

**ESSAYS ON THE PERFORMANCE, DISCLOSURE, AND CORPORATE  
GOVERNANCE OF ISLAMIC BANKS**

By

AMAL ALABBAD

A dissertation submitted to the

Graduate School-Newark

Rutgers, The State University of New Jersey

In partial fulfillment of requirements

For the degree of Doctor of Philosophy

Graduate Program in Management

Written under the direction of

Suresh Govindaraj

And approved by

---

Dr. Suresh Govindaraj (Chair)

---

Dr. Dan Palmon

---

Dr. Divya Anantharaman

---

Dr. Picheng Lee

Newark, New Jersey

October, 2015

© 2015

**AMAL ALABBAD**

**ALL RIGHTS RESERVED**

## **ABSTRACT OF THE DISSERTATION**

### **ESSAYS ON THE PERFORMANCE, DISCLOSURE, AND CORPORATE GOVERNANCE OF ISLAMIC BANKS**

By AMAL ALABBAD

Dissertation Director: Dr. Suresh Govindaraj

In this study, I empirically investigate relative efficiency, accounting conservatism, and corporate governance in Islamic banking. It is crucial for Islamic banks to be efficient in order to withstand competitive pressures and financial crisis. Academic evidence, however, from Islamic banking studies is inconclusive on the question of whether Islamic banks are more or less efficient than their conventional counterparts. There is also doubt on the relevance of conservatism concept to financial reporting practices of Islamic banking because of Zakah (Islamic tax). Moreover, the institution of Shariah supervisory board (SSB) as an additional layer of governance in Islamic banks plays an important role in affecting bank risk-taking.

The first essay empirically examines the relative efficiency of Islamic banks compared to conventional banks using a sample of Islamic and conventional banks from the Bankscope database. I define efficiency as the level of capital buffer banks would maintain for any given level of asset risk. Due to profit and loss sharing (PLS) scheme that dominates the deposit side of Islamic banks, majority of the depositors are equity-like holders whose returns depend on bank performance (Archer and Karim, 2009). Therefore, I hypothesize that Islamic banks would maintain lower capital reserves, for any given level of asset risk, compared to their conventional counterparts. However, I

find that Islamic banks hold more capital and reserves, for a given level of asset risk, which suggest that Islamic banks are less efficient than their conventional counterparts. I find that Islamic banks that engage more in Islamic mode of finance and are highly funded by PLS contracts are less efficient than Islamic banks that engage less in such contracts. In further cross-sectional tests, I find that smaller Islamic banks are significantly less efficient than larger Islamic banks due to the absence of risk diversification tools in small banks, and that Islamic banks tend to be less efficient before and after the financial crisis of 2007-2008.

The second essay explores the nature of Islamic banks' financial reporting incentives created by Shariah with respect to accounting conservatism. Adherence to Shariah rules, Islamic bank, as a separate entity, is obligated to pay Islamic tax or Zakah in order to maintain social justice and alleviate poverty. This indicates that the financial reporting of Islamic banks would be influenced by such obligation. Many Islamic accounting scholars cast doubt on the relevance of conservatism concept. Some scholars claim that the conservatism concept is not relevant for Islamic accounting reporting because it leads to understating assets that could be subject to Zakah (Adnan et. al. 1997). Others argue, however, that what is meant in Islamic accounting by conservatism concept is the selection of the accounting techniques that has the most favorable impact on society not the owner. For instance, it is better to overestimate funds "anti-conservative" for Zakah purposes (Haniffa and Hudaib, 2001). I posit that Islamic banks apply an anti-conservatism practices in financial reporting to be consistent with Shariah rules. Using Basu (1997) and Ball and Shivakumar (2005) models, I find that Islamic banks recognize earnings decrease on timely bases while recognize earnings increase with delay. This

would suggest that Islamic banks take the same accounting conservatism approach as conventional banks and Shariah does not play significant roles in term of financial reporting. In addition, I find that Islamic banks report more conservatively than conventional banks due to additional obligation of Zakah payment and higher litigation risk exposed to the Islamic banks.

Prior literature argues that board' characteristics paly an important roles in influencing bank risk-taking (Jensen, 1993; Yermack, 1996; Pathan, 2009). In third essay, I examine whether the board structure of Islamic bank, in particular Shariah supervisory board (SSB), influence risk-taking behaviors. Under Shariah rules, Islamic banks are expected to engage in less risk-taking investments. Focusing on board's characteristics that mostly examined in the literature, I find that large SSB is positively associated with bank risk-taking. The result is consistent with Pathan (2009) that larger number of directors in the board is less effective in monitoring bank activities due to coordination and free-riding problems. Consistent with Shivdasani and Yermack (1999), Christy et al (2009), and Falato et al. (2014), I also find that scholars with multiple memberships, or busy members, in SSB are positively associated with bank risk. Scholars with multiple seats are too busy to mind the business and unable to provide meaningful managerial monitoring. Moreover, the results show that foreign scholars are more effective in monitoring banks' Shariah compliance as they provide expertise and independent monitoring over management, which in turn enhance firm value (Oxelheim, and Randoy, 2003; Chi, Sul, and Min, 2012). Further analysis provides some evidence that most of the findings on the association between SSB structure and bank risk are derived from countries in the Gulf Corporation Council (GCC) where Shariah governance is ruled

internally at bank level, and such associations are more pronounced after the global financial crisis. This study sheds light on current practices of Islamic governance and emphasizes the need for well-functioning Shariah board that works with board of directors and management to better realize the goals of Islamic banks in practice.

## **ACKNOWLEDGEMENTS**

The process of writing this thesis has been long and eventful, sometimes hopeful and occasionally even desperate. During the years many people have helped and supported me and now it is time to thank them all. I would like to express my gratitude for the guidance from committee members, help from friends, and support from the family.

I am sincerely grateful to the Chair of my dissertation Professor Suresh Govindaraj for continuous support of my study and research, for his patience, motivation, competence, and kind guidance. I am also thankful for Professor Divya Anantharaman for her valuable comments, suggestions, expertise, and precious time at different stages of the project. All my friends and colleagues, both former and present, at Rutgers Business School deserve my heartfelt thanks for inspiring discussions and significant support.

Finally, I would like to express my deepest appreciation to my family, friends and other relatives who have supported me in this process. I owe my warm thanks to my Mom for her endless support, for always believing in me and constantly listening to me. Last, but not least, I am deeply grateful to my husband Jafar for all his love, support, encouragement, and patience. Together we can now concentrate on other challenges and miracles of life.

Amal Alabbad

## **DEDICATION**

I dedicate my dissertation work to my husband, Jafar, who has been a constant source of support and encouragement during the challenges of graduate school and life. I am truly thankful for having you in my life. I also dedicate this work to my wonderful daughters Fatimah and Khawlah for being here for me throughout the entire doctorate program. All of you have been my best cheerleaders. This work is also dedicated to my parents who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve.



## TABLE OF CONTENTS

<b>ABSTRACT .....</b>	<b>ii</b>
<b>LIST OF TABLES .....</b>	<b>xi</b>
<b>LIST OF APPENDICES .....</b>	<b>xii</b>
<b>CHAPTER 1: Efficiency in banking; Islamic vs. conventional banks .....</b>	<b>1</b>
<b>1. Introduction .....</b>	<b>1</b>
<b>2. Background and hypotheses development .....</b>	<b>4</b>
<b>2.1 Shariah law, risk sharing, and intermediation role of Islamic banking.....</b>	<b>4</b>
<b>2.2 Hypotheses development.....</b>	<b>6</b>
<b>3. Research design.....</b>	<b>8</b>
<b>4. Sample and descriptive statistics.....</b>	<b>12</b>
<b>4.1 Sample selection.....</b>	<b>12</b>
<b>4.2 Descriptive statistics.....</b>	<b>13</b>
<b>5. Empirical Results .....</b>	<b>14</b>
<b>5.1 Comparing efficiency of Islamic and conventional banks.....</b>	<b>14</b>
<b>5.2 Partitioning Islamic banks by the intensity of Shariah- compliant products.....</b>	<b>16</b>
<b>5.3 Partitioning Islamic banks by size.....</b>	<b>17</b>
<b>5.4 Islamic banks before and after the financial crisis period.....</b>	<b>18</b>
<b>6. Conclusion .....</b>	<b>19</b>
<b>Reference.....</b>	<b>20</b>
<b>CHAPTER 2: Accounting conservatism in Islamic banking .....</b>	<b>40</b>
<b>1. Introduction .....</b>	<b>40</b>
<b>2. Literature review .....</b>	<b>44</b>
<b>2.1 Underlying structure of accounting conservatism .....</b>	<b>44</b>
<b>2.2 Islamic tax and conservatism in Islamic banks .....</b>	<b>46</b>
<b>3. Hypotheses development .....</b>	<b>47</b>
<b>4. Research design .....</b>	<b>48</b>

5. Sample and descriptive statistics .....	52
5.1 Sample selection .....	52
5.2 Descriptive statistics .....	53
6. Empirical results .....	55
7. Further analysis .....	56
7.1 Conservatism in Islamic vs. conventional banks .....	56
8. Summary and conclusion .....	59
Reference .....	61
<b>CHAPTER 3: Roles of Shariah governance and bank risk-taking .....</b>	<b>78</b>
1. Introduction .....	78
2. Related literature and hypotheses development .....	82
2.1 Shareholders incentives, Shariah supervisory boards and bank risk-taking.....	82
2.2 Hypotheses development.....	84
2.2.1 SSB size and bank risk-taking.....	84
2.2.2 SSB membership and bank risk-taking.....	85
2.2.3 SSB oversees and bank risk-taking.....	86
3. Sample, variable measurement, and descriptive statistics.....	87
3.1 Sample.....	87
3.2 Measures of bank risk.....	87
3.3 Measures of explanatory variables.....	88
3.4 Empirical model and estimation method.....	91
3.4.1 Empirical model.....	91
3.4.2 Estimation method.....	92
3.5 Descriptive statistics and correlation matrix.....	92
4. Empirical results.....	93
5. Robustness tests.....	95
5.1 Ordinary least square (OLS) .....	95
5.2 Three-stage square (3SLS) .....	96
6. Further analysis.....	97

