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AUTHORS	Joseph Antoine Haskour Khalid Shams Abdulqader Rami Zeitun

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Joseph Antoine Haskour (Qatar), Khalid Shams Abdulqader (Qatar), Rami Zeitun (Qatar)

Market power in the GCC banking sector

Abstract

This study attempts to find whether market concentration has been a main driver for market power in the Gulf Cooperation Council (GCC) banking industry over the period of 2002-2008. Using the methodology of the new empirical industrial organization approach that measures the Lerner index as a proxy of the market power, the results highlight evidence for market power in GCC banking sector with mean Lerner index of 42% for the period of study. The results, however, indicate that more concentration and consolidation contributed in lessening the market power in GCC countries over the study period.

Keywords: market power, banking sector, GCC, Lerner index, traditional IO, new empirical IO, competition, concentration.
JEL Classification: G21, P34, D4.

Introduction

The economies of Gulf Cooperation Council (GCC) enjoy a significant relief from the 2008 global financial crises, boosted by oil prices rebound. Rising from average $55 in 2009 to $75 a barrel in 2010, the jump in the oil revenues is expected to re-enable GCC economies to march on their economic policies; and this has been reflected in stronger budgets inducing greater economic diversification and sustainability. In the midst of this rebound, GCC banking industry is reshaping its structure by witnessing greater merger and acquisition activities to cope with debt defaults that resulted from the 2008 global financial crisis, which lead to a greater tendency towards more concentrated markets[1]. Although merger and acquisition activities have extended their benefits on cutting costs and consolidating banking functioning in the economy, the policymakers and market participants may view the new shaped market structure as a concern in the sense that it could harm competition and induce greater market power.

In the light of the perspective of banking industry concentration and competition, this study will contribute to the literature by examining the GCC banking market power. The study attempts to find whether concentration has been a main driver for market power in the GCC banking industry. It analyzes banking industry competition using the Lerner index, a technique to follow to measure market power practice within GCC banking industry over the period of 2002-2008. The study also evaluates the impact on market power by examining the determinants such as bank size, loan risk and elasticity of demand for loans. Both market power and its determinants are estimated in panel data model framework.

The rest of the paper is structured as follows. Section 1 reviews the literature. Section 2 develops the research methodology and the model. Section 3 explains the data. Section 4 highlights the major results and analysis. The final section concludes the paper.

1. Literature review

The concern that banks exercise market power by setting prices above marginal costs has been investigated in the banking literature. Pagano (1993) explains the negative impact of market power, which allows banks to generate large rents from charging higher loan rates and reward the savers with low rates; by doing this, banks generate lower equilibrium quantities of funds that should be available for lending, and hence reduce the capacity for economic growth. The study by Guzman (2000) focuses on two identical banking industries: highly concentrated and more competitive banking industries. Guzman finds that the highly concentrated market enables banks to have more monopolistic power, which as a result, extend finance at higher interest rates than these operating in more competitive banking industry. The empirical study by Bikker and Haaf (2002) finds evidence from a broad sample of countries (both European and non-European) that competition decreases with the increase of market concentration.

Some authors argue that monopolistic banking industry does not always mean higher practice of market power. A study by Petersen and Rajan (1995) indicates that in a more monopolistic banking market, more finance are extended, especially to the category of newly established businesses. This is because banks operating in monopolistic banking market are more able to attract businesses and afford charging them lower rates in order to establish strong and long-term customer relationship. Moreover, Berger et al. (2009) have conducted a study on banks operating in 23 countries. They have found that lower risk is witnessed in banks that have greater market power; while the hypothesis that market power increases credit risk is found with limited

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[1] During the study period, Emirates Bank International merged with National Bank of Dubai; National Bank of Kuwait took over Boubyan Bank; Barwa Bank of Qatar took over both The First Finance and The First Investor finance companies and formed Barwa Bank Group.

support. Nevertheless, the study by Jiménez et al. (2010) find that increase in banks' market power usually result in a decrease in bank credit risk.

