International Journal of Research in Entrepreneurship & Business Studies
eISSN-2708-8006, Vol. 1, issue. 2, 2020, pp. 33-43
https://doi.org/10.47259/ijrebs.124

Measuring Competition in Banking Sector in Oman

Amira Saleh Mohammed Al Maamari
Faculty of Business, Sohar University, Sultanate of Oman
Email: Amira-almaamari@hotmail.com

Article History: Received on 10st Sep. 2020**, Revised on** 29th Nov. 2020**, Published on** 25th Dec. 2020

Abstract

Purpose of the study: The purpose of the study was to investigate and measure the competitive environment in the banking sector in Oman.

Design/Methodology/Approach: This study considered an effort towards measuring the nature of competition of 12 out of 16 Omani banks from 2009 to 2019 over applying Panzar and Rosse (PR-model). It measured the competition index, called H-statistic, as it gives a quantitative assessment of the competitive nature of the studied market. The non-structural model was adopted to measure the competitive behaviour of the banking sector. The data was taken from Muscat Securities Market (MSM) over obtaining financial statements of banks and data was tested using the Statistical Package for Social Sciences (SPSS).

Findings: The result showed that it was not able to reject the monopolistic competition that H value considered between values of zero and one for the banking market in Oman. Thus, Omani banks operate under monopolistic competition.

Practical Implications: The study has interesting policy implications. It is recommended to encourage foreign banks' presence to enhance the competitive condition of the banking sector thus making sure the exit and entrance of banks in the industry to raise the competition.

Social Implications: The flexibility in the competitive condition of the banking sector will lead to increase competition so this will produce a variety of services and products to improve the banks' performance and customer satisfaction.

Originality/value: This is the first study of its kind in studying and testing the competitive environment for the banking sector in Oman using the PR-model.

Keywords: Banking Competition in Oman, Monopolistic Competition, Market Equilibrium, Market contestability, Pazan and Rosse (PR model).

Introduction

There are many pre-requisites to establish a sound and effective financial system in a country. The banking and financial sector is influenced by the extent of the country's intervention, and it reflects the Gross Domestic Product (GDP) growth. The importance of financial institutions' performance lies in raising the rate of economic growth, which has made researchers interested in studying this aspect (Al-Muharrami et al., 2006). While Odedokun (1998) found that financial intermediation is an effective method for the growth of the national economy in developing countries. The banking sector faces many challenges, such as instability risk with its impact on the assets and liabilities. Banks are more exposed to the risk of overstretching in their investments than other institutions. Therefore, the potential for exacerbation of these risks is huge when banks operate in a competitive environment, and this appears over increasing both bailouts and risk of closures in the event of failure of individual financial institutions (Polemis, 2015). The subject of the banking industry is one of the major topics in the field of scientific research and it is related to the nature of banking competition and the extent of its positive impact in terms of economic and financial stability. The theory of competition along with the market clarifies the relationship between competition, economic stability, quality of services, and growth demonstrated that the number of competitors is small through this theory (Perrakis et al., 1982). However, the main driver behind the market competition is the great pressure generated by the entry of a new competitor into the market. To measure the competitive behaviour of the banking sector, the non-structural model will be adopted. Competitive models measure by focusing on competitive behavior among banks without the need to use clear information about market structuring (Bresnahan, 1982 and Panzar & Rosse, 1987). It depends on measuring competition by relying on deviations of competitive pricing that can be derived from the conditions of profit maximization balance, and these are considered as their main advantage when compared to other structural measures (Bikker et al., 2009). The main reason why these models are described as non-structural is that they are based on assumptions that factor does not focus on a market structure that influence their competitive behaviour among banks. Many studies related to the banking sector are based on the Panzar and Rosse model for measuring a competition index, called H-statistic, as it gives a quantitative assessment of the competitive nature of the studied market. The H-statistic is calculated through reduced-form revenue equations and measures the elasticity of total revenue related to

changes in factor input prices (Panzar & Willig, 1977). Therefore, this research is conducted as the first study in this field as H statistics is used as a measure of competition.

Murjan & Ruza (2002) concluded that banking sectors in both the MENA region operate under monopolistic competition while in Gulf Cooperation Council (GCC) tend to have a lower rate of competition during the period from 1993-2002. While Al-Muharrami et al. (2006) summarized that banking sectors operate within the monopolistic competition. Turk Ariss (2008) analysed competition for 12 countries in the MENA region found that monopolistic competition is common in most banking sectors in the MENA region. It was also concluded the indicators of both the market contestability and the activity restrictions are significant factors to determine the level of competition among countries in the region. The non-structural model was used based on the P-R approach (Panzar & Willig, 1977; Panzar & Rosse, 1982; Panzar & Rosse, 1987) to test and assess the nature of competition along with the banking sector market in Oman.

