Market Structure and profit efficiency in Islamic Banks: An Empirical Study

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Abstract

The study aims to identify and measure the impact of market structure through market concentration and profit efficiency. The purpose of this paper is to examine the relationship between market structure and profit efficiency, through an empirical study on 52 banks in 6 countries during the period 2010-2018, using regression panel data analysis.

The study found a strong relationship between the variables of market structure and profit efficiency, where in Islamic banks there is a negative relationship between market concentrations ('HHI' & 'CR') of Islamic deposits and profit efficiency, and also a negative relationship between market concentration ('HHI' & 'CR') of financing 'Musharaka, Murabaha, Ijarah…' and profit efficiency.

In contrast, in conventional banks, there is a positive relationship between market concentration ('HHI' & 'CR') of deposits and profit efficiency and a positive relationship between market concentration ('HHI' & 'CR') of loans and profit efficiency.

Keyword. Market Structure; Banking Efficiency; Concentration ratio; Profit Efficiency; HH Index.

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1. INTRODUCTION

Islamic banks have emerged and developed during the past three decades to absorb the cash surplus in Islamic countries, Despite the high level of competition imposed by conventional banks, it was able to impose its position in the banking sector. To study the market structure in the banking industry, it is necessary to measure the concentration of loans and deposits in banks, to know its efficiency in light of competition.

the phenomenon of competition Banking has become one of the most serious challenges facing banking institutions at the local and international levels, especially in light of Global developments and recent manifestations witnessed by the banking field such as mergers and liberalization of trade in financial services, This requires each country to modernize and develop its banking sector in a way that enables it to face international competition, and this can only come if there was an internal competition between the constituent institutions of this sector, which contributed to increasing its profitability and competitiveness.

Competition contributes to a large degree to the growth and development of the banking sector quickly and effectively, as it has an important impact on improving the quality of banking services provided and raising the productivity and level of efficiency of the institutions operating in it.

From the introduction, the following question is addressed:

What is the nature of the relationship between the variables of market structure & profit efficiency in Islamic banks?

To answer the main question, the study has formulated the following hypotheses:

There is a statistically significant relationship between the variables of market

structure and profit efficiency.

There is a positive relationship between the concentration of loans and profit efficiency.

There is a positive relationship between the concentration of deposits and profit efficiency.

There is a positive relationship between the concentration of financing (Murabaha, Ijarah, Musharaka…) and profit efficiency.

There is a positive relationship between the concentration of Islamic deposits and profit efficiency.

Market shares of both loans and deposits are concentrated at the level of conventional banks.

2. Literature Review

Several studies have been conducted to examine market structures and concentration measuring techniques, ((Jacob & Katharina, 2002); (Ismail, 2017); (Etty & Noer, 2014); (Mehmet & Nawar, 2012); (Uzonwanne & Ezenekwe, 2018)) agree that there are many concentration criteria such as concentration ratios, HHI, Lorenz curve, Gini coefficient… The most widely used are the company concentration rate (CRn) and the Herfindahl-Hirschman Index (HHI), it can be determined which of the competitive markets are in the scope of perfect competition. And also, all of ((John, 1998); (Matthews , 2010); (Joaquin , José, Francisco, & Javier, 1999) (Nader, 2019); (Donsyah , 2004)) attempts to demonstrate the topic of banking efficiency; concepts, drivers, measures, literature and conceptual model. And determine the different technique to measure both of profit and cost efficiency in banking sector.

(Hassan , 2018) on his paper tried to analyses the impact of market frame through

its dimension (market concentration, barriers to entry, product differentiation, integration) on the efficiency of banks by touching the concepts of the vertical frame and efficiency of banks. (Mustapha , 2007) study the impact of market power and efficiency on bank on commercial banks in Jordan, this paper aims to estimate, analyses profit and cost efficiency for 14 commercial banks from 1993 to 2004, using the parametric free distribution method DFA. The results come in favor of competition, and do not support the traditional structure-conduct-performance hypothesis, in a way that can be considered that the Jordanian commercial banking industry, far from the non-competitive practices among the most abandoned banks.