<b>6.1 Shariah supervisory boards and bank risk-taking in GCC vs. others.....</b>	<b>97</b>
<b>6.2 Shariah supervisory boards and bank risk-taking before and after the financial crisis period.....</b>	<b>98</b>
<b>7. Conclusion.....</b>	<b>98</b>
<b>References.....</b>	<b>100</b>

## LIST OF TABLES

<b>Table 1.1 Descriptive statistics .....</b>	<b>27</b>
<b>Table 1.2 Correlations .....</b>	<b>29</b>
<b>Table 1.3 The efficiency of Islamic vs. conventional banks.....</b>	<b>30</b>
<b>Table 1.4 Efficiency of Islamic banks: Partitioning on the intensity of Shariah compliant products.....</b>	<b>32</b>
<b>Panel A: Intensity of Shariah-compliant product on asset side of balance sheet.....</b>	<b>32</b>
<b>Panel B: Intensity of profit-loss sharing products on deposit side of balance sheet.....</b>	<b>34</b>
<b>Table 1.5 Assessing efficiency of Islamic banks across different size groups.....</b>	<b>36</b>
<b>Table 1.6 Assessing efficiency of Islamic banks before and after the financial crisis.....</b>	<b>38</b>
<b>Table 2.1 Descriptive statistics.....</b>	<b>68</b>
<b>Table 2.2 Correlations.....</b>	<b>70</b>
<b>Table 2.3 Conservatism in Islamic banks.....</b>	<b>72</b>
<b>Panel A: Basu (1997) model.....</b>	<b>72</b>
<b>Panel B: Ball and Shivakumar (2005) model.....</b>	<b>73</b>
<b>Table 2.4 Conservatism in Islamic banks vs. conventional bank.....</b>	<b>74</b>
<b>Panel A: Basu (1997) model.....</b>	<b>74</b>
<b>Panel B: Ball and Shivakumar (2005) model.....</b>	<b>76</b>
<b>Table 3.1 Descriptive statistics.....</b>	<b>107</b>
<b>Table 3.2 Correlations .....</b>	<b>108</b>
<b>Table 3.3 GLS random effect (RE) regression results of Islamic bank risk.....</b>	<b>109</b>
<b>Table 3.4 OLS regression results of Islamic bank risk.....</b>	<b>111</b>
<b>Table 3.5 Three-stage least square (3SLS) regression results of bank risk.....</b>	<b>113</b>
<b>Table 3.6 Shariah boards and bank risk-taking in GCC vs. others.....</b>	<b>115</b>
<b>Table 3.7 Shariah boards and bank risk-taking before and after the financial crisis.....</b>	<b>117</b>

## **LIST OF APPENDICES**

### **CHAPTER 1: Efficiency on banking; Islamic vs. conventional banks**

<b>Appendix A1 Basic terminology of Islamic banking .....</b>	<b>23</b>
<b>Appendix B1 Variable definitions .....</b>	<b>24</b>
<b>Appendix C1 Banking sector type in sample countries .....</b>	<b>25</b>
<b>Appendix D1 Sample selection criteria .....</b>	<b>26</b>

### **CHAPTER 2: Accounting conservatism in Islamic banking**

<b>Appendix A2 Variable definitions .....</b>	<b>65</b>
<b>Appendix B2 Banking sector type in sample countries .....</b>	<b>66</b>
<b>Appendix C2 Sample selection criteria .....</b>	<b>67</b>

### **CHAPTER 3: Roles of Shariah governance and bank risk-taking**

<b>Appendix A3 Islamic banking in sample countries .....</b>	<b>105</b>
<b>Appendix B3 Variable definitions .....</b>	<b>106</b>

## **CHAPTER 1: Efficiency in banking; Islamic vs. conventional banks**

“Islamic banks did not suffer as much during the financial crisis as conventional banks because they did not deal in exotic derivatives or artificial money creation instruments such as collateralized debt obligations,” --- GARP.org<sup>1</sup>

### **1. Introduction**

The recent global financial crisis and increased complexity of financial institutions shed doubts on the efficacy of current banking supervision and regulation frameworks. It also attracted the attention of market participants and researchers to Islamic banking, as a possible substitute to fill the gap left by failed conventional banks (Campbell, 2010). While some academics and policy makers point to the advantages of Islamic banking as a system that promotes economic growth and absorbs macro-financial shocks (Hasan and Dridi, 2010), others believe that Islamic finance simply seeks to replicate the functions of conventional financial instruments and is primarily a form of rent-seeking legal arbitrage (El- Gamal and Hulusi, 2005).

Islamic banks operate mostly in Middle East and Southeast Asia, with Bahrain and Malaysia as the biggest hubs. In these regions, Islamic banking has established itself as a choice of banking alongside the conventional interest-based banking, and has been expanding rapidly over the last two decades in both Muslim and non-Muslim countries. As it is expanding from its niche, the Islamic banking industry is becoming a market that could rival the conventional sector in many countries. Dusuki and Abdullah (2007) point out that Islamic banking can no longer be perceived as a system operated only to fulfill the religious obligations of the Muslim community, but as a system striving to fulfill the

---

<sup>1</sup> See Bang and Kuriyan [2013].

needs and demands of new customers as well.

The growth of Islamic banking continues to attract and draw the attention of several institutions all over the world. Almost 25 percent of Islamic financial institutions now operate in countries that do not have Muslim majorities, while interest-based (i.e., conventional) banks have opened up “Islamic windows” to attract the growing number of Muslims living in Europe and North America (Pollard and Samers, 2007). Despite this rapid growth of Islamic banking and finance, little academic research exists on the efficiency of Islamic banks.

This paper compares corporate efficiency of Islamic and conventional banks across a sample of 22 countries with both Islamic and conventional banks. We define corporate efficiency as a relative association between bank risk taking behavior and levels of capital buffer held, relative to bank portfolio asset risk. In addition, we examine the corporate efficiency of Islamic banks across different size, different region, and during the recent global financial crisis. Our paper thus shed light on the claim that Islamic banks are doing better job than conventional counterparts.

Islamic finance relies on the notion of equitable sharing in which no one can claim any compensation without incurring some risk. Islamic, or Shariah-compliant finance, as a result, relies on profit and loss sharing (PLS) schemes, on both liability and asset side of the bank’s balance sheet, in which Islamic banks play a traditional intermediation function. Unlike conventional banks’ deposits, the main contractual agreements between Islamic banks and their ‘depositors’ are based on PLS, or Mudaraba contracts. In this scheme, depositors do not have the same rights as depositors or shareholders in conventional banks, but they are required to absorb any losses on assets,

except in cases of negligence or misconduct by the bank. Thus, these investment accounts are not insured accounts or guaranteed, as pointed out by Archer and Karim (2009), which makes them very different in payoffs from conventional bank deposits. Due to risk sharing scheme that dominate the deposit side of Islamic banks, it will be more efficient for the banks to engage in riskier investment decisions in order to maximize returns on equity, which simultaneously have a negative affects on bank capitalization.

We compare a sample of Islamic banks and conventional banks over the period 2000-2012, along the dimensions of asset risk (which we capture using volatility of net income and comprehensive income) and capital buffer. We find that Islamic banks hold more capital and reserves, for a given level of asset risk, which suggest that Islamic banks are less efficient than their conventional counterparts. To examine further the notion that the Shariah-compliant contracts are responsible for inducing this efficiency, we partition the sample of Islamic banks cross-sectionally by the intensity of Islamic finance products on both asset and liability sides of the balance sheet. We find that Islamic banks that engage more in Islamic mode of finance and are highly funded by PLS contracts are less efficient than Islamic banks that engage less in such contracts. In further cross-sectional tests, we find that smaller Islamic banks are significantly less efficient than larger Islamic banks; and that Islamic banks tend to be less efficient before and after the financial crisis of 2007-2008.

This study makes an interesting contribution to the emerging literature on Islamic finance. While there is an abundant literature on the efficiency conventional banking industry, there is only sparse literature focusing on Islamic banking efficiency either in isolation or in comparison to conventional banking. Al-Muharrami (2008) claims that



Islamic banks are significantly more efficient than conventional banks, using a small sample size of Islamic banks. Abdull-Majid et al. (2010) find that the relative operating efficiency of Islamic and conventional banks varies significantly across countries. Srairi (2010) finds that Islamic banks are significantly less efficient than conventional banks, but does not explore further the reasons for the difference. Recent study by Beck, Dmeriguc-Kunt, and Merrouche, (2013) analyze the differences in business orientation, efficiency, asset quality, and stability of Islamic and conventional banks controlling for time-variant country-fixed effects. They find that Islamic banks are less cost effective, but have higher intermediation ratios. They also find that Islamic banks perform better during crises in terms of capitalization and asset quality. Unlike previous papers, we measure efficiency on banking focusing on bank behavior and regulatory capital, within the ground of theoretical model of Islamic banks. Also, we deeply examine efficiency on Islamic banks across different dimensions, controlling for time and country effects to clearly identify major factors of Islamic bank's efficiency.

