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Financial Stability of Islamic and Conventional Banks in Saudi Arabia: Evidence using Pooled and Panel Models [1]

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ABSTRACT

The financial crises are considered the major challenges facing the prosperity and stability of the banking system and menace its stability. Several studies on financial and banking sector have demonstrated that Islamic banks have shown more financial robustness and stability compared to conventional banks, over periods of financial crises. This research aims to measure the stability extent of the Saudi Arabia banks including Islamic banks and conventional banks using quarterly data from 2005 to 2011. This period is characterized by the global financial crisis shocks (2007-2008). The sample used is composed of six banks including two Islamic banks (*AlRajhi* Bank and *AlBilad* Bank) and four traditional banks (*Riyad* Bank, Saudi Investment Bank, Saudi British Bank and Saudi American Bank). This sample represents an important part of 64% of the Saudi banking sector and covers close to two thirds of banks whose shares are traded on the Saudi stock market. The research focuses on three types of variables related to bank, banking system and macroeconomic levels. The paper is based on quantitative tools using panel regression and pooled regression to model the z-score index for testing the banks stability in Saudi Arabia. The panel data model shows that Islamic banks reduce relatively the value of the financial stability index; meanwhile, they contribute efficiently to enhance the financial stability through the diversification of their assets. The findings indicate those *Riyad* Bank and SAMBA groups support efficiently the financial stability of banking sector, while *AlRajhi* bank has a positive but moderate role in enhancing the banking sector stability. The Saudi banking sector has relatively less level of competitiveness, that affecting negatively the financial stability. The limited representation of Islamic banks in the Saudi banking sector jeopardizes any efforts to improve the financial stability index.

JEL Classification:
Key words: Islamic Banks, Financial Crisis, Financial Stability, Z-score Model, Saudi Arabia.

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I. Introduction

Financial crises are strongly related to financial and banking systems, given the international financial liberalization market, where a local financial system is no longer isolated from changes of the global system. In the last decade of twentieth century Islamic banks were firstly established and had growing role in the international financial system since then. In fact, CIBAFI (2010) indicates that total world Islamic finance has reached around one trillion U.S. dollars at the end of 2009.

During the last financial crisis (2007-2009) a large number of conventional banks around the world have announced bankruptcy (140 U.S. Banks in 2009)[2]; while no single Islamic bank failure has been reported. The logical question to be raised here, is whether Islamic banks are immunized against financial shocks? And if so, can this be explained by the free-interest system, or by the fact that the Islamic banks do not invest in derivatives, "*Tawaruq*" and loans sale?[3] (Chapra, 2000a, 2000b; Siddiqi, 2000; Hassan, 2006). In other word, can the immunity of Islamic banks against international financial crises be due to its incomplete integration in the global financial system?

Studying the stability of Islamic banks requires the distinction between banks according to its asset structure in its budget. Firstly, Islamic banks adopted single layer *Mudarabah*, where they mobilize their liabilities directly in different investment opportunities. This model was faced by a lot of operational risks. Accordingly, Islamic banks switched to the use of multi-layers *Mudarabah* Islamic model, *i.e.*, *Mudarabah* of assets (sources) and liabilities (uses), where all assets are financed through Profit Loss Sharing system (PLS).

The purpose of this paper is to test the hypothesis that Saudi Islamic banks are relatively less vulnerable to international financial crises, compared to Saudi conventional banks. The financial system and banking system are always threatened by risks which lead to financial crises. Banking sector could be major driver of financial crises or one of channels transmitting the impacts of crises to other financial sectors and local or international real economies. Historical data shows that the banking sector was mostly the heavily damaged party by financial crises. During the last international financial crisis, the banks losses in the world were estimated to be more than 1.8 trillion dollars, followed by insurance companies with around

[2] http://www2.fdic.gov/hsob/SelectRpt.asp?EntryTyp=30

[3] The sale of loans is forbidden in Islam even if there are non interest loans.

one trillion dollars. The importance of this paper stems from the perception that the stability of Saudi Islamic banks in responses to financial shocks, due to the adoption of the PLS system, is expected to contribute positively to the international financial stability.

II. Nature of financial banks crises

Since the financial crises of Latin-America and East Asia during the 1990s, international organizations have paid more attention to find out the causes and factors leading to the international financial crises. These efforts were conducted to elaborate an Early Warning System to expect the occurrence of future crises, to take precaution measures to reduce their damaging impacts.

Although each financial crisis has its own features and causes, there are some common internal and external features and reasons for all crises. Considering previous studies, the main reason behind the possibility of financial crises is asymmetry of information available to different participants, concerning rigorous macroeconomic fluctuations, including term of trade changes, variability of world interest rates and incentives to the flow of funds, exchange rate changes, and the vast expansion of banks credit, followed by a collapse of asset prices, causing a miss-match between banks liabilities and assets maturity. In addition, money supply was growing at faster rate than GDP. Moreover, financial crises were caused by excessive government interventions through banking sector regulation (conflicted objectives of government policy and interest groups in banking operations), and the weak accounting and legal systems concerning banks objectivity and comprehensive attitude toward exposure and dissemination of banks financial standing, as well as the inefficient monitoring and control of banks, concerning early corrective actions, and coordination between banks owners, managers, and investors, and concerned government agencies.