Review of Literature

Khan et al. (2018) studied the effect of small changes in total revenue belong to bank earn the cost, concluded the banking industry go through monopolistic competition and was touching a perfectly competitive environment. Gutiérrez de Rozas (2007) concluded that the banking system operating under competition, which was the result of concentration. Bikker & Haaf (2002) focused on studying the market structure of Banks, their concentration, and the relationship between competition and concentration. Claessens & Laeven (2004) used the method of Panzar and Rosse to reflect the strength of the relationship between concentration and contestability to determine the bank's competition. Park & Weber (2006) identified the actual structure through which the banks can earn their profits. The result showed that the banks earn their profits under monopolistic competition. Duncan and Langrin (2004) adopted the PR model to examine the competitiveness of market structure for the banking industry. It indicated that the banking sector was running under monopolistic competition to earn its profits. Drakos and Konstantinou (2005) calculated H-statistic from the reduced form equation to provide the estimated value and worked out F-test. The outcome indicated that the range of 0 and 1 is the value so it concluded that the structure was monopolistic. Hussain et al. (2013) obtained the revenues in the banks operating under monopolistic competition and market imbalance. Rahman et al. (2019) studied the relationship between credit cost and interbank-competition showed that bank competition obtains a positive impact in terms of credit cost. Su et al. (2020) examined the impact of competition in the banking industry in terms of stability, or vulnerability. They displayed a negative impact on systematic risk and competition support of the financial system stability. Chemmanur et al. (2020) investigated the association between larger bank competition and the screening of potential borrowers and found that bank credit was highly affected by borrowing-firm. Fungáčová et al. (2017) examined the influence of bank competition on the growth of the economy over studying the impact of competition in the context of bank credit cost. They got that bank competition rises the credit cost and indicates a positive influence of bank competition is stronger for smaller companies.

Murjan and Ruza (2002) studied the power of competition in the MENA region concluded that banking sectors in both MENA region operate under monopolistic competition. Al-Muharrami et al. (2006) summarized that banking sectors operate within the monopolistic competition. Turk Ariss (2008) analysed competition for the countries in the MENA region about the factors clarifying the differences in banking competition. It was concluded that the indicators of both market contestability and activity restrictions are significant factors in determining the level of competition among countries in the region.

Non-Structural Approach

Demsetz (1973) and Pelzman (1977) argued that the efficiency measure was the source of focus rather than market power. They found that the company's competencies might be different and thus this may create uneven market shares as well as a high level of focus. The difference in efficiency can be seen from top management and production technology (Neuberger, 1997). Manson assumed that the price rises are easy for companies with a high concentration in the market. Here the price was higher than marginal cost and therefore less efficient. While Shaffer (1994) discussed the issue of considering price decline as an indicator for measuring market efficiency. He explained that competition would appear between companies at lower prices. Structure Conduct Performance (SCP) model assumed a one-way relationship between structure, behaviour, and performance. Therefore, the market structure was affected by corporate behaviour and vice versa (Vesala, 1995). The non-structural approach argued that corporate behaviour and market structure are correlated due to the retroactive effects of behaviour on market structure (Vesala, 1995). It was found that market performance influenced decisions regarding companies entering the market. Perrakis et al. (1982) found that the main feature of disputed markets was the freedom to enter and exit the market. This type of market attracts customers through the low price and it is easy to recover the costs as the company exits the

International Journal of Research in Entrepreneurship & Business Studies
eISSN-2708-8006, Vol. 1, issue. 2, 2020, pp. 33-43
https://doi.org/10.47259/ijrebs.124

market because the old companies will take retaliate because of the low prices. Panzar & Rosse (1987) developed a method that depended on the company's cost structure. This method relied on distinguishing the level of competition in the markets, by knowing the relationship between corporate revenues and factors that change prices. Bikker and Haaf (2002) and De Bandt and Davis (2000) studied the influence of the banking consolidations in the US and European countries on the competition. Molyneux et al. (1994) attempted to measure consolidation's influence on competition in the initial implementation of the single market policy in the context of banks.

Research Methodology

Secondary data was used in this study. All commercial banks in Oman either local or foreign banks have been included in this study. The data was taken from the websites of the Central Bank of Oman (CBO) and Muscat Securities Market (MSM). The financial statements of the seven local banks were collected from the financial statements of banks, specifically from the balance sheet and income statement for the period 2009 to 2019, while the financial statements of foreign banks were collected from their websites separately. Overall, the data was obtained from 12 banks. This was the most comprehensive data sample ever used in implementing the P-R methodology of the Omani banking industry. PR-approach was used in the study Panzar and Rosse (1982) and Panzar & Rosse (1987) over utilizing different pricing strategies to find out the required cost and revenue at the different conditions of the market. The study went through measuring the level of competition either its monopoly, perfect competition, monopolistic competition, oligopoly, or natural monopoly upon pierce competition of the market. Two equations were to apply the Bank's fixed-effect model. This research study tested the competitive environment of the Omani banking industry in the context of the public relations approach. Where the first equation was as follows:

$$\ln(IR_{it}) = \alpha + \beta_1 \ln(IE_{it}) + \beta_2 \ln(PE_{it}) + \beta_3 \ln(OE_{it}) + \gamma_1 \ln(ET_{it}) + \gamma_2 \ln(NLT_{it}) + \gamma_3 \ln(TA_{it}) + \delta D + \mu_1 + \varepsilon_{it} \text{)-----1}$$

Where i and t signify bank and year, IR_{it} – Gross Interest Revenue(IR) divided by Total assets which are used as a proxy for bank Output prices (dependent variable); IE_{it} – Interest Expense(IE) divided by Total Deposits which is used as a proxy for input cost (independent variable); PE_{it} – Personal Expenses (PE-Salaries of staff) divided by Total assets which are used as a proxy for input cost of labour (independent variable); OE_{it} – Operating Expenses (OE) and administrative Expenses divided by Total Assets as a proxy for the cost of fixed assets (independent variable); ET_{it} – Equity divided by Total Asset. (Independent Variables); NLT_{it} – Net loan divided by Total Asset (independent variable); TA_{it} – Natural Log of Total asset used as a proxy for size effect (independent variable); D – dummy year, μ - bank-specific fixed effect (independent variable); μ_i – Bank specific fixed effect.

