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How did Islamic banks do during global financial crisis?

Abstract

It is generally argued that Islamic banks are safer than conventional banks. The prime reason is their product structure that is essentially asset-backed financing. Research studies prior to recent global financial crisis have generally concluded that the performance of Islamic banks have been better than conventional banks. There are, however, others who have argued that their history is too young to authentically conclude. The recent global financial crisis has brought this question to the fore once more. It is well known that conventional banks have suffered everywhere on this planet during the recent crisis, only the degree and the bounce back differ. What about Islamic banks? How did they do during crisis? This study shows that Islamic banks have suffered more than conventional banks during recent global financial crisis in terms of capital ratio, leverage and return on average equity, while conventional banks have suffered more than Islamic banks in terms of return on average assets and liquidity. Over the four years period, i.e. 2006-2009, Islamic banks performed better than conventional banks.

Keywords: Islamic banks, conventional banks, capital adequacy, global financial crisis, bank performance.

JEL Classification: G21.

Introduction

The current financial crisis has brought to the fore the vulnerability of conventional banks. It is a general belief that the crisis has not affected the Islamic banks as much as conventional banks. The main reason for this being the inherent nature of Islamic banks, which shun the risky and much misunderstood financial products and also the fact that it is an asset backed banking. In this context, a comparison of the performance of Islamic banks vis-à-vis conventional banks would make a very interesting question.

This paper compares the conventional and Islamic banks performance in the GCC (Gulf Cooperation Council)¹ before and during the recent global financial crisis using the ratio analysis.

The study uses six ratios, namely, capital adequacy ratio (*CAR*), cost to income ratio (*CTI*), return on average assets ratio (*ROAA*), return on average equity ratio (*ROAE*), equity to total assets ratio (*E/TA*), and liquid assets to total assets ratio (*LA/TA*). These ratios are spread across five bank performance parameters, namely, capital, efficiency, profitability, liquidity and leverage. The study pertains to the period of 2006-2009. The sample size is 12 banks, 6 Islamic and 6 conventional.

This paper is organized as follows. Section 1 discusses literature review. Section 2 explains the key differences between Islamic and conventional banks. Data and methodology are explained in Section 3 followed by analysis in Section 4. The last Section gives the conclusion and points to further research.

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¹ Gulf Cooperation Council is an economic group of six countries, namely, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates.

1. Literature review

Literature abound as far as conventional banking is concerned. However, Islamic banking in its contemporary form is the newer of the two and not many in-depth empirical researches are available in this regard. Zineldin (1990) compares the two types of banking and put forth his arguments, using the theory and practice of Islamic banking, and concluded the superiority of Islamic banking. The empirical studies extended to various other Islamic countries like Egypt and Malaysia, and almost all of them, have concluded that Islamic banking performance is relatively better than its conventional counterparts. While Kazarian (1993) compares the two types in Egypt, Samad (1999) compares the efficiency of the two types of banks in Malaysia with empirical analysis of four years. Samad opines that Bank Islamic Bank in Malaysia had superior managerial skills than conventional banks. Samad and Hassan (1999) focus on liquidity ratios of Islamic banks and also on popularity of Islamic lending. They test the hypothesis that the liquidity ratios of Islamic banks are higher in the initial years and lower later due to learning curve.

Zaher and Hassan (2001) have documented comprehensively the working and structure of Islamic finance and banking, and have explained the theory behind the growth of Islamic finance. They have also articulated the difference between profit and loss sharing (PLS) that exists in Islamic banks vis-à-vis interest payment in conventional banks.

Iqbal (2001) examines ratios for 8 years of Islamic and conventional banks across various Islamic countries. The paper compares the performance of Islamic banks with conventional banks as “control group”, and concludes that Islamic banks have done better than conventional banks.

Samad (2004) examines the two types of banking in Bahrain for a period of 10 years from 1991 to 2001. He finds no major difference with respect to profit-

ability and liquidity, but finds that credit risk is much less in Islamic banks coupled with superior credit performance.

