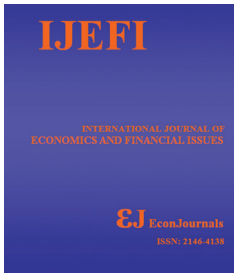


International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2019, 9(2), 12-23.

The Effect of the 2008 Global Financial Crisis on the Capital Structures of Conventional and Islamic Banks in the Gulf Cooperation Council Region

Talla M. Aldeehani*

College of Business Administration, Kuwait University, Kuwait. *Email: talla@cba.edu.kw

Received: 19 November 2018 **Accepted:** 01 February 2019 **DOI:** https://doi.org/10.32479/ijefi.7459

ABSTRACT

The paper investigates the determinants of capital structures of conventional banks (CBs) and Islamic banks (IBs) before and after the 2008 global financial crisis. We gathered data on the banking industry of the Gulf Cooperation Countries for the period 2003-2016 covering 53 banks, 10 of which are Islamic. Our results indicate that the crisis had significant effects on bank liquidity, lending, profitability, size and growth. They also indicate that the capital structures of CBs and IBs, before and after the crisis are determined differently. Due to the contractual setup and capital adequacy requirements, we believe that IBs, had it not been for the faith, do not enjoy enough maneuverability space to enhance shareholders wealth. Accordingly, questions regarding how much IBs' clients know about faith and the contradicting provisions of Islamic law in the context of investment decision making were raised. Practical and theoretical implications and recommendations are discussed.

Keywords: Capital Structure, Islamic Banks, Financial Crisis
JEL Classifications: G01, G21, G32

1. INTRODUCTION

Like any other business firm, a bank exists, mainly, to achieve wealth maximization for its owners. Operationally, they do that by borrowing money (from depositors and pay interest to them) and lending money (to borrowers and receive interest from them). The positive difference between the interest received and the interest paid is called the spread. Interest spread is the prime source of bank profitability which drives its value. As such, banks must recognize deposits as an obligation and report them as debt. Therefore, deposits represent a substantial proportion of a bank's capital structure.

The question of whether capital structure affects value or not is still debatable in the theoretical and empirical literature. However, scholars and regulators recognize its association with risk. That is the risk of being unable to pay interest and principal to lenders. To mitigate that risk, global and domestic regulators have been imposing capital adequacy measures. Islamic banks (IBs), however, are less concerned with this risk (the failure to repay interest to depositors.) That is because they mobilize deposits under the Islamic agreements of mudaraba, musharakah, murabahah, etc. which do not promise (religiously, prohibits) the return of interest and do not guarantee the return of the principal. Therefore, the capital structure of an IB, typically, consists of three components: Debt, equity and deposits which are considered neither debt nor equity.

The uniqueness of the IB capital structure as compared to that of a conventional banks (CB) has many theoretical and practical implications and raises many questions. This paper, strives to provide answers to questions that are related to the capital structure. Legitimate questions in this context include: (1) What are the determinants of the capital structures of IBs versus CBs?

(2) Did the 2008 global financial crisis affect the mix of capital structures of both types of banks? If it did, then, (3) have the determinants changed?

The nature of this inquiry requires a market where both CBs and IBs co-exist and operate for a, relatively, prolonged period. To conduct this investigation, the market of the six countries of the Gulf cooperation council (GCC) fits this requirement.

In the following section of the paper, we review the relevant literature with the objective of identifying the variables to be investigated and extract our research hypotheses. It will, then, be followed by the research methodology section where we discuss the scope of the paper, the nature of the data collected, and the methods used to test the hypotheses. We, then, present and discuss our results and compare them with the existing studies. That is followed by the concluding remarks where we briefly review the process of our investigation, summarize and emphasize our main findings concluding with the possible implications and recommendations.

2. REVIEW OF THE RELEVANT LITERATURE

Most of the literature on corporate structure considers the work of Modigliani and Miller (MM) (1958 and 1963) as a milestone in the development of the theory. In a nutshell, MM (1958) argue, under certain conditions, and sometimes considered unreal, that the capital structure is irrelevant to value. Some scholars have quickly criticized MM's propositions as being unrealistic. To rectify their propositions, MM (1963) have relaxed one critical assumption that is related to corporate taxes and argued that, because interest on the debt (one important proportion of corporate capital structure) reduces taxes payable to the government, then it increases profit which is a main driver of corporate value. This argument implies that more debt (to a certain level when bankruptcy risk offsets the tax saving benefit of the debt) leads to better value.

Relating this theory to today's banking industry is very challenging for several reasons. First, while non-banking firms use debt to fund their businesses (products/services), CBs consider debt as their sole business. For some banks, debt (borrowing in the form of client accounts) forms over 90% of their total assets. They depend on interest spreads to make profits. Tax treatment of bank interest differs than that of non-banking firms. Second, banks are missing lending opportunities because of the regulatory constraints on the capital requirement. Bankers believe that to maintain the minimum requirement of regulatory percentage of capital, raising more debt must be accompanied with more capital which has a higher cost that offsets the benefit of the interest spread. Miller (1995) has called for scrapping the current costly banking system in favor of more corporate independence in raising funds based on "*Fisher's 100% money proposal*." Third, banks are taxed differently in different countries. In fact, some countries do not apply taxes. Fourth, during the 1970s, and still growing in numbers and size all over the world, IBs have been offering unique forms of banking mechanisms based on the prohibition of paying or receiving interest. In fact, they do not use debt to attract external funding. Instead, they use unconventional means of profit and loss sharing mechanisms and contracts assuming no financial risk. Nevertheless, like CBs, they abide by similar regulatory capital requirements.

In light of this background, we recognize three strands of research related to the capital structure of banks. The first; strives to investigate the applicability of the theory to banks. The late Merton Miller, one of the M and M pioneers of this theory, wrote a paper titled "*Do the M & M propositions apply to banks?*" in response to this thread of research. He concluded with only three words "*Yes and no*" (see Miller, 1995). "*Yes*" if banks were left to work within a capital market devising its own rules and regulations and "*no*" when confined with certain government and international regulation limiting their ability to raise external funding. Obviously, we have no solid answer to that question. However, today, the second answer applies since the capital structure of banks is highly regulated. Most of the research on this subject confirm this conclusion. Kashyap and Stein (2000), for example, did an imperial investigation of the applicability of MMs "indifferent" proposition on all insured commercial banks in the US and concluded that the capital structure does matter. Indeed, Diamond and Rajan (2000) came up with the same conclusion. Similar arguments were made by Mehran and Thakor (2011) and Miles et al. (2013) among others. De Angelo and Stulz (2013), on the other hand, argue that although neutrality proposition of MM does not hold, they provide evidence of the effect of operating policy on bank value.

The second and third strands of research deal, mainly, with the direction of causal effect. The second looks at the capital structure as an explanatory variable. The general outcome of this strand, which is more extensive, confirms the notion that bank capital structure matters to performance and value. Because of the unrealistic assumptions, the critique of MM's proposition of capital structure irrelevance to value started right after the publication of their renowned paper in 1958. In 1963, MM relaxed the non-tax assumption and concluded that the capital structure does matter to value, and that value is maximized with 100% debt. Later, Miller (1977) considered personal taxes and confirmed the relevance of capital structure to value. For banks, recent scholars including Berger and Di Patti (2006), Naceur and Kandil (2009), Naceur and Omran (2011), Adams and Mehran (2012), Awunyo-Vitor and Badu (2012), Berger and Bouwman (2013), Goyal (2013) and Gambacorta and Shin (2016) have proved that the capital structure of a bank does explain performance and value.