3.Market structure:

The concept of market structure is a Tool for providing some framework to the theories investigating the market situation. The commonest three elements of market structure had been deposited by (Bain, 1951) as number, size, and size distribution of sellers and buyers, the degree of product differentiation, and conditions of entry into the market (Uzonwanne & Ezenekwe, 2018). Market structure also known as the number of industrial enterprises and their relative distribution in the economy, as a measure of the five largest organizations, production volume, total capital, sales, or the number of workers in the industry, which call the industrial concentration ratio.

3.1. Market structure forms:

From (Steven & David, 2011), (Uzonwanne & Ezenekwe, 2018), market structure can be divided into four shapes; Perfect competition, monopoly, monopolistic competition, and oligopoly.

- **Perfect competition:** Perfect competition is a market structure where an infinitely large number of buyers and sellers operate freely and sell a homogeneous commodity at a uniform price. It has the features of unlimited

contestability (no barriers to entry), an unlimited number of producers and consumers, and a perfect elastic demand curve.

- **Monopoly:** Monopoly is the form of market organization in which there is a single seller of a commodity for which there are no close substitutes. Thus, it is at the opposite extreme from perfect competition as a pure monopoly exists when a single firm is the sole-producer of a product.

- **Monopolistic competition:** A monopolistic competition refers to a market structure with a relatively large number of sellers offering similar but not identical products. Monopolistic competition is a situation in which the market, basically, is a competitive market but has some elements of a monopoly. In this form of market there are many firms that sell closely differentiated products. Therefore, a monopolistic competition is a market structure in which no cooperation occurs among the many sellers.

- **Oligopoly:** The term Oligopoly means 'Few Sellers'. An Oligopoly is an industry composed of only few firms, or a small number of large firms producing bulk of its output. In other words, oligopoly exits where few large firms producing a homogeneous or differentiated product dominate a market. Since, the industry comprises only a few firms, or a few large firms, any change in Price and Output by an individual firm is likely to influence the profits and output of the rival firms. automobile and gasoline industries, major soft drink firms, airlines and milk firms can be cited as an example of Oligopoly.

3.2. Market Concentration:

The importance of concentration ratios arises from their ability to capture structural features of a market. Concentration ratios are therefore often used in

structural models explaining competitive performance in the banking industry as the result of market structure (Jacob & Katharina, 2002). And the most important measures of market concentration can be cited for the following growth:

- **The k bank concentration ratio (CRk):**

simplicity and limited data requirements make the k bank concentration ratio one of the most frequently used measures of concentration in the empirical literature. Summing only over the market shares of the k largest banks in the market (Jacob & Katharina, 2002), it takes the form:

$$CR_k = \sum_{i=1}^{k} \left(\frac{xi}{x}\right) = \sum_{i=1}^{k} Si$$

where CR_k; concentration rate for k banks, xi: production of a company (bank), x: total production enterprises in the same industry, Si: single enterprise (bank) share of market. Giving equal emphasis to k leading banks, but neglecting the many small banks in the market, there is no rule for the determination of the value of k, so that the number of banks included in the concentration index is rather arbitrary decision. The concentration ration may be considered as one point on the concentration curve, and it is one-dimensional measure ranging between zero and unity. The index approaches zero far an infinite number of equally sized banks (given that the k chosen for the calculation of the concentration ratio is comparatively small as compared to the total number of banks) and it equals unity if the banks included in the calculation of the concentration ratio make up the entire industry.