Qorchi (2005) discusses the rise of Islamic finance not only in the Muslim countries but also in Europe and the U.S. He discusses the unique features of Islamic financial instruments that are more contract based between the savers and the seekers of funds and the various contracts in vogue in Islamic banks.

Based on the study of Malaysian banks, Choong and Ming (2006) argue that distinguishing feature of Islamic banking, that is the PLS, is merely in theory and that Islamic banking deposits are not interest-free, but are very much dependent on actual interest rates in the market. They do not find much difference between the structure of the two banking types and opine that a very negligible proportion of banks actually practice PLS.

Notwithstanding the general soundness of GCC banks, Abdullah et.al. (2010) find some weaknesses associated with the operational aspects of GCC banks. The rapid credit growth, concentration risk, and low liquidity levels by international comparison are seen as the three major operational weaknesses of GCC banks.

Beck et al. (2010) have compared the two types of banking and their performance across many countries, during recent crisis and conclude that though both types of banking were affected by the crisis, Islamic banks had higher capitalization coupled with higher liquidity reserves, resulted in better performance of Islamic banks.

This paper is an addition to the growing body of literature that compares the Islamic and conventional banks. If majority of the literature has found Islamic banks, performed well most of the times, then it should reflect the same during the crisis. Hence, we have compared the two types before the recent global financial crisis and during the crisis, in order to examine the hit Islamic banks had vis-à-vis conventional banks and the superiority or otherwise of performance of Islamic banks during crisis. We find that despite hit in terms of certain ratios during crisis period, Islamic banks have performed better than conventional banks during four year period of 2006-2009.

2. Main differences between Islamic and conventional banks

The philosophy and fundamental tenets of Islamic banking are different from the conventional banking. The foundation of Islamic banking is based on the Islamic faith and Islamic banks must stay within the limits of Islamic law or the Shariah in all of its actions and deeds. The original meaning of the Arabic word "Shariah" is "the way to the

source of life" and is now used to refer to legal system in keeping with the code of behavior called for by the Holy Qur'an (Koran). Amongst the governing principles of an Islamic bank are four basic principles: no interest transactions ('Riba' or interest is prohibited), risk sharing, asset/service backing, and contractual certainty ('Gharar' or uncertainty free contracts) (Suleiman, 2000). The Islamic banks deal in Shariah compliant products and services only.

Conventional banking, on the other hand, follows the age old convention of interest-based mobilization of funds and lending. The charged interest reflects the price of credit and signifies the opportunity cost of capital. Thus, conventional banking is based on debtor-creditor relationship between depositor and the bank, on the one hand, and borrower and bank, on the other.

Another important feature of Islamic banking is that no reward can be earned without undertaking commensurable risk which is equally applied to capital, as well as labour. Hence, no reward can be earned by capital without exposing it to business risk. The financial relationship under Islamic framework is, thus, more of a partnership in nature. Thus, Islamic banking is based on the principle of PLS. This principle enables the Islamic bank to share profit and loss with their depositors, unlike conventional banks. This principle of PLS is based on fiduciary trust and partnership between the creditor, debtor and the bank (Suleiman, 2000).

All banking functions within Islamic banking purview have to be in compliance with the Shariah. Since this law does not allow Islamic banks to undertake contracts with inherent uncertainties (Gharar), it precludes Islamic banks from trading in derivatives. Whereas there is no such restriction as far as conventional banks are concerned.

In brief, money is essentially a medium of exchange in Islamic banking, and not a store of value or commodity as in conventional banking. Money is exchanged to move the wheels of business and not just earn interest. Since business has both risk and return, Islamic banking follows PLS and not interest earning. It is for such characteristics that Islamic banking is considered safer than conventional banking.