The third strand of research, which is less extensive, investigates the variables that explain bank capital structure. This strand becomes narrower when considering IBs with their unique capital structure. Examples of such research include the work of Kleff and Weber (2008) who investigated how German banks determine their capital compared to other countries. They largely confirmed the findings of the research done on other countries. They tested the effects of variables such as profitability, risk, size, deposits, provisions and regulatory pressures. Gropp and Heider (2010) investigated the determinants of bank capital

structure of US and European bank during the period from 1991 to 2004. They documented a shift in bank capital structure from deposits to non-deposit liabilities. All explanatory variables had significant effects. Their explanatory variables include the market to book value, profitability, size, size of collaterals and dividends. The dependent variable is defined as one minus the equity over assets. Examples of research considering IBs, within this strand of research, include the work of Meero (2015) who explored the relationship between the capital structure and performance IBs compared to CBs in the GCC region during 2005-2014. He used the profitability measures of return on assets and return on equity to represent performance. The capital structure variables include debt to total assets ratio, equity to total assets ratio and debt to equity ratio. He found a significant effect of the ROA ratio on the capital structure of both types of banks. Meero's study, however, did not control for the effect of the 2008 global financial crisis. Similarly, Abdullah and Naser (2015) studied the determinants of commercial banks' capital structure in the GCC region during 2001-2010 without controlling for the crisis. They considered the variables of ROA, liquidity, tangibility, risk, bank age, growth and size as determinants of bank leverage. All variables, except liquidity and risk, were found to have significant effects.

Based on this review of the literature, we argue that we still do not know what determines the capital structure of a CB compared to an IBs when we control for market conditions. Still, we do not know how the capital structure of both bank types reacted in response to a significant global financial crisis.

3. DEVELOPMENT OF RESEARCH CONCEPTUAL FRAMEWORK AND HYPOTHESES

Following the previous concluding arguments, to investigate the determinants of capital structure of CBs and IBs, we must control for country-specific market conditions and country-specific regulations. For this purpose, we need to focus on a region of countries hosting an adequate sample of CBs and IBs who share similar market conditions and bank regulation (in this case, the GCC region).

For the explanatory variables, we follow the typical performance measures identified by previous research. Because CBs and IBs differ in their capital structures and because IBs do not consider debt as a source of external funding, we exclude leverage as a proxy for the capital structure. Banks are confined to a minimum percentage of capital of about 8% of risk-weighted assets. They tend to adhere to this ratio. Therefore, we also exclude the level of equity. Since the level of deposits is the main source of external funding for both types of banks, it seems plausible to consider the amount of deposits on total assets (*doa*) as a proxy of the capital structure. The ratio of deposits to total assets, as a capital structure measure was the focus of many researchers (see for example Kusairi et al. 2018) investigating the stability of banks. Within this framework, we consider the effect of some bank performance measures on the level of deposits as a proxy for the capital structure for CBs and IBs. We want to know what determines the structure. Furthermore, we want to know how these determinants differ in response to a major global financial crisis.

We picked performance explanatory variables that are typically considered by earlier research. These variables represent liquidity, lending, profitability, tangibility, growth ($[EPS_t - EPS_{t-1}]/EPS_{t-1}$), size (ln [A]), and the risk index.

Liquidity (*liq*) is represented by the ratio of cash and cash equivalent items divided by total assets. This is a credible measure of very short-term liquidity of a bank to mean very short-term liabilities and urgent withdrawal of cash from lenders. It is assumed to be an important determinant of capital structure on the other side of the balance sheet. This ratio is also assumed different for each bank type.

Lending (len) is a measure of the amount of loans/facilities provided by the bank about its total assets. We believe this is an important determinant of the bank capital structure as it is the main business of all banks. We are concerned with the financial size of lending for CBs versus IBs.

Profitability (*pro*) is represented by the ratio of net income to total equity. With this ratio, we want an indicator of how much money a shareholder makes. This is important, as the ratio is a driver of bank value, from an owner point of view. Since firm value maximization is the ultimate goal, and it is associated with profitability, we believe that the capital structure could be explained by profitability.

Tangibility (*tan*) is measured by the amount of net fixed assets of the bank in relation to its total assets. The reason for including this variable as a possible determinant of capital structure is to validate results obtained by previous research.

Equity (*equ*), this variable is represented by the ratio of total equity to total assets. We believe that this variable is highly regulated by international and local authorities. That is because the increase in deposits is reflected in an increase in the regulatory capital of banks as they have to abide by a certain minimum. Many of the reviewed literature have confirmed its association with the level of deposits. As such, we do expect a positive causal effect of the level of equity on the capital structure of both bank types.

Growth (*gro*), There are many proxies for firm growth. We adopt the growth of earnings per share due to its strong association with the bank value. It is calculated as EPS of the years less its lagged value dividing the product by the lagged value. We assume the growth rate of the bank is a determinant of its capital structure.

Size (*siz*) is the natural log of a bank's total assets. Many researchers, as discussed in the relevant literature, have found that size does matter for a bank's capital structure. We want to validate this finding for the conventional and IBs operating in the GCC region.

Risk index (*ri*) is represented by the ratio of return on total assets (ROA) and total equity on total assets (*E/A*) divided by the standard

deviation of return on assets (σ_{ROA}). Clearly, this ratio measures the rate of profit the bank makes on its total assets and the rate of equity on total assets per one unit of the standard deviation of the return of total assets. This is depicted in this equation:

$$RI = \left(\frac{ROA + E / A}{\sigma_{ROA}} \right)$$

Higher values of *RI* indicate lower risks and lower values indicate higher risks. Our selection of this measurement of risk is motivated by the fact the capital structure of our bank type is fundamentally different. Since IBs do not assume debt as a major source of funding, we preferred a proxy of risks that evades the size of debt.

The relevance of MM propositions to the capital structure of a CB is still controversial. In fact, there is a strong argument of its irrelevance to IBs due to the prohibition of interest. The fundamental difference of capital structures of CBs and IBs implies that they must be determined differently. Furthermore, as each bank type perceives financial risk relevant to external funding differently, one would expect that they respond differently to a global financial crisis in terms of their capital structures. Kok and Schepens (2013) studied the reaction of large European banks to the 2008 global financial crisis and found that the capital structure is significantly affected. Schepens (2016) investigated the effect of taxation on capital structure of banks and found that favorable tax treatment can lead to better bank capitalization. Schandlbauer (2017) found similar results with regard to taxation treatment and capital structure.

Therefore, our main hypothesis is that the capital structures of CBs and IBs in the GCC region and all the identified potential determinants have changed significantly in response to the 2008 global financial crisis. We also hypothesize that the capital structures of CBs and IBs are determined differently, before and after the crisis, by the variables identified.

4. DATA, METHODOLOGY AND RESULTS

To investigate causal effects before and after the 2008 global financial crisis, we strived to consider as many earlier financial statements as possible. We targeted the period from 2003 to 2016. Relatively new banks were cancelled out. Additionally, to maintain a strongly balance panel data; we cancelled out more banks with an insufficient number of years. We, therefore, ended up with 53 banks in the GCC region, 43 of which are CBs and 10 are IBs.

Before analyzing causality, it is always interesting to look at the descriptives of the data starting with the correlation matrix of all the variables. This matrix is shown in Table 1.