The remainder of the paper is structured as follows. Section 2 presents background of basic Shariah-compliant products and theoretical background for the hypotheses. Section 3 presents research design. Section 4 describes the sample used in the paper. Section 5 discusses our major findings and Section 6 concludes

## **2. Background and hypothesis development**

### **2.1 Shariah Law, Risk Sharing, and intermediation role of Islamic Banking**

Islamic banking refers to banking activities that are consistent with the principles of Shariah, or Islamic code of law. Under Shariah law, Islamic banks, on the one hand, are prohibited from participating in activities associated with *riba*, which is defined as a premium or interest that is paid by the borrower to the lender, speculative activities

(Gharar), and financing for illicit sectors such as weapons, drugs, alcohol, and pork. On the other hand, Shariah-compliant finance relies on profit sharing and loss bearing principles, and posits that all transactions have to be backed by a real economic transaction that involves a tangible asset. To comply with Shariah law, Islamic banks and their clients develop specific products, called Shariah-complaint financial products, to avoid interest - bearing transactions and apply a certain degree of risk sharing.

The major principle that differentiates Islamic banks from conventional banks is the paradigm of profit-loss sharing (PLS) or (Mudaraba contracts) that allows Islamic banks to play a traditional intermediation function. On the deposit side, the main bulk of funding comes from Mudaraba based contracts, which means that depositors' funds will be pooled into a common fund in order to be used by the bank without any control rights. The bank decides how to invest the funds from investment-deposit accounts. The ex-ante rate of return on investment (interest rate premium) in conventional banks is replaced by an uncertain ex- post rate of return that must follow the principle of PLS. Moreover, such deposits are not guaranteed in capital value and do not yield any fixed or guaranteed rate of return. In the event banks record losses, depositors may lose part or all of their investment deposits. Such investment deposits can be either linked to a bank's profit level or to a specific investment account on the asset side of a bank's balance sheet. Therefore, "depositors" or investment account holders (IAH) have payoffs that resemble more closely the payoffs of equityholders of conventional banks, who earn dividends for their investment (Khan, 1991), than the payoffs of creditors of those conventional banks.

Islamic banks play a commercial role as well as intermediation role on the asset side of Islamic balance sheets. One can distinguish between two categories of Islamic assets:

commercial assets and PLS assets. Commercial assets include the instruments of Murabaha, Istisna, Salam, and Ijara, which are not based on the principle of PLS, but rather on a transfer of ownership of (underlying) assets from bank to customers. PLS assets are mainly Musharaka and Mudaraba financing based contracts. Under Musharaka contract, the Islamic bank is one of several investors with profits and losses being shared among all investors in proportion to their participation. Mudaraba is a form of business partnership between Islamic bank and borrowers, which are based strictly on profit-loss sharing. Under the Mudaraba contract, profits are shared at a predetermined ratio while losses are borne exclusively by the bank with limited liability provisions covered for the entrepreneur. Although the entrepreneur has the ultimate control over his/her business, major investment decisions have to be approved by the bank. The entrepreneur has to carefully manage the project in order to increase his earnings as it depends directly on the performance of the project.

## 2.2 Hypothesis development

Capital adequacy requirements are meant to address two problems; protection of depositors from any loss and protection of banking system from collapse that may be caused by a contagion effect. As for Islamic banks, the structure of liabilities and the nature of profit and loss (PLS) scheme in Islamic banks have an important implication for the level of regulatory capital ratio (Grais and Kulathunga, 2007). The banks stand on equity-based capital structure, dominated by equity and investment deposits that are based on PLS scheme. Therefore, there is no need for capital ratio if the Islamic banks are structured as pure PLS based organization. The reason is that depositors deposit their money with complete understanding that they may lose their money. As a result, it is not the capital adequacy that can save the depositors from bearing loss. However, due to

informational asymmetry and risk aversion by investors, there currently exist fixed claim liabilities on the Islamic banking balance sheets, which necessitates the imposition of capital adequacy requirements at minimum.

Moreover, failure of an Islamic bank is not likely to pose a threat to the entire banking system, as there is no case for stringent capital adequacy requirements on the ground of the contagion effect. Another argument for capital ration is to impose market discipline on banks when there is a deposit guarantee scheme in effect, which may cause banks to take more risks than depositors would like to bear. The case does not stand for imposing a capital adequacy requirement as far as PLS deposits are concerned. Islamic banks do not subscribe, at least in theory, to a deposit guarantee scheme, as it will have Shariah implications.

According to previous discussion, we hypothesize that due to the fact that majority of depositors in Islamic banks, unlike conventional banks, are equity like holders whose returns depend on bank performance, Islamic banks would maintain lower capital buffer than conventional counterparts, for any given level of asset risk. Our first hypothesis is;

**H1:** Islamic banks will maintain lower capital reserves, for any given level of asset risk, compared to their conventional counterparts.

The intensity of Shariah - compliant products, as a result, has also an impact on the level of capital reserve Islamic banks hold for any given level of risk. Islamic banks that engage more in Shariah mode of finance, on asset side, will maintain lower capital reserves for any given risk level. Moreover, Islamic banks that are funded heavily on PLS based contracts, on deposit side, will hold lower reserves for a given level of asset risk. We therefore hypothesize the following;

**H2:** The more intensity of Shariah - complaint products Islamic banks engage, the lower capital reserves hold, for any given level of asset risk.

### 3. Research design

We use the following empirical specification to examine bank efficiency, focusing on the level of capital holding:

$$\begin{aligned} \text{LNCAP}_{i,t} = & \alpha_0 + \alpha_1 \text{ASSETRISK}_{i,t-1} + \alpha_2 \text{SIZE}_{i,t} + \alpha_3 \text{ROA}_{i,t} + \alpha_4 \text{REALESTLOAN}_{i,t} + \\ & \alpha_5 \text{LIQUIDITY}_{i,t} + \alpha_6 \text{OVERHEAD}_{i,t} + \alpha_7 \text{DIVERSIFICATION}_{i,t} + \alpha_8 \text{MENA}_{i,t} + \\ & \alpha_9 \text{GDPGR}_{i,t} + \alpha_{10} \text{INFLATION}_{j,t} + \alpha_{11} \text{SRIGHT}_{i,t} + \alpha_{12} \text{DEPINS}_{j,t} + \alpha_{13} \text{RLAW}_{j,t} + \\ & \alpha_{14} \text{ENTRY}_{j,t} + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

Where  $i$  denotes bank  $i$ ,  $j$  denotes country  $j$  and  $t$  denotes the time period.

Analyses are at the firm-year level. We test H1 using the natural logarithm of capital buffer (LNCAP) as the dependent variable. LNCAP is defined as the natural logarithm of the ratio of regulatory capital to total assets at the end of the year. We measure ex ante asset risk of a bank (ASSETRISK) using volatility of net income and comprehensive income respectively as income-based measures. Following Hodder, Hopkins, and Wahlen (2006), we estimate volatility by calculating the standard deviation of the time series of each of the two income measures, as a percent of average total assets, for each bank.

We estimate eight empirical models to test the degree of efficiency of Islamic banks relative to conventional banks. Model 1 and 2 estimate the association between capital buffer and asset risk among Islamic banks only while models 3 and 4 test the same association for conventional banks only. We pool Islamic and conventional banks in model 5 and 6 and introduce ISLAMICDUMMY, as an indicator variable that sets to one if a bank is an Islamic bank and to zero otherwise, and the interaction ISLAMICDUMMY\*ASSETRISK using income volatility and comprehensive income

volatility respectively. In Model 7 and 8, we estimate the difference between the two types of banks using the fully interacted models where ISLAMICDUMMY is interacted with all independent variables in the model, including control variables.

If managers of Islamic banks maintain lower capital buffer for a given level of asset risk we expect the coefficient on ISLAMICDUMMY\*ASSETRISK to be negative and significant, suggesting that Islamic banks are more efficient than conventional banks due to risk sharing scheme that dominate the liability side of Islamic banks. Conversely, if the coefficient on ISLAMICDUMMY\* ASSETRISK is positive and significant, that suggests that Islamic banks are less efficient than their conventional counterparts. We compare efficiency of Islamic banks to conventional banks within each country by introducing country fixed-effects and time fixed-effects in all specifications, to control for any unobservable variation across countries and time.

We employ a number of bank and country level control variables that in previous research have been shown to affect the size of bank capital buffers. At the bank level, we control for bank size (SIZE), as larger banks tend to have lower levels of capital (Flannery and Rangan, 2008). This is because larger banks are able to diversify their lending, which in turn lowers their exposure to idiosyncratic shocks and reduce required capital. We include Return on asset (ROA), measured as net income as a percentage of average beginning and ending total assets, to control for banks' profitability. As more profitable banks find it easier to accumulate equity through retained earnings inline with the "pecking order theory of finance" whereas less profitable banks might decide not to increase capital as much as more profitable peers, due to cost of issuing equity (Flannery and Rangan, 2008). REALESTLOAN is loans and leases as a percentage of total assets,

which we include to control for composition of the loan portfolio. Real estate loan is a key factor that negatively affects bank capital level, particularly during the recent financial crisis. We expect banks with relatively more real estate loans to have higher capital buffers.

We also control for bank LIQUIDITY that measured as liquid assets scaled by deposit and short term funding. We would expect that bank with higher liquidity tend to meet withdrawal request, which reduce bank's exposure to risk and reduce and required level of capital buffer. OVERHEAD is non-interest expense divided by average total assets. Higher overhead expenses are an indicator of lower efficiency and higher agency problem, which indicate that management is not efficient and prudent enough to monitor the risk (Abedifar et al. 2013). DIVERSIFICATION, measured through non-interest income divided by total operating income, has an impact on bank capital. Prior studies, on one hand, argue that banks with greater diversification helps to collect more information from different business lines, which in turn lower risk and capital buffer. On the other hand, there is another strand of literature argues that banks focus on non traditional activities have higher risk and higher capital buffer due to lack of experience (Cihak and Hesse, 2010; Rajhi and Hassairi, 2014).