The literature, also, varies in examining the determinants affecting the level of market power. For example, the study of Rhoades (1985) on the US banking market provides strong arguments favoring market share rather than concentration as a determinant of market power. Moreover, Berger and Hannan (1989) explore the price concentration relationship and find evidence for an inverse relationship between deposit rates and market concentration. In the study of Fernandez de Guevara et al. (2005), the authors stress that the explanatory factors influencing market power have not been found significant in EU, which in turns rejects the hypothesis that a more concentrated banking industry contributes to increasing market power of banks. The study of Coccorese (2009) targets single-branch banks in small areas in Italy, and finds that the results have significantly rejected the pure monopoly pricing hypothesis, and proves that the ability of these banks to exploit their market power is very limited. In Russian banking industry, the study by Fungacova et al. (2010) finds that Russian bank competition has slightly improved during the period of 2001-2007. Furthermore, they find greater market power for state-owned banks and less market power for foreign-owned banks.

In GCC banking industry, most of researches have investigated the determinants of banking profitability, rather than market power. For example, Al-Khouri (2011) finds that credit risk, liquidity risk and capital risk are among risk factors that generally affect GCC banking profitability. Moreover, Al-Obaidan (2008) used the structure-conduct-performance analysis and incorporated technical inefficiency factor to verify what leads to more GCC concentrated market. He finds that higher profits are captured by more efficient banks; these more efficient banks gain higher market shares and, thus, cause more concentrated market.

To sum up, the literature exploring the determinants of market power in GCC banking industry turns out to be very limited and does not directly tackle the question of what determines GCC banking market power. This research contributes in filling this gap. The next section will explain the methodology and the framework this study uses to examine what determines the market power in GCC banking industry.

2. Research methodology

The existing empirical research provides two main methods for measuring competition in the banking industry: the traditional industrial organization (Mason, 1939; Bain, 1951); and the new empirical industrial organization approaches (Angelini and Cetorelli, 2003; Uchida and Yoshiro, 2005). The traditional industrial organization approach uses the market structure test to analyze the market power. Accordingly, competition among banks is indirectly proportional to the concentration level where greater concentration causes less competitive bank conduct (leading to higher profit margin). Based on this, competition can be measured by calculating the concentration ratio indices.

The new empirical industrial organization approach circumvents the problems connected to inferring competition from indirect proxies such as market structure or market shares of the traditional industrial organization approach. In fact, the new approach's measure of competition level is based on the Lerner index, which provides non-structural tests using direct micro-level bank data (bank price and marginal cost).

2.1. Lerner index. The Lerner index has been used in recent studies on bank competition and market power (Schaeck and Cihak, 2008; Berger et al., 2009). Based on the new empirical industrial organization approach, we will measure the competition level in the GCC banking industry by calculating the Lerner index, which is based on individual bank-level data. The Lerner index is calculated as the ratio of the difference between price and marginal cost to price. As such, the Lerner index interval ranges from zero to one, where the interval varies from perfect competition (value of 0) to perfect monopoly (value of 1). In the banking context, the Lerner index would represent the extent to which a particular bank has market power to set its price above marginal cost.

Following Fernandez de Guevara et al. (2005) and Carbo-Valverde et al. (2009), the bank's price is calculated by estimating the average price of bank production as the ratio of total revenue to total assets. The marginal cost is derived from the total cost estimated on the basis of a natural log function with one output (proxied as total assets) and three input prices (price of labor, price of physical capital, and price of borrowed funds).

The total cost function is denoted as follows:

$$\ln TC = \alpha_0 + \alpha_1 \ln y + \frac{1}{2}\alpha_2 (\ln y)^2 + \sum_{j=1}^{3} \beta_j \ln w_j + \sum_{j=1}^{3} \sum_{k=1}^{3} \beta_{jk} \ln w_j \ln w_k + \sum_{j=1}^{3} \gamma_j \ln y \ln w_j + \varepsilon, \quad (1)$$

where *TC* is the sum of personnel expenses, other non-interest expenses and interest paid; *y* represents the total assets, *W* refers to the (prices of labor, physical capital, borrowed funds), w_1 is the price of labor estimated by the ratio of personnel expenses to total assets), w_2 represents the price of physical capital (estimated by the ratio of other non-interest expenses to fixed assets), and w_3 is the price of borrowed funds (estimated by the ratio of interest paid to total funding). The estimated coefficients of the total cost function are then used to derive the marginal cost (MC) as follows:

$$MC = \frac{TC}{y}\left(\alpha_1 + \alpha_2 \ln y + \sum_{j=1}^{3} y_j \ln w_j\right), \quad (2)$$

when the marginal cost function is estimated and the price of output is retrieved, then the Lerner index is calculated as the ratio of the difference between price and marginal cost to price. The Lerner index is calculated for each bank to obtain a direct measure of bank competition level.