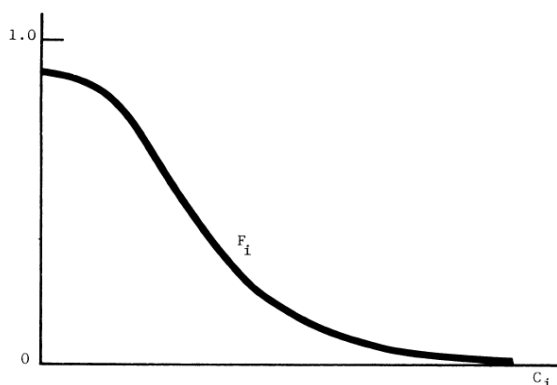
3. Methodology and data

This study compares selected conventional and Islamic banks in the GCC. The study compares the two systems based on five performance parameters, namely, capital adequacy, efficiency, profitability, liquidity and leverage. Basel I and II had laid special emphasis on capital adequacy as an indicator of safety of banks. Basel III, more recently, has added leverage and liquidity as additional indicators of

safety of banks. It has indeed been well known that financial performance of any business, including banks, should cover profitability, liquidity and leverage. Efficiency ratio essentially belongs to the family of profitability ratios as it compares cost to income, but provides a good view of operational efficiency of banks. Keeping the above in mind, we have used six ratios to analyse and compare performance of Islamic banks and conventional banks. What exactly is the focus of analysis and comparison with reference to these parameters has been elaborated below.

3.1. Capital adequacy. With the advent of Basel regulations, capital adequacy ratio (*CAR*) was introduced to the world of banking. This ratio measures the amount of capital (as defined by Basel) the bank has to hold in relation to its total risk weighted assets (*RWA*), including off-balance-sheet exposure. This came to be known as the most important ratio for banks and the buffer against heavy losses that could threaten the very existence of a bank. Since banks are heavily leveraged institutions, it must maintain sufficient capital to cover its *RWA*. This ratio is all the more meaningful during an economic crisis as this ratio acts as a predictor of bank failure and to reduce this probability, a bank may strengthen its capital well in time. As Figure 1 depicts, the lower the capital (C_i) the higher the probability of failure (F_i) (Santemero and Watson, 1977). This ratio gauges the safety and soundness of a bank (Estrella, Park and Persitiani, 2000) and as such a comfortable *CAR*, especially during a crisis, adds confidence to the safety and soundness of a bank. Other things remaining the same, financial crisis should adversely affect the *CAR* of banks as the riskiness of assets tends to go up during crisis.

Probability of Failure



Source: Santemero and Watson (1977).

Fig. 1. Probability of failure for an individual bank, given various capital quantities

This figure explains the importance of capital in a banking business. As discussed by Santemero and Watson (1977), the above figure relates the quantity

of capital, C_i , to probability of failure for an individual bank, F_i . As indicated by the figure, higher the C_i , lower is the F_i .

The authors state that in order for a bank to remain solvent, assets must be greater than the liabilities, so that there is a positive capital. Assets and liabilities at time t is denoted by A_t and L_t . Thus, $A_t - L_t = C_t$.

The authors opine that at any point in time, the assets must be greater than the liabilities and there must be continual addition to the bank's portfolio. Thus:

$$A_t = L_t + C_t,$$

where L_t is the market value of liabilities and A_t is the market value of assets. Thus, it follows that:

$$A_{t+1} \geq L_{t+1}, \text{ or } C_{t+1} \geq 0 \text{ for all } t$$

Hence:

$$\Delta A_{t+1} - \Delta L_{t+1} + C_t \geq 0.$$

The above is represented by x_{t+1} which denotes the net change in a bank's portfolio from t to $t + 1$. The above is a random variable and can be denoted as a probability density function $f(x_t)$ with mean x_t and σ_{x_t} .

Failure is defined as a situation, where portfolio losses exceed capital:

$$x_t + C_t < 0.$$

So, the above indicates the importance of a bank's capital. To be solvent, a bank has to have positive capital. Thus, given its capital, a cumulative density function can be constructed that relates capital to probability of failure:

$$F_t = \int_{-\infty}^{-C_t} g(x_t) dx_t, \text{ such as } \frac{\partial F_t}{\partial C_t} < 0.$$

This highlights why capital adequacy is so important in banks.

We examine the *CAR* of conventional banks vis-à-vis Islamic banks to determine which type of banks have suffered more during crisis and which one is still better capitalized. This ratio is calculated as: *capital/RWA*. The capital and *RWA* are calculated as per standardized approach of Basel II.

