conventional commercial banks.[9] The share of Islamic banks in the deposit market in 2000 was no more than 15% compared to 24% in 2007. Concurrently, the two- and three-largest conventional commercial banks controlled 47% and 58% of total deposits respectively in 2000, and retreating to 43% and 54% respectively in 2007.

Although widely used, the standard *n*-largest market shares concentration measure suffers from two main disadvantages: the cutoff point is determined arbitrarily, and it can be somewhat insensitive to the share distribution, especially the failure to adequately capture the changes in concentration due to the market entry and/or exit of relatively smaller participants. These shortcomings can be eliminated by using a concentration measure such as the Herfindahl-Hirschman Index (HHI),[10] which provides a static representation of market concentration at a given point in time. The HHI is obtained by computing the sum of the squared market share percentages across all banking firms in a given geographic market. Theoretically, its value can range from zero in a market having an infinite number of firms to 10,000 in a market having just one firm controlling 100% of the market share. The index, however, does not treat all banks on an equal basis due to the squaring of the market shares, which stresses the importance of size by assigning greater weights to banks with larger market shares relative to banks with smaller market shares.

(9) The same trend is observed in the banking industry of almost all other GCC countries, where Islamic banks are quickly gaining market share previously controlled by conventional commercial banks. This, in part, is due to the high public demand for Islamic financial products, and the lack of proper liquidity control instruments and measures on the part of regulators within the region.

(10) Since 1982 this, otherwise ordinary statistic, has been made famous due to the fact that it was used by the US Department of Justice as the basis for its merger guidelines. The US guidelines regards a banking industry to be competitive if the HHI is less than 1000, somewhat concentrated if the HHI lies between 1000 and 1800, and very concentrated if the HHI is more than 1800. Under these guidelines, the US Federal Reserve Bank routinely approves a bank merger if two post-merger conditions exist; namely if the post-merger market HHI is lower than 1800 points, and the increase in the index from the pre-merger value is less than 200 points (less than 50 points in other industries). In such cases, it is presumed that the merger has no anti-competitive effects. However, if the post-merger market HHI is higher than the 1800-point threshold, the regulators will check for the existence of other mitigating factors. If the mitigating factors are not sufficient to justify the merger, the regulators may require the divestiture of some offices and/or branches in order to bring the concentration ratio to or below the 1800-point threshold. See, for example, Federal Reserve Bank (1998) and Rhoades (1993) for further discussion on the HHI concentration index. Also, see Al-Muharrami *et al.* (2006) for an application of the index.

Table 1 shows the value of HHI in the deposit market for Kuwaiti banks. Based on United States' (US') guidelines, during the period 2000-2005 the Kuwaiti banking market may be regarded as extremely concentrated (HHI $>$ 1800). During the period 2006-2007, however, the combined effect of the entry of a new Islamic bank and the conversion of another specialized bank to an Islamic bank resulted in added share diffusion consequently characterizing the local banking market as being as fairly concentrated (1000 $<$ HHI $\leq$ 1800). Despite the concentrated local banking market, the decreasing HHI values reflect increasing competition among Kuwaiti banks in general, and among the three largest banks in particular, where there appears to be a race for the leadership of the local banking market between the conventional commercial banks on the one hand and the Islamic banks on the other. Interestingly, this result in banking concentration measures was observed during a period when the CBK was implementing the Basle Core Principle's financial regulation and supervision over the commercial banks. At the same time, the banks were also granted more freedom in asset selection and operational scope. Despite the introduction of these policy measures, a small group of large banks in Kuwait have managed to emerge, over time, due to both market mechanisms and government encouragement. It is presumed, however, that the desire to obtain economies of scale and scope to be the main driving force behind the preference for larger sized banks.

The Regulatory Environment

The CBK was established in 1968, by the virtue of Law No. 32/1968 concerning Currency, the Central Bank of Kuwait and the Organization of the Banking Business (i.e., The Banking Law).[11] It is responsible for regulating the operations of conventional commercial, Islamic, and specialized banks. Over the years the CBK has adopted a comprehensive approach to establishing systematic prudential policy regulations[12] and guidelines for bank management standards, and for inspecting and overseeing the operations of individual banks; authorizing entry into, and changes in, the structure and composition of the banking sector; enforcing legal and regulatory prudential stan-

(11) Prior to the enactment of the banking Law, monetary regulation in Kuwait was confined to the issuance of bank notes and coins only. This responsibility was carried out by the Kuwaiti Currency Board, which was established in 1960 by virtue of Amiri Decree No. 41/1960.

(12) The prudential policy regulations set by the CBK include foreign currency exposure limits, credit concentration ratios, consumer lending limits, and liquid asset ratios.

dards, and establishing regulatory reporting requirements and procedures. All in all, the CBK has established procedures and guidelines that are generally considered stricter than those described by the Basle Committee on Banking Supervision. Despite these prudential regulations, however, the efficiency of local banks has been found to be low (Al-Obaidan, 2001; Limam, 2001; Mahmood *et al.*, 2004).