The PR-H-Statistics defined as the sum of coefficients of IE, PE and OE i.e.

$$(H = \beta 1 + \beta 2 + \beta 3) \text{-----2}$$

H-Statistics can have a value less than or equal to zero, between zero and one, or equal to one. If the value of H≤0 means that the banking, market in Oman operates under monopoly or short-run oligopoly. If the value of H=1 means that the banking market is in a state of perfect competition, natural monopoly. If the value of 0<H<1 means that banks in Oman are operating under monopolistic competition. The overall assumption of H-Statistics shown in three main assumptions. The first assumption is when H ≤ 0, banks are under monopoly equilibrium imply each bank operates independently as under monopoly profit maximization conditions (H is a decreasing function of the perceived demand elasticity) or perfect cartel. The second assumption is when 0 < H < 1, banks are monopolistic competition's free entry equilibrium (H is an increasing function of the perceived demand elasticity). The third assumption that means banks are perfect competition – Free entry equilibrium with full efficient capacity utilization (Panzar & Willig, 1997; Panzar & Rosse, 1982; Panzar & Rosse, 1987; Nathan & Neave, 1989).

Table 1: General Information of Licensed banks in Oman (as of 31.12.2018)

#	Banks' name	Date of Establishment	Licensed branches	Operating branches
Local banks				
1	National Bank of Oman SAOG	1973	61	61
2	Oman Arab Bank SAOG	1973	57	57
3	HSBC Bank of Oman SAOG	1975	48	48
4	Bank Muscat SAOG	1981	149	149
5	Bank Dhofar SAOG	1990	61	61
6	Sohar International Bank	2007	30	30
7	Ahli Bank SAOG	1997	14	14

International Journal of Research in Entrepreneurship & Business Studies
Vol. 1, issue. 2, 2020, pp. 34-44
https://doi.org/10.47259/ijrebs.123

Foreign banks				
8	Standard Chartered Bank	1968	1	1
9	Habib Bank Limited	1972	7	7
10	Bank Melli Iran	1974	1	1
11	National Bank of Abu Dhabi	1976	7	7
12	Bank Saderat Iran	1976	1	1
13	Bank of Baroda	1976	3	3
14	State Bank of India	2004	1	1
15	Bank of Beirut	2006	5	5
16	Qatar National Bank	2007	5	5
Total			451	451

However, only 12 banks were included in this study as some of the banks recently opened ones in Oman where others had not published their financial statements. Accordingly, the 12 banks are classified into two main categories i.e. local and foreign banks. The local banks are National Bank of Oman SAOG, Oman Arab Bank SAOG, HSBC Bank of Oman SAOG, Bank Muscat SAOG, Bank Dhofar SAOG, Sohar International Bank, and Ahli Bank SAOG. The foreign banks are Standard Chartered Bank, Habib Bank Limited, National Bank of Abu Dhabi, State Bank of India, and Qatar National Bank.

Appendix.1 shows the annual data of the twelve banks. The data set is shown separately for each bank and these data represented the following variables gross interest revenue, total assets, interest expense, total deposits, personal expenses, operating expenses, equity, and net loan for the duration from 2009 to 2019.

Table 2. Variables' calculation

Bank Name	Year	Gross Interest revenue /Total Assets	Interest Expense / Total Deposits	Personal Expenses (Salaries of staff)/Total Assets	Operating Expenses and administrative Expenses /Total Assets	Equity /Total Asset	Net loan /Total Asset	Natural Log of Total asset
National Bank of Oman	2009	3%	-21%	-1%	-2%	14%	76%	1440%
	2010	3%	-30%	-1%	-2%	15%	76%	1441%
	2011	3%	-16%	-1%	-2%	13%	75%	1462%
	2012	3%	-19%	-1%	-2%	12%	75%	1475%
	2013	3%	-19%	-1%	-2%	11%	71%	1488%
	2014	3%	-36%	-1%	-2%	12%	78%	1491%
	2015	3%	-19%	-1%	-2%	16%	78%	1500%
	2016	3%	-17%	-1%	-2%	15%	76%	1508%
	2017	3%	-43%	-1%	-2%	16%	76%	1506%
	2018	3%	-40%	-1%	-2%	15%	79%	1509%
	2019	2%	-26%	-1%	-2%	15%	77%	1511%
Oman Arab Bank	2009	4%	-1%	-1%	-2%	15%	66%	1366%
	2010	3%	-1%	0%	-2%	15%	69%	1377%
	2011	3%	-1%	-1%	-2%	14%	74%	1392%
	2012	3%	-1%	0%	-2%	13%	68%	1413%
	2013	3%	-1%	0%	-2%	13%	74%	1419%
	2014	2%	-1%	0%	-2%	11%	69%	1441%
	2015	2%	-1%	-1%	-2%	11%	77%	1450%
	2016	2%	-2%	-1%	-2%	14%	77%	1454%
	2017	3%	-2%	0%	-2%	13%	77%	1458%
	2018	3%	-2%	0%	-2%	15%	79%	1466%
	2019	3%	-2%	-1%	-2%	15%	80%	1473%
HSBC Bank of Oman	2009	3%	-1%	-2%	-2%	16%	59%	1385%
	2010	3%	-1%	-1%	-2%	15%	55%	1396%
	2011	2%	-1%	-1%	-2%	14%	55%	1404%
	2012	2%	-1%	-1%	-2%	12%	50%	1470%