- **The Herfindahl-Hirschman Index (HHI):**

It is the most commonly used method after concentration ratio. HHI is a measure of the distribution ranging from 0 to 1, this index is the sum of the squares of the relevant company shares which is determined as a ratio (percentage) of the total volume of the market (Ismail, 2017). This index is widely used in studies especially in the United States, and has been used by the U.S. Department of justice's Anti-trust Division since 1982, as a measure of market concentration in anti-trust cases (Zhou, 2003). And is calculated according to the following formular:

$$HHi = \sum_{i=1}^{k} (\frac{xi}{x})^2 = \sum_{i=1}^{k} Si^2$$

where Si is the bank's market share. ***HHi*** is the sum of the squares of banks sizes measured as market shares, as mentioned above, the Herfindahl-Hirschman Index stresses the importance of larger banks, and it incorporates each bank individually, so that arbitrary cut-offs and insensitivity to the share distribution are avoided. The HHI index rages between 1/n and 1, reaching its lowest value, the reciprocal of the number of banks, when all banks in a market are equal size, and reaching unity in the case of monopoly (Jacob & Katharina, 2002).

In banks, the Herfindahl-Hirschman Index measured in two sides, Market share of deposits which is divide total bank deposits per bank by total deposits across the banking sector. And Market share of loans which also measured by divide the volume of bank by the total loans granted at the banking sector level. The HHI became a popular measure of the degree of competition during the 1980s, when the Justice Department used it to classify markets. A market in which the HHI is less than 1,000 is regarded as being competitive. A market in which the HHI lies between 1,000 and 1,800 is regarded as being moderately competitive. But a market in which the HHI exceeds 1,800 is regarded as being uncompetitive. The Justice Department scrutinizes

any merger of firms in a market in which the HHI exceeds 1,000 and is likely to challenge a merger if the HHI exceeds 1,800 (Michael Parkin, 2012).

4. Economic Efficiency:

The concept of economic efficiency comes easily to the economist, given an economic objective and information on relative prices, an individual optimum in defined as a profit-maximizing objective given input and output prices, or cost minimization given factor inputs and input prices. Under certain optimistic or restrictive assumptions, economic efficient for the unit is generalized into an equilibrium that can be construed as a socially efficient equilibrium (Koopmans , 1951).

From (Farrell , 1957), economic efficiency can be separated into technical efficiency and allocative efficiency. The formal definition of technical efficiency according to (Koopmans , 1951) is a case where an increase in any output requires a reduction in at least one other output or an increase in at least one other input. Similarly, a reduction in any input requires an increase in at least one other input or a reduction in at least one output (Matthews , 2010). From the definition of technical efficiency comes technical inefficiency which is a position where a producer could produce the same output with less at least one input or use the same inputs to produce more of at least one output.

The term efficiency is different from the term effectiveness, both are used to describe the performance of an entity, but according to (Said & Ilham, 2014), efficiency summarizes the idea to produce with the best manner, which means that efficiency is focused on the use of minimum inputs to produce the best output, in other words, the optimized use of resources to generate the best products with the minimum costs. We can consider efficiency as the study of the optimized use of internal factors of the firm.

On the other hand, the effectiveness concept summarizes the yield of factors and the reach of goal, without considering the manner and the resources optimized use (Nader, 2019).

Before deciding whet methods to use in the measurement of efficiency it is important to consider the efficiency concept employed. Efficiency has been estimated using a number of efficiency concepts including production and cost. Productive efficiency is derived as the distance an individual institution has form the 'optimal' or 'best practice' institution existing on a production function. This hypothesized 'best practice' institution firm is defined with reference to all the institutions in the sample set. Assumptions of total transferable productive technology and firm objectives of output maximization and cost minimization are made for production or cost functions respectively (John, 1998).

4.1. Cost Efficiency:

(John, 1998) defines the cost efficiency that it estimates how far the production costs of an individual institution differs from the production costs of a best practice institution or firm operating under the similar conditions, and producing the same outputs. This measure is defined with reference to a cost function constructed from the observations of all institutions considered within the sample set. The cost function assumes the total production costs of individual institutions are dependent on the price of variable inputs, such as capital and labour, the quantity or value of outputs produced, random error and any other additional variables accounting for the environment or particular circumstances of individual institutions. A cost function allows the measurement of the least cost proportions of inputs in terms of input prices. This framework enables the consideration of both productive efficiency and the optimal proportion of inputs in terms of unput prices or allocative efficiency.