Table 1 shows that our suggested dependent variable (dao) is significantly correlated with three of the suggested regressors. The correction coefficient is significantly positive with liquidity. This is understandable as the increase in deposits is logically associated with an increase in cash and liquidity. The correlation coefficient is significantly negative with the size of equity. The interpretation of this result is that the GCC banks have a comfortable capital adequacy rate that with the increase of deposits they do not have to increase their capital because the minimum required ratio has already been achieved. The third significant correlation coefficient is with the size of assets. This coefficient is positive which is also logical as the increase in deposits is reflected in an increase in total assets. As for the correlation between the suggested independent variables, we notice highly significant coefficients between the size of equity and the size of total assets. This high correlation may be an indicator of the undesirable problem of co-linearity when estimating multiple regression models.

We also present in Tables 2 and 3 an analysis of the variables means grouped according to the status of the economy for each bank type.

Tables 2 and 3 indicate differences in the means of the variables selected. We do not know, however, whether or not these differences are significant. To perform a test of mean significance, we need to check whether or not the data exhibits normal distributions. Table 4 shows the results of the Shapiro-Wilk W test for normality.

The results presented in Table 4 indicate that all values are greater than the W score with significant P = 0.0000 for all z-scores rejecting the null hypothesis that data is normally distributed. These results imply that we need a test that does not assume normality. We, therefore, choose the Kruskal-Wallis equality-of-populations rank test. The results of this test are exhibited in Table 5.

Table 5 indicates that the rank sum of five of the suggested explanatory variables is significantly different. These variables are liquidity, lending, profitability, size and growth. The other three suggested explanatory variables and the suggested dependent variable exhibited insignificant results.

A graphical representation of each of variables found to have a significant rank sum in addition to the suggested dependent variable representing capital structure is shown Figure 1. The

Table 1: Correlation matrix

Variables	*doa*	*liq*	*len*	*tan*	*eoa*	*roe*	*ri*	*siz*	*gro*
doa	1.0000								
liq	0.2317	1.0000							
len	0.1571	−0.0214	1.0000						
tan	0.0309	−0.0323	0.1538	1.0000					
eoa	−0.5309	−0.0315	−0.1685	0.1243	1.0000				
roe	−0.0046	0.0619	−0.0150	0.0187	0.0789	1.0000			
ri	0.0467	0.1010	−0.1147	−0.0078	0.0870	0.0863	1.0000		
siz	0.3720	0.0462	0.0173	−0.0305	0.4983	0.0102	0.0022	1.0000	
gro	0.0310	−0.0100	0.0153	−0.0229	−0.0028	0.0165	−0.0311	−0.0184	1.0000

Table 2: Means of the variable for CBs grouped by economic status

Variables	Conventional banks	Mean	SE	[95% CI]	
liq	Before crisis	0.0847741	0.0047203	0.0755025	0.0940458
	After crisis	0.1020291	0.0030688	0.0960013	0.108057
len	Before crisis	0.5753593	0.0091717	0.557344	0.5933746
	After crisis	0.6067732	0.0067001	0.5936127	0.6199337
tan	Before crisis	0.0094138	0.0005176	0.0083972	0.0104305
	After crisis	0.0090659	0.0003064	0.008464	0.0096677
doa	Before crisis	0.7445629	0.0090024	0.7268801	0.7622457
	After crisis	0.7357359	0.0071636	0.721665	0.7498069
eoa	Before crisis	0.1497695	0.0043089	0.1413058	0.1582333
	After crisis	0.1501975	0.0028102	0.1446776	0.1557174
roe	Before crisis	0.1356301	0.0453454	0.0465617	0.2246986
	After crisis	0.1113172	0.0032204	0.1049915	0.1176428
ri	Before crisis	24.90763	1.288443	22.37684	27.43842
	After crisis	24.40225	0.9618978	22.51287	26.29163
siz	Before crisis	8.888431	0.0763232	8.738515	9.038347
	After crisis	9.612693	0.058422	9.497939	9.727447
gro	Before crisis	0.2626054	0.1556546	−0.0431352	0.568346
	After crisis	1.045218	0.8069885	−0.5398887	2.630324

CBs: Conventional banks

Table 3: Means of the variable for IBs grouped by economic status

Variables	Islamic banks	Mean	SE	[95% CI]	
liq	Before crisis	0.0456499	0.0039994	0.0377371	0.0535628
	After crisis	0.0697136	0.0055176	0.0587969	0.0806303
len	Before crisis	0.7252132	0.0138446	0.6978214	0.752605
	After crisis	0.7151494	0.0089449	0.6974516	0.7328471
tan	Before crisis	0.0148008	0.0024801	0.0098939	0.0197077
	After crisis	0.0158947	0.0017734	0.012386	0.0194034
doa	Before crisis	0.6371924	0.032132	0.5736184	0.7007664
	After crisis	0.627567	0.0245712	0.5789523	0.6761816
eoa	Before crisis	0.1719849	0.0100945	0.1520127	0.1919572
	After crisis	0.1481437	0.0052177	0.1378202	0.1584671
roe	Before crisis	0.178939	0.0145436	0.1501641	0.207714
	After crisis	0.0700495	0.0123986	0.0455185	0.0945804
ri	Before crisis	18.45237	1.647763	15.19223	21.71251
	After crisis	15.54728	1.058248	13.45351	17.64105
siz	Before crisis	8.317091	0.1819041	7.957189	8.676992
	After crisis	9.250331	0.1422288	8.968928	9.531734
gro	Before crisis	0.4462808	0.2119353	0.0269616	0.8655999
	After crisis	−0.1754537	0.1534661	−0.4790902	0.1281828

Table 4: Shapiro-Wilk test for normal data

Variable	Observations	W	Value	z-score	P value
liq	689	0.91895	36.433	8.766	0.00000***
len	689	0.92204	35.045	8.671	0.00000***
tan	689	0.67418	146.458	12.158	0.00000***
doa	689	0.70741	131.523	11.896	0.00000***
eoa	689	0.86347	61.374	10.037	0.00000***
roe	689	0.12208	394.635	14.574	0.00000***
ri	689	0.77185	102.557	11.289	0.00000***
siz	689	0.98490	6.786	4.669	0.00000***
gro	689	0.05650	424.110	14.750	0.00000***

*, ** and *** Significant at the 10%, 5% and 1% levels respectively

means of each of the selected variables are grouped according to the country, bank type and the status of the economy. We start with the variable representing the capital structure (doa) illustrated in Figure 1.

Figure 1 indicates that KSA enjoys the highest means of deposits to assets ratio followed by Oman, UAE (about average), Qatar, Kuwait and lastly Bahrain. This result may be explained by the more population, KSA enjoys compared to the other GCC countries. In fact, Oman enjoys the second higher population which is ranked second. Compared to IBs, CBs exhibit higher means of deposits to asset ratios when the ratio is grouped according to bank type. This result may be explained by the size of CBs compared to IBs. Although insignificant, after the crisis, GCC banks enjoyed a slight increase in the ratio of deposits to assets. Using the Kruskal-Wallis test of equality of rank, the differences are statistically significant with a χ^2 *(5)* value of 166.994 and P = 0.0001. The same applies when grouping according to bank type. The differences are statistically insignificant when grouping according to the status of the economy.