2.2. Market power determinants. In the estimations, we analyze the determinants of the market power of GCC banks. We follow the recent literature on the selection of variables that determine market power (Fernandez de Guevara et al., 2005; Fungacova et al., 2010). As the above analysis provides the method to calculate Lerner index variable, the determinant variables are identified as follows.

The Herfindahl-Hirschman index (HHI) variable is used to measure the concentration. It is defined as the HHI for market share in deposits computed at the country level, taking into consideration that no significant activities are sought for banks outside their national territories. Based on market share of deposits, the largest two banks and the largest three banks are considered significant stake of the banking market for the calculation of the Concentration ratio (CR) and the Herfindahl-Hirschman index. HHI variable is then calculated using the following formula:

$$HHI = \sum_{i=1}^{n} \left(MS_i\right)^2, \quad (3)$$

where MS_i is the market share for bank *i*. Variable *HHI* is useful for examining whether a positive link exists between concentration and market power. The existence of such a link would be a strong argument of the existence of the impact of concentrated market structure on inducing the market power. This may call for greater need for competition against the consolidation of the banking industry.

Total Assets Log (*Assets*) variable is used to measure the impact of bank size on market power. Being "too big to fail" can play a role by offering an advantage to large banks in attracting depositors, which could lead to wider margins and more market power. Also, the economies of scale may exist, allowing the largest banks to benefit from decreasing unit cost. Nonetheless, the existence of a relationship between size and market power would also contribute to boost the opportunities for consolidation in the GCC banking industry. Moreover, the squared term of variable Total Assets (Log $(Assets)^2$) is also used to capture any possible nonlinearity in the relationship between size and market power (Fungacova et al., 2010). The existence of the link between (Log $(Assets)^2$) and market power would argue against a pro-merger policy for competitive reasons.

Loans to Total Assets ratio (*LA*) is used to measure the default risk. Banks that allocate more of their resources into loans would normally enjoy higher margins. In addition, market power estimation determinants include variable Total Assets to GDP (*TAGDP*), which is used to measure the elasticity of loan demand (Corvoisier and Gropp, 2002). In fact, the greater the elasticity in the demand for banking products is, the higher becomes the importance of other non-banking financing sources; hence, the lower the market power of the banks is realized.

Therefore, the determinants of concentration, size, default risk, and elasticity of demand are used to estimate the market power of GCC banking sector. The section below explains the obtainment of the data of the model variables.

3. Data

To estimate the model, the study uses data from financial statements of GCC banks obtained from BankScope database. The data sample covers 52 banks that are fully licensed commercial. The sample period covers the years of 2002-2008. Our final sample consists of 364 observations, which are available for the estimations. Descriptive statistics for all variables are reported in Table 1.

Table 1. Descriptive statistics

	Mean	Median	St. deviation
Learner index (*LI*)	0.42	0.44	0.07
Herfindahl-Hirschman index (*HHI*)	0.19	0.13	0.12
Two largest banks market share (*CR2*)	0.55	0.58	0.18
Three largest banks market share (*CR3*)	0.68	0.72	0.18
Total Assets (*TA*)	10,097,268,570	5,870,694,199	11,182,996,175

Table 1. Descriptive statistics

	Mean	Median	St. deviation
Loans to Total Assets (*LA*)	0.56	0.57	0.15
Total Assets to GDP (*TAGDP*)	0.86	0.79	0.26

The following section will study the market power of the GCC banks based on the calculated Lerner index. Then it examines the market power determinants based on three panel regression estimations undertaken.

4. Results and analysis

This section analyzes the market power of GCC banks from 2002 to 2008. It begins by providing information on the mean values and the trend of the Lerner index. Then it identifies the competition level in each country and examines the determinants of market power.

4.1. Market power of GCC banks. Table 2 provides the estimated total cost function and its coefficients, which are used to derive the marginal cost and then calculate the Lerner index as the ratio of the difference between price and marginal cost to price[1].

Table 2. Total cost regression using the random effects model

Random effects model	
Variable	Coefficient
LY	0.755 **
LY_2	0.00172
LW_1	2.972 ***
LW_2	0.0150
LW_3	-0.369
LW_1LW_1	0.0602
LW_1LW_2	0.0324
LW_1LW_3	-0.0198
LW_2LW_2	-0.0300***
LW_2LW_3	-0.0700***
LW_3LW_3	0.0629***
$LYLW_1$	-0.0891***
$LYLW_2$	-0.0063
$LYLW_3$	0.0510***
Constant	7.307***
Hausman test	30.11 ***
R squared	.09
No. observations	364
No. of banks	52

Notes: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively.