Up until 2003, Kuwait had only one Islamic bank with a total monopoly power over the local market, given its special status, i.e., not falling under the supervision and monitoring of the CBK.(13) In order to increase competition between conventional commercial and Islamic banks, and provide a level playing field, a new law concerning Islamic banks was introduced in mid-2003.(14) The CBK expected the new law to regulate existing and future Islamic banks on a sound basis, as the law takes into account not only the special characteristics of Islamic banks, but also appropriate supervisory principles and standards. In February 2004, regulators announced yet another amendment to the Banking Law.(15) The new amendment represented an important step towards bringing Kuwait's banking regulations into conformity with international developments in banking supervision and liberalization of financial services. The new law strengthens the regulator's ability to carry out consolidated supervision of external branches and subsidiaries of Kuwaiti banks, imposes limits on ownership concentration in Kuwaiti banks,(16) eliminates the legal restrictions on the entry of foreign banks into

(13) The Kuwait Finance House (KFH), established in 1977, was the only Islamic bank in Kuwait until 2003. By the end of 2007, its paid-up capital was KD 171.535 million. Up until 2003, KFH was allowed to accept all kinds of deposits, but did not follow the CBK's discount rate rule in its lending operations. It was also permitted to engage in non-banking operations such as buying, selling and owning real estate, and trading in other household durables.

(14) Law No. 30/2003, passed in June 2003, outlines the conditions set to establish new Islamic banks, Islamic banking units affiliated with conventional commercial banks, and Islamic banking branches of foreign banks. Moreover, the law amends the earlier Banking Law by adding a new Part 10 in Chapter 3 (Articles 86 to 100 relate to Islamic banks), and allows the CBK to introduce Islamic instruments in order to regulate their liquidity. Shortly after its enactment, regulators announced the adoption of a gradual approach to licensing new Islamic banks whereby two new banks other than the existing KFH shall be licensed in the first stage with a minimum capital requirement of KD 75 million. The CBK announced that, among other things, the licensing policy is aimed at improving the competitive environment for Islamic banks in the local market, and allows the CBK to test, evaluate and adjust, if necessary, its supervisory policy and instructions regarding Islamic banking.

(15) Law No. 28/2004 had been passed earlier in January 2004.

(16) The law sets a maximum limit for any individual ownership in a bank at 5% of its capital.

the local market,[17] and sets the minimum capital requirements for banks operating in the local market at KD 75 million and at KD 15 million for branches of foreign banks, in order to reinforce the capital base of local banks in the face of international competition.[18] In March 2004, the CBK announced a third amendment to the Banking Law, which set the principles, rules and regulations with regard to the minimum requirements for the licensing and operation of foreign banks in Kuwait. In April 2004, Kuwait's government approved the regulators' recommendation to remove the government guarantee of deposits, which had been introduced in 1986, with the launch of the Difficult Credit Facilities Program.[19] In December 2005, the CBK adopted the Basle II Capital Adequacy Standard for application in the country's conventional commercial banks, making Kuwait the first Arab country to apply the standard.[20]

A review of the regulatory environment indicates that the early years of the second millennium constituted a period of unparalleled financial reform in the Kuwaiti banking system. The amendments to the Banking Law were made to bring it into full conformity with the principles of effective banking supervision set by the Basle Committee, and to fall in line with Kuwait's international commitments with the WTO's General Agreement on Trade in Services (GATS), and the anticipated GCC's monetary union. Indeed, regulators on many occasions

(17) This elimination conforms to the GATS most-favored-nation (MFN) treatment principle. Prior to enacting this law, any foreign entry would require the participation of the Kuwaiti government, a bank, or other financial institution in the capital of the foreign bank.

(18) The law also expanded the scope and responsibilities of the bank's external auditors to reinforce its supervision of banks, and forces units under CBK's supervision to set a minimum national workforce ratio in those units at 50% of the total workforce or a rate specified by the Council of Ministers.

(19) This program was introduced as a consequence of severe financial crisis that hit the national economy as a result of the collapse on an informal securities market in 1982, and was reinforced in 1992, due to Iraqi invasion of Kuwait in 1990.

(20) Determination of the capital requirements for the revised standard is more sensitive to banks' actual risks, and aims to encourage banks to improve their risk management by allowing lower weights for banks' claims on entities with high credit assessments, thus giving banks the advantage of utilizing credit-risk loosening systems. The revised standard includes capital requirements for banks' operational risks and public disclosure requirements, both of which are important in encouraging banks to apply best practices in managing and monitoring various aspects of risk. However, the CBK continues to require local banks to abide by a 12% minimum capital adequacy ratio, whereas the ratio recommended by the Basle Committee on Banking Supervision is 8%. The revised standard will be applied to Islamic banks, after its adoption by the Islamic Financial Service Board (IFSB), in the same way that Basle I was adopted.

have been stressing the need for the local banking industry to prepare for the expected increase in both the level as well as the nature of competition by actively encouraging consolidation and mergers among local banks in order to remove redundancy and excess capacity, and create solid financial entities capable not only of withstanding the new challenges brought about by global financial liberalization but also taking advantage of the opportunities generated by it.(21) Banks, in turn, have responded to these developments by taking a number of measures such as restructuring their branch network both locally and abroad,(22) increasing their utilization of advanced technology, enhancing their focus on branding and specialization by concentrating on activities where they have a comparative advantage (e.g., retail banking), acquiring geographically diversified foreign banking assets, making alliances with renowned financial institutions, and increasing focus on non-interest income and fee-based activities (e.g., asset managment, insurance, and mutual funds).

Despite the liberalization efforts, however, structural characteristics obtained from conventional as well as HHI measures continue to identify the Kuwaiti banking industry as somewhat concentrated suggesting that oligopolistic behavior may have not been prevented. A small group of large banks have managed to emerge over time, and increase its share of the banking market, due to both market mechanisms and government encouragement. In such a situation, it is natural to emphasize the negative implication of increased concentration in the form of loss of welfare as a result of non-competitive pricing compared to the presumed benefits of synergy and reduced costs in large institutions. This is because the traditional stance suggests that increased concentration encourages collusion and anti-competitive practices by banks, whereas the theory of contestability suggests otherwise, since it appears that the preference for concentration is largely driven by the desire to realize economies of scale and scope. It thus becomes interesting to examine whether the observed concentrations resulted in any form of oligopolistic behavior

(21) Refer to the text of the interview with the CBK's Governor in AlRai daily newspaper on Sunday, August 10, 2008, issue no. 10632.