Regarding liquidity, Oman enjoys the highest means of the ratio of liquidity to assets followed by UAE, KSA, Kuwait, Bahrain and then Qatar. A logical explanation is that countries with more economic growth are likely to exhibit less bank liquidity. This explanation is supported by the low means of the growth ratio

Table 5: Kruskal-Wallis equality-of-populations rank test

Variable	Status of crisis	Observations	Rank sum	χ^2	P value
Liquidity	Before	265	77625.00	29.477	0.000***
	After	424	160080.00		
Lending	Before	265	85263.00	5.877	0.0153**
	After	424	152442.00		
Profitability	Before	265	122934.00	153.670	0.0001***
	After	424	114771.00		
Tangibility	Before	265	90395.00	0.164	0.6854
	After	424	147310.00		
Equity to total assets	Before	265	90377.00	0.170	0.6801
	After	424	147328.00		
Deposits to total assets	Before	265	94781.00	1.743	0.1867
	After	424	142924.00		
Risk index	Before	265	92873.00	0.324	0.5689
	After	424	144832.00		
Bank size	Before	265	71832.00	59.419	0.0001***
	After	424	165873.00		
Growth of EPS	Before	265	103456.00	22.404	0.0001***
	After	424	134249.00		

*, ** and *** significant at the 10%, 5% and 1% levels respectively

Figure 1: Means of *doa* grouped by country, bank type and the status of the economy

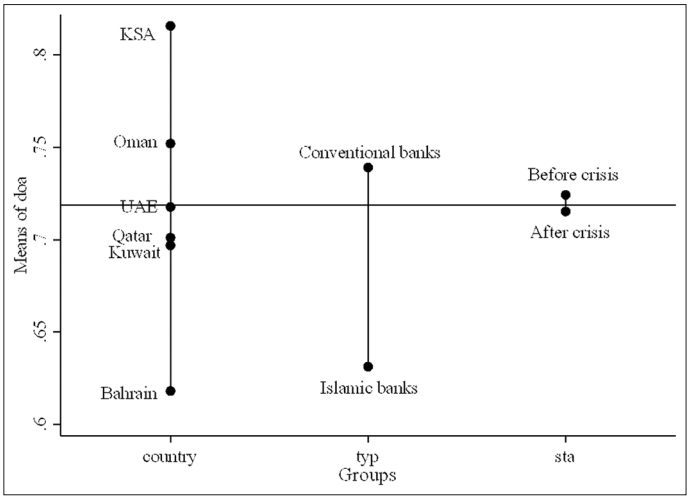
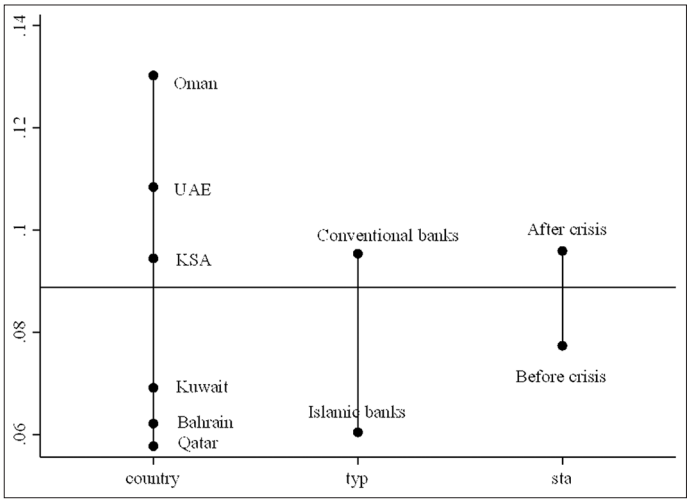


Figure 2: Means of *liq* grouped by country, bank type and the status of the economy



for Oman discussed later. The differences in the means of *liq* ratio are statistically significant with a $\chi^2(5)$ value of 149.366 and P = 0.0001. The same applies when grouping according to bank type and status of the economy. Compared to IBs, CBs enjoys more liquidity. This result may be explained by the fact that IBs enjoy a variety of instruments to mobilize funds compared to CBs hence the less availability of liquidity.

The differences in the mean lending ratio are highly significant across the six countries with a $\chi^2(5)$ value of 150.651 and P = 0.0001. The highest is Oman, followed by UAE, KSA, Kuwait, Bahrain and lastly Qatar. This result may be related to the size of assets. When lending is high compared to the size of assets, then the ratio is higher. The differences in the ratio for the other groups are also statistically significant.

The difference of rate of return on equity means is significant with a $\chi^2(5)$ value of 88.580 and P = 0.0001. It is also statistically significant when grouped according to bank type and status of the economy. The lower profitability of Kuwait and Bahrain may be interpreted by more competitive and relatively more mature banking system. With higher competition, one would expect a lower margin of profitability. The higher and significant means of CBs profitability may be interpreted by the fact CBs were able to enjoy earlier stability following the 2008 crises compared to IBs. The higher and significant means of profitability before the crisis may be explained by the effect of the crisis that started in 2008. After the crisis, all banks suffered a decrease in most of the performance indicators including profitability.

Differences in size according to all groups were found to be statistically significant. Based on the country grouping, KSA enjoys the larger banks, followed by Kuwait, Qatar, UAE, Bahrain and lastly Oman. When grouping according to bank type, CBs enjoy larger bank size. This is understandable as IBs are relatively new. The size of banks after the crisis appeared larger. This is also logical as more banks were established and the existing banks are expanding.

The means of the growth ratio based on the country and bank type grouping were statistically insignificant. However, it is highly

Figure 3: Means of *len* grouped by country, bank type and economy status

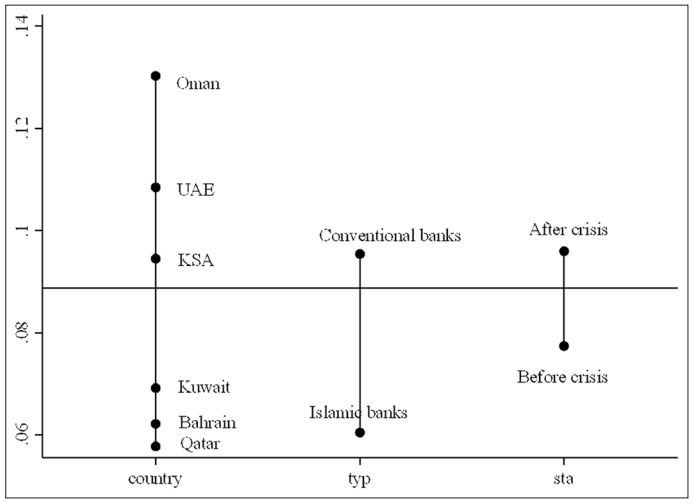
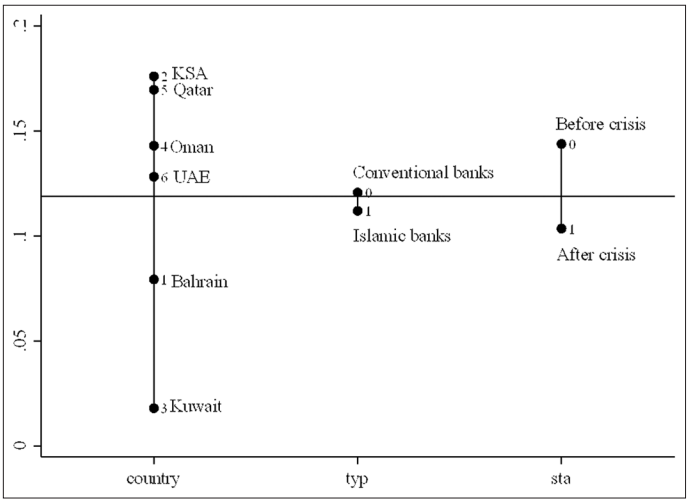


Figure 4: Means of *roe* grouped by country, bank type and the status of the economy



significant when grouping according to the status of the economy with a χ^2 *(1)* value of 22.404 and P=0.0001 (Figures 2-6).