Banks financial crises may also happen because of changes in exchange rates, through banks speculation in FOREX, or the unexpected deterioration of the value of its holding of real and financial assets. Central banks are willing, in such cases, to play its role as last resort to rescue insolvent banks and to prevent the occurrence of a banking system crisis. Accordingly, it is believed that the existence of one of more of the abovementioned factors enhances the possibility of a banking sector crisis. An economy, under these circumstances, will not be able to accommodate or absorb financial shocks generated by the instability of prices, interest rates and exchange rates. It would be difficult for the economy also to resist shocks of liquidity,

credit and shocks related to changes in the structure of emerging financial institutions, because of reassessment of their financial assets, and changes in organizational structure or in the demand of assets. Therefore, several financial indices have been developed, such an early warning devices, to expect future financial shocks and to moderate its inverse financial and economic impacts.

Banks receive loan applications form investors of different levels of risk and moral commitments toward financial deals with banks. Feasibility studies of investor's project may help banks to assess the applicant level of risks, which consequently lessen adverse selection. However, such studies do not help bank to avoid moral hazards, which normally happen after signing the loan agreement. Furthermore, some loans may involve uncertainty concerning investors' default intention. It is not an easy task for banks to accurately make the distinction between these risk levels caused by asymmetric information of banks and investors.

Financial crises may be an exchange rate crisis, which leads to a large loss of the country international reserves, as a result mainly of the local currency devaluation. Another type of financial crises is that caused by bank failure, a situation that requires central bank interference to provide banks with reserves and to restructuring the banking system. Financial crises may also take place because of debt crisis, when debtors default on bank loans, or even when banks believe that defaults become a definite event. Facing such circumstances, banks are expected to adopt credit rationing strategy, depriving the economy from any new loans, settling outstanding loans. In some cases, the financial crisis may be related to the public debt, to Government failure in the repayment of the public debt, raising investment risk, discouraging foreign capital inflow, causing an exchange rate crisis. Facing such uncertainties, banks charge higher interest rates on loans by adding some risk allowance as an insurance premium. However, risky investors are the most likely to be willing to pay the high interest rates, given the high rates of returns expected on their projects. By contrast, low risk and moderate returns projects may turn to be infeasible, given the high financing cost. Accordingly, Banks will be forced to finance mainly risky projects, a practice known as adverse selection, which endanger the financial stability of the banking sector.

Moral hazards may also occur because of asymmetric information between banks and investors with respect to after contracting behavior of the later. Looking for highest possible

profits, some investors violate the loan contract by utilizing funds received from banks in rather riskier projects than those agreed upon in the contract. Thus, moral hazards raise banks' risk, increase interest on loans, and enhance adverse selection by banks, which all lead to inefficient allocation of financial resources and adverse impacts on the economy performance.

III. Literature review

There are few papers using quantitative models to analyze the financial stability of the Islamic and conventional banks. Čihak and Hesse (2010, 2008) analyze, via z-score as a criterion of stability, a sample of twenty countries extracted from the BankScope database, which contain the Islamic banks and conventional banks. The Islamic banks are classified into small and large banks following their assets-size with a threshold of one billion dollars and having at least 1% of the total assets of banks in the country. The findings of Čihak and Hesse indicate that small Islamic banks are more stable than small conventional banks and large Islamic banks, large conventional banks are more stable than large Islamic banks, and small Islamic banks are more stable than Islamic banks are large. They don't show if the large conventional banks are less stable than small Islamic banks.

The Islamic banks could be affected positively or negatively by financial crisis or banking crisis or bankruptcies of conventional banks even if the Islamic banks operate with its assets following the Islamic finance. So, Standard & Poor's Credit Rating indicates that the Islamic financial institutions satisfy 15% of Muslims needs of financial services, and that the size of assets compatible to Islamic-*Shariah* reaches 400 billion dollars in 2009 *i.e.* approximately 10% of international market, which is around 4 trillion dollars. The expansion of the Islamic finance model could reduce the immunity of Islamic banks.

The paper of AlKholi (2009), by using several stability bank indexes, concludes that the Saudi Islamic and conventional banks have been supported by SAMA and reflect fragile stability. He shows that the Saudi banking sector has successfully absorbed the shocks of international financial crisis. This shock absorption increased the customers' confidence and contributed to avoid a local financial crisis and its detrimental repercussion on real economy. Saudi banks reserves have been increased by more than three times to face the loan losses, SAMA policy and credit rationing by banks reduce significantly the negative effects of the international financial crisis on Saudi banks. During the first nine months of 2009, the profitability of Saudi banks indicates a tenuous decline around 2.6% (18.86 billion Riyals in

2009 versus 19.37 billion Riyals in 2008). At the same time, *AlBilad* Bank and Saud British bank recorded losses respectively at 66% and 11%; the losses of *AlBilad* Bank would be more related to local factors.

Hasan & Dridi (2010) determine the effects of recent international financial crisis, especially during the period (2007-2008), on the conventional and Islamic banks in eight countries, including the GCC countries. Using a range of banking indicators such profitability, loan growth, asset growth and the external credit rating, they find that Islamic banks have been affected by the crisis, but in a different way comparatively to conventional banks. The Islamic banks profitability in 2008 reduces the negative impact of the international financial crisis. Also, the growth rate of credits and investments assets (loans granted in the PLS system) exhibit that the performance of Islamic banks is better than conventional banks, given the large losses incurred by conventional banks following the international financial crisis. Then, the Islamic banks contribute to realize the financial stability. However, the Islamic banks have some weaknesses related to their risk management. In that case, they are exposed to potential financial shocks, which require reliable financial instruments to resolve the risk management above all liquidity risk.