Moving from bank to country-related measures, we control for (annual) growth of GDP to account for the effect of macroeconomic conditions on the capital level of banks. According to previous studies (Ayuso et al., 2004; Lindquist, 2004; Jokipii and Milne, 2008), capital buffer and economic activities tend to be negatively related. Banks tend to decrease their capital buffer during economic booms and increase it during economic downturns. However, Berger et al. (1995) argue that banks with external growth

strategies might increase their capital buffer during economic booms to exploit acquisition opportunities. Therefore, the expected sign for the coefficient of this variable is ambiguous in the influence of capital ratios. We include for INFLATION to control for variations across countries. In addition, we add a regional dummy MENA, that set to one if a country located in Middle East and North Africa regions and to zero otherwise, as different regions have different rules, regulations, cultures that might have an impact on bank asset risk and capital level.

Risk-taking incentives of banks also depend on institutional and legal factors of the country's environment. We control for law and order in different countries (RLAW) using data from La Porta et al. (1998). We also use measure of shareholders' rights (SRIGHT) from La Porta et al. (1998) to control for extent of monitoring by shareholders. Managers in countries with stronger shareholders' rights may choose to have lower capital buffers. Keeley (1990) suggests that bank risk-taking is related to the degree of competition between banks; anticompetitive restrictions endow banks with market power and increase the value of the bank's charter. Therefore, such restriction reduces banks' incentives to take risk. Restrictions that lead to less competition are as a result associated with larger capital ratios. We introduce ENTRY as a measure of legal and administrative restrictions on bank entry that we obtain from a database provided by Barth et al. (2001). The literature also suggests that deposit insurance schemes may increase bank's incentives to take risks. Thus, We include DEPINS as a dummy variable that take a value of one if there is explicit deposit insurance and zero otherwise. Data was obtained from Demirgüç-Kunt et al. (2008). Appendix B1 defines all variables in detail.

#### **4. Sample and descriptive statistics**

##### **4.1 Sample selection**



We use data from Bankscope, a global database with data on both listed and non-listed banks, to obtain bank financial information and identify banks' type. Following Beck et al (2013), we only include banks with at least two observations and countries with data on at least banks. We eliminate outliers in all variables by winsorizing at the 1st and 99th percentiles within each country. We also confirm the categorization of Islamic banks in BankScope with information from Islamic Banking Associations and country-specific sources.

We restrict the sample to only countries with both conventional and Islamic banks, which allows us to control for any time and country effects by introducing year and country dummies. The sample covers the period 2000-2012, which allows us to analyze the effect of financial crisis on the efficiency of Islamic banks, and include 723 banks across 22 countries, out of which 104 are Islamic banks. Appendix C1 presents the number of Islamic and conventional banks across 22 countries.

The initial sample consists of 13,559 firm-years observations to estimate asset volatility. Observations with missing control variables, and missing macroeconomic data from World Banks Survey yields a sample of 6,761 observations, out of which 882 observations are for Islamic banks. Appendix D1 provides details on the sample selection procedure.

## 4.2 Descriptive statistics

Table 1.1 describes all variables for the sample of Islamic, conventional, and both sets of banks. All continuous variables are winsorized at 1% and 99%. Mean (median) capital buffer is 11.9% (10.7%) of total assets, with interquartile range of 4.5%–27.3%, for the sample. Islamic banks have significantly higher capital buffer than conventional banks. Mean (median) of LNCAP is 15.2% (13.5%) for Islamic banks and 12.4% (10.6%) for conventional banks. In term of asset risk, INCOMEVOL has mean of 3.8% while COMINCOMEVOL has a mean of 3.9% for the entire sample. Islamic banks engage in more risky investments than conventional counterparts. Both measures of asset risk; INCOMEVOL and COMPINCOMEVOL have a mean of 5.6% and 5.7%, respectively, for Islamic banks while they have a mean of 3.6% and 3.7%, respectively, for conventional banks.

At bank control level, Table 1.1 reveals that conventional banks are larger than Islamic banks. Islamic banks are small as compared to conventional banks because most of Islamic banks have started their operations recently. ROA varies from -2.1% to 3.3% with an average of 1.2% for the sample, with no significant differences between Islamic and conventional banks. OVERHEAD ranges from 0.6% to 8.4% for entire sample with an average of 4.5%. Islamic banks have significantly higher overhead cost than conventional banks.

At country level, Table 1.1 indicates that MENA is highly significant for Islamic banks, which indicate that most of Islamic banks are located in Middle East and North Africa. ENTRY, SRIHGT, and RLAW are significantly higher for conventional banks than Islamic banks. This indicates that conventional banks have higher entry

requirements, shareholders rights, and higher tradition for law and order.

Table 1.2 provides correlations between key variables for the pooled sample. ISLAMICDUMMY is negatively correlated with size, inflation, entry, and shareholders rights. On the other hand, ISLAMICDUMMY is positively correlated with LNCAP, INCOMEVOL, COMPINCOME VOL, OVERHEAD, DEPINS, and RLAW. Positive correlation between Islamic banks and deposit insurance indicates that Islamic banks are more prevailed in countries with explicit deposit insurance. This raises a concern on whether deposits in Islamic banks are guaranteed or not as there is a concern among Shariah supervisory members across countries about insurance applicability for Islamic deposits.

Consistent with Demirgüç-Kunt and Ditrageache (2002), RLAW is positively correlated with LNCAP, which indicate that banks in countries with high quality of government rules appear to hold larger capital buffer. Moreover, DEPINS is negatively correlated with LNCAP, consistent with the notion that explicit deposit insurance increase moral hazard incentives, resulting in lower capital buffer.

The correlation matrix also shows that INCOMEVOL and COMPINCOMVOL are significantly and negatively correlated with SIZE and positively and significantly correlated with DEPINS, which are consistent with Flannery and Rangan (2008) and Demirgüç-Kunt and Ditrageache (2002).

## **5. Empirical results**

### **5.1 Comparing efficiency of Islamic and conventional banks**

Table 1.3 presents the main tests within countries and years. Columns 1 and 2 present the basic model with firm-specific and country-specific control variables to test the association between asset risk, measured by volatility of net income and

comprehensive income respectively, and capital buffer, among Islamic banks only. INOMCEVOL as well as COMPINCOMVOL are significantly and positively associated with capital buffer, at 1% level. Columns 3 and 4 show a basic model with firm-specific and country-specific control variables to test this association within conventional banks. Both volatilities are also significantly and positively associated with capital buffer, at the 5% level. In column 5 and 6, we introduce an indicator variable to examine the difference in this association between Islamic and conventional banks, using partially interacted models. The results show, contrary to expectation, that the association between capital buffer and asset risk is significantly more positive for Islamic banks than for conventional banks, as indicated by the positive and significant coefficients on both interaction term ISLAMICDUMMY\* INCOMEVOL and ISLAMICDUMMY\* COMPINCMVOL. This indicates that for a given level of asset risk in their portfolios, Islamic banks hold significantly higher capital buffer than their conventional counterparts, within each country that has both Islamic and conventional banks. Moreover, we run fully interacted models in columns 7 and 8 in which we interact ISLAMICDUMMY with each of asset risk measures and control variables. The results reveal that Islamic banks maintain higher capital level than conventional banks for any given level of risk.

In terms of economic significance, there is 4.1% and 5.1% increase in the level of capital buffer for one standard deviation increases in asset risk, measured by INCOMEVOL and COMPINCOMEVOL respectively, for the sample of Islamic banks (Table 1.3 column 1 and 2). As for the difference in the level capital holding between Islamic and conventional banks, column 5 and column 6 reveal that Islamic banks are likely to hold capital buffer 1.7% and 1.5%, respectively, higher than conventional banks,

for one standard deviation increases in income volatility and comprehensive income volatility. Also, fully interacted models (Table 1.3 columns 7 and 8) indicate that for one unit increase in standard deviation, Islamic banks are more likely to hold capital buffer of 1.8% and 1.5% higher than conventional banks for any level of income and comprehensive income volatilities respectively.

Table 1.3 yields a number of additional results that are worth drawing out. As expected, we find that larger banks hold smaller capital buffers, and that more profitable banks hold larger buffers. We also find that banks with high real estate loans maintain lower capital buffer. In term of business diversification, the results reveal that banks that diversify their financing lack the expertise, which increase risk exposure that cause banks to maintain higher capital level. At the country-specific controls, banks in countries with a strong tradition of law and order and with higher entry requirements appear to maintain larger capital buffers, consistent with prior evidence presented by Demirgüç-Kunt and Detragiache (2002). Moreover, in line with Saunders et al. (1990), there is strong evidence that banks in countries where shareholders' rights are strong hold smaller capital buffers. Our results on deposit insurance are consistent with the notions that explicit insurance exacerbates risk-taking incentives.

These results point broadly to the lower efficiency of Islamic banks compared to their conventional counterparts. But some important questions remain: under what conditions are Islamic banks likely to be less efficient?

## 5.2 Partitioning Islamic banks by the intensity of Shariah-compliant products

To examine H2, we first partition the sample of Islamic banks by the intensity of Shariah-compliant products on the asset side, scaled by bank total assets. The results in Table 1.4, Panel A, using partially and fully interacted models in column 3 and 4

respectively, show that the association between capital buffer and asset risk is more positive for Islamic banks that finance more in Shariah products than Islamic banks that finance less on such products. This indicates that Islamic banks with high intensity of Islamic mode of finance are less efficient than Islamic banks with lower Islamic mode of finance.

Secondly, we partition Islamic banks by the intensity of Shariah – compliant products on deposit side. Specifically, we partition the sample based on the annual median of PLS or Mudaraba contracts, scaled by total assets. Using partially and fully interacted models, the results in Table 1.4, Panel B shows that the association between capital buffer and asset risk is significantly higher for Islamic banks that are funded more with PLS contracts, compared to other Islamic banks that funded less with such contracts. Therefore, the results provide evidence, contrary to our predictions, that intensity of Shariah-compliant products on both side of the balance sheet of Islamic banks leads to higher capital reserves for a given risk level.