4.2. Profit Efficiency:

(Joaquin , José, Francisco, & Javier, 1999) in his opinion see that profit efficiency is a broader concept than cost efficiency since it takes into account the effects of the choice of a certain vector of production both on costs and on revenues. Two profit functions can be distinguished, depending on whether or not there is market power: the standard profit function and the alternative profit function. The standard profit function assumes that markets for outputs and inputs are perfectly competitive. The bank maximizes profits by adjusting the amounts of inputs and outputs.

There are many ways to measure cost and profit efficiency, (Donsyah , 2004) measured economic efficiency in general with financial ratio method, so cost efficiency has been measured by several ratios as assets profit margin and cost to income, where $PM=R/A$ & $CTI=C/I$; where (R) is the net result. (A) is total assets. (C) is costs. (I) is income before provisions. And also profit efficiency has been measured by the ratio of assets benefit and equity multiplier in this formular: $PE=I/A$ & $EM=E/A$, where (I)is income before provisions. (A) is total assets. (E) is Equity.

5. Methods and Variables:

5.1. Variables of study:

The model includes a dependent variable (assets benefit) which express profit efficiency in banks, and four independent variables reflect to market structure, which consist concentrations ratios (CR_d) (CR_l), and the Herfindahl-Hirschman Index for two sides, deposits and loans (HH_d) (HHl). Beside of that, there are two control variables which are CTI (cost to income), and bank size (BCZ) measured by the logarithm of total assets (Table 1).

Table 1. Variables of study

Variable		symbol	measurement
Dependent variable	Profit efficiency	PE	Total incomes/total assets
	Concentration ratio (loans)	CR_l	
Independent variables	Concentration ratio (deposits)	CR_d	$CR_l = \sum_{i=1}^{k} Si$
	Herfindahl-Hirschman Index (loans)	HH_l	$CR_d = \sum_{i=1}^{k} Si$
	Herfindahl-Hirschman Index (deposits)	HH_d	$HHi = \sum_{i=1}^{k} Si^2$
	The size of bank (variable control)	SZE	$HHi = \sum_{i=1}^{k} Si^2$
		CTI	Logarithm of total assets
	Cost to income ratio (variable control)		Total costs/ total incomes

5.2. Model and sample:

In order to study the relationship and measure the influence of market structure and economic efficiency; cross correlation analyses are uses according to the following equation:

$$PE_{it} = \alpha0 + \beta1 CRd_{it} + \beta2 CRl_{it} + \beta3 HHd_{it} + \beta4 HHl_{it} + \beta5 CTI_{it} + \beta6 SZE_{it} + \varepsilon_{it}$$

Where (PE_{it}): the dependent variable that shows profit efficiency measured by assets benefit (income before provisions/ total assets); ($\beta1$ - $\beta6$): coefficients of independents variables; (CRd_{it}): concentrate ratio of deposits; (CRl_{it}): concentrate ratio of given 'loans/financing for Islamic banks'; (HHd_{it}): the Herfindahl-Hirschman Index for deposits; (HHl_{it}): the Herfindahl-Hirschman Index for given 'loans/ financing for Islamic banks'; (CTI_{it}): cost to total income before provision ratio; (SZE_{it}): logarithm of total assets; (ε_{it}): random error.

The research was conducted by taking secondary data from annual reports of 52 commercial and Islamic bank in GCC countries (Table 2), and also annual reports of central bank in 6 countries, for the period 2010-2018. The evolution of the average variables under study is shown in (Table 3).