Tables 3 to 6 present the structural properties of the individual banking sectors in each country. Table 3 shows a decreasing index for the concentration ratios (CR2 and CR3) for all GCC countries except Oman. Bahrain is the most concentrated market, followed by Oman, Qatar, Kuwait, Saudi Arabia and then the UAE, which is the least concentrated market.

Table 4 summarizes the Total Assets as well as Total Assets to GDP ratio. It shows that Saudi Arabia has the largest banking market measured by assets size, followed by the UAE, Kuwait, Qatar, Oman and then Bahrain. Moreover, Table 4 shows that the trend of the elasticity of demand (proxied by the ratio of Total Assets to GDP) is increasing for all GCC countries except for Kuwait and Oman.

Table 3. Concentration ratios for 2 and 3 largest banks (HHI and mean LI)

Country	Year	CR2	CR3	*HHI*
Qatar	2008	64.47%	76.42%	2902
Qatar	2007	65.67%	78.76%	3007
Qatar	2006	66.01%	79.82%	3072
Qatar	2005	62.05%	76.27%	2663

[1] As in Tables 2 and 7-9, although R squared measures the goodness of fit, there is no universal acceptable value of R squared in mixed models. Moreover, among researches conducted using panel random effects model some have found small value of R squared. See for example, Fungacova, Solanko, and Weill (2010). "Market Power in the Russian Banking Industry", BOFIT Discussion Papers 3/2010, Bank of Finland, Institute for Economies in Transition.

Table 3 (cont.). Concentration ratios for 2 and 3 largest banks (HHI and mean LI)

Country	Year	CR2	CR3	*HHI*
Qatar	2004	62.86%	76.76%	2927
Qatar	2003	66.15%	78.63%	3174
Qatar	2002	68.90%	79.18%	3461
KSA	2008	32.52%	44.93%	1212
KSA	2007	35.81%	48.07%	1264
KSA	2006	34.22%	46.28%	1225
KSA	2005	34.82%	47.68%	1236
KSA	2004	35.78%	47.77%	1272
KSA	2003	36.81%	49.72%	1312
KSA	2002	37.75%	50.93%	1331
Kuwait	2008	54.32%	66.14%	1934
Kuwait	2007	53.68%	65.78%	1947
Kuwait	2006	51.92%	65.78%	1876
Kuwait	2005	52.71%	63.72%	1903
Kuwait	2004	52.80%	62.85%	1940
Kuwait	2003	56.06%	66.26%	2109
Kuwait	2002	58.08%	69.14%	2300
Oman	2008	72.09%	83.64%	3462
Oman	2007	66.58%	80.05%	3036
Oman	2006	64.43%	79.92%	2932
Oman	2005	58.24%	75.66%	2481
Oman	2004	58.94%	76.12%	2577
Oman	2003	60.91%	77.33%	2542
Oman	2002	64.45%	80.19%	2635
Bahrain	2008	77.23%	93.93%	3609
Bahrain	2007	71.93%	87.36%	3612
Bahrain	2006	73.72%	90.05%	3771
Bahrain	2005	79.37%	92.59%	4188
Bahrain	2004	83.98%	92.99%	4980
Bahrain	2003	89.24%	95.66%	5837
Bahrain	2002	95.82%	100.00%	6807
UAE	2008	30.84%	41.13%	946
UAE	2007	30.04%	42.32%	967
UAE	2006	30.20%	41.26%	974
UAE	2005	29.92%	41.20%	1011
UAE	2004	30.60%	43.01%	1022
UAE	2003	32.65%	43.57%	1063
UAE	2002	33.94%	45.55%	1093

Notes: CR2 is the largest two banks, CR3 is the largest three banks Herfindahl-Hirschman index (HHI), Learner index (LI).