	2013	2%	-1%	-1%	-3%	14%	44%	1461%
	2014	2%	0%	-1%	-2%	14%	52%	1462%
	2015	2%	0%	-1%	-2%	14%	55%	1460%
	2016	2%	0%	-1%	-2%	14%	63%	1463%
	2017	2%	0%	-1%	-2%	14%	60%	1466%
	2018	3%	-1%	-1%	-2%	14%	59%	1467%
	2019	2%	-1%	-1%	-2%	14%	59%	1475%
Bank Muscat	2009	3%	-3%	-1%	-3%	12%	66%	1558%
	2010	3%	-2%	-2%	-3%	14%	68%	1558%
	2011	3%	-2%	-2%	-2%	12%	67%	1579%
	2012	3%	-2%	-2%	-2%	13%	71%	1588%
	2013	3%	-2%	-2%	-2%	14%	69%	1595%
	2014	2%	-2%	-2%	-2%	13%	66%	1609%
	2015	2%	-1%	-1%	-2%	11%	53%	1634%
	2016	2%	-2%	-1%	-2%	14%	66%	1620%
	2017	2%	-2%	-2%	-2%	16%	66%	1623%
	2018	2%	-2%	-1%	-2%	16%	64%	1632%
	2019	2%	-2%	-1%	-2%	16%	63%	1632%
Bank Dhofar	2009	3%	-3%	-1%	-2%	14%	80%	1421%
	2010	3%	-2%	-2%	-2%	14%	76%	1432%
	2011	3%	-2%	-2%	-2%	12%	76%	1449%
	2012	3%	-2%	-2%	-2%	12%	78%	1458%
	2013	3%	-2%	-2%	-2%	12%	73%	1477%
	2014	2%	-1%	-1%	-1%	10%	71%	1498%
	2015	2%	-1%	-1%	-1%	13%	76%	1509%
	2016	2%	-2%	-1%	-1%	14%	76%	1519%
	2017	2%	-3%	-1%	-1%	14%	77%	1526%
	2018	2%	-3%	-1%	-2%	17%	66%	1525%
	2019	2%	-3%	-2%	-2%	16%	61%	1528%
Sohar International Bank	2009	2%	-4%	-1%	-2%	11%	77%	1384%
	2010	2%	-3%	-1%	-2%	10%	72%	1405%
	2011	2%	-2%	-1%	-2%	9%	71%	1417%
	2012	2%	-2%	-1%	-1%	8%	64%	1440%
	2013	2%	-2%	-1%	-1%	9%	68%	1445%
	2014	2%	-2%	-1%	-2%	9%	69%	1455%
	2015	2%	-2%	-1%	-1%	11%	75%	1461%
	2016	2%	-3%	-1%	-1%	11%	76%	1474%
	2017	2%	-4%	-1%	-1%	14%	74%	1486%
	2018	2%	-4%	-1%	-1%	9%	74%	1493%
	2019	2%	-4%	-1%	-1%	10%	70%	1507%
Ahli Bank	2009	2%	-3%	-1%	-1%	15%	72%	2024%
	2010	2%	-2%	-1%	-1%	13%	81%	2051%
	2011	3%	-2%	-1%	-2%	13%	83%	2065%
	2012	3%	-2%	-1%	-1%	15%	84%	1391%
	2013	3%	-2%	-1%	-1%	14%	82%	1411%
	2014	2%	-2%	-1%	-1%	12%	84%	1431%
	2015	2%	-2%	-1%	-1%	12%	80%	1446%
	2016	2%	-2%	-1%	-1%	13%	80%	1446%
	2017	2%	-3%	-1%	-1%	15%	81%	1452%
	2018	2%	-3%	-1%	-1%	16%	82%	1464%
	2019	2%	-4%	-1%	-1%	15%	82%	1474%
Qatar National Bank	2009	2%	-3%	-1%	-2%	11%	61%	1676%
	2010	2%	-2%	-1%	-3%	11%	59%	1698%
	2011	3%	-1%	0%	-1%	14%	64%	1728%
	2012	2%	-1%	0%	-1%	13%	68%	1747%
	2013	3%	-2%	0%	-1%	12%	70%	1766%
	2014	3%	-2%	0%	-1%	12%	70%	1776%
	2015	2%	-2%	0%	-1%	12%	72%	1786%

International Journal of Research in Entrepreneurship & Business Studies
Vol. 1, issue. 2, 2020, pp. 34-44
https://doi.org/10.47259/ijrebs.123

	2016	2%	-4%	-1%	-1%	10%	54%	1815%
	2017	2%	-4%	0%	-1%	10%	72%	1827%
	2018	2%	-5%	0%	-1%	10%	71%	1833%
	2019	2%	-5%	0%	-1%	10%	72%	1842%
State Bank of India	2009	8%	-6%	-2%	-2%	0%	6%	1771%
	2010	8%	-6%	-2%	-2%	0%	10%	1780%
	2011	8%	-5%	-2%	-2%	0%	10%	1795%
	2012	9%	-6%	-2%	-2%	0%	10%	1803%
	2013	9%	-6%	-2%	-2%	0%	11%	1819%
	2014	9%	-6%	-2%	-2%	0%	10%	1833%
	2015	9%	-6%	-2%	-2%	0%	10%	1846%
	2016	8%	-6%	-2%	-2%	0%	14%	1860%
	2017	8%	-6%	-2%	-2%	0%	12%	1874%
	2018	6%	-5%	-2%	-2%	0%	10%	1898%
	2019	7%	-5%	-2%	-2%	0%	11%	1905%
National Bank of Abu Dhabi	2009	2%	-2%	-3%	-1%	10%	67%	1684%
	2010	2%	-2%	-3%	-1%	11%	65%	1691%
	2011	2%	-1%	-2%	-1%	10%	62%	1710%
	2012	2%	-1%	-2%	-1%	10%	55%	1727%
	2013							
	2014	2%	-1%	0%	-1%	9%	52%	1749%
	2015	2%	-1%	-4%	-1%	11%	51%	1757%
	2016	2%	-1%	-1%	-1%	15%	52%	1804%
	2017	2%	-1%	-1%	-1%	15%	49%	1807%
	2018	2%	-2%	0%	-1%	14%	47%	1817%
	2019	2%	-2%	0%	-1%	13%	50%	1827%
Habib Bank Limited	2009	5%	-5%	0%	-3%	10%	53%	1512%
	2010	5%	-5%	0%	-3%	10%	49%	1520%
	2011	5%	-5%	0%	-3%	10%	40%	1532%
	2012	4%	-5%	0%	-2%	8%	31%	1567%
	2013	3%	-5%	0%	-2%	8%	33%	1570%
	2014	4%	-5%	0%	-2%	9%	32%	1574%
	2015	4%	-4%	0%	-2%	8%	29%	1592%
	2016	4%	-4%	0%	-3%	8%	30%	1576%
	2017	3%	-3%	0%	-2%	7%	32%	1583%
	2018	3%	-4%	0%	-3%	7%	36%	1594%
	2019	3%	-6%	0%	-3%	7%	36%	1590%
Standard Chartered Bank	2009	2%	-2%	-1%	-2%	6%	12%	1203%
	2010	2%	-2%	-1%	-2%	8%	10%	1220%
	2011	2%	-2%	-1%	-2%	7%	46%	1234%
	2012	2%	-2%	-1%	-2%	7%	45%	1241%
	2013	2%	-2%	-1%	-2%	7%	44%	1247%
	2014	2%	-1%	-1%	-1%	6%	40%	1254%
	2015	1%	-1%	-1%	-2%	8%	41%	1242%
	2016	2%	0%	-1%	-2%	8%	40%	1243%
	2017	2%	0%	0%	-2%	8%	43%	1245%
	2018	1%	-2%	-1%	-2%	7%	37%	1249%
	2019	1%	-2%	-1%	-2%	7%	37%	1253%