4.1. Estimating Causal Effect

To model and estimate causal effects for such data, researchers typically adopt one of two popular techniques: The fixed effects and the generalized least square with random effect. We believe it is plausible to follow suit. One may believe that the variation across the banks selected and countries is random and uncorrelated allowing the use of the random effect model rather than the fixed effect model. In the same time, however, we are interested in assessing the net effect of the explanatory variables on the dependent variable (representing the capital structure) after removing any time-invariant characteristics that are not associated with random variation. To choose between the two models, we shall use the Hausman selection technique.

Before the estimation process, however, we need to deal with some of the key issues of linear regression models. Data stationary, co-linearity, autocorrelation, and homoscedasticity are of utmost importance.

Figure 5: Means of *siz* grouped by country, bank type and the status of the economy

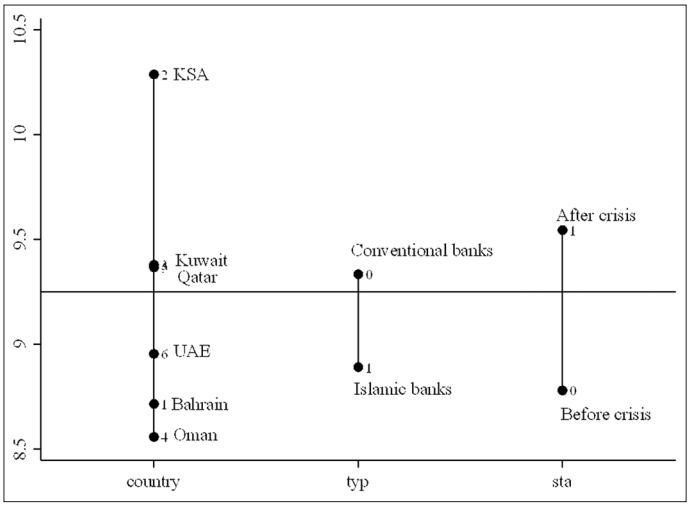
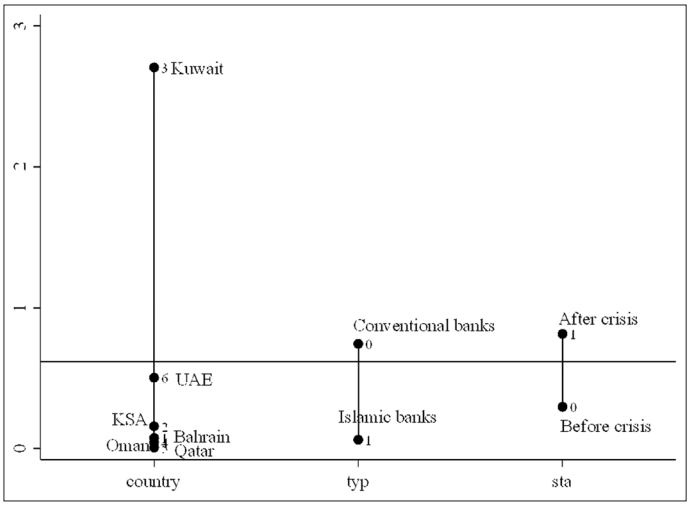


Figure 6: Means of *gro* grouped by country, bank type and economy status



For regression estimation to hold, we assume that the error term variance is constant. If it is not, then we are facing a heteroskedasticity problem which we need to deal with. One way of resolving this problem is to use a robust standard error in the estimation process instead of the regular standard error. The advantage of using the robust standard error is that it relaxes the OLS assumption that the errors are independent and identically distributed. Additionally, it does not change coefficients estimates and provides a better and trustworthy p-values. Autocorrelation is the assumption that the time series are correlated with its lagged values. We avoid this problem by using, relatively, a time series of fewer than 20 observations. For stationarity, we use the unit root test to isolate non-stationary panels. Finally, we deal with the co-linearity problem using the variance inflation factor (VIF). The higher the VIF score the higher the correlation between the independent variables. Some researchers consider a value of 10 or higher unacceptable. Others prefer 2.5 as a cutting point. Table 6 exhibits the results of the unit root test.

For 53 panels and 13 periods, the procedure tests the hypothesis that panels contain unit roots against the alternative hypothesis that they do not. All the results of the ADF regressions with 1 lag shown in Table 6 reject the null hypothesis indicating data stationary for all the variables at the 1% level of significance. As all the variables passed the unit root test, we then turn to check the problem of multi-co-linearity. Table 7 depicts the results of the VIF test.

All VIF scores for all the variables indicate values less than the critical value 2.5 indicating the relative independence of all possible explanatory variables.

Table 6: Results of the unit root test

Variable	Adjusted t-statistic	P value
liq	−5.2240	0.0000***
len	−4.8162	0.0000***
roe	−16.5155	0.0000***
tan	−8.9203	0.0000***
doa	−8.2779	0.0000***
eoa	−12.7418	0.0000***
ri	−14.8576	0.0000***
siz	−13.4110	0.0000***
gro	−19.2015	0.0000***

*, ** and *** Significant at the 10%, 5% and 1% levels respectively

Table 7: Results of the VIF test of multi-co-linearity

Variable	VIF	1/VIF
Eoa	1.43	0.697338
Siz	1.35	0.740663
len	1.08	0.924680
tan	1.05	0.949295
ri	1.04	0.964331
roe	1.02	0.980980
liq	1.02	0.983294
gro	1.00	0.997372

Mean VIF=1.12. VIF: Variance inflation factor

4.2. Choosing between Fixed Effect and Random Effect Models

To decide on which model to adopt, we perform the Hausman selection test. This test analyzes the correlation between the independent variables and the effects. If a correlation exists between the explanatory variables and unique errors, then the random model is more appropriate otherwise the fixed effect model is more appropriate. The null hypothesis of the test is that there is no correlation. The Hausman test requires the estimation of both models to analyze the calculated coefficients. The final results of this test are illustrated in Table 8.

The first column of Table 8 contains the selected explanatory variable. Coefficients (b) in the second column are the results of estimating an OLS regression with fixed effect using these regressors with *doa* representing the capital structure as a dependent variable. The third column contains the resulting coefficients (B) of the same OLS regression with random effect. The Hausman test analyzes the differences between the two coefficients as shown in the fourth column to estimate the standard error. The outcome of the test as shown in the bottom raw of the table indicates a χ^2 value of 31.87 with a P = 0.0001 rejecting the random effect model. As a result, a fixed effect model is adopted in this paper.

4.3. Estimating Fixed-effect Models

A common general panel data regression can be written as:

$$y_{it}=\alpha+bx_{it}+\varepsilon_{it} \quad (1)$$

Where y_{it} is the dependent variable of bank i at time t, α is constant, b is a coefficient, x_{it} is the explanatory variable for bank i at time t, and ε is the error term.