The study of Imam and Kpodar (2010) identifies the factors affecting the world expansion of Islamic banks, which, in case of success, could be a new alternative financial model for finance industry. They use many factors affecting the international spread of Islamic banks such rate of Muslim population per country, technology of the domestic financial system, competitiveness of the domestic financial system, average of per capita income, real interest rate, events of September 11, 2001, crude oil price, and integration degree to Middle East countries. The findings show that the average of per capita income and the competitiveness in the banking system have significant positive impacts on the spread of Islamic banks, expressing the increasing need for Islamic financial intermediation across the world. Also, the decrease in real interest rates less than 3.5% conducts to more deposits in the Islamic banks. The paper of Ariss (2010) focuses on competitiveness conditions of Islamic and conventional banks by using several indicators such PR H-statistic index and Lerner index (market power of bank). Using yearly data from 2000 to 2006, the findings indicate that the weakness competitiveness is related significantly and positively to higher level of profitability, and that traditional banks are more competitive than the Islamic banks. Quasi all research uses annual data; our paper by using quarterly data contributes to enrich the previous research modeling the financial stability

of banks in face of shocks due to financial crises. The panel data features are firstly that the sample from 2005 to 2011 represents an important part of 64% of the Saudi banking sector with Islamic and conventional banks and covers close to two thirds of banks whose shares are traded on the Saudi stock market, and secondly that the sample contains the events of the recent global financial crisis (2007-2009).

IV. Banks Data and tests

Saudi banking system is composed of a total of eleven banks, including two distinguished groups, Islamic and conventional banks (Table 1 and Table 2). Four banks were classified as Islamic banks, according to the non-interest financing practice of this group of banks.[4] The rest seven banks are conventional banks. For the purpose of this paper, a sample of six banks were selected, two Islamic banks (*AlRajhi* and *AlBilad* banks), and four conventional banks (*Riyad* bank, Saudi Investment bank, Saud British bank, and Saudi American bank), where the last two represent offshore banks, with its close links to international banks around the world that allow the investigation of the international financial crisis impacts on these banks and on the Saudi financial system (see appendix 8.1: panel definitions).

The stability index (z-score) in sub-annual level is calculated using quarterly data collected and constructed from the Saudi financial market "*Tadawul*" over the period 2005-2011.[5] The last financial crisis has revealed some weaknesses of the Saudi banking system, on top of which are: first, the high concentration of bank loans to a limited number of firms and individuals. Second, the large portion of banks' investment in foreign assets with relatively high rates of returns compared to interest rates on domestic assets, especially after lowering the reverse repo by SAMA, and the lack of new government bonds during the same period, and the resulted liquidity surplus, which were channeled to the international markets (Ghassan et *al*., 2011).

The world financial crisis has caused some Saudi banks to encore losses, particularly those involved in foreign investment, loans trade, speculation in foreign currency and gold markets, and financial derivatives deals. Third, banks showed some degree of credit rationing and become relatively more conservative in issuing new loans. On the other hand, Saudi banking sector have shown some healthy signs during the financial crisis, where its record profitability levels were maintained. Net banks' profits were declined only by approximately 2.6% after the

[4]This link "http://www.halal2.com/main.asp?id=71" specifies Islamic and non-Islamic features of firms and banks registered in Saudi stock market.
[5] The international database BankScope allows only annual financial data.

conservative measures taken by banks. Total reserves, voluntarily, boosted to 6.04 billion Riyals, over the period January to September 2009, compared with 1.58 billion Riyals a year before, as a precautionary action to meet any possible losses due to investors' defaults on banks' loans. Also, it was noticed that equity capital of Saudi banks have increased, and banks' assets have not suffered the drastic negative impacts that hit banks' sectors in industrial countries around the world, where some giant famous banks were forced to announce bankruptcy. Saudi banks' huge reserves most likely have shielded domestic banks against the tremendous negative impacts of international financial crisis. Moreover, some well-known international credit rating agencies as Moody's and Standard & Poor's, has reported that basic financial forecasts of the Saudi banking sector are relatively stable, flexible and had the ability to absorb negative shocks of the international financial crisis and the declining world economic growth.

The prior step is to implement the panel unit root test on the relevant variables given in equation (x) below (Descriptive statistics, Tables 3).[6] A widely used panel unit root tests are Hadri (1999) as a common root test and Im, Pesaran and Shin (IPS, 2003) as an individual root test. The Hadri test considers the null hypothesis of no unit root and assumes that persistence parameters are common *i.e.* identical in the panel data. Accordingly, it assumes a common process of the panel unit root under null hypothesis ($\rho_i=\rho, i=1, \dots, 6$) considering a following process for panel data $y_{it} = \rho_i + \eta_i t + \varepsilon_{it}$ where $\varepsilon_{it}$is the specific-individual error, t stands for a time-trend which is related to fixed or individual effects. Similarly, to KPSS test, this test depends on the residuals from the individual OLS regressions on constant and time-trend. The statistic LM_1 is formed allowing for homoscedasticity hypothesis and alternatively the statistic ML_2 is related to consistent heteroscedasticity assumption, which leads to Z-statistic values (Table 4.2). The IPS test considers the null hypothesis of unit root and supposes that the persistent coefficient may vary between banks. Accordingly, it assumes an individual process of the panel unit root under null hypothesis ($\rho_i=0, i=1, \dots, 6$) and considering a following individual ADF regression for each bank $\Delta y_{it} = \rho_i y_{it-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{it-j} + X_{it}^{'}\alpha + \varepsilon_{it}$. The average of the t-statistics of ρ_i from the individual ADF regressions is adjusted to calculate $\bar{t}_{NT}$ statistics. When the lag order $p_i$is non-zero for some cross-sections, the IPS test shows that a properly standardized $\bar{t}_{NT}$ *i.e.* $W_{\bar{t}_{NT}}$statistic fellows asymptotically a standard normal