Findings

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Ir	132	.029	.017	0	.091
Ie	132	.044	.072	0	.433
Pe	132	.01	.007	0	.038
Oe	132	.017	.005	0	.035
Et	132	.109	.043	0	.166
Nlt	132	.58	.217	0	.844

International Journal of Research in Entrepreneurship & Business Studies
eISSN-2708-8006, Vol. 1, issue. 2, 2020, pp. 33-43
https://doi.org/10.47259/ijrebs.124

Ta	132	15.427	2.285	0	20.65

Table.3 shows that Ta has the highest mean value of 15.427 with Std. Dev. of 2.285. Moreover, the Pe has the lowest mean of .01 and .007 as Std. Dev. In general, almost all the independent variables result that the data points tend to be close to the mean of the data set due to all of them carry out low standard deviation.

Table 4. Pairwise correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Ir	1.000						
(2) Ie	0.119	1.000					
(3) Pe	0.273	0.053	1.000				
(4) Oe	0.310	0.110	-0.062	1.000			
(5) Et	-0.635	0.083	-0.155	-0.009	1.000		
(6) Nlt	-0.565	0.135	-0.116	-0.152	0.825	1.000	
(7) Ta	0.430	0.032	0.199	-0.016	-0.064	-0.028	1.000

Table.4 shows the correlation between each variable with each one another. In terms of all variables, the correlation indicates a negative correlation as seen in Figure.1 but once for the 1,2,3, and 4 variables, it shows a positive correlation which is seen in Figure.2. This is because of missing values of some banks' data sets.

Figure 1. Negative correlation

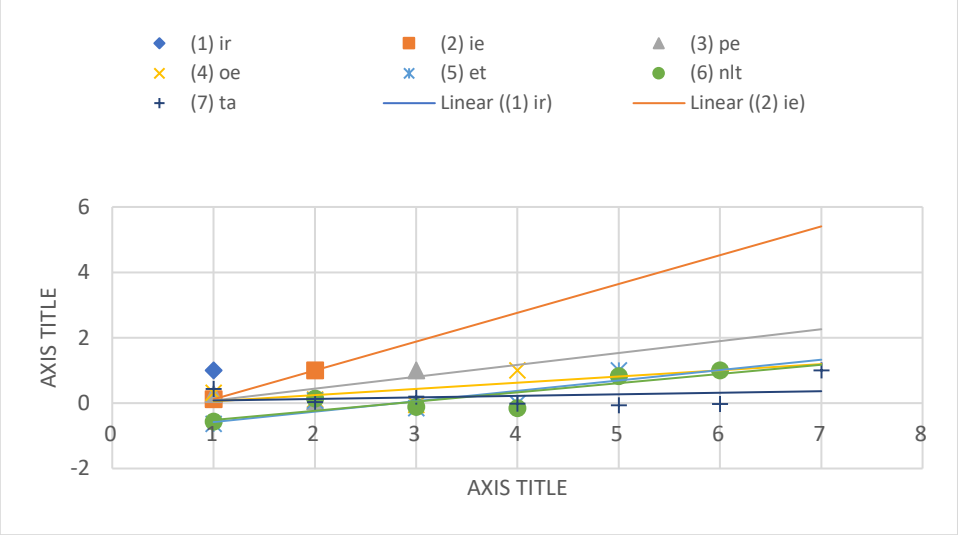
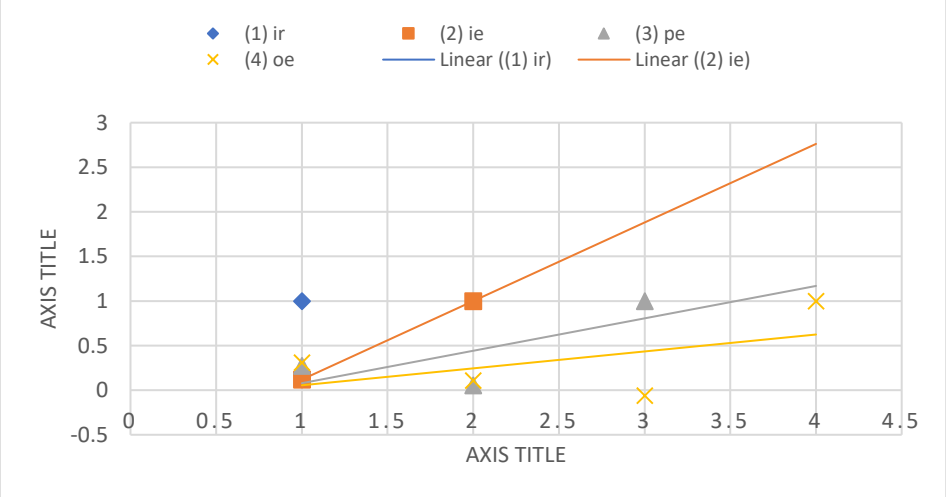