Table 8: Results of the Hausman test for model selection

Regressor	Coefficients		(b-B) Difference	Sqrt diag (V_b-V_B) SE
	(b) fe	(B) re		
liq	−0.0049553	−0.0004783	−0.004477	
len	0.1293911	0.1263613	0.0030298	
tan	−0.1439868	−0.1103547	−0.0336321	
eoa	−0.8797152	−0.8694178	−0.0102974	0.0334624
roe	−0.0031752	−0.0028118	−0.0003634	
ri	0.0027047	0.0024706	0.0002341	0.0003084
siz	−0.0239546	−0.0219104	−0.0020442	0.0001859
gro	0.000093	0.000099	−5.98e-06	

χ^2 (8)=(b-B)' [(V_b-V_B)$^{-1}$] (b-B) = 31.87. P value=0.0001 (reject random effect). Fixed effect model is more appropriate

Table 9: Results of the panel data regression using the whole period data set for conventional banks

Variable	Coefficient	Robust SE	Z	P value	[95% CI]	
liq	−0.0042879	0.0618109	−0.07	0.945	−0.1290273	0.1204515
len	0.1196892	0.0589347	2.03	0.049**	0.0007542	0.2386242
tan	0.3400648	0.5981068	0.57	0.573	−0.8669635	1.547093
eoa	−0.8894821	0.2327484	−3.82	0.000***	−1.359187	−0.4197768
roe	−0.0016019	0.0020978	−0.76	0.449	−0.0058355	0.0026317
ri	0.0024546	0.0011227	2.19	0.034**	0.0001888	0.0047204
siz	−0.020704	0.0063422	−3.26	0.002***	−0.0335031	−0.0079049
gro	0.000106	0.0000281	3.77	0.000***	0.0000493	0.0001627
_cons	0.9316772	0.0540751	17.23	0.000***	0.8225491	1.040805

R^2: 0.3003, F (8.42): 25.75, P value: 0.0000, *, ** and *** Significant at the 10%, 5% and 1% levels respectively

To investigate the effect of the selected explanatory variables on capital structure, excluding the variables representing the status of the economy and the type of bank, we estimate this model

$$doa_{it}=\alpha+\beta_1 leq_{it}+\beta_2 len_{it}+\beta_3 pro_{it}+\beta_4 tan_{it}+\beta_5 gro_{it}+\beta_6 siz_{it}+\beta_7 ri_{it}+\varepsilon_{it} \quad (2)$$

Where doa_{it} is the deposits to total assets ratio representing the dependent variable: Capital structure of bank i at time t. *leq* is liquidity, *len* is lending, *pro* is profit, *tan* is tangibility, *gro* is growth, *siz* is size, *ri* is the risk index, *sta* is the status of the economy and *typ* is the bank type. These are the explanatory variables. α, β_1, β_2, β_3, β_4, β_5, β_6, and β_7 and are coefficients. ε is the error term.

Following the estimation of equation (2) and to capture the response of each bank type to the global financial crisis, data will be split into four new data sets. Set 1 contains data on CBs before the crisis, Set 2 contains data on CBs after the crisis, Set 3 contains data on IBs before the crisis and set 4 contains data after the crisis. Equation (2) will then be re-estimated four times after dropping the variables representing the status of the economy and bank type.

Before investigating the causal effect for the two periods of before and after the financial crisis, we thought it would be interesting to analyze the effect for the whole period and then compare the determinants of capital structure for each data set. Table 9 depicts the results of estimating our fixed effect panel regression model for CBs for the whole period before and after the financial crisis.

With whole period data set, all the variables are significant determinants of the capital structure except for tangibility and profitability. The R^2 measure of goodness-of-fit with a value of 0.3003 implies the absence of other determinants that are not included in the model counting for about 70% of the variation in the capital structure. The model, however, is well-specified with an *F* score of 25.75 and a P = 0.0000.

Table 10 presents the results of estimating the data regression model for CBs using the before-the-crisis data set.

The results in Table 10 show that only for the eight variables have significant effects. These variables are the size of equity, profitability, risk index and growth of earnings.

Table 11 illustrates the results of estimating our model for CBs using the after-the-crisis period.

Table 11 indicates three significant determinants. These determinants are the size of lending, the size of equity and the risk index. These three variables count for about 42% of the variation in the capital structure as indicated by R^2. The *F* score and its P-value indicate a well-specified model.

A summary of the causal effects of each repressor on the capital structure of CBs for the three data sets is presented in Table 12.

For IBs, Table 13 presents the results of estimating the model using the whole period data set.

Table 13 shows four significant determinants of the capital structure of IBs. These determinants are the size of equity, profitability, the risk index and bank size in terms of its assets. These variable explain only13.65% of the variation in the capital structure as indicated by the R^2. The goodness-of-fit measure of *F* implies that the model is well specified with a score of 12.28 and P = 0.0000.

The outcome of estimating the model for IBs before the crisis is illustrated in Table 14.

Table 10: Results of the panel data regression model: Before-the-crisis period for CBs

Variable	Coefficient	Robust SE	Z	P value	[95% CI]	
liq	−0.0000495	0.0821096	−0.00	1.000	−0.1657533	0.1656544
len	0.1016996	0.091406	1.11	0.272	−0.0827652	0.2861644
tan	0.6845632	0.4324579	1.58	0.121	−0.1881722	1.557298
eoa	−0.6814098	0.232944	−2.93	0.006***	−1.15151	−0.2113099
roe	−0.0079121	0.0020261	−3.91	0.000***	−0.0120009	−0.0038232
ri	0.0002223	0.0010537	0.21	0.834	−0.0019042	0.0023487
siz	−0.0540994	0.0135232	−4.00	0.000***	−0.0813904	−0.0268084
gro	0.0016287	0.0007841	2.08	0.044**	0.0000463	0.0032111
_cons	1.257631	0.1093017	11.51	0.000***	1.037051	1.478211

R^2: 0.0698, F (8.42): 42.78, P value: 0.0000. *,** and ***Significant at the 10%, 5% and 1% levels respectively. CBs: Conventional banks

Table 11: Results of the panel data regression model: The after-the-crisis period for CBs

Variable	coefficient	Robust SE	Z	P value	[95% CI]	
liq	0.0131316	0.092976	0.14	0.888	−0.1745015	0.2007646
len	0.1826819	0.0895362	2.04	0.048**	0.0019905	0.3633733
tan	1.075596	0.8646527	1.24	0.220	−0.6693438	2.820536
eoa	−0.793377	0.2441036	−3.25	0.002***	−1.285998	−0.3007558
roe	0.043631	0.0401241	1.09	0.283	−0.0373426	0.1246047
ri	0.0024446	0.0011394	2.15	0.038**	0.0001452	0.0047439
siz	0.0061919	0.0137394	0.45	0.655	−0.0215354	0.0339192
gro	−1.42e-07	0.0000362	−0.00	0.997	−0.0000732	0.0000729
_cons	0.6089305	0.1325007	4.60	0.000***	0.3415332	0.8763277

R^2: 0.4239, F (8.42): 3.05, P value: 0.0086. *, ** and *** Significant at the 10%, 5% and 1% levels respectively. CBs: Conventional banks

The results in Table 14 indicate that the capital structure of IBs before the crisis is explained by two variables only. The two variables are the level of equity and to a lesser extent the risk index (at the 10% significance level). These two variables count for about 16% of the variation in the capital structure. Nonetheless, the model is well-specified as indicated by the significant *F* score with a P = 0.0000.

