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THE NEXUS AMONG COMPETITION, RISK AND PERFORMANCE IN BANKING SECTOR OF SAUDI ARABIA

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ABSTRACT

The determination behind this research paper is to inspect the relation among competition, risk, and financial performance in the Saudi Arabian banking sector for 2011-2019. This paper used Two steps Generalized Method of Moment (GMM) as an estimation technique. This study focused on Lerner Index and Herfindahl-Hirschman Index to gauge bank competition and used three alternative measures for risk, namely credit risk, liquidity risk, and z-score. The coefficients of the Lerner Index and Herfindahl-Hirschman Index are significant and positive with profitability which signifies that higher competition in Saudi Arabian banks led to a decrease in profitability which is explained in the Structural Conduct Performance Hypothesis. Z-score shows a significant positive relationship with profitability. Credit risk has a positive relationship with profitability reveals that risk-adjusted returns are being targeted by risk-averse shareholders trying to gain more profits to compensate for the higher credit risk. The outcome of the study provides a comprehensive framework to the Central bank and other regulatory authorities to introduce micro and macro prudential policies that are aligned to the stability of the financial system.

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INTRODUCTION

Banking sector which is considered as the main pillar for every country to well establish the economy. This sector plays a vital role in growing the economy. A country can grow economically well when the investors boost up the confidence of the consumers and try to focus on future and upcoming projects (Luo et al., 2016). Financial institutions often act as a transitional factor so that the borrowers and lenders can interact and develop opportunities for investment which in turn grow the economy. Financial intermediaries are helpful in compiling the capital as well as they are great sources to allocate the resources, which in turn spark the economy (Demirgüç-Kunt & Huizinga, 1999). Massive loans are provided to the industry by banks and then capital markets are being developed which play a pivotal role in the growth of the economy. There are studies which we have gone through in literature showing that there is a relation which boosts up the financial sector and growth of the economy (Galindo et al., 2007).

In literature, we can find many research papers which report the competition of banks with profitability. Different researchers examined detailed research on this area in different economies that are developed and emerging (Jeon & Miller, 2002; Chortareas et al., 2012; Mirzaei et al., 2013; Seelanatha, 2010). Researchers argued that the market power and profit margin of banks erode by excessive competition in the banking industry and provoke them to take high risks which may result in instability and failure. In the same way, Berger et al. (2009) stated that when there is an increase in competition, then found a decrease in franchise value, market power, and profit margins.

Furthermore, the literature throws light that cost is being minimized by banks because of higher competition which may help to mitigate moral hazard and adverse selection problems, which later on may reduce the financial stability and loan defaults (Boyd & De Nicoló, 2005). Banks usually take more risks in an environment where there is low competition, the reason why big banks have more importance, that they are able to gain implicit or explicit subsidies from governments for safety net objectives. Almost all of the financial institutes target that they earn more profits and focus on the maximization of profit. Banks get more and more by earning funds at lower rates and giving them to investors and borrowers at higher rates. A great number of credits be delivered by banks, which they usually want to extend so that they can get higher profits. When banks are unable to get borrowed money back, then profitability is reduced, and the risk associated with banks be increased.

It is considered that the most regulated industry in the world is the banking industry (Chortareas et al., 2012). The relation between bank competition and profitability might create an alarming signal for policy interference. Many Researchers did

great work while taking the risk and profitability of banks into account (Ang et al., 2006; Iqbal & Mohsin, 2019). This study also being consistent with the need and importance related to the banking sector, examines for the first time the nexus among risk, competition and performance of the banks in Saudi Arabia. Developing countries like Saudi Arabia, hardly highlight or monitor the competition among banks and efficiency according to performance where banks have a dominating position in the financial sector. So this paper measures the performance along with competition, risk, and a few control variables. This paper analyzed the profitability of banks along with competition and risk in the banking sector of Saudi Arabia because the management of the baking sector is reflected by it.