### 5.3 Partitioning Islamic banks by size

Size is an important factor that determines the regulatory capital ratio. Large banks benefit from economies of scale in screening and monitoring borrowers and from greater diversification. In addition, because of their “too-big-to-fail” position, large banks might hold less capital buffer. As for Islamic banks, many Islamic banks are considerably smaller than their conventional banks. Beck et al. (2013) documents that smaller Islamic banks are less cost effective, in term of operation, than larger Islamic banks, due to the complexity of Shariah-complaint products, and higher associated compliance cost. In addition, Jill et al. (2014) indicate that small Islamic banks are more affected by the absence of risk diversification tools, which in turns cause smaller Islamic banks to be

more risky than larger Islamic banks. Therefore, we would hypothesize that larger capital reserves and higher risk level have an impact on corporate efficiency of small Islamic bank compared to large Islamic banks.

In Table 1.5, we partition the Islamic sample by the annual median of total assets. In column 1, we run the model on large Islamic banks only and find negative association, significant at 15%, between asset risk and capital buffer, indicating that large Islamic banks maintain low capital level for any level of risk. Column 2 shows that the coefficient on INCOMEVOL is highly and positively associated with LNCAP, at 10% significant level, for small Islamic banks. This indicates that small Islamic banks hold large capital reserves for a given level of risk, suggesting lower efficiency. However, in column 3 and 4 where we run partially and fully interacted models, the results reveal that large Islamic banks are more efficient than small Islamic banks. The coefficients on INCOMEVOL\*LARGE BANKS are negative and significant at 10% for both partially and fully interacted models. These findings so far on inefficiency of Islamic banks are driven by smaller Islamic banks.

#### 5.4 Islamic banks before and after the financial crisis period

Banks, including Islamic banks, all over the globe have suffered during financial crisis of 2007-2008. For further analysis, we examine the corporate efficiency of Islamic banks before and after the global financial crisis. We introduce an indicator variable (POST) that takes a value of one for the year 2008 onwards and zero otherwise. Table 1.6, column 1 shows that the association between capital buffer and asset risk within Islamic banks is high, significant at the 5% level, after the crisis period, and same association hold before crisis (column 2), within the same banks. However, partially and fully interacted models (column 3 and 4) for the entire sample, before and after crisis, show no

difference in the association between capital buffer and asset risk. Overall, we document that Islamic banks maintain more capital reserves relative to their asset risk before and after crisis period.

## **6. Conclusion**

This paper draws on risk taking behavior and its implications on governance and regulatory structure of Islamic banks. While major players in Islamic finance are in fact equity holders, Islamic banks hold more capital and reserve. We provide evidence that Islamic banks are inefficient in comparison to conventional banks by examine the relation between bank asset risk and level of capital buffer. Our analysis reveals interesting results; Islamic banks that are funded and/or finance heavily on Shariah compliant products are less efficient than Islamic banks that are less funded and/or financed by such products, smaller Islamic banks are inefficient compared to large Islamic banks, and inefficiency of Islamic banks holds before and after crisis.



## References

- Abdul-Majid, M., Mohammed, N., Nor Ghani, and Said, F., 2005. Efficiency of Islamic banks in Malaysia. *Islamic Finance and Economic Development*.
- Al-Muharrami, S., 2008. An examination of technical, pure technical and scale efficiencies in GCC banking. *American Journal of Finance and Accounting*, 1(2), 152-166.
- Archer, A., and Abdel-Karim, A., 2009. Profit- Sharing Investment Accounts in Islamic Banks: Regulatory Problems and Possible Solutions. *Journal of Banking Regulations*, vol.10.
- Ayuso, J., Perez, D., Saurina, J., 2004. Are capital buffers procyclical? Evidence from Spanish panel data. *Journal of Financial Intermediation* 13, 249–264.
- Beck, T., Demeriguc-Kunt, A. & Merrouche, O. 2013. Islamic vs. Conventional Banking: Business Model, Efficiency and Stability. *Journal of Banking & Finance*, 37, 433-447.
- Berger, A.N., 1995. The relationship between capital and earnings in banking. *J. Money, Credit, Banking* 27 (2), 432– 456.
- Campbell, A., 2010. Middle East maelstrom. *Risk magazine*, 2 September, 2010 publication, Incisive Financial Publishing Ltd.
- Cihak, M., Hesse, H. 2010. Islamic banks and financial stability: an empirical analysis. *Journal of Financial Services Research* 38, 95–113.
- Demirgüç-Kunt, A., Detragiache, E. 2002. Does deposit insurance increase banking system stability? An empirical investigation. *J. Monet. Econ.* 49 (7), 1373–1406.
- Demirguc-Kunt, A., E. Kane, and L. Laeven. 2008. Determinants of deposit-insurance adoption and design. *Journal of Financial Intermediation* 17 (3): 407–438
- Dusuki, A. W., and Abdullah, N. I. 2007. Why do Malaysian Customers Patronize Islamic Banks? *International Journal of Bank Marketing*, 25(3), 143-160.
- El-Gamal, M.A., Hulusi, I. 2005. Inefficiency and heterogeneity in Turkish banking: 1990–2000. *Journal of Applied Economics* 5, 641–664.
- Flannery, M., Rangan, K. 2008. What caused the bank capital build-up of the 1990s?. *Review of*

Finance, 12(2):391-429.

Grais, W. and Kulathunga, A. 2007. Capital structure and Risk in Islamic Financial Services. In John Wiley & Sons (eds.) *Islamic finance: the regulatory challenge*, 69-93.

Hasan, M., Dridi, J. 2010. The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study. IMF Working Paper # WP/10/201.

Hodder, L., Hopkins, P., and Wahlen, J., 2006. Risk-Relevance of Fair Value Income Measures for Commercial Banks. *Accounting Review*.

Husain, I. "Islamic Banking: A Central Banker Looks Back" GARP.org organization, July 2, 2013.

Jill, J., Marwan, I., and Vassileios, P., 2009. The efficiency of Islamic and conventional banks in the Gulf Cooperation Council (GCC) countries: An analysis using financial ratios and data envelopment analysis, LUMS Working Papers Series. Lancaster University Management School.

Jokipii, T., Milne, A., 2008. The cyclical behavior of European bank capital buffers. *Journal of Banking and Finance*, 32, 1440-1451.

Keeley, M.C., 1990. Deposit insurance, risk and market power in banking. *Amer. Econ. Rev.* 80, 1183–2000.

Khan, M., 1991. Time Value of Money and Discounting in Islamic Perspective. *Review of Islamic Economics*, Vol. 1, No. 2, pp. 35–45.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. 1998. Law and finance. *J. Public Econ.* 106, 1113–1155.

Lindquist, K., 2004. Banks' buffer capital: How important is risk? *Journal of International Money and Finance*, 23, 493-513.

Pollard, J., and Samers, M. 2007. Islamic Banking and Finance: Postcolonial Political Economy and The Decentering of Economic Geography. 313-330.

Rajhi, W., and Hassairi, S., 2014. Islamic banks and financial stability; a comparative empirical analysis between MENA and Southeast Asian countries. Working paper.

Saunders, A., Strock, E., Travlos, N.G. 1990. Ownership structure, deregulation, and bank risk taking. *Journal of Finance* 45 (2), 643–654.

Srairi, S.A., 2010. Cost and profit efficiency of conventional and Islamic banks in GCC countries. *Journal of Productivity Analysis* 34, 45–62.

## Appendix A1: Basic terminology of Islamic banking

Term	Explanation
<b>Profit-loss sharing (PLS) contracts</b>	
Mudaraba (Trustee finance contract)	Rabb -ul- mal (capital' s owner) provides the entire capital needed to finance a project while the entrepreneur offers his labor and expertise. Profits are shared between them at a certain fixed ratio, whereas financial losses are exclusively borne by rabb-ul-mal. The liability of the entrepreneur is limited only to his time and effort.
Musharaka (Equity participation)	The bank enters into an equity partnership agreement with one or more partners to jointly finance an investment project. Profits (and losses) are shared strictly in relation to the respective capital contributions.
<b>Non-PLS contracts</b>	
Ijara (Lease, lease purchase)	A party leases a particular product for a specific sum and a specific time period. In the case of a lease purchase, each payment includes a portion that goes toward the final purchase and transfer of ownership of the product.
Istisna (Deferred payment, deferred delivery)	A manufacturer (contractor) agrees to produce (build) and to deliver a certain good (or premise) at a given price on a given date in the future. The price does not have to be paid in advance (in contrast to buy Salam, which is explained later). It may be paid in installments or part may be paid in advance with the balance to be paid later on, based on the preference of the parties.
Murabaha (Mark-up financing)	The seller informs the buyer of his cost of acquiring or producing a specified product. The profit margin is then negotiated between them. The total cost is usually paid in installments.
Salam (Pre-payment, deferred delivery)	The buyer pays the seller the full-negotiated price of a product that the seller promises to deliver at a future date.