Figure 2. Positive correlation



International Journal of Research in Entrepreneurship & Business Studies
Vol. 1, issue. 2, 2020, pp. 34-44
https://doi.org/10.47259/ijrebs.123

Table 5. Results based on the fixed effect

Ir	Coeff.	Std.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Ie	.009	.012	0.78	.44	-.014	.032	
Pe	-.101	.084	-1.20	.231	-.268	.065	
Oe	.127	.129	0.98	.328	-.129	.384	
Et	.086	.023	3.70	0	.04	.132	***
Nlt	.024	.005	4.71	0	.014	.035	***
Ta	0	0	-0.69	.491	-.001	0	
2009b.year	0	.	.	.	.	.	
2010.year	.001	.001	0.53	.596	-.002	.004	
2011.year	0	.002	-0.10	.923	-.003	.003	
2012.year	-.001	.002	-0.54	.592	-.004	.002	
2013.year	-.002	.002	-1.20	.233	-.005	.001	
2014.year	-.003	.002	-1.64	.103	-.006	.001	
2015.year	-.004	.002	-2.32	.022	-.007	-.001	**
2016.year	-.003	.002	-2.24	.027	-.006	0	**
2017.year	-.007	.002	-4.17	0	-.01	-.004	***
2018.year	-.008	.002	-5.16	0	-.011	-.005	***
2019.year	-.008	.002	-4.94	0	-.011	-.005	***
Constant	.01	.004	2.49	.014	.002	.018	**

Mean dependent var	0.029	SD dependent var	0.017
R-squared	0.573	Number of obs.	132.000
F-test	8.710	Prob > F	0.000
Akaike crit. (AIC)	-1112.651	Bayesian crit. (BIC)	-1063.643

*** $p<.01$, ** $p<.05$, * $p<.1$

From Table.5, it can be seen that the fixed effect test is significant at a 5% significance level determined that the fixed model considers an idle method to estimate such data. Regarding the strength of the correlation is observed from the R-squared value. R-squared value is 0.573 which indicates a strong correlation.

Table 6. Linear regression

Ir	Coeff.	Std.Err.	t-value	p-value	[95% Conf	Interval]	Sig
ie	.031	.013	2.48	.015	.006	.056	**
Pe	.266	.141	1.89	.061	-.013	.545	*
Oe	.875	.175	4.99	0	.527	1.222	***
Et	-.211	.038	-5.55	0	-.286	-.136	***
Nlt	-.006	.008	-0.74	.461	-.021	.009	
Ta	.003	0	7.10	0	.002	.004	***
2009b.year	0	.	.	.	.	.	
2010.year	.001	.004	0.15	.881	-.007	.009	
2011.year	.001	.004	0.15	.885	-.008	.009	
2012.year	.001	.004	0.17	.863	-.007	.009	
2013.year	0	.004	0.08	.939	-.008	.009	
2014.year	-.003	.004	-0.81	.42	-.012	.005	
2015.year	-.003	.004	-0.78	.434	-.011	.005	
2016.year	-.001	.004	-0.14	.885	-.009	.008	
2017.year	-.001	.004	-0.28	.781	-.01	.007	
2018.year	-.004	.004	-1.01	.317	-.013	.004	
2019.year	-.005	.004	-1.08	.281	-.013	.004	
Constant	-.006	.008	-0.75	.454	-.023	.01	

Mean dependent var	0.029	SD dependent var	0.017
R-squared	0.695	Number of obs.	132.000
F-test	16.370	Prob > F	0.000
Akaike crit. (AIC)	-825.258	Bayesian crit. (BIC)	-776.251

*** p<.01, ** p<.05, * p<.1

Table.6 showed that R-squared=0.695 demonstrates a strong correlation and the descriptive variables are applicable in explaining 75% of the dependent variable. Low SD indicates that the data points tend to be close to the average of the data set. The results represent that we reject the null hypothesis and take the alternative at 5% significance level. It obtains that bank-specific fixed are in the data and estimation of the fixed-effect model can take place in these results. In a way, every single variable that in equation (1) is statically significant at 5% significance level. The results of the variables Pe, and Oe has positive and significant coefficients. It shows that higher input prices reflect higher revenue to banks. Et shows lower equity of banks i.e. banks play in risk condition are gaining more revenue. About the major results (basic hypothesis and H-statistics) outlined over adding the coefficient value of Pe and Oe respectively.

H-statistics result from the equation (1) that (H= β1+ β 2 + β3) so, H= 0.031+0.266+0.875 = 1.172. Therefore, the natural competition of the banking industry shows the same result of a fixed effect, which is monopolistic competition. So any 1% cost increase will be reflected with an increase but less than 1% in the revenue as the rate of elasticity of demand is not the required level.