Table 2. The study sample (2010-2018)

Country	Bank name	Country	Bank name
The United Arab Emirates	Emirate Dubai national bank (ENBD) Abu Dhabi Commercial bank (ADCB) Abu Dhabi Islamic bank (ADIB) Bank of Sharjah (BOS) First gulf bank (FGB) Dubai Islamic bank (DIB) Mashreq bank (MASQ) Emirate Islamic bank (EIB) Sharjah Islamic bank (SIB) National bank of Ras Al- Khaimah (RAK)	**Kuwait**	National bank Kuwait (NBK) Kuwait finance House (KFH) Gulf bank (GULFB) Burgan bank (BURGANB) Commercial bank of Kuwait (ALTIJARI) Al Ahli bank of Kuwait (ABK) Boubyan Bank (BOUBYANB) Ahli United (AHLINITED) Warba bank (WARBA) Kuwait international Bank (KIB)
KSA	Al-Ahly Bank (NCB) Al-Rajhi Bank (ARAJ) Riyad Bank (RIAD) Samba bank (SAMBA) Arabe National (Bank ANB) Alinma Bank (ALINMA) Al-Bilad bank (ALBILAD) Bank Al-Jazira (ALJAZIRA) Alawwal bank (AWAL) SAAB (SAAB)	**Bahrain**	Ahli United (BAHLIU) Arab Banking Corporation (ABC) Al-Baraka bank (BARAKA) Gulf International Bank (GIB) Bahrain bank kuwait (BBK) Al-Salem bank (ALSALEM) Bahrain Islamic bank (BISB)
Qatar	Qatar Islamic bank (QIB) Qatar National bank (QNB) The Commercial bank of Qatar (CBQ) Masraf Al Rayan (MAR) Qatar International Islamic bank (QIIB) Doha bank (DHBK) Barwa bank (BARB) Qatar Development bank (QDB) Al-Khaliji bank (ALKHA) Ahli bank (AHLYB)	**Oman**	Muscat bank (MUSCAT) National bank of Oman (NBO) Nizwa Bank (NIZWA) AL-Izz bank (ALIZZ) Bank Dhofar (ZAFAR)

Table 3. Evolution of the average variables of the study during the period 2010-2018

Year	PE	CR$_l$	CR$_d$	HH$_l$	HH$_d$	SZE	CTI
2010	0.0439	0.6086	0.6253	0.1385	0.1520	4.0356	0.5932
2011	0.0438	0.6498	0.6471	0.1536	0.1716	4.0138	0.5886
2012	0.0423	0.6481	0.6634	0.1568	0.1871	4.0611	0.5862
2013	0.0403	0.6769	0.6691	0.1736	0.1883	4.1171	0.8850
2014	0.0404	0.7042	0.6617	0.1802	0.1807	4.1763	0.6820
2015	0.0429	0.7081	0.6721	0.1798	0.1862	4.2163	0.5633
2016	0.0414	0.7195	0.6975	0.1910	0.2108	4.2468	0.5663
2017	0.0402	0.7482	0.7291	0.2061	0.2250	4.2847	0.5432
2018	0.0418	0.7564	0.7304	0.2106	0.2280	4.3017	0.5190

Table 4. Statistical data for the variables of study

Variable	Lowest value	Greatest value	Average
PE	8.414 E-05	0.1960	0.0417
CR$_l$	0.4984	0.8764	0.6911
CR$_d$	0.4476	0.9355	0.6773
HH$_l$	0.0531	0.3381	0.1767
HH$_d$	0.0540	0.5229	0.1922
SZE	2.4080	7.3636	4.1892
CTI	0.1367	5.9012	0.6052

Table 3 and table 4 shows the most important statistical data for variables used in the study; where it is clear that the dependent variable (PE) is estimated at about 4.17%; which means that most of GCC banks in general has a significant percentage of profit efficiency by using their assets to generate profits. As for the variables (CRl) & (CRd) shows that the average of concentration of loans and deposits for the largest five banks measured by total assets in each country are estimated at 69.11%, 67.73% for the period 2010-2018; which express that all five banks in each country controls the banking sector of their countries with this percentage. For the variables (HHl) & (HHd) shows that the average of the Herfindahl-Hirschman Index for loans and deposits measured by the largest five banks in each country are estimated at level of 0.17; 0.19, which express that the banking market in GCC in general is between moderately and highly concentrated with regard to given loans and deposits attracting. As for the variable (CTI) it is clear that most of banks in GCC can generate 60% of incomes on each dollar expended in the different operations of banks.