Table 4. GCC banking sector (Total Assets to GDP ratio)

	Year	Total Assets (in USD)	GDP (in USD)	Total Assets to GDP ratio
Qatar	2002	15,300,960,833.60	19,400,000,000.00	0.79
	2003	18,132,472,080.00	23,500,000,000.00	0.77
	2004	22,651,183,553.60	31,700,000,000.00	0.71
	2005	31,367,624,801.60	42,500,000,000.00	0.74
	2006	44,842,346,441.60	56,800,000,000.00	0.79
	2007	67,967,641,334.40	71,000,000,000.00	0.96
	2008	93,120,674,800.00	92,650,000,000.00	1.01
Saudi Arabia	2002	132,645,344,104.80	189,000,000,000.00	0.70
	2003	144,013,865,468.40	215,000,000,000.00	0.67
	2004	168,222,880,566.00	250,000,000,000.00	0.67
	2005	193,013,676,997.20	316,000,000,000.00	0.61
	2006	217,867,723,282.80	357,000,000,000.00	0.61

Table 4 (cont.). GCC banking sector (Total Assets to GDP ratio)

	Year	Total Assets (in USD)	GDP (in USD)	Total Assets to GDP ratio
Kuwait	2007	272,084,821,178.40	384,000,000,000.00	0.71
	2008	332,009,445,142.80	469,000,000,000.00	0.71
	2002	55,706,963,400.00	38,100,000,000.00	1.46
	2003	62,310,074,772.00	47,900,000,000.00	1.30
	2004	63,244,903,480.00	59,400,000,000.00	1.06
	2005	73,592,157,276.00	80,800,000,000.00	0.91
	2006	95,701,494,152.00	102,000,000,000.00	0.94
	2007	130,195,673,476.00	115,000,000,000.00	1.13
	2008	141,339,824,780.00	148,000,000,000.00	0.95
Oman	2002	9,841,871,676.00	20,000,000,000.00	0.49
	2003	10,050,454,232.00	21,500,000,000.00	0.47
	2004	11,185,174,546.00	24,700,000,000.00	0.45
	2005	12,195,057,420.00	30,900,000,000.00	0.39
	2006	16,104,029,760.00	36,800,000,000.00	0.44
	2007	21,799,477,882.00	41,600,000,000.00	0.52
	2008	28,914,951,884.00	67,670,000,000.00	0.43
Bahrain	2002	5,010,722,082.00	8,490,000,000.00	0.59
	2003	5,928,326,456.00	9,750,000,000.00	0.61
	2004	7,079,582,463.00	11,200,000,000.00	0.63
	2005	7,878,410,033.00	13,500,000,000.00	0.58
	2006	9,559,795,646.00	15,600,000,000.00	0.61
	2007	11,713,485,010.00	18,500,000,000.00	0.63
	2008	14,557,415,692.00	21,900,000,000.00	0.66
UAE	2002	62,831,501,532.80	75,300,000,000.00	0.83
	2003	70,033,477,113.60	88,600,000,000.00	0.79
	2004	89,813,956,232.00	104,000,000,000.00	0.86
	2005	133,262,468,539.20	133,000,000,000.00	1.00
	2006	185,424,311,072.00	163,000,000,000.00	1.14
	2007	264,900,181,145.60	199,000,000,000.00	1.33
	2008	321,989,357,289.60	255,000,000,000.00	1.26
GCC	2002	281,337,363,629.20	350,290,000,000.00	0.80
	2003	310,468,670,122.00	406,250,000,000.00	0.76
	2004	362,197,680,840.60	481,000,000,000.00	0.75
	2005	451,309,395,067.00	616,700,000,000.00	0.73
	2006	569,499,700,354.40	731,200,000,000.00	0.78
	2007	768,661,280,026.40	829,100,000,000.00	0.93
	2008	931,931,669,588.40	1,054,220,000,000.00	0.88

The estimation of market power for GCC banks for each year is presented in Table 5. The mean Lerner index for the period of 2002-2008 is 42%. This reflects high market power in GCC banking industry. The index is larger than what is observed in developed countries and other emerging markets, as well as MENA countries. For example, Fernandez de Guevara et al. (2005) study shows a mean Lerner index of 10% for Germany, France, Italy, Spain and the UK. In Guevara and Maudos (2007) study, the Spanish banking sector identified a range for the yearly mean Lerner indices between 16.9% and 24.9%. Moreover, the Carbo-Valverdeet al. (2009) study on the EU countries has observed an EU mean Lerner index of 16% with a country level index ranging from 11% to 22%. The study of Fungacova et al. (2010) has found a mean Lerner index of 21.4% in Russia, while the study of Anzoategui et al. (2010) found a mean Lerner index of 14.4% in Lebanon, 19.3% in Egypt, and 47.3% in Algeria.