Estimating the model for after the crisis data set is depicted in Table 15.

Table 15 indicates that the capital structure of IBs after the crisis is determined by profitability, the risk index, the level of equity (at the 10% significance level) and the growth of earning (also at the 10% significance level). These variables count for only 7% of the variation in the dependent variable. The *F* score appears to be significant with a score of 50.03 and a P = 0.0000.

A summary of the effects of each explanatory variable on the capital structure of IBs for the three data sets is presented in Table 16.

Table 12: Summary of causal effects findings for CBs

Data set	*liq*	*len*	*tan*	*eoa*	*roe*	*ri*	*siz*	*gro*
All								
Effect								
Sign		+		−		+	−	+
Before crisis								
Effect								
Sign				−	−	+	−	+
After crisis								
Effect								
Sign		+		-		+		

CBs: Conventional banks

5. DISCUSSIONS OF THE FINDINGS

We investigated two interrelated inquiries on banks' capital structures and performance indicators. First, we investigated the effect of the 2008 global financial crisis on eight specific performance indicators including liquidity, lending, tangibility, profitability, risks, size, growth and capital structure. Five of these indicators were found to respond significantly different after the crisis. These indicators are liquidity, lending, profitability, size and growth. Only profitability responded negatively to the crisis. We interpret this result by the fact that banks in the GCC region were forced to take substantial provisions following the years 2008. These provisions have affected equity drastically which was reflected in the calculation of the rate of return on equity for the after-crisis data set. The other four indicators had responded positively to the crisis.

Banks liquidity has increased which may be explained by regulatory pressures exercised over the banks following the crisis. The increase in lending after the crisis may be explained by the fact that interest rates have dropped drastically during the prolonged crisis.

The level of assets has increased which cannot be explained by an increase in the level of deposits because this variable did not witness a significant change after the crisis. Therefore, a possible explanation could be the establishment of new banks or the expansions of the existing ones.

The risk index of the banks after the crisis changed positively in response to the crisis indicating lower risks. This is logical due to the increased regulatory pressures from local and international banking authorities.

Table 13: Results of the panel data regression using the whole period data set for IBs

Variable	Coefficient	Robust SE	Z	P value	[95% CI]	
liq	−0.0084143	0.0956082	−0.09	0.932	−0.2246951	0.2078665
len	0.0991619	0.1032086	0.96	0.362	−0.1343121	0.3326359
tan	−0.6835245	0.5706434	−1.20	0.262	−1.97441	0.6073606
eoa	−1.212401	0.2504507	−4.84	0.001***	−1.77896	−0.6458426
roe	−0.107833	0.0329093	−3.28	0.010***	−0.182279	−0.033387
ri	0.0060282	0.0021599	2.79	0.021**	0.0011423	0.0109142
siz	−0.0378921	0.0114674	−3.30	0.009***	−0.0638331	−0.0119511
gro	−0.0022536	0.00177	−1.27	0.235	−0.0062577	0.0017504
_cons	1.010451	0.1600597	6.31	0.000***	0.6483706	1.372531

R^2: 0.1365, F (8.9): 12.28, P value: 0.0000. *, ** and *** Significant at the 10%, 5% and 1% levels respectively. IBs: Islamic banks

Table 14: Results of the panel data regression model: Before-the-crisis period for Bs

Variable	Coefficient	Robust SE	Z	P value	[95% CI]	
liq	−0.3953608	0.2437443	−1.62	0.139	−0.9467487	0.156027
len	0.0838652	0.2049467	0.41	0.692	−0.3797565	0.547487
tan	−0.7705189	0.9740111	−0.79	0.449	−2.973885	1.432847
eoa	−1.24278	0.2486891	−5.00	0.001***	−1.805354	−0.680206
roe	−0.0539832	0.1110046	−0.49	0.638	−0.305093	0.1971267
ri	0.003074	0.0015638	1.97	0.081*	−0.0004636	0.0066116
siz	−0.0413337	0.0331657	−1.25	0.244	−0.1163596	0.0336923
gro	−0.0010198	0.0037299	−0.27	0.791	−0.0094575	0.0074179
_cons	1.116731	0.2128917	5.25	0.001***	0.635137	1.598326

R^2: 0.1612, F (8.9): 93.66, P value: 0.0000. *, ** and *** Significant at the 10%, 5% and 1% levels respectively. IBs: Islamic banks

Table 15: Results of the panel data regression model: The after-the-crisis period for CBs

Variable	Coefficient	Robust SE	Z	P value	[95% CI]	
liq	0.1204829	0.1754707	0.69	0.510	−0.2764594	0.5174251
Len	−0.0275923	0.1277885	−0.22	0.834	−0.31667	0.2614855
tan	−1.040665	0.8264215	−1.26	0.240	−2.91016	0.8288304
eoa	−1.680677	0.833939	−2.02	0.075*	−3.567178	0.205824
roe	−0.1883199	0.0402949	−4.67	0.001***	−0.2794732	−0.0971666
ri	0.0146976	0.005573	2.64	0.027**	0.0020906	0.0273046
siz	−0.0072113	0.0291227	−0.25	0.810	−0.0730913	0.0586688
gro	−0.0058767	0.0029805	−1.97	0.080*	−0.0126191	0.0008656
_cons	0.754782	0.3004707	2.51	0.033**	0.0750701	1.43449

R^2: 0.0693, F (8.9): 50.03, P value: 0.0000. *, ** and *** Significant at the 10%, 5% and 1% levels respectively. CBs: Conventional banks

Table 16: Summary of causal effects findings for IBs

Data set	*liq*	*len*	*tan*	*eoa*	*roe*	*ri*	*siz*	*gro*
All								
Effect								
Sign				−	−	+	−	
Before crisis								
Effect								
Sign				−		+		
After crisis								
Effect								
Sign				−	−	+		−

IBs: Islamic banks

The second inquiry of this research is related to causal effects on banks' capital structure. Our results indicate that for CBs, considering the whole period, capital structure is determined by the ratios of lending to assets, equity to assets, risk index, size and growth of earning. The ratio of lending affected the ratio of deposits to assets (the proxy for capital structure) positively. The ratio of equity to assets (the other main component of the capital structure) has a negative effect on the ratio of deposits. This is logical as a decrease in one component leads to an increase in the other component of the same item. The effect of the risk index on the capital structure is positive implying that a decrease in the level of risk leads to an increase in the ratio of deposits to assets. When considering the before-the-crisis dataset, two determinants changed. The first is the absence of the lending effect and the presence of the negative profitability effect. This negative effect may be interpreted by the fact lower profit put more pressure on the bank to increase deposits to increase lending activities leading to a better interest spread. For the after-the-crisis data set, the capital structure of CBs is determined by only three variables. These variables are the ratio of lending to assets, the ratio of equity to assets and the risk index. Interpretation of these results remains the same.

As for IBs, using the data of the whole period, the capital structure is determined by *eoa*, *roe*, *ri* and *siz*. All with negative effects indicating a decrease in the capital structure proxy (the ratio of deposits to total assets) when they increase. This result is not uncommon (see, for example, Rajan and Zingales, 1995; Frank and Goyal, 2004; Gropp and Heider, 2010).

For the before-crisis data set, the effects of *roe* and *siz* were absent. The capital structure was found to be affected by two variables: *eoa* with a negative sign and the *ri* with a positive sign. For the after-crisis data sets, the capital structure is determined by *eoa* with a negative sign, *roe* with also a negative sign, *ri* with a positive sign and *gro* with a negative sign.