A regression assesses the relationship between two or more dependent variables. Once this is executed, an F-value and its significance level is calculated. The common significant level for F-value is p < .05. Thus, the model describes a significant amount of variance in the outcome variable. R2 acts as an indicator in the percent of the variance in the outcome variable that is explained through the set of predictor variables (Lani, 2020).

Table 7. Revised Regression results

Ir	Coeff.	Std.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Ie	.013	.014	0.89	.373	-.015	.041	
Pe	-.005	.107	-0.05	.96	-.215	.204	
Oe	.141	.162	0.87	.385	-.177	.46	
Et	.023	.029	0.80	.426	-.034	.08	
Nlt	.009	.006	1.37	.171	-.004	.021	
Ta	.001	0	1.75	.08	0	.001	*
2009	0	.	.	.	.	.	
2010	.001	.002	0.31	.76	-.003	.004	
2011	0	.002	-0.09	.932	-.004	.004	
2012	-.001	.002	-0.49	.625	-.005	.003	
2013	-.002	.002	-1.13	.26	-.006	.002	
2014	-.003	.002	-1.56	.118	-.007	.001	
2015	-.004	.002	-2.01	.044	-.008	0	**
2016	-.003	.002	-1.60	.11	-.007	.001	
2017	-.006	.002	-2.81	.005	-.01	-.002	***
2018	-.008	.002	-3.77	0	-.012	-.004	***
2019	-.007	.002	-3.69	0	-.011	-.004	***
Constant	.014	.006	2.46	.014	.003	.025	**

Mean dependent var	0.029	SD dependent var	0.017
Overall r-squared	0.009	Number of obs	132.000
Chi-square	62.444	Prob > chi2	0.000
R-squared within	0.484	R-squared between	0.153

*** p<.01, ** p<.05, * p<.1

The results reported in Table.7 display that the null hypothesis is rejected. In contrast, the null hypothesis (H0 = 0 < H < 1) is accepted at 5% significance level. F-statistics and the corresponding p-value is shown in Table.8. The basis of such outcomes argued that banks in Oman for a period of 2009-2019. It seems to be in a state of monopolistic competition due to the sum of H- statistics is 0.149 (0.013 + -0.005 + 0.141) the result

of Ie, Pe, and Oe respectively. Therefore, any minor change in cost by increased at 1% will be reflected with an increase but less than 1% in the revenue. As the rate of elasticity of demand is not to the required level.

Conclusion

We know that banks play an unimaginable role in allocating economic resources in countries. Also, their practice has a fundamental impact on providing liquidity insurance, transferring assets, and obtaining payment services. All of these contribute to the growth and development of the economy. From this standpoint, it is essential to measure the competition level in the banking markets appears to be widely justified. Competition analysis has to be transformed into a successful area of the banking economy. Therefore, the interest revenue acts as the dependent variable in this equation. Furthermore, there are other variables linked with the estimated equation which are the bank-specific control. This equation is appraised based on the model of bank-specific fixed effect. The equation of competition test for the sample period 2009-2019 confirms the presence of monopolistic competition among Omani banks. As for other analysis that is done in this study, are somewhat similar to that we could not reject the null hypothesis of monopolistic competition for the sample period. Also, for the secondary result that seen in the analysis and the model specification, individual variables are concerned both the input cost variable and banks specific variable), fixed effect model is shown significant value in the equation. Both the R-squared value and other criteria of the best model are fulfilled. The input price of funds has a positive relationship with the banks' revenue. We find from the results of the study that the relationship of equity and revenues is negative and this indicates that the bank that risks getting high revenues. While the variable size shows a positive relationship with revenues, large banks can obtain high returns when compared to small banks. The same applies to banks that offer banking facilities such as loans. Finally, the financial banking sector can only be compared to specific sectors. The views are mixed regarding the degree of competition desired in the financial banking sector. Intense competition is supposed to be a reason to reduce mediation expenses and improve efficiency. This comes at the expense of undermining the lending period, thereby reducing the profitability of banks. Therefore, both the solvency and the ability of financial institutions to withstand liquidity shocks could be seriously undermined. We also find that the exchange context that banking regulators play reinforces its role in providing the necessary barrier against negative developments. From clarifying concepts related to financial stability, efforts must be made towards the common fundamentals behind competition banking sectors.

Recommendations

The monopolistic competitive environment also has a low rate of entry and exit from the banking market. Therefore, excellence in the services provided plays a major role in increasing the bank’s profits in the short term. In the event of raising the interest rate, wherein the long term increase in customers while maintaining reasonable profitability. The monopolistic competition reflects that any increase of 1% means an increase in profits. This is because the rate of demand elasticity is not at the expected level. Therefore, banks must intensively be marketing their services in a way that reflects the hidden differences that the customer may not be able to distinguish when compare. Marketing is an effective tool for such creating such differentiation.

References

1. Al-Muharrami, S., Matthews, K., & Khabari, Y. (2006). Market structure and competitive conditions in the Arab GCC banking system. *Journal of Banking & Finance*, *30*(12), 3487-3501. https://doi.org/10.1016/j.jbankfin.2006.01.006
2. Bikker, J., & Haaf, K. (2002). Competition, concentration, and their relationship: An empirical analysis of the banking industry. *Journal of Banking & Finance*, *26*(11), 2191-2214. https://doi.org/10.1016/s0378-4266(02)00205-4
3. Bikker, J., Shaffer, S., & Spierdijk, L. (2009). The Panzar-Rosse Revenue Test: To Scale or Not to Scale. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1458889
4. Bresnahan, T. (1982). The oligopoly solution concept is identified. *Economics Letters*, *10*(1-2), 87-92. https://doi.org/10.1016/0165-1765(82)90121-5
5. Chemmanur, T. J., Qin, J., Sun, Y., Yu, Q., & Zheng, X. (2020). How does greater bank competition affect borrower screening? Evidence from China's WTO entry. *Journal of Corporate Finance*, *65*, 101776. https://doi.org/10.1016/j.jcorpfin.2020.101828
6. Claessens, S., & Laeven, L. (2004). Competition in the Financial Sector and Growth: A Cross-Country Perspective. *Financial Development and Economic Growth*, 66-105. Palgrave MacMillan: London. https://doi.org/10.1057/9780230374270_3