This paper contributed in the following ways, (i) this study aimed to assess the impact of bank competition and risk on the profitability of banks. This study used different types of risks and used structural as well as non-structural measures for bank competition. (ii) This study examined the relationship of competition and risk on the profitability in the banking sector of Saudi Arabia from 2011-2019. This paper provides insight into the relationship between bank competition and risk taking together with profitability in the banking sector of Saudi Arabia. (iii) As far as the bank competition is concerned, this paper focused on the Lerner Index and HH index to measure bank competition, then it's a good addition in the empirical literature.

Bank Competition and Profitability

Bank competition is one of the important factors of banking industry that is measured extensively and widely discussed in terms of concept. Although it is considered as a concerning issue among the behavior of banks but it could also have an impact on the entire financial system. The findings of the studies in literature usually linked the bank competition with risk-taking behavior of banks and highlighted the variety of findings gained from many concepts of bank competition. There are two major paradigms, structural and non-structural, in banking sector regarding the measurement of competition. The first approach that is structural is established on two hypotheses of Structural Conduct Performance and Efficient Structure Hypothesis. Structure Conduct Performance originally was designed by Bain (1951).

One of the mostly used measure for bank competition is the Lerner Index in the empirical literature. Researchers used this method for measuring bank level competition are Cipollini & Fiordelisi (2012) among others. Researchers mostly give preference to Lerner Index over HH Index because it can measure the competition of each bank every year. We used both in this study. There are different results regarding the relationship between bank competition and profitability in the literature. Pasiouras & Kosmidou (2007) took data from European banks and found no relationship between bank competition and profitability. Their work was supported by Tan (2016), who examined the impact of both on the Chinese banking sector as a sample and reported no relation between them.

Risk and Profitability

It is considered that the most regulated industry in the world is the banking industry (Chortareas et al., 2012). In literature, we can see two approaches related to risk and competition. When banks are experiencing higher competition, they mostly follow riskier policies, and riskier assets are a good choice for investment and looking for such opportunities which can produce more income. Banks tend to indulge all the strength in those activities, which would give the high returns that might even lead to a decrease in the franchise value (Keeley, 1990) or the capital buffers are enhanced (Allen & Gale, 2004; Iqbal et al., 2015). The unwilling attitude of banks towards their counterparts is also one of the reasons to intensify the risk level in banks (Allen & Gale, 2004), usually to give cooperation and assistance to interbank (Sáez & Shi, 2004). It is a general concept that there is a higher risk of being involved while doing banking activities linked it with insolvency. However, the risk is being evolved from the competition or by the market power of banks. The amount of information that banks can gather also be damaged or weakened in the time period of high competition, which therefore expands the loan default risk. In developed as well as in developing countries' banking sector empirically proved these theoretical findings. Yeyati and Micco (2007) worked on Latin American banking sector, other researchers worked on the risk and competition approach from different developed and developing countries (Liu et al., 2012). Banks may face different categories of risks while doing banking activities. The current study is dealing deals with the insolvency risk, liquidity risk and credit risk in order to find relation of these categories of risk with profitability of Saudi Arabian banks.

Liquidity risk is considered one of the most common risks associated with banking activities. Banks have to borrow in order to deal with their day to day working operations. Then they have to bear more costs to fulfill their requirements for cash in order to run their daily activities smoothly. The reputation of banks be damaged when banks are reporting liquidity issues also face insolvency (Jenkinson, 2008), and liquidity risk is extensively measured with the ratio of liquid assets to total assets. When the ratio is high, then there is less liquidity (Abbas et al., 2019; Moudud-Ul-Huq, 2020). Few studies done by researchers depicted that liquidity risk and bank profitability have negative relation due to the fact that less returns be expected by holding liquid assets in hand (Barth et al., 2003). Insolvency risk is used by many researchers and they use z-score to calculate it (Doumpos et al., 2015). We used Z-score in this study to calculate this risk (Berger et al., 2009; Tan, 2016). Credit creation is an activity in banks that creates most of the income. Despite the fact major risk is linked with this activity at both ends whether it is borrower or lender. Banks that have high credit risk, depositors have hesitation in dealing with such banks because they might face bankruptcy while engaging themselves with them. Therefore, researchers came up with variations in results which depicted the negative relation with profitability of banks (Yao et al., 2018; Staikouras & Wood, 2004) whereas the Chinese banking sector was under investigation and found no relation with profitability (Tan & Floros, 2012; Tan, 2016).