(22) Since the enactment of the reforms to the Banking Law up to 2007, banks in Kuwait have increased their local and foreign branch network by 91 and 5 branches respectively. On the other hand, the number of foreign branches operating in the local market has increased by 5 as well.

or market power on the part of banks, a hypothesis that is valid only if the Kuwaiti banking market is not contestable.

Analytical Framework

The traditional viewpoint on the relationship between competition and market structure is based on the monopoly-power hypothesis. According to this hypothesis, increased market concentration fosters collusion and anti-competitive practices by firms. The more concentrated the market, the less the degree of competition among its firms. As a result, banks in more concentrated markets are expected to earn excess (e.g., collusive or monopolistic) profits by charging wider margins for intermediation than banks in less concentrated markets. However, the analysis and empirical examination of the hypothesis via the so-called structural models generated criticism and a widespread dissatisfaction among researchers due to a number of inconsistent assumptions and contradictory results (e.g., Gilbert 1984).

To overcome the theoretical and empirical limitations of the traditional structural approach, a number of studies (e.g., Bresnahan, 1982; Lau, 1982; Panzar and Rosse, 1982, 1987) have proposed a non-structural estimation technique to measure the degree of competitive behavior among firms in a given geographic market. The technique, based on the theory of contestability, assumes that firms can enter and/or exit any market with little sunk costs, and that both the existing firms as well as the potential competitors face the same cost functions. [(23)] In the case of the banking industry, it implies that banks serving in a concentrated market may still behave competitively as long as there exists a threat of entry from potential competitors that offer the same set of services as offered by the existing banks but at lower costs. Hence, in equilibrium, no excess profits are earned by the existing banks in response to preventing the potential competitors from entry.

The degree of competition or market power is determined via the so-called PR *H*-statistic (Panzar and Rosse, 1982, 1987; Shaffer, 1982; Bres-

(23) A market is said to be contestable, if existing firms are forced to revert to competitive behavior through marginal cost pricing, even in the face of increased market concentration, if they feel the threat of entry from price-cutting potential competitors. Nathan and Nave (1989, p. 578) define a market as being perfectly contestable when there are absolutely no barriers (i.e., economic, legal, or regulatory) to entry, completely costless exit, and highly price-elastic demands for the industry's outputs. Further details on contestability theory can be found in Baumol (1982) and Baumol *et al.* (1982).

nahan, 1989; Nathan and Neave 1989; Molyneux *et al.* 1994; and Claessens *et al.* 2001) which measures the extent to which changes in factor prices are reflected in the firm's revenues. The PR model assumes that, depending on the market structure, firms adopt different pricing strategies as input costs changes. Rosse and Panzar (1977), and Panzar and Rosse (1982, 1987) show that the *H*-statistic can reflect the structure and conduct of the market to which the firm belongs. Thus, H is negative ($H \leq 0$) when this structure is a monopoly, a perfectly colluding oligopoly, or a conjectural variation short-run oligopoly, as under these conditions, an increase in input prices will increase marginal costs, reduce equilibrium output and subsequently reduce total firm revenue. In contrast, H equals unity ($H = 1$) when there is perfect competition, as any increase in input prices increases both marginal and average costs without altering the optimal output of any individual firm. The exit of some firms increases the demand faced by each of the remaining firms, thereby leading to an increase in prices and total revenues by the same amount as the increase in costs. H is also unity ($H = 1$) for a natural monopoly operating in a perfectly contestable market, as well as a sales-maximizing firm subject to a breakeven constraint. If H lies between zero and unity ($0 < H < 1$) then a case of monopolistic competition exists. Here, an increase in input prices will lead to a less than proportional increase in revenues, as the demand for the firm's output facing individual firms is inelastic.

De Bandt and Davis (2000) show that a number of working assumptions are needed before a directly proportional relationship can hold between the value of the *H*-statistic and the degree of capital markets' competition. First, it is assumed that banks have normally shaped revenue and cost functions. Second, banks must be treated as single product firms (i.e., one composite output) consistent with the so-called intermediation approach to banking.[24] This means, however, that the level and nature of competition in the deposit market is taken to be entirely independent from

(24) Research on the production structure of banks follows, in general, two approaches: the intermediation approach, and the production approach. The intermediation approach views banks as intermediaries producing various types of loans and investments by using labor, capital, and funds as inputs. Under this approach outputs are measured by the monetary volume (e.g., KD, dollar, etc.), and total cost includes both interest expense and other production costs. The production approach, however, views banks as producers of financial services, such as deposits and loans using only labor and capital as inputs. Under this approach outputs are measured as the number of serviced accounts, and interest costs are not included in the total cost.

that in the loan market. Third, in order for the *H*-statistic to be meaningfully interpreted banks must be in long-run equilibrium. This suggests that competitive capital markets will equalize risk-adjusted rates of return across banks such that, in equilibrium, rates of return should not be correlated statistically with input prices. Thus, to test for equilibrium, the *H*-statistic is calculated with the return on assets replacing bank revenue as the left-hand variable in the regression equation (Molyneux *et al.*, 1994 and Shaffer, 1982). A market is found to be in long-run equilibrium (disequilibrium) if $H = 0$ ($H < 0$).