[6] The panel unit test is more sensible to high autocorrelation, which involves appropriate lag length in the test equation. The Hadri test has a different procedure for choosing the lag length; it requires the choice of kernel method estimation and bandwidth method to weighting the auto-covariances by selecting the small ones.

distribution (Table 4.1). The results of unit root panel test indicate that banks' variables have unit root using either IPS or Hadri test. This finding suggests that the bank's variables would be cointegrated. Also, the results of unit root tests exhibit that banking sector, and macroeconomic variables are no stationary except the economic growth variable.

V. Stability index Model

5.1 Banks Financial Stability Measurement

There are several well-known methods measuring the stability of financial systems, and banking sector. Among these methods, Value at Risk (VaR) (Holton, 2003, Manganelli & Engle, 2001), Stress Test (Aragonés et *al*., 2001; BIS, 2000) and z-score model (Altman, 1983). This model is considered the best amongst all other methods, as it has the advantage of predicting the possibilities of future bank insolvency, while other methods just find out if the bank may face a liquidity problem.

In fact, insolvency is more serious and dangerous problem than liquidity, which means that the bank liabilities exceed its assets, or the bank become insolvent. A bank may become illiquid even when it is solvent, if its assets are held in illiquid assets (long term financial assets or real assets) that can only be liquidated at high cost. The bank may be forced to sell such assets at considerable loss, by selling it at lower than its nominal value.

Altman measure can be applied to conventional and Islamic banks as well, using banks' accounting data. The z-score for banks takes the following definitions:

$$z = \frac{k_{t:q}+\mu_{t:q}}{\sigma_{t:q}} \tag{1}$$

$$k_{t:q} = \left(\frac{E}{A}\right)_{t:q},\ \mu_{1,t:q} = \overline{\left(\frac{R_{t:q}}{A_{t:q}}\right)} \quad \text{or} \quad \mu_{2,t:q} = \frac{\bar{R}_{t:q}}{\bar{A}_{t:q}},\quad \sigma^2 = V\left(\frac{R}{A}\right)_{t:q} \tag{2}$$

where k is the ratio of equity capital plus total reserves to assets. μ represents the ratio of average returns to assets, where average returns are calculated on base of four observations per year; we use the first formula. σ stands for the standard deviation of returns to assets, and measures the volatility of returns on assets.[7] The z-score bank's stability index is used for predicting financial distress. It is based on a standard indicator of financial soundness of a

[7] Strobel (2010) shows that the best measure of standard deviation require high frequency such the branch banks data.

group of different financial institutions, and focuses on bank's risk of insolvency.[8] The z-score reflects the probability of insolvency or bank liabilities exceed assets. Assuming a normally distributed bank return μ, then the probability of default is $p(\mu < -k) = \int_{-\infty}^{z} \mathrm{N}(0,1)\mathrm{d}\mu$. The z-score measures the number of standard deviations that a return realization must fall to deplete equity (Čihak, 2007). The greater z-score indicates the lower likelihood of bank insolvency risk; the index will take high value when capitalization, measured in terms of risk error, is large.

The z-score seems to be appropriate to measure the Islamic bank risk, because it is not affected by the nature of the bank activities; but it focuses on risks involved in the investment of bank assets and reserves. It is especially suitable for banks adopting investment strategies that prefer high risk assets given a high rate of return, or low risk assets even at low rate of returns, which guarantees the z-score objectivity (Čihak & Hesse, 2010, 2008; Maechler et *al*., 2005). But in the context of financial shocks and crises the high risk may lead to meager or negative returns, whilst the small risks may turn to big returns. These volatilities require a specific modeling of z-score index to explain its determinants in the long run such the GARCH models.

The z-score index may be incompatible with the nature of Islamic banking relying mainly on the PLS system, which leads to a common risk of the investor and bank via "*Mudarabah*" and "*Musharakah*" contracts. It is probable that the capital value and reserves do not reflect the financial strength of Islamic banks, because the investor shall bear a part of the risk according to a formula of PLS contracts, and thus reduce fairly the risk of Islamic Banks. These banks may seek for adjustments processes in risk-taking rates by the investors through appropriate contracts of PLS system and new methods of capital investment. The conventional banks also seek for adjustment processes of interest rates on deposits and loans to avoid insolvency (Čihak & Hesse, 2010, 2008).

[8] In fact, insolvency is more serious and dangerous problem than liquidity, which means that the bank liabilities exceed its assets, or the bank become insolvent. A bank may become illiquid even when it is solvent, if its assets are held in illiquid assets (long term financial assets or real assets) that can only be liquidated at high cost. The bank may be forced to sell such assets at considerable loss, by selling it at lower than its nominal value. The concept of financial distress, widely used to make financial analysis of banks data, indicates the negative performance of banks. The case of financial distress occurs when the bank becomes insolvent even if bank assets exceed its liabilities. While the concept of economic failure shows that the return rate of investments is less than the interest rate on short loans. Also, the financial failure happens when the enterprise is unable to pay its debts and short-term obligations. The bankruptcy indicates the inability of a company to pay its debts and short-term obligations and the difficulty to manage their financial needs from external funding sources.