METHODOLOGY

As described in the literature that researchers are now taking a keen interest in inspecting the relationship of profitability with bank competition along with other bank related factors from the

past two decades. In this paper, we focused on the relationship among bank competition, risk, and profitability in the banking sector of Saudi Arabia. The banking sector of Saudi Arabia has different types of banks including commercial, public sector, private, foreign, Islamic, and Microfinance banks. The data of sample banks were collected for 9 years from 2011-2019.

A model designed by Athanasoglou et al. (2008) and Tan (2016) was the proposed model used to estimate the relation between profitability, competition and risk along with other controlled variables.

$$Profit_{it} = C + Profit_{i,t-1} + \sum_{j=1}^{j} \beta_j X_{it}^{j} + \sum_{I=1}^{I} \beta_I X_{it}^{I} + \sum_{m=1}^{m} \beta_m X_{it}^{m} + e_{it} + \mu_{it} \quad (1)$$

In equation 1, i indicates the bank, t shows the time period that would be in years and $Profit_{it}$ is a dependent variable showing the indicators for the profitability of a specific bank in specific year t which is going to measure with *NIM* and *PBT*.

X_{it} refers to the determinants related to the profitability of banks which is divided into three categories, bank specific determinants X_{it}^{j} representing bank specific variables, X_{it}^{I} representing industry specific variables X_{it}^{m} representing macroeconomic variables.

Researchers used many methods in the literature while calculating the determinants of profitability of banks. Few researchers practiced the Generalized Method of Moments in most of the studies (Dietrich & Wanzenried, 2014; Goddard et al., 2013; Tan, 2016). We used two step system GMM in this study as an estimation technique. Table 1 shows the measurement of all the variables used in this study.

Table 1. Variable formulation.

Dependent variables	Measurement of variables
Net Interest margin	(Total interest income –total interest expenses)/(Total Assets)
PBT	Bank's Profitability before taxes/ Total assets
Independent variables	
Bank's Specific Variable	*Measurement*
Size	Natural logarithm of total assets
Capitalization	Total shareholder's Equity/ Total assets
Diversification	Non-interest income/ Total Revenue
Taxation	Tax/Operating profit before tax payment
Operational cost management	Operational cost/Total assets (OCM)
Z-score	$Z - score_{it} = \frac{ROA_{it} + \frac{E_{it}}{TA_{it}}}{\delta ROA_{it}}$
Credit risk	Loan loss provisions/Gross loans
Liquidity risk	Liquid Assets/Total Assets
Industry Specific Variable	*Measurement*
HH Index	HHI is the sum of the squares of the market shares (assets) of each bank in the financial system
Macroeconomic Variables	*Measurement*
GDP growth rate	Annual GDP growth rate
Inflation	Annual inflation

RESULTS AND DISCUSSIONS

The section of results and discussions displays the empirical conclusions. In this section, we first present the results of descriptive statistics of all the variables used in this paper, then correlation analysis, and finally for regression analysis using the two-step system GMM estimator.

Descriptive Statistics

Descriptive statistics presented in a Table 2, showing the mean, standard deviation, minimum and maximum values of all the variables being used in the study for the banking industry of Saudi Arabia. Mean values of profitability measures and the minimum and maximum values show stability in profitability in Saudi banks during the study period. Not much variation has been examined.

As far as other explanatory variables are concerned, mean values of size and capitalization show the strength in the Saudi Arabian banking sector. Summary statistics of taxation display lower to higher tax rates are being paid by banks of Saudi Arabia. Operational cost management values show that Saudi Arabian banks efficiently managed their operational cost-efficiency. The lower values of non-performing loans suggest that Saudi Arabian banks have lower credit risk. The mean higher values of z-score indicate that Saudi Arabian banks are stronger having less probability of insolvency. We used a non-structural measure to calculate competition in Saudi Arabian banks that is Lerner Index. We used a structural measure for measurement of bank competition that is HH-index.