Table 2 presents summary of results from selected cross-country and country-specific studies that have used this methodology for banking industry. As is evident, banks in most of the countries are found to be operating under conditions of monopolistic competition. Of particular interest to the current investigation is the study by Al-Muharrami *et al.* (2006) on the six GCC countries for the period 1993-2002. Using the data set on privately held and domestically owned banks, they estimated a bank reduced-form revenue model for each country and concluded that, during 1993-2002, banks in Kuwait, Saudi Arabia, and the UAE operated under perfect competition. Their result is somewhat intriguing given the small number of banks in those GCC countries and the high concentration ratios presented.(25)

Following the development by Shaffer (1982, 1989, 1993), Nathan and Neave (1989), Molyneux *et al.* (1994), and De Bandt and Davis (2000) a model for obtaining estimates of the competitive condition for Kuwait's banking industry is formulated, which specifies a reduced-form revenue equation as follow:

$$\begin{aligned} \ln TRVASS_{it} = {} & \alpha_0 + \alpha_1 \ln PL_{it} \\ & + \alpha_2 \ln PK_{it} + \alpha_3 \ln PF_{it} + \alpha_4 \ln ASSET_{it} \\ & + \alpha_5 \ln LONASS_{it} + \alpha_6 \ln CAPASS_{it} \\ & + \alpha_7 \ln IBTDEP_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

where:

$TRVASS$ = Total revenue to total assets ratio,

(25) Al-Muharrami *et al.* (2006) report concentration ratios in the Kuwaiti deposit market for two years only. They show that the two- and three-largest banks ratios increased from 48% and 61% respectively in 1995, to 49% and 62% respectively in 2002. They also report that the HHI decreased from 1983 in 1995 to 1897 in 2002 (Table 2, p. 3491). The 2002 conventional concentration ratios are almost the same as the ones reported in Table 1. The HHI value in 2002 reported in this study, however, is a little higher. The slight discrepancies may be attributed to minor differences in the data definitions between BANKSCOPE used by Al-Muharrami *et al.*, and the Institute of Banking Studies (IBS) databases used by the present study.

Table 2
Finding From Applications of the PR Methodology to Banking Studies

Author(s)	Countries	Years	Competitive Condition[a]
Developed Economies			
Shaffer (1982)	New York (USA)	1979	MC
Nathan and Neave (1989)	Canada	1982-84	PC: 1982 MC: 1983-84
Molyneux *et al.* (1994)	Germany, UK, France, Italy, and Spain	1986-89	M: Italy MC: UK, France, Spain, Germany (except PC: 1987)
Coccorese (1998)	Italy	1988-96	MC: (except PC: 1992 and 1994)
Bikker and Groenveld (2000)	15 EU countries	1989-96	MC: (except PC: Belgium and Greece)
De Bandt and Davis (2000)	France, Germany, Italy, and USA	1992-96	MC: Large banks, Italy (small banks) M: small banks (except Italy)
Bikker and Haaf (2002)	23 countries	Various ranges (up to 1998)	MC: (for overall sample)
Emerging Economies			
Gelos and Roldos (2002)	Argentina, Brazil, Ghile, Gzech Republic, Mexico, Hungry, Poland, and Turkey	1994-99	MC
Philippatos and Yildrim (2002)	15 Central and Eastern European countries	1993-2000	MC: (except PC: large banks)
Belaisch (2003)	Brazil	1997-2000	MC: (except foreign banks)
Levy-Yeyati and Micco (2003)	Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, and Peru	1993-2002	MC
Developing Economies			
Prasad and Ghosh (2007)	India	1996-2004	MC
Al-Muharrami *et al.* (2006)	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE	1993-2002	MC: Bahrain, Qatar PC: Kuwait, Saudi Arabia, UAE U: Oman

Source: Prasad and Ghosh (2007). For this study recent references were added to the original table.
a. M - monopoly; MC - monopolistic competition; PC - perfect competition; U - undetermined.

PL = Personnel expenses to employees ratio (i.e., unit price of labor),[26]

PK = Capital expenses to fixed assets ratio (i.e., unit price of capital),[27]

PF = Annual interest expenses to own funds ratio (i.e., unit price of funds),[28]

$ASSET$ = Total bank assets,

$LONASS$ = Loans to total assets ratio,

$CAPASS$ = Risk capital to total assets ratio,

$IBTDEP$ = Interbank deposits to total deposits ratio.

Eq. (1) reflects both the inter-temporal as well as the cross-sectional dimensions. The subscript i represents the ith bank in the cross-section, where $i = 1...n$, and n is the total number of banks. The subscript t represents the tth time period, where $t = 1...T$, and T is the number of observed time periods. ε_{it} is taken to be a random error, and ln represents the natural logarithmic operator. Finally, $\alpha_0...\alpha_7$ are parameters that need to be estimated.

Majority of the studies on banking competition report cross-sectional results only. The implicit assumption is that banks, although differ in the scale of their operation, all have access to the same factor markets, and depending on their specialization can rely on different factor markets. Hence, the observed variability in specific input prices is attributed to either bank specialization or accessing different factor markets. In the present setting, however, it is argued that the inter-temporal dimension is an equally important determinant of input price variability.[29]

Following De Bandt and Davis (2000), the current investigation defines total revenue to be the sum of income from interest-based activities that results from producing loans and investments only, and other income from fee-based activities. Consistent

(26) The unit price of labor is defined as the ratio of personnel expenses, including salaries and other benefits, to the average number of full-time employees.

(27) The unit price of capital is defined as the ratio of capital expenses to the mean value of fixed assets. However, the only data available in the IBS publication is on other expenses, which includes the charge for depreciation and occupancy expenses. Therefore, a proxy for the unit price of capital is constructed by dividing the value of other operating expenses by the mean value of fixed assets.