3.2. Efficiency. One of the important ratios, measuring the efficiency of banks, is the cost to income ratio (*CTI*). The cost/income ratio or efficiency ratio is the standard benchmark of bank efficiency. It measures the overheads or costs of running the bank, the major element of which is normally salaries, as percentage of income generated before provisions. It is a measure of efficiency although if the lending margins in a particular country are very high

then the ratio will improve as a result. It can be distorted by high net income from associates or volatile trading income.

We compared the *CTI* of two types of banks in order to determine which type of banking is more efficient. The ratio is calculated as:

Total Cost/Total Income (= *Overheads / (Net Interest Revenue + Other Operating Income) * 100*).

3.3. Profitability. The two most common measures, but nonetheless most important measures of profitability, are return on average assets (*ROAA*) and return on average equity (*ROAE*). *ROAA* is perhaps the most important single ratio in comparing the efficiency and operational performance of banks as it looks at the returns generated from the assets financed by the bank. While *CTI* does measure operational efficiency, but certain inefficiencies of banks are not captured by this formula. These inefficiencies are captured by the revenue side and, hence, the profitability formula becomes all the more important. In fact, the objective of maximizing profits is based not just on minimizing costs, but maximizing revenues as well (Maudos et al., 2002). Hence, these ratios are important measure of profitability.

This study compares the two profitability ratios before and during the crisis for Islamic and conventional banks in order to determine if there are any significant differences between these two types of banking in terms of the hit they got during crisis. *ROAA* is calculated as:

*Net Income / Average (Total assets) * 100*.

ROAE is calculated is:

*Net Income / Average (Total equity) * 100*.

3.4. Liquidity. The importance of liquidity in banks cannot be overemphasized. The recent crisis has underscored the import of maintaining enough liquidity in banks. This ratio indicates the amount of liquid assets a bank has to meet its liabilities.

We examine the liquid ratio between the two banking systems to determine which system is more liquid. The liquid ratio is calculated as:

Liquid assets/Total assets (LA/TA).

3.5. Leverage. Yet, another important measure of bank performance is leverage. The leverage measures the proportion of owners' money compared to the total assets of the company. Given the fact that banks are heavily leveraged institutions, this ratio assumes significance in order to understand what proportion of its assets are financed by owners'

money. A low level of equity (or a high amount of debt), used in financing a bank's assets, also increases its insolvency risk and, hence, becomes a target for acquisition (Wheelock & Wilson, 2000).

We examine the leverage ratio between the two systems. The ratio is calculated as:

Equity / Total assets (E/TA).

The period of study is four years, i.e. 2006-09. The period of 2006-07 represents before the crisis period and the 2008-09 periods represents during the crisis period.

The sample for this study includes GCC banks, having total asset size of USD 10 billion or more as of December 2009. As of December 2009, GCC had 19 conventional banks and 7 Islamic banks, having total assets size USD 10 billion or more. In the absence of complete data available for one Islamic bank, it was decided to exclude it and have a sample of 6 Islamic banks. From 19 conventional banks having total assets size of USD 10 billion or more, it was decided to include in our study only 6 conventional banks, having asset size comparable to 6 Islamic banks included in the sample. The sample, thus, comprises 12 GCC banks, 6 Islamic and 6 conventional (Appendix A).

The data for this study has been drawn from BankScope. The structure of ratios as presented by BankScope, is given in Appendix B.

We used the student t-test to test the difference between the means of Islamic and conventional banks of all the ratios. We used excel, Minitab and SPSS and found that all three gave the same results. The authors had earlier found during the course of another study some differences in results, while using Excel, Minitab and SPSS for undertaking regression analysis. It was, therefore, decided to run on all three. Interestingly, there was found no difference for tests of significance. The purpose of reporting this here is that those researchers who may not have easy and ready access to Minitab and SPSS may use Excel for simpler analysis like the one done in our study, without any hesitation.

Various hypotheses tested regarding difference between means, using t-tests, are shown in Section 4.