## Appendix B1: Variable definitions

Variable	Definition
Dependent Variable	
LNCAP	Natural logarithm of tier 1 regulatory capital scaled by total asset. Data from Bankscope database.
Independent Variable	
INCOMEVOL	Firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. Data from BankScope database.
COMPINCOMEVOL	Firm-specific standard deviation of annual comprehensive income, expressed as a percentage of average total assets, and measured over each five-year period. Data from BankScope database.
Control Variables	
SIZE	Natural logarithm of total assets. Data from BankScope database.
ROA	Net income divided by the average total assets. Data from BankScope database.
REALESTLOAN	Loans and leases divided by total assets. Data from BankScope database.
LIQUIDITY	Liquid assets scaled by deposit and short term funding. Data from BankScope database.
OVERHEAD	Non-interest expense divided by average total assets. Data from BankScope database.
DIVERSIFICATION	Non-interest income divided by total operating income. Data from BankScope database.
MENA	Indicator set to one if a country is located in the Middle East and North Africa and zero otherwise.
DEPINS	Indicator set to one if a country has an explicit deposit insurance scheme and zero otherwise. Data from Demircuc-Kunt, Kane, and Laeven (2008).
SRIGHT	Index aggregating the following shareholders rights: One Share-One vote, Proxy by mail, shares blocked before meeting, cumulative voting, and Oppressed minorities mechanism. The index ranges from 0 to 5. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).
RLAW	A scale of 1 to 10 for the assessment of the law and order tradition in the country produced by the country risk rating agency International Country Risk (ICR). Lower scores indicate less tradition for law and order. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).
ENTRY	The sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001)
GDPGR	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregate on constant US. Dollars. Data from World Bank survey.
INFLATION	Change of customer price index (CPI) from year to year. Data from World Bank survey.

**Appendix C1: Banking sector type in sample countries**

<b>Country</b>	<b>Islamic Bank</b>	<b>Conventional Bank</b>
Bahrain	16	18
Bangladesh	5	31
Cayman Islands	1	23
Egypt	3	30
Gambia	1	7
Indonesia	1	76
Jordan	3	11
Kuwait	6	9
Lebanon	3	45
Malaysia	17	33
Mauritania	1	7
Pakistan	9	28
Qatar	4	7
Saudi Arabia	2	11
Singapore	1	20
Sudan	11	12
Syria	2	13
Tunisia	1	16
Turkey	4	32
United Arab Emirates	4	20
United Kingdom	5	164
Yemen	4	6
Total	104	619

**Appendix D1: Sample Selection Criteria**

	<b>Data source</b>	<b>Firm-years</b>
Firm-years with earnings data to estimate asset volatility	BankScope	13559
Firm-years with data for firm-level control variables	BankScope	9565
Firm-years with data for country-level control variables:		
Contracting environment	LaPorta et. al. (1998)	6845
Macroeconomic factors	World Bank	6761
Final Sample:		6761
Final Sample - Islamic Banks Only		882
Final Sample - Conventional Banks Only		5879

**Table 1.1: Descriptive statistics**

Variable	Bank Type	Observation	Mean	S.dev.	P5	P25	Median	P75	P90
Dependent variable									
LNCAP	Islamic	882	0.158*	0.208	0.040	0.078	0.135	0.172	0.351
	Conventional	5879	0.124	0.143	0.048	0.079	0.106	0.136	0.246
	All	6761	0.119	0.152	0.045	0.081	0.107	0.147	0.273
Independent variable									
INCOMEVOL	Islamic	882	0.056*	0.074	0.001	0.004	0.011	0.124	0.183
	Conventional	5879	0.036	0.064	0.001	0.003	0.006	0.019	0.181
	All	6761	0.038	0.065	0.001	0.003	0.006	0.022	0.183
COMPINCOMEVOL	Islamic	882	0.057*	0.074	0.001	0.005	0.013	0.137	0.183
	Conventional	5879	0.037	0.063	0.001	0.003	0.007	0.022	0.172
	All	6761	0.039	0.065	0.001	0.004	0.008	0.026	0.183
Control variables									
SIZE	Islamic	882	6.675	1.782	3.758	5.458	6.714	7.865	8.799
	Conventional	5879	7.397*	2.044	4.332	5.951	7.245	8.688	10.094
	All	6761	7.303	2.026	4.229	5.867	7.182	8.561	9.970
ROA	Islamic	882	0.013	0.045	-0.072	0.003	0.012	0.026	0.060
	Conventional	5879	0.012	0.027	-0.016	0.004	0.011	0.019	0.031
	All	6761	0.012	0.030	-0.021	0.004	0.011	0.020	0.033
REALESTLOAN	Islamic	882	0.438	0.258	0.000	0.241	0.476	0.650	0.750
	Conventional	5879	0.440	0.226	0.042	0.268	0.455	0.615	0.724
	All	6761	0.440	0.231	0.027	0.266	0.457	0.619	0.731
LIQUIDITY	Islamic	882	0.485*	0.295	0.105	0.160	0.605	0.759	0.769
	Conventional	5879	0.446	0.303	0.099	0.144	0.303	0.748	0.759
	All	6761	0.451	0.302	0.100	0.146	0.337	0.769	0.769
OVERHEAD	Islamic	882	0.052*	0.056	0.011	0.021	0.033	0.062	0.099
	Conventional	5879	0.044	0.059	0.005	0.017	0.027	0.044	0.080
	All	6761	0.045	0.059	0.006	0.017	0.028	0.045	0.084
DIVERSIFICATION	Islamic	882	0.433	0.389	0.000	0.156	0.333	0.601	1.000
	Conventional	5879	0.416	0.344	0.000	0.222	0.333	0.500	0.867
	All	6761	0.418	0.350	0.000	0.215	0.333	0.501	0.913
GDPG	Islamic	882	0.284	0.883	0.018	0.039	0.057	0.078	0.173
	Conventional	5879	0.268	0.873	0.011	0.032	0.049	0.067	0.099
	All	6761	0.270	0.874	0.011	0.032	0.050	0.068	0.109
INFLATION	Islamic	882	0.081	0.101	0.006	0.022	0.049	0.097	0.143
	Conventional	5879	0.096	0.134	0.009	0.021	0.045	0.098	0.450
	All	6761	0.094	0.130	0.008	0.022	0.045	0.098	0.450
DEPINS	Islamic	882	0.490	0.500	0.000	0.000	0.000	1.000	1.000
	Conventional	5879	0.689	0.463	0.000	0.000	1.000	1.000	1.000
	All	6761	0.663	0.473	0.000	0.000	1.000	1.000	1.000
MENA	Islamic	882	0.502*	0.500	0.000	0.000	1.000	1.000	1.000
	Conventional	5879	0.307	0.461	0.000	0.000	0.000	1.000	1.000
	All	6761	0.332	0.471	0.000	0.000	0.000	1.000	1.000
ENTRY	Islamic	882	7.418	0.923	6.000	7.000	8.000	8.000	7.000
	Conventional	5879	7.750*	0.596	7.000	8.000	8.000	8.000	8.000
	All	6761	7.707	0.657	7.000	8.000	8.000	8.000	8.000
SRIGHT	Islamic	882	1.003	1.477	0.000	0.000	0.000	1.000	3.000
	Conventional	5879	1.775*	1.696	0.000	0.000	1.000	4.000	4.000
	All	6761	1.674	1.689	0.000	0.000	1.000	4.000	4.000
RLAW	Islamic	882	6.082	2.062	3.030	4.170	6.780	8.330	8.330
	Conventional	5879	6.268*	2.167	2.730	3.980	6.780	8.570	8.570
	All	6761	6.244	2.155	3.030	3.980	6.780	8.570	8.570
Partitioning variables for Islamic banks									
ISFINANCE		882	0.516	0.500	0.000	0.000	1.000	1.000	1.000
PLS		882	0.505	0.500	0.000	0.000	1.000	1.000	1.000
LARGEBANKS		882	0.065	0.247	0.000	0.000	0.000	0.000	0.000





**Table 2: Correlation**

	LN CAP	INCOM EVOL	COMPI NCOM EVOL	ISLAMI CDUM MY	ROA	SIZE	REALE STLOA N	LIQUID ITY	OVERH EAD	DIVER SIFICA TION	GDPG	INFLA TION	DEP INS	MENA	ENTRY	SRIGH T	RLAW
LNCAP	1																
INCOMEVOI	<b>0.182</b>	1															
COMPINVOI	<b>0.174</b>	<b>0.997</b>	1														
ISLAMICDU	<b>0.344</b>	<b>0.105</b>	<b>0.105</b>	1													
ROA	0.002	-0.001	-0.005	0.011	1												
SIZE	<b>-0.268</b>	<b>-0.180</b>	<b>-0.174</b>	<b>-0.120</b>	<b>0.035</b>	1											
REALESTLO	<b>-0.246</b>	<b>-0.157</b>	<b>-0.153</b>	-0.003	<b>0.075</b>	<b>0.226</b>	1										
LIQUIDITY	<b>0.163</b>	<b>-0.062</b>	<b>-0.058</b>	-0.002	0.021	<b>-0.037</b>	<b>-0.175</b>	1									
OVERHEAD	<b>-0.214</b>	<b>0.200</b>	<b>0.196</b>	<b>0.045</b>	<b>0.044</b>	<b>-0.138</b>	<b>-0.056</b>	<b>0.040</b>	1								
DIVERSIFIC	0.230	0.154	0.150	0.017	<b>0.059</b>	<b>0.031</b>	<b>-0.113</b>	<b>0.122</b>	<b>0.464</b>	1							
GDPG	<b>0.062</b>	-0.003	-0.004	0.006	<b>-0.085</b>	<b>0.034</b>	-0.006	<b>0.062</b>	<b>0.026</b>	-0.022	1						
INFLATION	<b>-0.034</b>	-0.002	0.004	<b>-0.040</b>	-0.005	<b>-0.054</b>	<b>-0.010</b>	<b>0.071</b>	<b>-0.081</b>	<b>-0.111</b>	<b>0.057</b>	1					
DEPINS	<b>-0.095</b>	<b>0.039</b>	<b>0.034</b>	<b>0.142</b>	<b>-0.047</b>	<b>-0.029</b>	<b>-0.055</b>	0.008	<b>0.077</b>	<b>-0.044</b>	<b>-0.034</b>	<b>-0.118</b>	1				
MENA	<b>0.079</b>	<b>-0.073</b>	<b>-0.062</b>	<b>0.140</b>	<b>0.061</b>	<b>0.056</b>	<b>-0.0261</b>	<b>-0.109</b>	<b>-0.162</b>	<b>-0.050</b>	<b>-0.060</b>	<b>0.278</b>	<b>-0.401</b>	1			
ENTRY	<b>0.166</b>	-0.002	-0.009	<b>-0.170</b>	<b>-0.055</b>	<b>-0.119</b>	<b>-0.088</b>	<b>0.052</b>	<b>0.061</b>	<b>0.117</b>	<b>-0.068</b>	<b>0.063</b>	<b>0.181</b>	<b>-0.101</b>	1		
SRIGHT	<b>-0.205</b>	<b>0.028</b>	0.0195	<b>-0.154</b>	<b>0.098</b>	<b>0.072</b>	<b>-0.118</b>	<b>0.091</b>	<b>0.164</b>	<b>0.064</b>	0.024	<b>-0.392</b>	<b>0.311</b>	<b>-0.609</b>	0.022	1	
RLAW	<b>0.258</b>	<b>0.049</b>	<b>0.047</b>	0.029	<b>0.026</b>	<b>0.220</b>	<b>-0.107</b>	<b>0.170</b>	<b>0.051</b>	<b>0.124</b>	<b>0.142</b>	<b>-0.065</b>	0.024	<b>0.155</b>	0.009	<b>0.199</b>	1

Bold text indicates significance at the 0.05 level or better.