5.2 Financial Stability Model

The financial stability index is influenced by three sets of variables related to banks, banking sector and macroeconomic, respectively. The bank determinants include five variables: logarithm of z-score (LZSCOR), logarithm of total assets (LAST), loans to assets ratio for conventional banks or ratio of finance activity to assets in case of Islamic banks (ratio of credits to assets, RCA),[9] in addition to ratio of operating costs to income (RCI) and income diversity (IDV).The banking sector determinants include three variables: logarithm of Herfindahl [10] index (LHHI), which measures banks' competitiveness, that ranges between zero for highly competitive and 10000 for a least competitive market (Ariss, 2010). It also includes the share of Islamic banks *i.e.* ratio of Islamic banks' assets to total assets of the banking sector (SHIB), which may also be measured by the ratio of Islamic banks' deposits to total bank sector deposits. The macro variables are both real rate of economic growth (GRW) and rate of inflation (INF).

To capture the impacts of a specific bank on financial banking stability, two bank dummy variables were introduced one for conventional banks (CBD) and the other for Islamic banks (IBD). These variables are expected to take on a negative sign indicating the financial weakness of the related bank group, whereas a positive sign reflecting the financial strength of the related bank group and its contribution to the banking sector stability. It is also possible to use a composed variable in testing the hypothesis that the Islamic banks contribute to the financial stability of banking sector. The IDV variable interacts with both dummy variables IBD and CBD. If the interaction with IBD takes on a positive sign, it implies that the diversity of Islamic bank's income enhances the stability of the banking sector.

Given that the cross-section observations are less than the time series observations ($N < T$), and assuming the existence of serial correlation between banks' data, the unobserved random errors are expected to have variance covariance matrix $\Omega \otimes T$, with $\Omega = (\sigma_{ij})$, $i, j = 1, \dots, N$ where σ_{ij} is not necessarily equal zero (Heij et *al*. 2004). These features require using

[9] Instead of interest income (commissions) and interest charges in conventional banks, we use for Islamic banks finance income and finance charges.

[10] To calculate the income diversity, we use the following definition:
$idv = 1 - \left|\frac{Net\ interest\ income - Other\ operating\ income}{Total\ operatimg\ income}\right|$ where the net interest income, for Islamic banks, includes positive and negative income flows related to many model of PLS system. The higher value of this index indicates a higher diversification of income.

a Seemingly Unrelated Regression (SUR) model, which leads to formulate a pooled data model and use of several estimation techniques of z-score model.[11]

Based on the previous determinants of financial stability, the z-score model could be written as follows:

$$z_{it} = \alpha_i + \beta_i B_{it-1} + \gamma_i S_{t-1} + \omega_i M_{t-1} + \pi_i D_i + \varepsilon_{it} \quad (3)$$

where B_{it-1} stands for banks variables, S_{it-1} and $M_{i,t}$ represent banking sector and macroeconomic variables, respectively. We use also D_i as dummy variable to exhibit to distinguish between the impacts of conventional and Islamic banks on the financial distress on bank i. The term ε_{it} indicates the unobserved stochastic errors. The variables in right side of Eq. (3) are considered with one lag length to capture their effects on the expected z-score index.

Considering that the sum of cross fixed effects is zero (bottom of Tables 5), these effects appear in Figures 3 and represent the deviations from the global rate of z-score. The findings show that SIB, SAB banks and mainly BLD bank contribute positively to financial stability, whereas SAM and RJH banks and mostly RYD bank contribute negatively to financial index stability. To exhibit the global effect on banking sector, we formulate a Panel data model and using also numerous estimation methods:[12]

$$z_{it} = \alpha_i + \beta B_{it-1} + \gamma S_{t-1} + \omega M_{t-1} + \pi D_i + \varepsilon_{it} \quad (4)$$

The findings indicate that Islamic banks reduce the financial stability index in the average rate of 11.4% (Table 7.1). But they contribute to the financial stability in banking sector through the income diversity index, which improves the z-score on average at rate 21.6%. The serial correlation due to the dummy variable (IBD) relativizes these results.

The results of the Table 7.3 have some goodness statistical features, they show that Islamic banks contribute to improving financial stability in average with rate of 8.3% (*i.e.* $\frac{0.306}{3.742}$) through the diversification of financial products. The results of Table 8.2 from Panel GLS estimation

[11] Such the Pooled Least Square (PLS) method, without cross-section weights and using standard errors and covariances; the Generalized Pooled Least Squares (PGLS) method, with cross-section weights (correcting for both cross-section heteroscedasticity and contemporaneous correlation) and using SUR errors and covariances; the P2GLS method, with cross-section weights and using SUR errors and covariances, and set of common, cross-section specific and period specific instrumental variables.

[12] Obviously, when we consider panel banks, the fixed effects are less appropriate than the stochastic effects, but the small number of banks in our sample does not authorize such hypothesis.

indicate that fixed cross effects on z-score vary between banks. *AlBilad* bank contributes negatively to z-score more than SAIB and comparatively to the negative contribution of SABB (1.5% on average). Meanwhile *Riyad* Bank contributes efficiently to banking financial stability, SAMBA group enhances this stability significantly, and *AlRajhi* Bank has a slightly positive contribution (1.1% on average).