Table 5 shows the average of concentration ratio and also the Herfindahl-Hirschman Index for 'loans for commercial banks/financing (Musharaka, Murabaha, Ijara ...)' for Islamic banks and deposits in each country of GCC during the period of 2010-2018. As we see in the United Arab of Emirates; over than half (51%) of all loans and deposits in the banking sector in UAE are concentrated in five commercial banks compared to only 16% in also five Islamic banks; which express that commercial banks in UAE are extremely control the banking sector at a high rate compared to Islamic banks. And the same fact for the Kingdom of Saudi Arabia, Qatar, Kuwait; all of loans and deposits also concentrated in commercial banks in different levels compared to Islamic banks. As for Bahrain and Oman; we see an almost total concentration of loans and deposits at the commercial banks level; over than 90% of deposits in the banking sector of Bahrain is concentrated in four commercial banks, where only 02% in Islamic banks.

And about the banking market in UAE, KSA, HH index is estimated at the level of 0.05–0.08; which express that the banking market is in competition between commercial banks amongst themselves, and extremely (total) competition between Islamic banks on each other too (0.008-0.03). As for all of Qatar, Kuwait, Bahrain, and Oman; from the Herfindahl-Hirschman Index shows that the banking market in those countries is highly concentrated; which estimated at the level of 0.19 and 0.39 in commercial banks, and the Islamic banks remain in total competition except Kuwait which estimated at about 0.11; thus, the banking market is moderately concentrated between Islamic banks.

Table 5. Evolution of the average of (CR) & (HHI) in Islamic and commercial banks loans and deposits

Type of bank		UAE	KSA	QATAR	KUWAIT	BAHRAIN	OMAN
Conventional	CR_{loans}	0.51	0.55	0.68	0.76	0.84	0.66
	$CR_{deposits}$	0.49	0.65	0.85	0.60	0.90	0.65
	HH_{loans}	0.07	0.05	0.24	0.19	0.21	0.19
	$HH_{deposits}$	0.07	0.08	0.39	0.11	0.23	0.18
Islamic	$CR_{financing}$	0.15	0.23	0.20	0.11	0.06	0.01
	$CR_{deposits}$	0.16	0.25	0.05	0.28	0.02	0.003
	$HH_{financing}$	0.008	0.02	0.01	0.11	0.001	0.00
	$HH_{deposits}$	0.009	0.03	0.001	0.07	0.00	0.00

5.3. Estimation of parameters:

- **Pooled Least Square (PLS):** This approach is a simple way to use a combination of all the data (pooled), so there are N x T observations, where N denotes the number of cross section units and T denotes the number of time points used, which is regressed using the Ordinary Least Square (OLS) model.

- **Fixed Effect Model (FEM):** A Fixed Effects Model is a statistical model that represents the observed quantities in terms of explanatory variables that are treated as if the quantities were non-random. The fixed effect assumption is that the individual specific effect is correlated with the independent variables Xit or have patterns that are not random.

- **Random Effect Model (REM):** A random effect(s) model, is a kind of hierarchical linear model. The random effects assumption is that the individual specific effects are uncorrelated with the independent variables Xit. or have patterns that are random.

Since panel data was used, Hausman and Lagrange Multiplier tests were carried out to determine the best model. The Hausman test showed that the fixed effect model (FEM) was the best model between PRM and FEM.

Table 6 shows the results of the estimated correlation function between of assets

benefit which reflects to profit efficiency of banks, and the variables of market structure.