This table presents Pearson correlations between the main variables. All correlations are computed with entire sample of 6761 observations. INCOMEVOI is firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. COMPINCOMEVOI is Firm-specific standard deviation of annual comprehensive income, expressed as a percentage of average total assets, and measured over each five-year period. NPL is net impaired loans divided by gross loans. SIZE is the natural logarithm of (1 + total assets) of each bank. ROA is net income divided by the average total assets. REALESTLOAN is loans and leases divided by total assets. LIQUIDITY is cash and due from banks scaled by total asset. OVERHEAD is non-interest expense divided by average total assets. DIVERSIFICATION is non-interest income divided by total operating income. GDPG is a country's annual percentage growth rate of GDP at market prices based on constant local currency. INFLATION is change of customer price index (CPI) from year to year. DEPINS is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise (Demirguc-Kunt et al. (2008)). MENA is an indicator variable that sets to one when Islamic banks are located in the Middle East and North Africa (MENA), and to zero otherwise. In the sample, MENA includes Saudi Arabia, Bahrain, Qatar, Kuwait, Emirates, Jordan, Yemen, Syria, Turkey, Tunisia, Lebanon, and Egypt. ENTRY is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001). SRIGHT is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism (La Porta et. al. (1998)). RLAW is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 1.3: The efficiency of Islamic vs. conventional banks**

Dependent variable	Islamic banks LNCAP	Islamic banks LNCAP	Conventional banks LNCAP	Conventional banks LNCAP	Entire sample LNCAP	Entire sample LNCAP	Entire sample LNCAP	Entire sample LNCAP
INCOMEVOL	0.566*** [3.04]		0.283** [2.02]		0.174 [0.76]	0.131 [0.56]		
COMPINCOMEVOL		0.801*** [3.08]		0.273** [2.44]			0.122 [0.54]	0.102 [0.44]
ISLAMICDUMMY					0.055*** [2.94]	0.056* [1.53]	0.054*** [2.92]	0.053* [1.69]
INCOMEVOL*ISLAMICDUMMY					<b>0.262**</b> <b>[2.02]</b>	<b>0.231*</b> <b>[1.94]</b>		
COMPINCOMEVOL*ISLAMICDUMMY							<b>0.269**</b> <b>[2.05]</b>	<b>0.230*</b> <b>[1.91]</b>
SIZE	-0.187** [-2.47]	-0.189** [-2.04]	-0.035*** [-3.36]	-0.035*** [-5.40]	-0.038*** [-4.47]	-0.036*** [-3.65]	-0.038*** [-4.58]	-0.036*** [-3.73]
ROA	0.853*** [3.17]	0.942*** [3.45]	0.290* [1.69]	0.289* [1.68]	0.644*** [3.84]	0.543*** [2.71]	0.644*** [3.84]	0.543*** [2.71]
REALESTLOAN	0.023 [0.22]	0.052 [0.52]	0.109*** [2.90]	0.109*** [2.91]	0.097*** [2.59]	0.094** [2.44]	0.097*** [2.60]	0.094** [2.44]
LIQUIDITY	-0.021 [-0.28]	-0.026 [-0.35]	-0.084*** [-2.64]	-0.085*** [-2.64]	-0.071** [-2.12]	-0.097*** [-2.73]	-0.072** [-2.15]	-0.098*** [-2.75]
OVERHEAD	0.208 [0.70]	0.239 [0.78]	0.080 [0.70]	0.082 [0.71]	0.003 [0.02]	0.043 [0.32]	0.010 [0.08]	0.050 [0.37]
DIVERSIFICATION	0.039 [1.05]	0.045 [1.21]	0.063*** [2.83]	0.063*** [2.83]	0.073*** [3.66]	0.070*** [3.21]	0.073*** [3.65]	0.069*** [3.19]
MENA	0.147** [2.12]	0.196*** [2.87]	0.306 [6.56]	0.308 [6.60]	0.101 [1.40]	0.123* [1.69]	0.101 [1.40]	0.124* [1.70]
GDPGR	0.003 [0.36]	0.005 [0.61]	0.012*** [2.80]	0.012*** [2.81]	0.013*** [2.92]	0.014*** [2.94]	0.013*** [2.93]	0.014*** [2.94]
SRIGHT	0.016 [1.06]	0.007 [0.46]	-0.033*** [-3.98]	-0.033*** [-3.97]	-0.034*** [-3.45]	-0.034*** [-3.33]	-0.034*** [-3.45]	-0.034*** [-3.33]
DEPINS	-0.193*** [-2.92]	-0.231*** [-3.64]	-0.148*** [-3.90]	-0.148*** [-3.91]	-0.109** [-2.27]	-0.116** [-2.40]	-0.109** [-2.26]	-0.116** [-2.40]
RLAW	0.034** [2.00]	0.033* [1.89]	0.033*** [6.23]	0.034*** [6.25]	0.052*** [6.40]	0.050*** [6.20]	0.052*** [6.40]	0.050*** [6.19]
ENTRY	0.024 [1.14]	0.022 [1.08]	0.029*** [3.04]	0.029*** [3.03]	0.047*** [4.65]	0.046*** [4.14]	0.047*** [4.64]	0.046*** [4.13]
INFLATION	0.004** [2.22]	0.004** [2.12]	-0.000 [-0.71]	-0.000 [-0.72]	-0.001 [-0.95]	-0.001 [-1.25]	-0.001 [-0.93]	-0.001 [-1.24]
SIZE*ISLAMICDUMMY						-0.025** [-2.34]		-0.025** [-2.34]
ASSETGROWTH*ISLAMICDUMMY						-0.001 [-0.03]		-0.000 [-0.01]
ROA*ISLAMICDUMMY						0.258 [0.63]		0.257 [0.63]
COSTINCOME*ISLAMICDUMMY						0.016 [0.52]		0.016 [0.53]
REALESTLOAN*ISLAMICDUMMY						0.209** [2.30]		0.209** [2.31]
LIQUIDITY*ISLAMICDUMMY						0.068 [0.51]		0.066 [0.50]
OVERHEAD*ISLAMICDUMMY						0.289 [0.72]		0.284 [0.71]
DIVERSIFICATION*ISLAMICDUMMY						0.004 [0.09]		0.005 [0.11]

MENA*ISLAMIC						0.167***		0.168***
DUMMY						[3.72]		[3.75]
GDPGR*ISLAMIC						-0.005		-0.005
DUMMY						[-0.47]		[-0.46]
INFLATION*ISLAMIC						0.003**		0.003**
CDUMMY						[2.05]		[2.05]
DEPINS*ISLAMIC						0.031		0.032
DUMMY						[0.81]		[0.84]
ENTRY*ISLAMIC						0.006		0.005
DUMMY						[0.32]		[0.29]
SRIGHT*ISLAMIC						-0.005		-0.005
DUMMY						[-0.38]		[-0.39]
RLAW*ISLAMIC						-0.001		-0.001
DUMMY						[-0.09]		[-0.11]
Country fixed-effects	YES	YES	YES	YES	YES	YES	YES	YES
Time fixed-effects	YES	YES	YES	YES	YES	YES	YES	YES
Constant	0.174	0.240	0.526***	0.526***	0.085	0.111	0.087	0.112
	[0.85]	[1.17]	[6.30]	[6.29]	[1.03]	[1.21]	[1.05]	[1.22]
Observations	882	882	5879	5879	6761	6761	6761	6761
Adjusted R-squared	0.460	0.459	0.387	0.387	0.398	0.406	0.397	0.406

This table presents regression of capital buffer on asset risk and control variables for the sample of Islamic and conventional banks. The dependent variable LNCAP is the capital buffer calculated as logarithmic transform of tier 1 regulatory capital to total assets. INCOMEVOL is firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. COMPINCOMEVOL is Firm-specific standard deviation of annual comprehensive income, expressed as a percentage of average total assets, and measured over each five-year period. NPL is net impaired loans divided by gross loans. ISLAMICDUMMY is an indicator variable set to one if bank is an Islamic bank and to zero otherwise. SIZE is the natural logarithm of (1 + total assets) of each bank. ROA is net income divided by the average total assets. REALESTLOAN is loans and leases divided by total assets. LIQUIDITY is liquid assets scaled by deposit and short term funding. OVERHEAD is non-interest expense divided by average total assets. DIVERSIFICATION is non-interest income divided by total operating income. GDPG is a country's annual percentage growth rate of GDP at market prices based on constant local currency. INFLATION is change of customer price index (CPI) from year to year. DEPINS is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise (Demirguc-Kunt et al. (2008)). MENA is an indicator variable that sets to one when Islamic banks are located in the Middle East and North Africa (MENA), and to zero otherwise. In the sample, MENA includes Saudi Arabia, Bahrain, Qatar, Kuwait, Emirates, Jordan, Yemen, Syria, Turkey, Tunisia, Lebanon, and Egypt. ENTRY is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001). SRIGHT is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism (La Porta et. al. (1998)). RLAW is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm- level clustering are reported in brackets. \*\*\* , \*\* , and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 1.4: Efficiency of Islamic banks: Partitioning on the intensity of Shariah-compliant products**