(28) The unit price of funds available for loans is defined as the ratio of the combined value of annual interest expenses and provisions for loan losses to the average value of outstanding funds available for loans, where the latter is defined as the sum total of deposit liabilities and debts/loans liabilities representing loans or borrowings obtained by the bank from others.

(29) The small number of banks in Kuwait creates a technical constraint against reporting efficient cross-sectional results due to insufficient number of degrees of freedom. This observation is true for almost all GCC banking markets.

with the intermediation approach to banking, the independent variables in eq. (1) include a vector of three factor input prices; namely the unit price of labor PL_{it}, the unit price of capital PK_{it}, and the unit price of funds PF_{it}. Other control variables are included in the model to account for bank-specific size, risk, and cost characteristics similar to those utilized in earlier studies (e.g., Nathan and Neave, 1989 and Molyneux *et al.*, 1994). The variable $ASSET_{it}$ is a proxy for bank size and is expected to capture size-related differences in operation, e.g., scale economies. The relationship between $ASSET_{it}$ and $TRVASS_{it}$ is expected to be positive (negative) if the average bank exhibits economies (diseconomies) of scale. Since the endogenous variable, $TRVASS_{it}$, is not risk-adjusted, two explanatory variables, $LONASS_{it}$ and $CAPASS_{it}$, are introduced to account for bank-specific risk. The coefficient of the variable $CAPASS_{it}$ is expected to be negative, whereas the coefficient of the $LONASS_{it}$ is expected to be positive since larger fraction of loans on banks' balance sheet implies greater revenues. Finally, the variable $IBTDEP_{it}$ is included to account for differences in business mix, and a priori its relationship with $TRVASS_{it}$ can be either positive or negative.

Following previous studies, the long-run equilibrium condition is tested by calculating the *H*-statistic resulting from the estimation of an auxiliary equation with the return on assets, ROA_{it}, specified as endogenous variable replacing $TRVASS_{it}$ as left-hand variable in eq. (1). To determine the local banking industry's competitive and long-run equilibrium conditions the PR *H*-statistic is calculated as the sum of the input price elasticities, i.e., $H = \alpha_1 + \alpha_2 + \alpha_3$.

Empirical Results

To evaluate the competitive conditions in the local banking sector, the market under consideration needs to be fully defined. The same market definition used earlier for structural analysis is being used again for non-structural analysis with one added technical constraint; namely the panel data needs to be balanced.(30) Hence, for the purpose of estimating eq. (1), the banking industry in Kuwait, during the period 2000-2007, consisted of seven privately held and domestically owned banks that are fully licensed; commercial or Islamic. All the data

(30) The additional technical constraint applied to the earlier market definition- privately held and domestically owned banks that are homogeneous, provide similar services, use similar resources, and licensed as either conventional commercial or Islamic- results in excluding two relatively late market entrants; namely BOUBYAN and KIB, which have reported annual results starting from 2005 and 2007 respectively.

used in this paper were obtained from the financial operating reports published by the Research Unit of the Institute of Banking Studies (IBS) for the years from 2000 to 2007. The final sample consists of 56 bank-year observations. The period for the present study, however, was chosen because prudential ratios were uniformly available for all of the banks. Prior to 2000, the Islamic bank used different reporting guidelines than the conventional commercial banks.

The empirical implementation of eq. (1) and its auxiliary long-run equilibrium condition equation is based on a panel data that requires complex stochastic specifications. A variety of estimation methods maybe performed by varying the covariance structure of the residuals ε_{it}. First, eq. (1) is estimated by OLS using a pooled sample of banks. The implicit assumption here is that ε_{it} is independent and identically distributed across banks as well as over time. This implies no cross-sectional heteroscedasticity, no cross-sectional correlation, and no autocorrelation among banks' time-series. In order for inferences to be statistically meaningful these restrictions need to be handled adequately. This is performed in the second regression method, where the homoscedasticity restriction is relaxed by allowing the residual variance to vary across banks only. From a technical point of view, relaxing the cross-sectional homoscedasticity restriction allows individual banks to differentiate themselves based on the scale and scope of their operations, which is evident from the results of the structural analysis pointed out in the previous section. To achieve this eq. (1) is estimated by two-step GLS with initial cross-section weights computed from the residuals of the pooled regression.(31) Theoretically, the other two restrictions could be relaxed also based on the results of statistical tests, although in the current analysis this was not done due to constraints on degrees of freedom. Finally, the revenue model was tested for any affect that omitted bank-specific variables (due to aggregate supply or demand shocks), may have on inferences, a method used by Al-Muharrami *et al.* (2006). This was accomplished by re-estimating eq. (1) by a fixed-bank-effects regression.(32)

(31) The GLS with cross-sectional weights assumes that ε_{it} is independent but not identically distributed across banks, although it remains independent and identically distributed within each time series. Thus, it allows for heteroscedasticity across banks while maintaining the other restrictions of no cross-sectional correlation, and no autocorrelation within each bank's time-series.

(32) The fixed-bank-effects regression implies that the constant term in eq. (1) is dropped; instead the residual ε_{it} is re-specified as $\varepsilon_{it} = \beta_i + \mu_{it}$, where β_i is bank-specific dummy variable, and μ_{it} is an error term that is independent and identically distributed across individual banks as well as over time.

Table 3 presents the results for the estimation and testing of the equilibrium and competitive conditions for the Kuwaiti banking industry during the period 2000-2007. In general, for all estimation methods, the values of the R^2, standard error, and F statistic suggest an extremely good fit of the regression model. The majority of the parameter estimates appear to be statistically significant at a reasonable level. The starting point in the analysis, however, is to ensure that the banks operate in their long-run equilibrium, thereby implying that their returns are not correlated with input prices. This condition is satisfied for all three auxiliary equations with the resulting value of the equilibrium H-statistic not significantly different from zero. Hence, the data observations appear to be in long-run equilibrium, suggesting that estimates of the competitive condition H-statistic from the reduced-form revenue equation can be meaningfully interpreted, and that change in the local banking competitive condition, during the analysis period, may be taken as gradual.