Table 6. Estimation of parameters

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.128973	0.009077	14.20882	0.0000
CRl	0.008162	0.018026	0.452801	0.1509
CRD	-0.020237	0.013757	-1.470950	0.1421
HHL	0.008165	0.037549	0.217461	0.0280
HHD	0.010160	0.021708	0.468016	0.2400
SZE	-0.018758	0.002022	-9.277922	0.0000
CTI	-0.007324	0.000930	-7.878726	0.0000
Fixed Effects (Cross)				
ENBD--C	0.023995	BARB--C	-0.003718	
ADCB--C	0.018268	QDB--C	0.002419	
ADIB--C	0.013650	ALKHA--C	-0.019754	
FGB--C	0.005977	AHLYB--C	-0.018230	
BOS--C	0.022383	NBK--C	0.000571	
DIB--C	0.015339	KFH--C	0.015129	
MASQ--C	0.035309	GULFB--C	-0.011543	
EIB--C	0.006849	BURGANB--C	-0.007610	
SIB--C	0.000948	ALTIJARI--C	-0.013429	
RAK--C	0.076733	ABK--C	-0.012297	
NCB--C	0.013839	BOUBYANB--C	-0.017914	
ARAJ--C	0.020732	AHLINITED--C	-0.018144	
RIAD--C	0.004662	WARBA--C	-0.036011	
SAMBA--C	0.002170	KIB--C	-0.018612	
ANB--C	0.002280	BAHLIU--C	-0.003532	
ALINMA--C	-0.005154	ABC--C	-0.004912	
ALBILAD--C	0.006523	BARAKA--C	-0.023908	
ALJAZIRA--C	-0.004891	GIB--C	-0.022554	
AWAL--C	-0.003279	BBK--C	-0.006372	
SAAB--C	0.002732	ALSALEM--C	-0.022707	
QIB--C	0.001725	BISB--C	-0.017137	
QNB--C	0.053310	MUSCAT--C	-0.000247	
CBQ--C	0.043235	NBO--C	-0.009485	
MAR--C	0.000920	NIZWA--C	-0.031892	
QIIB--C	-0.004794	ALIZZ--C	-0.034415	
DHBK--C	-0.003386	ZAFAR--C	-0.013758	

Effects Specification			
Cross-section fixed (dummy variables)			
Root MSE	0.006359	R-squared	0.882256
Mean dependent var	0.041503	Adjusted R-squared	0.865887
S.D. dependent var	0.018550	S.E. of regression	0.006793
Akaike info criterion	-7.030165	Sum squared resid	0.018922
Schwarz criterion	-6.516039	Log likelihood	1703.059
Hannan-Quinn criter.	-6.827858	F-statistic	53.89711
Durbin-Watson stat	1.296165	Prob(F-statistic)	0.000000

Dependent Variable: PE; Method: Pooled Least Squares; Sample: 2010-2018; included observations: 9; Cross-sections included: 52; Total pool (balanced) observations: 468.

Table 6.1. Estimation of parameters (Islamic banks)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,066368	0.009077	14.20882	0.0000
CRl	-0,054443	0.018026	0.452801	0.1509
CRD	-0,082842	0.013757	-1.470950	0.1421
HHL	-0,05444	0.037549	0.217461	0.0280
HHD	-0,052445	0.021708	0.468016	0.2400
SZE	-0,081363	0.002022	-9.277922	0.0000
CTI	-0,069929	0.000930	-7.878726	0.0000

Table 6.2. Estimation of parameters (Conventional banks)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,191591	0.009077	14.20882	0.0000
CRl	0,07078	0.018026	0.452801	0.1509
CRD	0,042381	0.013757	-1.470950	0.1421
HHL	0,070783	0.037549	0.217461	0.0280
HHD	0,072778	0.021708	0.468016	0.2400
SZE	0,04386	0.002022	-9.277922	0.0000
CTI	0,055294	0.000930	-7.878726	0.0000

6. Results and discussion:

Tables: 6 & 6.1 & 6.2 shows the estimated coefficients of the model, the value of t statistic, the standard deviation and probability of error. The result shows that the coefficient of determination (R^2) estimated at 0.88 which express that there is a strong relationship between profit efficiency (PE) and the variables of market structure.

1. From table 6: It is clear that there is positive relationship between concentration ratio for loans, Herfindahl-Hirschman Index for both of loans and deposits and profit efficiency. However, there is a negative relationship between all of

concentration of deposits, size of bank, costs to income and profit efficiency of all the study sample.