4. Analysis

Table 1 gives the descriptive statistics of all the banks in the sample. The data, used for analysis, represent ratios for 4 year period (2006-09) for 12 banks in stacked data. So, there are 24 observations for each ratio.

Table 1. Descriptive statistics for sample banks

Ratios	Mean (%)	Median (%)	Standard deviation (%)	p-value	t-test
1. Capital ratio					
<i>CAR:</i>					
Conventional banks	15.30	15.25	2.02		
Islamic Banks	19.50	19.10	1.19	0.001228	3.328
2. Efficiency ratio					
<i>CTI:</i>					
Conventional banks	35.14	34.45	9.80		
Islamic Banks	35.16	38.40	10.67	0.497	0.00705
3. Profitability ratio					
<i>ROAA:</i>					
Conventional banks	1.76	1.98	1.41		
Islamic Banks	3.304	1.95	2.78	0.025	2.0166
<i>ROAE:</i>					
Conventional banks	12.49	15.11	12.81		
Islamic Banks	20.13	20.95	9.52	0.0119	2.3452
4. Liquidity ratio:					
<i>LA/TA:</i>					
Conventional banks	22.39	21.55	5.87		
Islamic Banks	24.50	24.90	8.43	0.1608	1.0032
5. Leverage ratio					
<i>E/TA:</i>					
Conventional banks	12.32	11.89	3.27		
Islamic Banks	15.08	14.73	4.13	0.0069	2.565

From Table 1 it can be observed that 4-year average *CAR* for Islamic banks is higher at 19.5% compared to conventional banks' average *CAR* at 15.3%. This difference is statistically significant at 5% alpha. This shows that the *CAR* of Islamic and conventional banks was statistically significantly different during the period of 2006-2009.

Table 1 further shows that there is a statistically significant difference between the two types of banks, as far as *ROAA*, *ROAE* and *E/TA* are concerned. However, there is no statistically significant difference between liquidity and efficiency ratios of these banks

during the period of 2006-2009. Since 4-year averages of all the ratios of Islamic banks were higher than conventional banks, it can be generally concluded that for the full period of four years, including before and during the crisis years, Islamic banks performed better than conventional banks.

However, in order to draw meaningful conclusions about their performance before and during the crisis, we separately compared Islamic banks and conventional banks, before and during the crisis. Table 2 below shows the results of the analysis for Islamic banks.

Table 2. Analysis of Islamic banks' *CAR*, before and during crisis

Ratios	Before crisis	During crisis	Before crisis	During crisis	Before crisis	During crisis
<i>CAR:</i>			<i>ROAA:</i>		<i>ROAE:</i>	
Mean	21.075	17.91667	2.996	3.0875	25.296	14.965
t-test	2.3563		-0.073		5.399	
p-value	0.01903		0.4715		0.000108	
t critical (one tail)	1.7958		1.7958		1.7958	
<i>LA/TA:</i>			<i>CTI:</i>		<i>E/TA:</i>	
Mean	26.7	22.29	36.616	38.9	16.35	13.79
t-test	1.3172		-1.00125		2.6883	
p-value	0.107265		0.1691		0.01054	
t critical (one tail)	1.7958		1.7958		1.7958	

We tested the null hypothesis that there is no difference between the means of all the ratios before (i.e. 2006-2007 period) and during the crisis (i.e. 2008-2009 period). Since we wanted to test the effect of

crisis on Islamic banks, the alternate hypothesis was that the mean of all ratios declined during the crisis, compared to before crisis period. We conducted a one tail paired t-test at 5% alpha. As given in Table 2,

we find that the decline in the following ratios of Islamic banks during the crisis have been statistically significant: *CAR* (from 21.05% to 17.92%), *ROAE* (from 25% to 14.97%), *E/TA* (16.35% to 13.79%).

Though *ROAA* and *CTI* show a small increase, the former from 3% to 3.1% and the latter from 36.6% to 38.9%, it is not statistically significant. The li-

quidity ratio shows a decline from 26.7% to 22.3%, but this decline is not statistically significant.