The Table 7.3 indicates that the index of operating cost to income has almost neutral role in improving the financial stability index, so it is reduced slightly at rate 0.01%. But, *AlBilad* bank has a high and unstable ratio of cost to income, while *AlRajhi* Bank proved to be highly competitive over to *Riyad* Bank. This ratio appears to be more unstable and less competitive in both SAIB and SABB. It appears from Table 7.3 that the variables of banks have the expected signs, as the banks that have a high level of RCA variable moves toward low index of financial stability (Table 8.2), such as *AlBilad* Bank and SAIB. But it seems that the marginal propensity (0.622) associated to the ratio of loans to assets (for conventional banks) or to the ratio of finance to assets (for Islamic banks) has a significant positive sign, which emphasizes the effects of banks with moderate RCA ratios.

The modest presence of Islamic banks in the Saudi banking sector does not qualify them to improve effectively the banking financial stability. The dominance of conventional banks reflects that they contribute to increase the z-score index, although some financial distress as in SAIB and SABB. But, the presence of Islamic banks leads to net improvement of the financial stability, so that the fixed cross effects (Table 5.3) exhibit that *AlBilad* bank, with small size compared to *AlRajhi* Bank, gets better the z-score index, while *AlRajhi* bank tends to reduce the Islamic financial stability index. These results may be explained by the involvement of *AlRajhi* bank, through the Profit-Loss Sharing system, in direct investment operations or long run and high risk financial investment intermediation. These results are similar in part to the findings of Čihak and Hesse (2010, 2008), that the small Islamic banks are more stable than the large ones.

It seems that the impact of competitive banks index LHHI has a negative sign and high significant parameter, which indicates that the Saudi banking sector relatively complains of weak competition, reflecting negative effects on financial stability. In addition, the estimated equations exhibit that the inflation rate affects negatively and significantly the z-score index, which illustrates the importance of economic and financial policies of the government in support of the financial stability in banking system.

VI. Conclusion

The paper uses the z-score as financial distress index of sample of Saudi banks including conventional and Islamic banks. The financial stability model is explained by variables reliable to individual banks, banking sector and macroeconomic. The models are designed for both pooled and panel data and estimated by several methods, the findings may be summarized as follows.

Pooled data model shows that SAIB and SABB and mainly *AlBilad* bank contribute positively to its financial stability index, while SAMBA group, *AlRajhi* Bank and in particular *Riyad* bank have a negative impact on its financial stability index. However, panel data model shows that Islamic banks reduce relatively the value of the financial stability index; meanwhile, they contribute efficiently to enhance the financial stability through the diversification of their assets. The fixed cross effects on z-score indicate that *AlBilad* Bank had the greatest negative contribution to the financial stability index, followed by SAIB and the SABB, this latter has the least negative impact on z-score. Results also show that *Riyad* Bank and SAMBA group efficiently support the financial stability of banking sector, while *AlRajhi* bank has a positive but relatively moderate role in enhancing the banking sector stability.

The findings indicate that the ratio of operating cost to income has almost neutral role in improving the financial stability index. *AlBilad* Bank has a high and unstable ratio of cost to income, while *AlRajhi* Bank proved to be highly competitive over to *Riyad* Bank. This ratio appears to be more unstable and less competitive in both SAIB and SABB. Conventional banks with high ratio of loans to assets or Islamic banks with high finance to assets ratio mostly have lower stability indices, as for instance *AlBilad* bank and SAIB. However, this ratio has a positive and significant marginal propensity, which emphasizes the effects of banks with moderate ratios. The competitiveness index seems to be negatively high and strongly significant, which indicates that the Saudi banking sector has relatively less level of competitiveness, that negatively affecting the financial stability. The limited representation of Islamic banks in the Saudi banking sector jeopardizes any efforts to improve the financial stability index.

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Appendices

1. Banks identity

***Riyad* Bank** (RYD) is a Saudi Joint Stock Company founded in 1957. It operates with 237 branches, a branch in London (UK), and an agency in Houston (USA) and a representative office in Singapore. The RYD provides a full range of banking and investment services. It also provides to its customers' non-interest based banking products approved and supervised by an independent *Shariah* Board established by RYD.

Saudi Investment Bank, SAIB (SIB) founded in 1976 and owned by the government. It operates with 45 branches, which 41 work under the *Al-asalah* Brand. SAIB provides a full range of traditional wholesale, retail and commercial banking products and services for the quasi-government and private industrial sectors including trade finance products for both imports and exports. Through *Al-asalah* Islamic Banking brand, SAIB offers several Shariah-compliant products and services.

Saudi British Bank, SABB (SAB) is a Saudi Joint-Stock company founded in 1978 and licensed to conduct banking business. SABB has a very strong and rich record in banking business as well as a successful history in Saudi Arabia in the launch and provision of banking services and products for retail and corporate customers. SABB is one of the first banks to issue the credit cards in the Saudi Market, use ATMs for equity subscription services, in addition to the use of Braille language in ATMs and the financing and support of MBA scholarship program at UK universities for Saudi citizens.

Samba Financial Group (SAMBA, SAM) founded in 1980 and enjoys an extensive network of branches in Saudi Arabia as well as in UK, Pakistan and Dubai. The SAMBA adopts a strategy of expansion in the regional markets and provides world class services to meet the financial needs of its private, corporate and institutional customers. Its strong suite of comprehensive and integrated conventional and Shariah-compliant financial products and services as well as financial advisory services has propelled Samba to the top tier of Saudi Financial institutions. The Bank aims to invest in its staff, reinforce its social responsibility and maximize its shareholders' returns. SAMBA was the first Bank in Saudi Arabia to offer Priority Banking (Gold and Diamond), Phone Banking, ATMs and Cash Deposit through ATMs, Debit Cards, Charge Cards, Islamic Credit Cards, Co-Branded Credit Cards, Al-Khair Credit Cards for ladies, "*Murabaha*"-Based Cash Financing, Phone Banking, Leasing ("*Ijarah*"), Foreign Exchange Derivatives, Interest Rate Derivatives, Credit Shield Insurance, and Automated Signature Verification.