2. From table 6.1: There is a negative relationship between all of; concentration of Islamic deposits 'Crd', concentration of financing (Musharaka, Murabaha, ijarah….)'CRf', Herfindahl-Hirschman Index of both financing, Islamic deposits and profit efficiency in Islamic banks. and also, negative relationship for all of size of bank, costs to income and profit efficiency.

3. From table 6.2: There is a positive relationship between all of; concentration of loans 'Crl', concentration of deposits 'Crd', Herfindahl-Hirschman Index of both loans and deposits, and profit efficiency. And also, positive relationship for all of size of bank, costs to income and profit efficiency.

7. Conclusion

from the empirical findings of this study, related to the impact of market structure on profit efficiency in the GCC area, we conclude the following results:

1. The banking industry in the GCC area in general is controlled by conventional banks compared to Islamic banks, where market shares of loans and deposits are concentrated at the level of large conventional banks in these countries.

2. All the countries in the GCC area banking markets are characterized by a high degree of concentration 'low competition', and therefore it can be said that the banking market is an oligopoly market. except the UAE banking sector which is characterized by a kind of competition, so the banking market in UAE is monopolistic competition.

3. In order to control profit efficiency in Islamic banks, it is necessary to operate in competitive markets, and drop the markets of high concentration.

Bibliography List :

Bain, J. (1951). Relation of profit rate to industry concentration. *Quarterly Journal of economics, 65*(3), 293-324.

Donsyah , Y. (2004). Efficiency in Islamic Banking: An Empirical Analysis of 18 Banks. *Islamic Economic studies, 12*(1), 1-19.

Etty , N., & Noer, A. (2014). Market structure and bank performance: Empirical Evidence of Islamic banking in Indonesia. *Asian Social science, Canadian Center of science and education, 10*(10), 105-117.

Farrell , M. (1957). The measurement of productive efficiency. *Journal of the royal stastical society, 120*(3), 253-290.

Hassan , M. (2018). Analyze the relationship between market structure and banking efficiency. *Journal Afak for sciences, 5*(1).

Ismail, U. (2017). Market structures and concentration measuring techniques. *Asian journal of agricultural extension Economics & sociology*(19/4), 1-16.

Jacob, A., & Katharina, H. (2002). Measures of competition and concentration in the banking industry: a review of literature. *economic & financial modelling.*, 1-46.

Joaquin , M., José, P., Francisco, P., & Javier, Q. (1999). Cost and profit efficiency in European banks. *Valenciano de investigations economics, 12*(1), 33-58.

John, A. (1998). Cost efficiency. Economies of scale and economies of scope in the British retail banking sector. *school of finance & law working paper series*(13), 1-33.

Koopmans , T. (1951). Efficiency allocation of resources. *The Econometric Society Econometrica, 19*(4), 455-465.

Matthews , K. (2010). Banking efficiency in emerging market economies. *Cardiff economies working papers*(12), 1-32.

Mehmet , U., & Nawar, H. (2012). Market concentration, Corporate Governance and innovation: Partial and Combined Effects in US-Listed Firms. *Journal of Governance and Regulation, 1*(3), 199-215.

Mustapha , A. (2007). The impact of market power and efficiency on bank on commercial banks in Jordan. *Jordan Journal of business, 3*(3).

Nader, A. (2019). Banking efficiency: concepts drivers & measures literature and conceptional model. *SSRN Electronic Journal*, 1-24.

Said , J., & Ilham. (2014). Exploring Effectiveness and Efficiency of banks in Switzerland. *International Journal of Academic Research in Business and Social Sciences, 4*(4), 313-325.

Steven , G., & David, S. (2011). *Priciples of Microeconomics.* USA: Openstax.

Uzonwanne, Z., & Ezenekwe, U. (2018). Economics study materials: Market structure. *Amaka Dreams LTd*, 113-124.

Zhou, B. (2003). Simulation of the Hirfindahl-Hirshman Index: the case of the ST. *Louis banking geographic market*(4), 17-32.