In the case of market competitive condition, first consider the revenue equation estimates based on the pooled OLS regression. The estimates show that there is evidence of cross-sectional heteroscedasticity, although the evidence is not compelling (LR = 14.94 with the critical values at the 1% and 5% levels being 16.81 and 12.95 respectively). However, the presence of heteroscedasticity might have potential implications for inferences based on this estimation method. To account for the presence of heteroscedasticity, the standard errors were corrected using White's (1980) heteroscedasticity-consistent covariance matrix.(33) The H-statistic constructed from the pooled estimates of the revenue equation is 0.588 and significantly rejects both hypotheses for monopoly ($H = 0$), and for perfect competition ($H = 1$) at the 1% level. Hence, using the restricted pooled estimates with heteroscedasticity-consistent covariance matrix correction, the banks in Kuwait appear to have been earning their revenues under conditions of monopolistic competition, a result consistent with the structural analysis in section 2 and findings of a majority of the studies for other countries reported in Table 2.

The value of the LR statistic indicates that the constraint of no cross-sectional heteroscedasticity imposed

(33) Using White's (1980) heteroscedasticity-consistent covariance matrix, appropriate inferences can still be made based on the pooled OLS results even without specifying the type of heteroscedasticity. Further discussion on improving the efficiency of OLS estimates using White's estimator can be found in Cragg (1982).

Table 3
Estimation and Testing Results for Long-run Equilibrium and Competitive Conditions in the Kuwaiti Banking Industry: Period 2000-2007

Estimation Method	Pooled				GLS (Cross Section Weights)				Bank Fixed Effects			
Variable	Ln *(TRVASS)*	SE[a]	Ln *(ROA)*	SE	Ln *(TRVASS)*	SE	Ln *(ROA)*	SE	Ln *(TRVASS)*	SE	Ln *(ROA)*	SE
Intercept	-1.1538**	(0.4716)	-6.0310***	(1.2937)	-0.8091**	(0.4108)	-6.6825***	(1.1059)				
Ln *(PL)*	0.0999**	(0.0500)	-0.0569	(0.1599)	0.1351***	(0.0429)	-0.1238	(0.1174)	0.2386**	(0.1102)	0.3354	(0.2861)
Ln *(PK)*	0.0296	(0.0358)	0.0857	(0.0932)	0.0464*	(0.0248)	0.1042	(0.0713)	-0.0080	(0.0405)	-0.0305	(0.1050)
Ln *(PF)*	0.4586***	(0.0381)	0.1115	(0.1033)	0.5197***	(0.0317)	0.0372	(0.0863)	0.4637***	(0.0411)	0.2007*	(0.1066)
Ln *(ASSET)*	0.2010***	(0.0730)	0.5914***	(0.1530)	0.1914***	(0.0514)	0.5905***	(0.1433)	0.0873	(0.1551)	-0.0933	(0.4027)
Ln *(LONASS)*	0.3523***	(0.1001)	0.7608***	(0.2731)	0.3138***	(0.0838)	0.6059**	(0.2292)	0.5210***	(0.1489)	1.5472***	(0.3866)
Ln *(CAPASS)*	0.2550**	(0.1182)	0.4244*	(0.2555)	0.2240***	(0.0825)	0.4036*	(0.2230)	0.2366	(0.1868)	-0.1128	(0.4850)
Ln *(IBTDEP)*	0.0173	(0.0165)	0.0830*	(0.0487)	0.0223	(0.0153)	0.0891**	(0.0396)	-0.0239	(0.0259)	0.0226	(0.0672)
d_NBK									0.2016	(1.2671)	0.0030	(3.2895)
d_CBoK									0.2599	(1.2350)	-0.1057	(3.2063)
d_GB									0.2250	(1.2065)	-0.3772	(3.1320)
d_ABK									0.0477	(1.1912)	-0.6509	(3.0926)
d_BKME									0.1121	(1.1458)	-0.5301	(2.9747)
d_BB									0.1296	(1.1881)	-0.4819	(3.0844)
d_KFH									0.1146	(1.1865)	-0.7988	(3.0803)
R^2	0.797		0.576		0.907		0.642		0.833		0.678	
SE of regression	0.09603		0.25926		0.08942		0.24778		0.09304		0.24153	
F-statistic	26.887***		9.332***		67.251***		12.273***		16.129***		6.813***	
H-statistic[b]	0.588		0.140		0.701		0.018		0.694		0.506	
F test $H = 0$	52.54***		0.41		157.44***		0.01		27.92***		2.20	
F test $H = 1$	25.77***				28.59***				5.41**			
Competitive Condition	Monopolistic Competition		Long-run Equilibrium		Monopolistic Competition		Long-run Equilibrium		Monopolistic Competition		Long-run Equilibrium	
Likelihood Ratio test[c]	14.94**		11.14									
Breusch-Pagan test[d]					37.25**		21.77					
F test [e] (*di = Intercept*)									1.52		2.22	

* Significant at 10%. ** Significant at 5%. *** Significant at 1%.

a. Heteroscedasticity-consistent standard errors.