Table 5. GCC mean Lerner Index over the period of 2002-2008

Year	Mean LI
2008	0.38
2007	0.37
2006	0.40
2005	0.46

Table 5 (cont.). GCC mean Lerner index over the period of 2002-2008

Year	Mean LI
2004	0.48
2003	0.46
2002	0.40
GCC mean Lerner Index (2002-2008)	0.42

Table 6. Lerner index per country over the period of 2002-2008

Country	Mean LI
Qatar	0.47
KSA	0.48
Kuwait	0.38
Oman	0.42
Bahrain	0.35
UAE	0.42

The estimated Lerner index in each of the GCC countries as given in Table 6 reports some differences in the market power level in the range of 10% or less over the study period of 2002-2008. Qatar's mean Lerner index is 47%, and the yearly mean has experienced a decrease from 47% in 2002 to 44% in 2008, with a peak of 54% in 2005 (see Figure 1). Figure 1 shows that the mean Lerner Index for Saudi Arabia over the study period is 48%. However, the yearly mean has experienced a decrease from 42% in 2002 to 41% in 2008, with a peak of 56% in 2004. Kuwait's mean Lerner index scores is 38%. The Kuwaiti banking sector shows an outstanding development in the market power level with a decreasing yearly mean Lerner index from 34% in 2002 to 28% in 2008, with a peak of 47% in 2005. The mean Lerner index for Oman is 42%. On the contrary to the trend in GCC, Oman has experienced an increase in market power with a mean Lerner index going up from 41% in 2002 to 45% in 2008, with a peak of 43% in 2004. For Bahrain, the mean Lerner index stands at 35%, and the yearly mean has experienced a decrease from 31% in 2002 to 30% in 2008, with a peak of 48% in 2004. In the UAE, the mean Lerner index levels at 42%. Obviously, the UAE banking sector represents another example of movement towards a decreasing market power indicated in the decrease of the mean Lerner index from 44% in 2002 to 38% in 2008, with a peak of 50% in 2005.

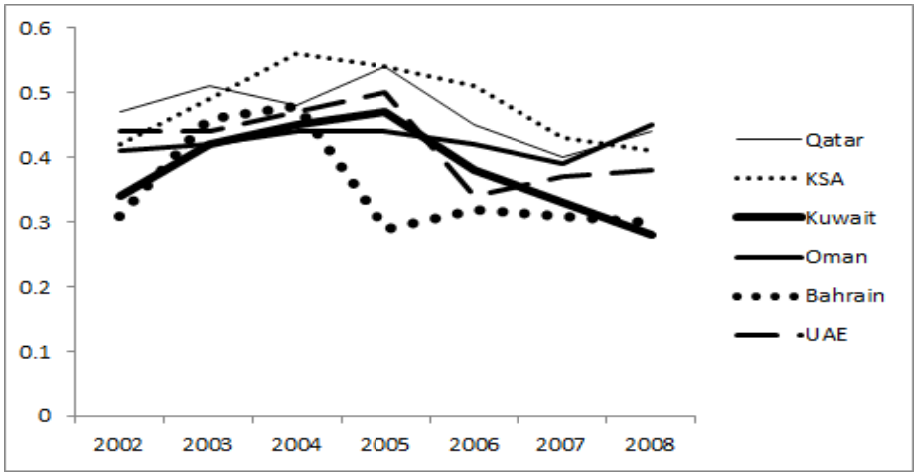

Fig. 1. Mean Lerner index trend for each GCC country

Figure 2 shows the GCC industry mean Lerner index decreasing to 40% in 2002, increasing in 2003, passing by the peak in 2004, and then flattening around 38% in 2008. This trend can be further explained by investigating the determinants impact on market power, which will be discussed in the next section.