The mean value of Lerner Index is 0.329 shows the bank competition in Saudi Arabia (higher values indicate less competition). As far as HHI value is concerned, values less than 1500 are considered as there is perfect competition in the market, so the values of aforementioned Table show that there is perfect competition in Saudi Arabian banks.

Table 2. Summary statistics.

Variables	Mean	Std. Dev.	Min.	Max.
Year	2015	2.594	2011.000	2019
NIM	.025	.005	0.014	.042
PBT	.019	.005	0.003	.033
Size	18.435	1.378	14.289	20.045
Capitalization	.189	.135	0.093	.759
Diversification	.187	.079	0.021	.429
Taxation	.231	.276	0.001	1.469
Operation cost management	.015	.005	0.009	.03
Credit risk	.023	.021	0.001	.117
Liquidity risk	.251	.136	0.081	.719
Z-score	71.63	55.984	17.430	235.798
Lerner Index	.329	.129	0.045	.566
GDP growth rate	3.285	2.976	-0.742	9.997
Inflation	1.918	2.206	-2.093	5.826
HHI	1337.219	62.422	1247.485	1426.794

Table 3 shows the correlation among variables. We checked the correlation coefficient of all the explanatory variables to examine if there is multicollinearity among variables. Correlation values show that there is no issue of multicollinearity, and we can safely proceed to regression analysis. Table 4 shows that the empirical results show the relationship among all the variables being involved in this study by using two step GMM econometric technique.

Table 3. Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Size	1.000											
(2) Capitalization	-0.322*	1.000										
(3) Diversification	0.271*	-0.548*	1.000									
(4) Taxation	-0.093	0.018	-0.207*	1.000								
(5) Operational cost management	-0.053	-0.235*	0.543*	-0.157	1.000							
(6) Credit risk	-0.238*	0.126	0.061	-0.015	0.522*	1.000						
(7) Liquidity risk	-0.304*	0.378*	-0.287*	0.070	-0.226*	0.046	1.000					
(8) Z-score	-0.066	0.268*	-0.368*	-0.122	-0.217*	-0.283*	0.023	1.000				
(9) Lerner Index	0.445*	-0.106	-0.023	-0.084	-0.601*	-0.239*	-0.081	-0.004	1.000			
(10)HH Index	-0.098	-0.078	0.488*	0.081	0.001	-0.144	0.096	-0.053	0.187	1.000		
(11) GDP growth rate	-0.103	-0.049	0.358*	0.136	0.035	-0.083	0.084	-0.030	0.161	0.238	1.000	
(12) Inflation	-0.100	-0.056	0.354*	0.200*	0.011	-0.122	0.091	-0.035	0.157	0.527*	0.462*	1.00

*** p<0.01, ** p<0.05, * p<0.1.

Table 4. Empirical analysis (Lerner Index as competition indicator).

Variables	NIM		PBT	
	Coef.	t-statistics	Coef.	t-statistics
L	-.119*	-1.81	-1.063**	-2.28
Size	-.009	-1.71	-.004	-0.29
Capitalization	-.016	-0.92	-.092	-0.41
Diversification	-.095***	-3.34	-.246	-1.65
Taxation	-.008	-1.29	-.069	-1.17
Operational cost management	0.019	0.212	0.032	0.653
Liquidity risk	-.028	-0.92	-.059	-0.66
Z-score	0	0.51	.001	0.96
Credit risk	-.007	-0.09	-.357	-1.15
Lerner Index	.028**	2.47	.19*	1.94
GDP growth rate	0**	2.22	0	0.66
Inflation	0	0.36	.002	0.94
Constant	.207*	1.91	.089	0.29
No. of observations	96		96	
No. of instruments	43		52	
F-test	4718.6		173.984	
AR2	0.358		0.726	
Hansen-J test	0.763		0.658	

Note: *, ** and *** denotes significance at 10, 5 and 1% levels, respectively.