6. CONCLUDING REMARKS

In the context of the GCC mixed banking industry, we have found evidence that the capital structures of CBs and IBs are determined differently. This conclusion applies for three data sets: The whole period data set, before-the-crisis dataset and after-the-crisis data set. Only the level of equity and risk index remained as determinants (with the same signs) of the capital structures of both bank types and for the three data sets. To generate more profitability and value, the conclusion from this finding is that the level of deposits can be increased if we can lower the level of equity. We know, however, that the level of equity is shaped by the capital adequacy requirements imposed by international and local regulators. Therefore, little maneuverability space is available, with this regard, to CBs or IBs to enhance further shareholders wealth. The positive effect of the risk index implies that the increased level of deposits is associated with lower levels of risks. With this finding and given the contractual setup of IBs, we believe that they face less maneuverability space to lower the perceived risk to enhance the level of deposits compared to CBs. Knowing that IBs do not guarantee deposits but provide a rate of return similar to that of CBs, had it not been for the faith factor, why would one deposit money in an IB when a safer option is provided by CBs?

Practically, and eliminating the faith factor, the latter statement implies that for IBs to compensate for the additional risk their depositors are bearing (being neither lenders nor owners) compared to depositors of CBs, they should consider an additional premium for their depositors. This is maybe a valid tactical strategic move to compete for more market share leading to better profitability and share value. The results also imply that for CBs to improve the levels of deposits and achieve better profitability and value, they should find ways to reduce the levels of risks.

Our results also have theoretical implications. If we assume that faith is the sole factor for the depositors to deal with IBs, then what is the rate of return cut-off point at which they would consider withdrawing their savings from the bank? In fact, we still know little about the perceptions of IBs' regarding the effect of faith on their banking decisions. We also know little about IBs' clients' knowledge regarding the various (and sometimes contradicting) provisions of Islamic law. To say the least, the

fundamental prohibition of paying/receiving interest is very much questionable by prominent Islamic law scholars. In fact, some say that the theoretical grounds upon which the provision of prohibiting payment of interest is weak and is out-of-unanimity of the prominent four-doctrines of Islam. A thorough discussion of the subject in the Arabic language can be found in Hasan (1999) and Aljazeeri (2004).

Furthermore, had IBs' clients had this knowledge, would they change their decisions to deposit their money in IBs while accepting the lower return and additional risk? All these questions are critical for a more comprehensive understanding of the relationship between IBs and their depositors. Radical scholars may believe that asking such questions is similar to rejecting well-established status quo (since the year1974) or refuting a basic and unanimously agreed upon Islamic ruling. Nevertheless, we urge Islamic finance scholars to pursue answers to these rigorous questions. We intend to do so.

REFERENCES

Abdullah, A.M., Naser, K. (2015), Determinants of capital structure of banking sector in GCC: An empirical investigation. Asian Economic and Financial Review, 5(7), 959-972.

Adams, R.B., Mehran, H. (2012), Bank board structure and performance: Evidence for large bank holding companies. Journal of Financial Intermediation, 21(2), 243-267.

Aljazeeri, A. (2004), Alfiqh ala Almathahib Alarbaa, Dar Alhadith: Cairo. Available from: http://www.darelhadith.com.

Awunyo-Vitor, D., Badu, J. (2012), Capital structure and performance of listed banks in Ghana. Global Journal of Human-Social Science Research, 12(5), 57-62.

Berger, A.N., Bouwman, C.H. (2013), How does capital affect bank performance during financial crises? Journal of Financial Economics, 109(1), 146-176.

Berger, A.N., Di Patti, E.B. (2006), Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. Journal of Banking and Finance, 30(4), 1065-1102.

De Angelo, H., Stulz, R.M. (2013), Why High Leverage is Optimal for Banks. NBER Working Paper Series (No. w19139). National Bureau of Economic Research.

Diamond, D.W., Rajan, R.G. (2000). A theory of bank capital. The Journal of Finance, 55(6), 2431-2465.

Frank, M.Z., Goyal, V.K. (2004), The effect of market conditions on capital structure adjustment. Finance Research Letters, 1(1), 47-55.

Frank, M.Z., Goyal, V.K. (2009), Capital structure decisions: which factors are reliably important? Financial management, 38(1), 1-37.

Gambacorta, L., Shin, H.S. (2016), Why bank capital matters for monetary policy. Journal of Financial Intermediation, 35, 17-29.

Goyal, A.M. (2013), Impact of capital structure on performance of listed public sector banks in India. International Journal of Business and Management Invention, 2(10), 35-43.

Gropp, R., Heider, F. (2010), The determinants of bank capital structure. Review of Finance, 14(4), 587-622.

Hasan, A. (1999), Currencies in Economic Finance: Their values and "Ah'kam", Dar Alfikr, Damascus. Available from: http://www.fikr.com.

Kashyap, A.K., Stein, J.C. (2000), What do a million observations on banks say about the transmission of monetary policy? American Economic Review, 90(3), 407-428.

Kleff, V., Weber, M. (2008), How do banks determine capital? Evidence from Germany. German Economic Review, 9(3), 354-372.

Kok, C., Schepens, G. (2013), Bank Reactions After Capital Shortfalls, Working Paper No. 250. Provided in Cooperation with National Bank of Belgium, Brussels. Available from: https://www.papers.ssrn.com/sol3/papers.cfm?abstract_id=2369800.

Kusairi, S., Sanusi, N.A., Ismail, A.G. (2018), Dilemma of deposit insurance policy in ASEAN countries: Does it promote banking industry stability or moral hazard? Borsa Istanbul Review, 18(1), 33-40.

Meero, A.A. (2015), The relationship between capital structure and performance in gulf countries banks: A comparative study between Islamic banks and conventional banks. International Journal of Economics and Finance, 7(12), 140-154.

Mehran, H., Thakor, A. (2011), Bank capital and value in the cross-section. The Review of Financial Studies, 24(4), 1019-1067.

Miles, D., Yang, J., Marcheggiano, G. (2013), Optimal bank capital. The Economic Journal, 123(567), 1-37.

Miller, M.H. (1977), Debt and taxes. The Journal of Finance, 32(2), 261-275.

Miller, M.H. (1995), Do the M and M propositions apply to banks? Journal of Banking and Finance, 19(3-4), 483-489.

Modigliani, F., Miller, M.H. (1958), The cost of capital, corporation finance and the theory of investment. The American economic review, 48(3), 261-297.

Modigliani, F., Miller, M.H. (1963), Corporate income taxes and the cost of capital: A correction. The American economic review, 53(3), 433-443.

Naceur, S.B., Kandil, M. (2009), The impact of capital requirements on banks' cost of intermediation and performance: The case of Egypt. Journal of Economics and Business, 61(1), 70-89.

Naceur, S.B., Omran, M. (2011), The effects of bank regulations, competition, and financial reforms on banks' performance. Emerging markets review, 12(1), 1-20.

Rajan, R.G., Zingales, L. (1995), What do we know about capital structure? Some evidence from international data. The Journal of Finance, 50(5), 1421-1460.

Schandlbauer, A. (2017), How do financial institutions react to a tax increase? Journal of Financial Intermediation, 30, 86-106.

Schepens, G. (2016), Taxes and bank capital structure. Journal of Financial Economics, 120(3), 585-600.