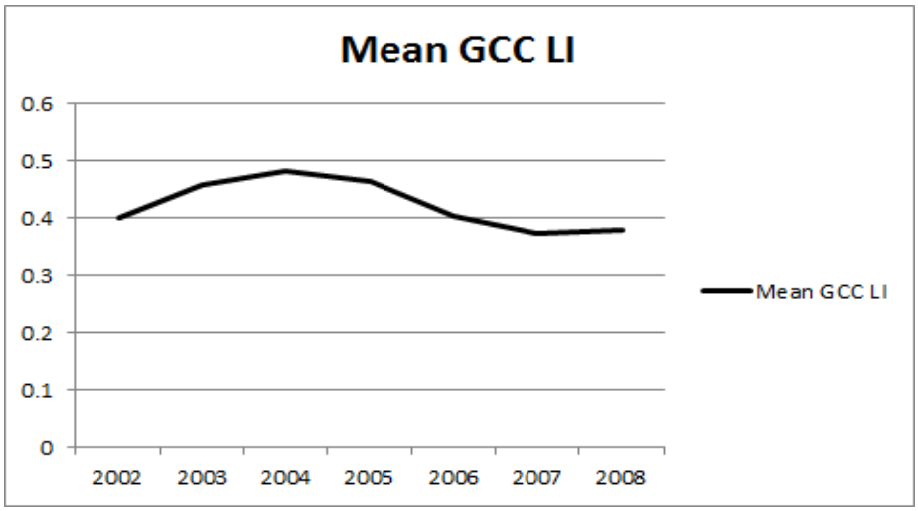

Fig. 2. Mean GCC LI

4.2. Analysis of the market power determinants. In this section we investigate the determinants of market power for GCC banks. In line with former studies, we perform panel regressions (Random Effects Estimation) of the Lerner index on a set of variables. Three different estimations are performed to check the sensitivity and the robustness of the results. Estimation (1) shown in Table 7 includes all determinants: *HHI*, Log(*Assets*), Log(*Assets*)^2, Loans Provisions to Total Loans ratio, Loans to Assets ratio and Total Assets to GDP ratio. This estimation would be the benchmark specification.

Table 7. Estimation (1) for market power determinants using the Random Effects model

Variable	Coefficient
HHI	-0.268 ***
LTA	0.595 ***
LTA^2	-0.027 ***
LA	-0.143 ***
PL	-0.035
TAGDP	-0.159 ***
Constant	-5.779 ***
Hausman test	24.58 ***
R squared	.07
No. observations	364
No. of banks	52

Notes: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. *HHI* is the Herfindahl Index, *LTA* is the Log (*Assets*), *LTA*^{2} is the Log (*Assets*)^2, *LA* is the Loans to Assets, *PL* is Loan Losses Provision to Loans, *TAGDP* is Total Assets to GDP.

Table 8. Estimation (2) for market power determinants using the Random Effects model

Variable	Coefficient
CR2	-0.215 ***
LTA	0.627 ***
LTA^2	-0.028 ***
LA	-0.143 ***
PL	-0.024
TAGDP	-0.163 ***
Constant	-6.082 ***
Hausman test	25.36 ***
R squared	.07
No. observations	364
No. of banks	52

Notes: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. *CR2* is the Concentration ratio in the largest two banks, *LTA* is the Log (Assets), *LTA*^{2} is the Log (*Assets*)$_2$, *LA* is the Loans to Assets, *PL* is the Loss Provision to Loans, *TAGDP* is the Total Assets to GDP.

Estimation (2) in Table 8 replaces *HHI* with *CR*2 (2 bank Concentration ratio), the results are comparable to Estimation (1). Estimation (3) shown in Table 9 replaces *HHI* with *CR*3 (3 bank Concentration ratio), the results are also comparable to Estimation (1).

Table 9. Estimation (3) for market power determinants using random effects model

Variable	Coefficient
*CR*3	-0.246 ***
LTA	0.651 ***
LTA^2	-0.029 ***
LA	-0.147 ***
PL	-0.029
TAGDP	-0.170 ***
Constant	-6.290 ***
Hausman test	31.92 ***
R squared	.08
No. observations	364
No. of banks	52

Notes: *, ** and *** denote statistical significance at 10%, 5% and 1% respectively. *CR*3 is the Concentration ratio in the largest three banks, *LTA* is the Log (*Assets*), LTA^2 is the Log $(Assets)^2$, *LA* is the Loans to Assets, *PL* is the Loss Provision to Loans, *TAGDP* is the Total Assets to GDP.

Surprisingly, the significant and negative coefficient of the HHI variable signals that concentration and market power worked in opposite way in GCC banking over the study period. This result is inconsistent with the intuitive hypothesis that a more concentrated banking industry contributes to increasing market power of banks. This finding is also similar to the results found by Fernandez de Guevara et al. (2005) for Europe, where they find a negative but insignificant relationship between market concentration and market power variables. We can deduce from this finding that consolidation or more concentration trends in the GCC banking over the study period have not lead to increased practices of market power. Given that market power will not evolve, the consolidated banking system may be an appropriate structure and more controllable supervisory framework for central banks in small economies like GCC countries.