***AlRajhi* Bank** (RJH) founded in 1976 and considered as one of the largest banking corporations in Saudi Arabia with a Saudi fully paid capital. RJH has the largest branch network (more than 500 branches) and the largest (ATM) network (2000 machines) and over 17,000 (POS) installed with merchants all over the Kingdom. The objectives of RJH are represented in practicing banking and investment activities respecting Islamic law. RJH is practicing banking and investment (individuals, companies) for its own account or on behalf of others within and outside the Kingdom.

***AlBilad* Bank** (BLD) is a Saudi joint stock company founded in 2005. The objectives of BLD are to provide all Islamic *Shariah* compliant banking services. The bank has, as part of its organizational structure, *Shariah* Department to oversee the follow-up and monitoring of the implementation of the *Shariah* decisions issued by the *Shariah* Committee.

2. Tables and Figures

Table 1: Banks Listed in the Saudi Stock Exchange (2012)

Bank	Code	Bank type	Capital (Billion SAR)
1. *Riyad* Bank	RYD	Conventional with IW	15.0
2. *Al-Jazirah*	JZR	Islamic	03.0
3. Saudi Investment Bank	SIB	Conventional with IW	04.5
4. Saudi Hollandi Bank	SHD	Conventional	03.3
5. Saudi Fransi Bank	SAF	Conventional with IW	07.2
6. Saudi British Bank (SABB)	SAB	Conventional with IW	07.5
7. Arab National	ARN	Conventional with IW	06.5
8. Saudi American Bank (SAMBA)	SAM	Conventional with IW	09.0
9. *AlRajhi* Bank	RJH	Islamic	15.0
10. *AlBilad* Bank	BLD	Islamic	03.0
11. *Al-Inma* Bank	IMA	Islamic	15.0

Source : http://www.tadawul.com.sa (2012). IW stands for Islamic windows.

Table 2: Main Differences between Islamic and Conventional Banks

	Conventional Banks	Islamic Banks
Model	Based on conventional law, Maximize profits subject to differential interest rates.	Based on Islamic law (*Shariah*), Maximize profits subject to Profit-Loss Sharing (PLS) System.
Risk	• Shifting risk when involved or expected. • Guarantee all its deposits. • Focus on credit-worthiness of the clients.	• Bearing risks when involved in any transaction. • Guarantee only current account deposits, but other deposits are invested via multilayer *Mudarabah* system as a part of PLS system. • Focus on the viability of the projects.
Money and liquidity	• Interests on borrowing from the any market. • Sale of Debts.	• Based on *Shariah*-compliant for any transaction. • Large restrictions on sale of Debts.

Workspace

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Mehmet Asutay and Abdullah Q. Turkistani

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Islamic finance in modern times emerged in the form of commercial banking in the mid-1970s as a response to the endogenisation of religious norms in shaping the norm and substance of financing to produce a moral economy-oriented proposition for developing economies and societies since Islam, as a religion, also provides the norms, values, principles and injunctions related to everyday aspects of economic and financial activity. While Islamic banking is a modern phenomenon, Islamic financing itself has been in practice within the periphery of the Muslim world ever since the Prophet Muhammad revealed such principles about fourteen centuries ago.

Islamic finance...

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Sayd Farook and M. Kabir Hassan

https://doi.org/10.2307/j.ctt1df4hmj.4

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While Islamic Finance has gained substantial prominence in the past decade, little is known about the potential risks it presents as an asset class. While there have been some Islamic banks that were about to collapse (see Henry and Wilson, 2004), there have been no large scale collapses of Islamic banks nor have there been any financial crises sparked by the fall of Islamic banks. Yet, if the share of Islamic finance grows at its current rate (15% by some estimates, Ainley *et al*., 2007), it is likely that the stability of Islamic banks will become an increasingly important topic...

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https://doi.org/10.2307/j.ctt1df4hmj.5

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The Global Financial Crisis (GFC) has been considered the most severe world financial and economic crisis in history. It has highlighted the fragility of the global finance system, leading to uneasy feelings that there is an urgent need to fundamentally re-think how fýnancial systems are functioning, and how they are regulated. The GFC has also provoked the financial challenges that a new architecture was needed to re-shape the financial system with an effective innovation rather than some make-ups (Chapra, 2008). Islamic finance may be the architecture that has ability to overcome the weaknesses of the financial system, contributing to the...

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Financial crises are strongly related to financial and banking systems, given the international financial liberalization market, where a local financial system is no longer isolated from changes of the global system. In the last decade of the twentieth century, Islamic banks were first established and have had a growing role in the international financial system since then. In fact, CIBAFI (2010) indicates that total world Islamic finance had reached around one trillion US dollars at the end of 2009.

During the last financial crisis (2007-2009) a large number of conventional banks around the world have announced bankruptcy (140 U.S. Banks...

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Jaizah Othman and Mohamad Asmady Shahadan

https://doi.org/10.2307/j.ctt1df4hmj.7

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Bank failures threaten the economic system as a whole. Therefore, it is crucial to predict bank financial failures in order to prevent or minimise the negative effects on the economic system. Due to this, the present paper analyses whether the wellknown Altman Emerging Market Z-score model can predict bankruptcy and at the same time measure the financial performance of Islamic banks in the GCC countries. This empirical analysis examines 14 Islamic banks in the GCC countries – consisting of 4 Islamic Banks in UAE, 4 Islamic banks in Bahrain, 2 Islamic banks in Qatar, 2 Islamic Banks in Saudi Arabia, and...