7. De Bandt, O., & Davis, E. (2000). Competition, contestability, and market structure in European banking sectors on the eve of EMU. *Journal of Banking & Finance*, *24*(6), 1045-1066. https://doi.org/10.1016/s0378-4266(99)00117-x
8. Demsetz, H. (1973). Industry Structure, Market Rivalry, and Public Policy. *The Journal of Law and Economics*, *16*(1), 1-9. https://doi.org/10.1086/466752
9. Drakos, K., & Konstantinou, P. (2005), Competition and Contestability in Transition Banking: An Empirical Analysis, *South-Eastern Europe Journal of Economics*, 3, (2), 183-209
10. Duncan, D., & Langrin, R. (2004). Testing for Competition in the Jamaican Banking Sector: Evidence from Bank-Level Data 1.
11. Fungáčová, Z., Shamshur, A., & Weill, L. (2017). Does bank competition reduce cost of credit? Cross-country evidence from Europe. *Journal of Banking & Finance*, 83, 104-120. https://doi.org/10.1016/j.jbankfin.2017.06.014
12. Gutiérrez de Rozas, L. (2007). Testing for Competition in the Spanish Banking Industry: The Panzar-Rosse Approach Revisited. *Banco de España Research Paper No. WP-0726. SSRN Electronic Journal*, 1-45. https://doi.org/10.2139/ssrn.1005116
13. Hussain, M., Shah, S., Latif, K., Bashir, U., & Yasir, M. (2013). Hindsight bias and investment decisions making empirical evidence form an emerging financial market. *International Journal of Research Studies in Management*, *2*(2), 77-88. https://doi.org/10.5861/ijrsm.2013.323
14. Khan, H., Ghafoor, A., Qureshi, F., & Rehman, I. (2018). Bank Competition, Financial Development, and Growth of Financially Dependent Industries: Fresh Evidence from China. *Global Economic Review*, *47*(2), 108-134. https://doi.org/10.1080/1226508x.2018.1436458
15. Molyneux, P., Lloyd-Williams, D., & Thornton, J. (1994). Competitive conditions in European banking. *Journal of Banking & Finance*, *18*(3), 445-459. https://doi.org/10.1016/0378-4266(94)90003-5
16. Murjan, W., & Ruza, C. (2002). The competitive nature of the Arab Middle Eastern banking markets. *International Advances in Economic Research*, *8*(4), 267-274. https://doi.org/10.1007/bf02295501
17. Nathan, A., & Neave, E. (1989). Competition and Contestability in Canada's Financial System: Empirical Results. *The Canadian Journal of Economics*, *22*(3), 576. https://doi.org/10.2307/135541
18. Neuberger, D. (1997). *Structure, conduct, and performance in banking markets* (No. 12). Thünen-Series of Applied Economic Theory-Working Paper.
19. Odedokun, M. (1998). Financial intermediation and economic growth in developing countries. *Journal of Economic Studies*, *25*(3), 203-224. https://doi.org/10.1108/01443589810215351
20. Panzar, J. C., & Rosse, J. N. (1982). *Structure, conduct, and comparative statistics*. Bell Telephone Laboratories.
21. Panzar, J., & Rosse, J. (1987). Testing for 'Monopoly' Equilibrium. *The Journal of Industrial Economics*, *35*(4), 443-456. https://doi.org/10.2307/2098582
22. Panzar, J., & Willig, R. (1977). Free Entry and the Sustainability of Natural Monopoly. *The Bell Journal of Economics*, *8*(1), 1-22. https://doi.org/10.2307/3003484
23. Park, K., & Weber, W. (2006). The profitability of Korean banks: Test of market structure versus efficient structure. *Journal of Economics and Business*, *58*(3), 222-239. https://doi.org/10.1016/j.jeconbus.2005.09.003
24. Pelzman, J. (1977). Trade creation and trade diversion in the Council of Mutual Economic Assistance 1954-70. *The American Economic Review*, *67*(4), 713-722.
25. Perrakis, S., Baumol, W., Panzar, J., & Willig, R. (1982). Contestable Markets and the Theory of Industry Structure. *The Canadian Journal of Economics*, *15*(4), 774. https://doi.org/10.2307/134928
26. Polemis, M. (2015). Does Monopolistic Competition Exist in The Mena Region? Evidence from the Banking Sector. *Bulletin of Economic Research*, *67*(S1), S74-S96. https://doi.org/10.1111/boer.12046
27. Lani, J. (2020). Regression. Retrieved Dec. 25, 2020, from Statistics Solutions https://www.statisticssolutions.com/directory-of-statistical-analyses-regression-analysis/regression/
28. Shaffer, S. (1994). Structure, conduct, performance, and welfare. *Review of Industrial Organization*, *9*(4), 435-450. https://doi.org/10.1007/bf01029516
29. Turk Ariss, R. (2008). Financial liberalization and bank efficiency: evidence from post-war Lebanon. *Applied Financial Economics*, *18*(11), 931-946. https://doi.org/10.1080/09603100701335408
30. Vesala, J. (1995). *Testing for competition in banking: Behavioural evidence from Finland* (1st ed.). Helsinki: Bank of Finland.