It is, thus, obvious that Islamic banks have also suffered during the crisis, particularly, in terms of *CAR*, *ROAE*, and *E/TA*. We then repeated this analysis with conventional banks to examine whether any of the averages of the stated ratios reduced significantly (Table 3).

Table 3. Analysis of conventional banks' *CAR*, before and during crisis

Ratios	Before crisis	During crisis	Before crisis	During crisis	Before crisis	During crisis
<i>CAR</i> :			<i>ROAA</i> :		<i>ROAE</i> :	
Mean	15.275	15.325	2.348	1.169	17.77	7.2025
t-test	-0.0529		3.648		2.619	
p-value	0.479		0.001915		0.0119	
t critical (one tail)	1.7958		1.7958		1.7958	
<i>L/TA</i> :			<i>CTI</i> :		<i>E/TA</i> :	
Mean	24.7	20.08	34.30	35.876	12.17	12.46
t-test	2.256		-0.095		-0.3505	
p-value	0.022		0.180		0.366	
t critical (one tail)	1.7958		1.7958		1.7958	

From the Table 3, it can be concluded that conventional banks' averages significantly reduced in respect of *ROAA* (from 2.35% to 1.17%), *ROAE* (from 17.77% to 7.20%) and *LA/TA* (from 24.7% to 20.08%) during the crisis period. It is interesting to conclude that while *ROAE* went down for both Islamic and conventional banks, Islamic banks suffered more in terms of *CAR* and *E/TA* and conventional banks suffered more in terms of *ROAA* and *LA/TA*.

Next, we tested various hypotheses, using t-tests regarding difference between means of each of the six ratios of Islamic banks and conventional banks, before and during crisis, to analyse characteristic differences as given at H_{02} . For example, Islamic banks would be better capitalized than conventional banks during the crisis. Hence, we may expect the *CAR* of the Islamic banks to be greater than conventional banks during the crisis. The stacked data represent 12 observations for the periods before the crisis and during the crisis for each type of banks.

We use the one tail t-test to examine the below hypotheses:

$$H_{01}: \text{Islamic } CAR \leq \text{Conventional } CAR$$

$$H_{A1}: \text{Islamic } CAR > \text{Conventional } CAR$$

Table 4. Analysis of Islamic and conventional banks' *CAR*, before and during crisis

<i>CAR</i>	Before crisis (06-07)	During crisis (08-09)
Mean-Islamic	21.075	17.916
Mean-conventional	15.275	15.325
t-stat.	2.722	2.0158
p-value (one tail)	0.008719	0.0304
t-critical	1.770933	1.7458

Table 4 indicates that *CAR* declined for Islamic from 21% to 17.9% and for conventional banks, it increased marginally, from 15.27% to 15.32%. The one-tail t-test signifies that the null hypothesis is rejected. Consequently, alternate hypothesis is accepted indicating that Islamic banks were better capitalized compared to conventional banks for both the periods.

The next set of hypothesis relate to bank efficiency. We test the following hypothesis regarding the cost income ratio:

$$H_{02}: \text{Conventional } CTI \leq \text{Islamic } CTI$$

$$H_{A2}: \text{Islamic } CTI > \text{Conventional } CTI$$

Table 5. Analysis of Islamic and conventional banks' *CTI*, before and during crisis

<i>CTI</i>	Before crisis (06-07)	During crisis (08-09)
Mean-Islamic	34.458	35.866
Mean-Conventional	34.306	35.976
t-stat (one tail)	0.0342	-0.0268
p-value (one tail)	0.486	0.489
t-critical	1.7171	1.7171

CTI ratio, as measure of efficiency, indicates that Islamic banks' mean ratio was 34.45% before the crisis and increased marginally to 35.86% during the crisis, whereas conventional banks' mean ratio was 34.30% which increased to 35.98% during the crisis. The t-test indicates that the null hypothesis of no difference of means between the two types of banks is accepted. Hence, there was no significant difference, as far as efficiency is concerned between Islamic and conventional banks, before or during the crisis.