b. Tested separately against zero and unity constraints using the Wald *F* test. The test statistic is distributed as an *F[1, nT-k]*; where *1* is the number of constraints, *n* is the number of bank cross-sections, *T* is the number of observed time periods, and *k* is the number of estimated parameters. The statistic's 1- and 5-percent critical values are 7.19 and 4.04 (7.28 and 4.07 for the bank fixed-effects estimation method) respectively. Computed *F* values that are greater than the critical values would significantly reject the null hypothesis with regard to the constraint placed on the *H*-statistic.

c. The Approximate Likelihood Ratio (LR) statistic is used to test for heteroscedasticity. The statistic is distributed as $x^2_{(n-1)}$; where *n* is the number of bank cross-sections. The statistic's 1- and 5-percent critical values are 16.81 and 12.95 respectively. Computed x^2 values that are below the critical values would retain the null hypothesis of no heteroscedastic residual variances.

d. The Breusch-Pagan (1980) statistic is used to test the null hypothesis of no correlation across banks. The statistic is distributed as $x^2_{(n(n-1)/2)}$; where *n* is the number of bank cross- sections. The statistic's 1- and 5-percent critical values are 38.93 and 32.67 respectively. Computed x^2 values below this would retain the null hypothesis of no correlation across banks.

e. The *F* test statistic is used to test the hypothesis that all dummy variables, in the bank fixed-effects estimation method, are all equal. Under the null hypothesis the statistic is distributed as *F[n-1, nT-n-k]*; where *n*, *T*, and *k* are as specified above. The statistic's 5-percent critical value is 2.32. Computed *F* values below this would retain the null hypothesis of equal intercepts.

on the structure of the model's covariance matrix might be a bit too strong and needs to be relaxed in order to allow for different bank variances. This suggests that the generation of total revenues per KD of assets is not an identical process across all Kuwaiti banks, and might have factors specific to each bank. To account for these bank differences eq. (1) is re-estimated by GLS with cross-section weights estimated from the residuals of OLS pooled regression as initial specification of the heteroscedasticity. The evidence shows that the competitive condition *H*-statistic value from the GLS regression is 0.701 and significantly rejects both the monopoly hypothesis as well as the perfect competition hypothesis. The result reconfirms the competitive condition implied from the OLS pooled regression and indicates that during the period 2000-2007, banks in Kuwait appear to have been earning their revenue under conditions of monopolistic competition. Although there is some evidence of cross-sectional correlation, it is not expected to substantially change the local banking market's competitive condition.(34) The results show that the competitive condition is robust to the model's covariance specification.

Table 3 also reveals that the signs of the GLS parameter estimates for all unit factor input prices are positive. The coefficients for the unit price of labor, PL_{it}, and for the unit price of funds, PF_{it}, are statistically significant at the 1% level, implying that they provide the highest contribution to the explanation of total revenues per KD of assets. As reflected by the magnitude of the coefficient, bank labor is one of the most important inputs to be addressed in any policy measure that is designed to restructure the Kuwaiti banking system to enhance its competitiveness and maximize the benefits that may be gained from the opportunities brought about by global financial liberalization. Similarly, the ability of banks to raise low-cost funds, either in the form of consumer deposit liabilities and/or borrowing from other financial institutions, is by far the most important factor in determining the overall competitive condition of the banking market in Kuwait. However, the coefficient for the unit price of capital, PK_{it}, appears to be only weakly significant in explaining total revenues per KD of assets. This result

(34) Estimating the full correlation matrix reduces the model's degrees of freedom by $n(n+1)/2$; where n is the number of bank cross-sections. However, the Breusch-Pagan (1980) statistic of 37.25 suggests that banks' earned revenues per KD of assets cannot be considered as a completely independent process. Instead, it appears that local banks tend to observe one another and copy each other's success.

corroborates the findings of the previous studies,[35] and may be explained in part, by the remark that rents and leases on banking premises may be paid to affiliated real estate companies, which for competition reasons charge their associated banks below market prices. Also, it may reflect the magnitude of the outsourcing services being purchased by Kuwaiti banks in their production of banking services. Hence, the balance sheet figures on material and equipment as well as occupancy expenses do not necessarily correspond to the use of these equipments and premises.

Among the other explanatory variables included in the model, the coefficient of the variable total bank assets, $ASSET_{it}$, is positive and highly significant. This relationship may be interpreted as indicating a strong presence of scale economies, implying that the average-sized bank in the Kuwaiti market can improve its operational efficiency by increasing the scale of its operation through asset growth both internally or by mergers and acquisitions, although the latter will undoubtedly increase the concentration measures for the local banking market.[36] The coefficients with respect to the bank-specific risk variables, $LONASS_{it}$ and, $CAPASS_{it}$ are both positive and statistically significant at the 1% level. Whereas the relationship between total revenue and loans to asset ratio, $LONASS_{it}$, turned out as expected, the sign of the risk-capital to asset ratio, $CAPASS_{it}$, is somewhat surprising since lower capital ratios are associated traditionally with greater levels of risk taking. Finally, the coefficient representing differences in the business mix variable, $IBTDEP_{it}$, is positive, and statistically insignificant, suggesting no clear advantage for banks engaged in wholesale vs. retail banking.

The last four columns in Table 3 show the revenue equation estimates based on the fixed-bank-effects regression, which may be interpreted as testing whether or not omitted bank-specific variables can significantly change the earlier inferences regarding the competitive condition in the Kuwaiti banking market.[37] A review of

(35) See, for example, Nathan and Neave (1989), Molyneux *et al.* (1994), and Al-Muharrami *et al.* (2006) where the price of capital proxy is rarely statistically significant at the 5% level.

(36) Hussain (unpublished work), using a translog multi-product cost function shows the significant presence of scale economies for all asset-size banks operating in the Kuwaiti market with the degree of returns to scale diminishing as bank size increases.