The size determinant Log (*Assets*) has been found positive and significant in explaining market power. This may suggest that GCC banks size expansions induce the market power up. In fact, increasing size enables banks to set prices either by raising them way above marginal cost, or for the prevailing prices, the banks size expansion pushes the marginal cost down, leaving a wider gap between marginal cost and prices. We stress on the latter insight since size expansion, to some extent, leads to more catching up of scale economies that lower marginal cost. In this essence, the size expansion of GCC banks has affected market power positively over the study period, not through setting higher prices but through decreasing marginal cost for the given prices.

In an elaborated analysis of the above explanation of the size effect, the variable Log $(Assets)^2$ is negative and significant. Comparing our results for GCC banks to former studies, we notice that they are consistent with the findings of Zuzana Fungacova, Laura Solanko and Laurent Weill (2010) on Russian banks and Fernandez de Guevara, Maudos and Perez (2005) on European banks, where they have both found a positive coefficient for size, but negative for squared size. The significantly negative coefficient of Log $(Assets)^2$ in this study suggests that increasing size enhances market power up to a certain point beyond which greater size turns to reduce market power level. In other words, small-sized banks and larger banks should have less market power than medium-sized banks. This finding of negative and significant Log$(Assets)^2$ variable also implies that economies of scale in GCC banking industry may not be strong enough to motivate the size increase continuously, where at one point, the size expansion will imply a diminishing market power. Based on this, we can conclude again that larger banks resulting from consolidation and merger may not necessarily induce market power practices.

In Estimation (2), HHI variable was replaced by CR_2 variable. The negative coefficient of *CR*2 signals that concentration is a significantly negative determinant of the market power. This result is also not in line with the hypothesis that a more concentrated banking industry contributes to increasing market power of banks. Similar to this result is also found in Estimation (3) when replacing *CR*2 with *CR*3. These results support the argument that more merger and consolidation activities in the GCC banking industry should not raise concerns regarding the market power practices since, actually, the increase in concentration lowers market power position.

Loans to Assets ratio have a significantly negative estimated coefficient. This goes in line with the

findings of Fungacova et al. (2010) for the Russian emerging market and Fernandez de Guevara et al. (2005) for Europe. This finding implies that more loans mean more risk accompanied with less market power. This finding could be possible in conjunction with the finding that larger concentration and bank size induce less market power of the period under study. Moreover, as in Petersen and Rajan (1995) study, more monopolistic banking market may have more finance extended since concentrated banking market has the ability driven by scale economies to afford charging lower rates.

As for elasticity of loan demand (using Total Assets to GDP ratio as a proxy), its coefficient is significant and negative, suggesting an existing relationship between the growth of the banking sector in GCC and its market power. In this essence, we infer that the greater the elasticity of demand for banking products, the higher the importance of other non-banking financing sources becomes.

All in all, the focus on banks expansion through own size increase or merger and acquisition could result in a high banking industry concentration, and thus, more market power practices. As proven in this study, concentration variables in GCC banking industry do not show a positive and significant effect on market power proxied by the Lerner index. Therefore, we could stress that greater concentration and greater merger and acquisition trend should not stand as a worry, as long as they do not increase market power edge.

Conclusion

This paper analyzes the competition level in the GCC banking sector during the period of 2002-2008. Compared to Europe and other emerging markets such as Russia, Lebanon and Egypt, GCC banking sector is seen to have more market power practices. The results on GCC banking sector show evidence of market power by scoring a high mean Lerner index of 42% for the period of study. However, the mean Lerner index of 42% for GCC countries shows a trend towards less market power over the study period as the yearly mean Lerner index level has decreased from 40% in 2002 to 38% in 2008.

The analysis of the market power determinants have shown significant role for concentration, size, default risk and elasticity of demand. Concentration variable shows that it is significantly and negatively related to market power. Bank size has a positive and significant effect on market power, which may indicate that banks seeking to increase their market shares will enjoy higher market power. However, the analysis on banks size stresses that the size effect on market power is coming from scale economies, enabling lower costs rather than setting higher prices. With respect to default risk, banks that spend more of their resources granting credits witness lower margins. With regard to the elasticity of loan demand variable, it indicates that greater elasticity of demand may lead to lower market power and higher importance of other sources of non-banking financing.

The overall results may indicate that banks in GCC countries tend to increase their sizes and market shares and ignore seeking greater market power. Upon this finding within the study period, greater concentration and greater merger and acquisition trends in GCC banking industry should not stand as a worry since they have not contributed to market power edge.

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