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Wael Eid and Mehmet Asutay

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The question posed by this paper is whether Michael Ainley is right when he assumes that risk management is similar across different cultures and religions, or in this case, whether it is similar for Islamic and conventional banks. Are Islamic banks akin to any other bank that simply provides financial services, and do they thus have similar risk management requirements?

The subject of risk management in Islamic banking has many facets. On the surface, the frequently repeated notion that Islamic banks are more resilient than their conventional counterparts is attractive in a world torn apart by financial crisis. Unfortunately, and...

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Mehmet Orhan and Harun Sencal

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The main purpose behind the formation of the GCC in early 1980s is still being realized even three decades after its inception. There has been considerable progress in the synchronization of the financial markets and mobility of commodities and factors of production through the member states of the council, namely Saudi Arabia, Kuwait, Qatar, United Arab Emirates, Oman and Bahrain. But the main achievement of the GCC would be the establishment of the monetary union which was the main purpose of the council in 1981 rendering the determination of the external anchor which is dominantly assumed to be the US...

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Hylmun Izhar

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Due to its computational and numerical intensity coupled with limited availability of data, a few adjustments will be made in testing Izhar's proposed theoretical model. Firstly, the process through which *VaR* is generated will undergo a slight modification since the variables in the analysis do not reflect non-linearity relationships. Nonlinearity might arise from derivative products such as options. As will be shown in the later section, none of the variables in the model are categorised as one, hence the issue of non-linearity is irrelevant since a quadratic relationship among variables does not exist. As a result, the issue of first...

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Ronald Rulindo and Tika Arundina

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The banking industry is considered among the most risky of industries. It is difficult to imagine another sector of the economy whereas many risks are managed jointly as in the banking industry (Cebenoyan and Strahan, 2004). Due to higher risk exposures, banking supervisors require banks to set aside what is called regulatory capital. The regulatory capital is built from capital adequacy ratio (CAR). The determination of CAR considers credit risk, market risk and operational risks that exist in the banks' balance sheet.

Due to the provision above, banks are required to hold higher amounts of capital if they intend...

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Mohammad Omar Farooq and Sowmya Vivek

https://doi.org/10.2307/j.ctt1df4hmj.12

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The phenomenal growth of Islamic banking and finance in recent years has highlighted needs for policies to help integrate Islamic finance in the national and global financial systems. There has also been an understandable increased interest of researchers into understanding unique aspects of Islamic banking and finance and how it can be standardized across the globe. Risk management in particular is drawing a lot of interest given the current turmoil in the financial system and infrastructure. Few Islamic bankers believe that Islamic banks overall are less susceptible to risk on account of their nature. However an overwhelming majority rightly feel...

13. 10 The Development of Islamic Securitization in the GCC Countries to Support Housing Finance Markets: An Assessment of Markets, Regulations and Policies (pp. 263-294)

Friedemann Roy and Zamir Iqbal

https://doi.org/10.2307/j.ctt1df4hmj.13

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Residential real estate finance markets are in a nascent stage in the Gulf Cooperative Council (GCC) countries.[2] Given their mortgage to GDP ratios, Kuwait, Qatar and the United Arab Emirates (UAE) are considered the most advanced markets. With an average of 9.1%, the size of GCC mortgage markets is equivalent to most mortgage markets of other more mature emerging economies. Only Malaysia, which is considered one of the most developed Islamic finance markets, has a higher mortgage loan to GDP ratio (36% in 2006).

The limited importance of the markets is due to a shortage in housing stock, particularly affordable...

14. 11 What determines Islamic Financial Development? Empirical Evidence from GCC countries

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Kaouthar Gazdar and Rihab Grassa

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Financial development has received, over the last decade, a great deal of attention as a source of economic growth. The theoretical argument given frequently to explain the relationship between financial development and economic growth was a well-developed financial system performs several and critical functions and then, enhances the efficiency of intermediation by reducing information, transaction, and monitoring costs (Levine 1997, 2005). Since this time, the question about the determinants of the financial development has become important and explored by many economists. A number of key publications have also given special attention to macroeconomic and institutional environments to explain the development...

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Khaled Elmawazini, Khiyar Abdalla Khiyar and Ahmad Al Galfy

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During the last three decades, the number of Islamic financial institutions has risen from one institution in 1975 to over 300 institutions operating in more than 75 countries worldwide (El Qorchi, 2005). These institutions are managing funds of around US$200 billion, with total assets of more than US$822 billion (Iqbal and Molyneux, 2005; Moin, 2008). More recently, Islamic finance markets have grown 15-20% on average, the fastest growth in the financial sector, over the last five years (Derbel *et al*., 2011). The fast growth rate of Islamic banking may be due to its advantages over conventional banking. The Islamic banking...

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Issam Al Tawari

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Islam through its economic philosophy has defined a complete system that prescribes specific patterns of economic behaviour for all individuals and society within an Islamic way of life. The concept of Islamic finance is only part of the key elements of Islamic economic philosophy and these elements will help the reader to develop a general framework of Muslim economic thinking and demonstrate the rationale and the principle of the idea of Islamic finance.

Islamic banking and finance is one of the fastest growing sectors on the global financial scene. It is growing at an annual rate of 15% with an...

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