(37) Al-Muharrami *et al.* (2006) estimated a similar model, provide estimates for the competitive condition PR *H*-statistic for all the GCC banking markets during the period 1993-2002, and conclude that the total revenue generation process in five out of six GCC banking markets (except for the UAE) is best represented by a fixed-bank-effects (pooled) regression model.

the results in Table 3 shows that the value of the competitive condition *H*-statistic is 0.694 and significantly rejects both the monopoly and the perfect competition hypotheses.(38) Hence, the fixed-effects estimators do not overturn the earlier inferences. Instead, they reconfirm that banks in Kuwait, during the years 2000-2007, earned their revenues as if operating under conditions of monopolistic competition. In fact, the relatively large standard errors estimates for the bank-specific dummy variables cast a little doubt on the validity of the omitted bank-specific variables assumption. In order to test this assertion, the significance of the fixed-bank-effects estimators was tested against the pooled estimators using the *F*-test. Table 3 shows that the test is unable to significantly reject the pooled specification (*F*-test = 1.52 with 5% critical value of 2.32) suggesting that bank-specific dummy variables are not statistically different from each other, and that they have no bearing on the inferences drawn from other estimation methods (i.e., pooled OLS and GLS). In other words, there is hardly any evidence to suggest that the fixed-effects method is the appropriate approach to model revenues generated by the banking industry in Kuwait.

Concluding Remarks

The objective of this paper was to analyze the market structure and the competitive condition within the banking industry in Kuwait during the period 2000-2007. This analysis should enable policy-makers to implement policies to strategically position Kuwaiti banks to work profitably in a liberalized and more competitive environment.

Increased market concentrations evident from the widely used *n*-largest banks market shares measure, and the more comprehensive HHI measure points to a Kuwaiti banking market that is between somewhat and very concentrated. Based on the results of an alternative non-structural and robust PR methodology, the *H*-statistic for competitiveness and contestability unequivocally indicates that the Kuwaiti banks, during the period of 2000-2007, earned their revenues as if operating under conditions of monopolistic competition, a market feature that is found in many developed and other emerging economies. Although the number of banks is quite small, the

(38) This is in sharp contrast to Al-Muharrami *et al.* (2006, Table 5, p. 3496) conclusion, who in the case of Kuwaiti banking market found *H*-statistic that is statistically not different from unity ($H = 1.02$), implying that Kuwaiti banks, during the period 1993-2002, operated under conditions of perfect competition.

research finds no evidence to support the earning of oligopoly profits. At the same time, the investigation finds no evidence to confirm that the local banking market operates under perfect competition, a market characteristic found by Al-Muharrami *et al.* (2006).

The results indicate that the local banks' ability to raise more funds by capturing larger shares of the deposit market is a key challenge in the local banks' strategy for competition. This is especially true in light of increased competition by foreign banks and 'threats of entry' due to the implementation of the GATS. Also, labor was found to be one of the most important inputs to be addressed in any policy designed to restructure the Kuwaiti banking system to enhance its competitiveness and maximize the benefits that may be gained by implementing Kuwait's international and regional commitments for the banking sector. The high growth rates seen in past years imply that local banks may experience shortages in qualified professionals in the near future and should direct their efforts towards attracting more professionals from abroad to fill this gap as the local labor market is unable to satisfy the expected future demand for banking professionals. Moreover, the empirical results suggest that banks in Kuwait work under a strong influence of scale economies. The observed high concentration ratios may be interpreted in light of efficiency gains and cost savings that results from large scale operations. Also, the findings provide justification for regulators' active encouragement for consolidation and mergers among local banks in order to create financial entities capable of not only withstanding the challenges brought about by global financial liberalization but also taking advantages of the opportunities generated by it. A caveat is that, given the small number of banks, such policy might cause even higher concentration ratios which demands special scrutiny on the part of regulators so as to ensure that any presumed mergers do not entail anti-competitive effects. The empirical findings of this paper have clear implications for banking efficiency and consolidation on the one hand, and the welfare of consumers in Kuwait on the other.

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الملخص

التنافسية والتسابق للسيطرة على حصص السوق: تقييم تجريبي للصناعة المصرفية في دولة الكويت

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تبحث هذه الدراسة في درجة التنافسية القائمة بين وحدات القطاع المصرفي في دولة الكويت خلال الفترة الزمنية ما بين عامي ٢٠٠٠ – ٢٠٠٧. فباستخدام طريقة بانزر – روز غير الهيكلية وبيانات مقطعية – زمنية يتم تقييم نموذج لمعادلة إيرادات البنوك بتقدير معادلة تراجع وحساب إحصاء **H-** بثلاثة أنماط: طريقة المربعات الدنيا العادية للبيانات المجمعة، وطريقة المربعات الدنيا العامة، وطريقة المؤثرات المثبتة. وتظهر نتائج التقييم الثلاثي أن السوق المصرفية في دولة الكويت غير محتكرة، بل قابلة للتسابق وإحراز النجاح بين المتنافسين، إلا أن نتائج التقييم تشير إلى أن البنوك الكويتية اكتسبت إيراداتها خلال فترة التقييم وكأنها تعمل ضمن شروط المنافسة الاحتكارية. وخلافًا لنتائج دراسة سابقة، لم تتوصل هذه الدراسة إلى أية دلالات تبين أن البنوك الكويتية تعمل ضمن شروط المنافسة الكاملة. وعلى ضوء النتائج المستخلصة من هذ ه الدراسة يعتقد بأن التركيز الناتج عن تفضيل البنوك كبيرة الحجم على غيرها إنما يكون لتمتع هذه البنوك بمزايا اقتصاديات الإنتاج والمجال على نطاق واسع.

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