We examine the profitability ratio with the following hypotheses:

$$H_{03}: \text{Islamic } ROAA \leq \text{Conventional } ROAA$$

$$H_{A3}: \text{Islamic } ROAA > \text{Conventional } ROAA$$

Table 6. Analysis of Islamic and Conventional banks' ROAA, before and during crisis

ROAA	Before crisis (06-07)	During crisis (08-09)
Mean-Islamic	3.713	2.8958
Mean-conventional	2.3483	1.1692
t-stat (one tail)	2.3086	2.01318
p-value (one tail)	0.01689	0.0296
t-critical	1.7396	1.7340

We test the null hypothesis that the mean ROAA of Islamic banks is lesser than or equal to conventional banks either before or during the crisis. The mean ROAA before the crisis for Islamic and Conventional banks was 3.71% and 2.35%, respectively. The means declined to 2.895% and 1.169%, respectively, during the crisis. The t-tests are significant for both before and during the crisis, indicating that the null hypothesis is rejected at 5% significance level. Hence, Islamic banks earned a higher return on assets than conventional banks for both the periods.

The other profitability ratio that we examine is ROAE. We test the following hypotheses for ROAE:

$$H_{04}: \text{Islamic } ROAE \leq \text{Conventional } ROAE$$

$$H_{A4}: \text{Islamic } ROAE > \text{Conventional } ROAE$$

Table 7. Analysis of Islamic and conventional banks' ROAE, before and during crisis

ROAE	Before crisis (06-07)	During crisis (08-09)
Mean-Islamic	25.29667	7.2025
Mean-conventional	17.7775	14.9658
t-stat (one tail)	2.6223	1.5156
p-value (one tail)	0.008159	0.074563
t-critical	1.724718	1.74588

Table 7 shows that the mean ROAE for Islamic and conventional banks prior to crisis were 25.30% and 17.77%, respectively, that declined to 7.20% and 15%, respectively, during the crisis. While the null hypothesis of Islamic banks' mean ROAE lesser than or equal to conventional banks' mean ROAE is accepted at 5% alpha prior to the crisis, it is rejected during the crisis, indicating that Islamic banks returned higher to the share holders than conventional banks during the crisis.

We examine hypothesis related to liquidity ratio, as defined by LA/TA. The following testable hypotheses is put forth:

$$H_{05}: \text{Islamic } LA/TA \leq \text{Conventional } LA/TA$$

$$H_{A5}: \text{Islamic } LA/TA > \text{Conventional } LA/TA$$

The results are mentioned in Table 8.

Table 8. Analysis of Islamic and conventional banks' LA/TA, before and during crisis

LA/TA	Before crisis (06-07)	During crisis (08-09)
Mean-Islamic	22.2416	26.75
Mean-conventional	24.7	20.083
t-stat (one tail)	0.9346	2.15325
p-value (one tail)	0.1800	0.02344
t-critical	1.7171	1.74588

Table 8 highlights that Islamic banks' mean LA/TA ratio was 22.24% before the crisis and 26.75% during the crisis, and conventional banks' mean LA/TA ratio was 24.7% before and 20.08% during the crisis. While the null hypothesis of Islamic banks' mean ratio less than or equal to conventional banks is accepted at 5% significance level before the crisis; the same is rejected during the crisis indicating that liquidity was higher in Islamic banks during the crisis.

Finally, we construct the following hypotheses to test the difference between the two E/TA means:

$$H_{06}: \text{Islamic } E/TA \leq \text{Conventional } E/TA$$

$$H_{A6}: \text{Islamic } E/TA > \text{Conventional } E/TA$$

The results are depicted in Table 9.

Table 9. Analysis of Islamic and conventional banks' E/TA, before and during crisis

E/TA	Before crisis (06-07)	During crisis (08-09)
Mean-Islamic	15.8638	14.29215
Mean-conventional	12.1725	12.4633
t-stat (one tail)	3.42838	0.96843
p-value (one tail)	0.001499	0.17249
t-critical	1.734064	1.729133

E/TA measures leverage. Table 9 shows that Islamic banks' mean E/TA declined from 15.86% before the crisis to 14.29% during the crisis, while conventional banks' mean ratio increased marginally from 12.17% before the crisis to 12.46% during the crisis. The null hypothesis of mean leverage of Islamic banks lesser than or equal to conventional banks is accepted at 5% alpha during the crisis, the same is rejected before the crisis indicating that Islamic banks had higher proportion of equity before the crisis.