The coefficients of the lagged dependent variables (NIM & PBT) are significant, showing that the models used in this study are Dynamic panel models and not static ones. The F-statistics reports the joint significance of the variables. The validity of the instruments is being monitored by the Hansen J-test. This test is consistent if there is heteroscedasticity and autocorrelation is present in the data set. This study applied two step GMM. Lerner Index showing positive values with profitability NIM & PBT)

depict that bank competition is negatively influencing the profitability of banks in Saudi Arabia (Nuraini, 2019). This is according to the findings of the Structure Conduct Performance (SCP) Hypothesis (Batten et al., 2019; Tan, 2016). Results explain that banks that have more or higher profits usually have a market power that is high; high market power means less competition. Bigger market share helped to get more profitability but resultantly competition is lesser. As far as risk variables are concerned, z-score, credit risk, and liquidity risk have no relation with profitability (NIM & PBT).

Table 5. Empirical analysis (HH Index as competition indicator).

Variables	NIM		PBT	
	Coef.	t-statistics	Coef.	t-statistics
L	-.443**	-2.45	-1.773**	-2.22
Size	.001	0.08	-.064	-1.46
Capitalization	-.108	-1.85	.115	0.74
Diversification	.004	0.21	-.285	-1.54
Taxation	.003	0.66	.04	1.41
Operational cost management	0.005	0.130	0.001	0.122
Liquidity risk	.002	0.05	-.058	-0.73
Z-score	0	2.08	-.002*	-2.08
Credit risk	.189**	2.31	-.349	-1.12
HHI	0***	-4.33	0	0.70
GDP growth rate	.001***	4.96	0	-0.03
Inflation	-.001**	-2.60	-.003	-1.66
Constant	.089	0.73	1.399	1.49
No. of observations	96		96	
No. of instruments	29		29	
F-test	100.808		19.768	
AR2	0.695		0.171	
Hansen-J test	0.653		0.853	

Note: *, ** and *** denotes significance at 10, 5 and 1% levels, respectively.

Table 5 identifies the empirical results that when competition is measured by the HH-Index, it shows the positive competition with net interest margin and profit before taxes which demonstrates that there is high competition in Saudi Arabian banks results in a decrease in profits.

As far as risk indicators are concerned, there is no relation of liquidity risk with profitability (NIM & PBT) in Saudi Arabian banks. Z-score showing the coefficient values which are significantly negative with profitability (PBT) identifies that when there is more insolvency risk, then the profitability of the banks be decreased. The significant positive values of credit risk for profitability (NIM) are similar to the results of Boahene et al. (2012). Results reveal that risk-adjusted returns are being targeted by risk-averse shareholders trying to gain more profits to compensate for the higher credit risk.

Inflation has a significant negative impact on profitability (NIM). It refers to the fact that inflation is unanticipated in Saudi Arabia over the sample time period; when inflation is not fully anticipated, then loan losses will be expanded, which will cause a decrease in the profitability of banks. GDP has a significant positive relation with profitability (NIM). The result signifies that the demand for lending increases in the growing economy (Athanasoglou et al., 2008).

CONCLUSION AND POLICY IMPLICATION

The paper attempts to analyze the nexus among risk, competition, and profitability in the Saudi Arabian banking sector for the period 2011-2019. The findings of the study signify the competitive environment in Saudi Arabian banking sector that is negatively influencing profitability. The findings get support from the Structural Conduct Performance Hypothesis. As far as the impact of different categories of risks on profitability is concerned, Credit risk values showing positive relation with profitability (NIM), reveal that risk-adjusted returns are being targeted by risk-averse shareholders trying to gain more profits to compensate for the higher credit risk. In addition to that, there is no impact of liquidity risk in Saudi banks; only a z-score is found to decrease the profitability.

The findings of the study present useful insights for policymakers as the impact of different risks and competition is analyzed for the first time in the Saudi Arabian banking industry. The outcome of the study provides comprehensive framework to the Central bank and other regulatory authorities to introduce micro and macro prudential policies that are aligned to the stability of the financial system. Saudi Arabian banking sector seems to be more competitive, which in turn decreases profitability, so the Saudi Arabian government should popularize a few entry barriers to cover this issue.

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