Conclusions

We have compared six different ratios, CAR, CTI, ROAA, ROAE, LA/TA and E/TA of Islamic and Conventional banks. We have compared both the banking systems for full four years, and also before and during the crisis, inter and intra group.

For full year analysis we found that Islamic banks have performed better than conventional banks for

the sample period with statistically significant results in respect of *CAR*, *ROAA*, *ROAE* and *E/TA*. This indicates that Islamic banks delivered better in profitability and were higher capitalized than conventional banks over four year period.

When analyzed, before and during the crisis, it was found that average *CAR*, *ROAE* and *E/TA* of Islamic banks had significantly reduced during the crisis, while for conventional banks, *ROAE*, *ROAA* and *LA/TA* significantly reduced during the crisis. There was no significant difference in *CAR* before and during the crisis for conventional banks. Even though Islamic banks' *CAR* showed downward trend, still its average was higher than conventional, both before or during the crisis. Our analysis suggests that Islamic banking, during crisis, suffered more in terms of capital adequacy and leverage while conventional banking suffered more in terms of return on average assets and liquidity. It is also clear that during the

crisis period, both, Islamic and conventional banks, suffered in terms of return on equity.

Finally, we found that *ROAA* was significantly higher for Islamic banks before and during the crisis. While there is no significant difference in terms of average *ROAE* between the two types of banking during the crisis, Islamic banks had higher ratio before the crisis.

In conclusion, it may be stated that Islamic banks did suffer during crisis in terms of lowering of *CAR*, *E/TA* and *ROAE*, but overall, over four years period, they performed better than conventional banks.

We would also like to add that the sample size of this study is small, having 6 Islamic and 6 conventional banks. In future, the sample size may be expanded to include banks having total assets less than USD 10 billion. This will be particularly useful as many of the GCC banks are relatively smaller sized banks.

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Appendix A

The sample for the study consisted of the below mentioned conventional and Islamic banks and their asset size as at the end of December 2009.

Banks	Country	Asset size (USD bn)
Conventional banks:		
Arab Banking Corporation, BSC	Bahrain	25.96
Ahli United Bank BSC	Bahrain	23.57
National Bank of Kuwait	Kuwait	44.96
Bank Muscat SAOG	Oman	15.20
Commercial bank of Qatar	Qatar	15.74
Abu Dhabi commercial bank	UAE	43.62
Islamic banks:		
Kuwait Finance House	Kuwait	39.36
Albaraka Banking group	Bahrain	13.16
AlRajhi bank	SA	45.52
Dubai Islamic Bank	UAE	22.95
Abu Dhabi Islamic Bank	UAE	17.44
Qatar Islamic Bank	Qatar	10.79

Appendix B

Ratios used in the study as per BankScope database. The structure of ratios as presented by BankScope are given below:

Return on average assets:

$$(\text{Net Income} / \text{Average(Total Assets)}) * 100$$

The average is for set of two years.

Total assets: includes *Total earning assets + Cash and due from banks + Foreclosed real estate + Fixed assets + Goodwill + Other intangibles + Current tax assets + Deferred tax + Discontinued operations + Other assets*

Equity: equity is defined as total funds belonging to the equity share holders. This also includes other comprehensive income as applied to the accounting rule. This is the total amount as found in the comprehensive statement of equity.

Total equity + pref. shares and hybrid capital accounted for as *Equity*.

Total Equity: includes *Common equity + Non-controlling interest + Securities revaluation reserves + Foreign exchange revaluation reserves + Other revaluation reserves*.

Pref. shares and hybrid capital accounted for as Equity: includes preference shares and premium; redeemable capital in cooperative banks; preference shares and premium.

Cost to income ratio:

$$(\text{Overheads} / (\text{Net interest revenue} + \text{other operating income})) * 100$$

Liquid assets: include *Trading securities and at FV through income + Loans and advances to banks + Cash and due from banks*.