Panel A: Intensity of Shariah-compliant products on asset side of balance sheet

Dependent variable	High intensity LNCAP	Low intensity LNCAP	All Islamic banks LNCAP	All Islamic banks LNCAP
INCOMEVOL	0.318a [1.60]	0.721** [2.60]	0.500*** [3.02]	0.200** [2.13]
ISFINANCE			0.042 [1.42]	0.262 [0.92]
INCOMEVOL*ISFINANCE			<b>0.408**</b> <b>[2.57]</b>	<b>0.290*</b> <b>[1.69]</b>
SIZE	-0.215* [-1.93]	-0.206* [-1.91]	-0.173** [-2.29]	-0.110 [-1.23]
ROA	0.844*** [3.17]	1.049** [2.58]	0.870*** [3.29]	0.900** [2.36]
REALESTLOAN	0.050 [0.53]	-0.181 [-1.25]	-0.062 [-0.81]	-0.223a [-1.59]
LIQUIDITY	-0.135 [-0.88]	-0.001 [-0.01]	0.023 [0.22]	-0.005 [-0.04]
OVERHEAD	-0.184 [-0.56]	0.332 [1.09]	0.185 [0.62]	0.323 [1.05]
DIVERSIFICATION	0.008 [0.16]	0.070 [1.43]	0.038 [1.02]	0.082* [1.71]
MENA	-0.149 [-1.44]	0.169* [1.94]	-0.010 [-0.14]	-0.062 [-0.66]
GDPG	-0.001 [-0.11]	-0.001 [-0.06]	0.003 [0.31]	0.008 [0.64]
INFLATION	0.004* [1.73]	0.001 [0.41]	0.004** [2.28]	0.002 [0.98]
DEPINS	-0.128** [-2.05]	-0.021 [-0.23]	0.029 [0.35]	-0.021 [-0.23]
ENTRY	0.032 [1.26]	0.053** [2.31]	0.019 [0.87]	0.014 [0.54]
SRIGHT	-0.047** [-2.42]	-0.005 [-0.18]	-0.048** [-2.42]	-0.043* [-1.79]
RLAW	0.085*** [7.35]	0.021a [1.54]	0.029** [2.11]	0.029** [2.06]
SIZE*ISFINANCE				-0.026* [-1.77]
ROA*ISFINANCE				-0.128 [-0.29]
REALESTLOAN*ISFINANCE				0.271a [1.62]
LIQUIDITY*ISFINANCE				0.047 [0.26]
OVERHEAD*ISFINANCE				-0.625a [-1.53]
DIVERSIFICATION*ISFINANCE				-0.070 [-1.07]
MENA*ISFINANCE				0.066 [0.71]
GDPG*ISFINANCE				-0.013 [-0.81]
INFLATION*ISFINANCE				0.002 [0.92]

DEPINS*ISFINANCE				0.050 [0.72]
ENTRY*ISFINANCE				0.023 [0.87]
SRIGHT*ISFINANCE				-0.004 [-0.14]
RLAW*ISFINANCE				0.022 [1.38]
Country fixed effects	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Constant	-0.132 [-0.63]	0.065 [0.28]	0.101 [0.55]	0.248 [1.06]
Observations	402	480	882	882
Adjusted R-squared	0.530	0.457	0.461	0.480

This table presents the regression of capital buffer on asset risk and control variables for the sample of Islamic banks only. Partitions are based on the annual median of Shariah-compliant products on asset side of the balance sheet, all scaled by total assets. LNCAP is the capital buffer calculated as logarithmic transform of tier 1 regulatory capital to total assets. INCOMEVOL is firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. ISFINANCE is an indicator variable set to one when Shariah-compliant products, scaled by total assets, are above the median, and to zero otherwise. SIZE is the natural logarithm of (1 + total assets) of each bank. ROA is net income divided by the average total assets. REALESTLOAN is loans and leases divided by total assets. LIQUIDITY is liquid assets scaled by deposit and short term funding. OVERHEAD is non-interest expense divided by average total assets. DIVERSIFICATION is non-interest income divided by total operating income. GDPG is a country's annual percentage growth rate of GDP at market prices based on constant local currency. INFLATION is change of customer price index (CPI) from year to year. DEPINS is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise (Demirguc-Kunt et al. (2008)). MENA is an indicator variable that sets to one when Islamic banks are located in the Middle East and North Africa (MENA), and to zero otherwise. In the sample, MENA includes Saudi Arabia, Bahrain, Qatar, Kuwait, Emirates, Jordan, Yemen, Syria, Turkey, Tunisia, Lebanon, and Egypt. ENTRY is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001). SRIGHT is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism (La Porta et. al. (1998)). RLAW is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

Panel B: Intensity of profit-loss sharing products on deposit side of balance sheet

Dependent variable	High intensity LNCAP	Low intensity LNCAP	All Islamic banks LNCAP	All Islamic banks LNCAP
INCOMEVOL	0.564** [2.42]	0.672*** [3.08]	0.472*** [2.79]	0.512*** [3.08]
PLS			0.044 [1.20]	0.081 [0.24]
INCOMEVOL*PLS			<b>0.609*</b> <b>[1.95]</b>	<b>0.446*</b> <b>[1.69]</b>
SIZE	-0.370* [-1.87]	-0.193** [-2.34]	-0.179** [-2.30]	-0.167** [-2.26]
ROA	1.873** [2.34]	0.724*** [2.67]	0.817*** [3.11]	0.725*** [2.78]
REALESTLOAN	0.347*** [3.63]	0.064 [0.78]	0.014 [0.19]	0.059 [0.74]
LIQUIDITY	-0.504*** [-2.98]	-0.109 [-0.92]	-0.028 [-0.27]	-0.090 [-0.76]
OVERHEAD	0.266 [0.35]	0.208 [0.75]	0.179 [0.61]	0.171 [0.61]
DIVERSIFICATION	0.010 [0.12]	0.041 [0.94]	0.038 [0.99]	0.042 [0.97]
MENA	0.344*** [0.96]	-0.064 [-0.44]	-0.011 [-0.15]	-0.093 [-0.93]
GDPG	0.029* [1.68]	-0.016 [-1.44]	0.004 [0.43]	-0.013 [-1.08]
INFLATION	0.001 [0.31]	0.005*** [2.76]	0.004** [2.05]	0.005*** [2.63]
DEPINS	-0.464*** [-3.91]	-0.141 [-1.06]	0.044 [0.51]	-0.096 [-0.92]
ENTRY	0.026 [1.03]	0.026 [1.01]	0.019 [0.86]	0.025 [0.97]
SRIGHT	-0.068*** [-4.20]	0.061 [1.42]	0.045** [2.25]	0.050* [1.93]
RLAW	0.003 [0.25]	0.044*** [3.19]	0.026* [1.81]	0.038** [2.18]
SIZE*PLS				-0.048*** [-2.65]
ROA*PLS				1.425a [1.49]
REALESTLOAN*PLS				0.386*** [3.37]
LIQUIDITY*PLS				-0.445** [-2.43]
OVERHEAD*PLS				0.354 [0.44]
DIVERSIFICATION*PLS				0.014 [0.16]
MENA*PLS				0.096 [0.77]
GDPG*PLS				0.034a [1.55]
INFLATION*PLS				-0.005 [-1.20]
DEPINS*PLS				-0.190** [-2.39]
ENTRY*PLS				-0.006 [0.87]

SRIGHT*PLS				-0.012
				[-0.36]
RLAW*PLS				0.000
				[0.01]
Country fixed effects	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Constant	0.263	-0.019	0.140	0.099
	[1.21]	[-0.07]	[0.73]	[0.45]
Observations	396	486	882	882
Adjusted R-squared	0.562	0.399	0.461	0.497

This table presents the regression of capital buffer on asset risk and control variables for the sample of Islamic banks. Partitions are based on the annual median of profit loss sharing schemes on deposit side, all scaled by total assets. Profit loss sharing schemes include Mudaraba and Musharaka. Mudaraba refers to a partnership loan where the depositor provides capital, and the bank has full control on the funds. In case there is a loss, the depositors may lose part or all of the deposits. In Musharaka contracts, the Islamic bank is one of several investors with profits and losses being shared among all investors in proportion to their participation. The dependent variable LNCP is the capital buffer calculated as logarithmic transform of tier 1 regulatory capital to total assets. INCOMEVOL is firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. PLS is set to 1 when profit loss sharing products, scaled by total assets, are above the annual median, and to zero otherwise. SIZE is the natural logarithm of (1 + total assets) of each bank. ROA is net income divided by the average total assets. REALESTLOAN is loans and leases divided by total assets. LIQUIDITY is liquid assets scaled by deposit and short term funding. OVERHEAD is non-interest expense divided by average total assets. DIVERSIFICATION is non-interest income divided by total operating income. GDPG is a country's annual percentage growth rate of GDP at market prices based on constant local currency. INFLATION is change of customer price index (CPI) from year to year. DEPINS is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise (Demirguc-Kunt et al. (2008)). MENA is an indicator variable that sets to one when Islamic banks are located in the Middle East and North Africa (MENA), and to zero otherwise. In the sample, MENA includes Saudi Arabia, Bahrain, Qatar, Kuwait, Emirates, Jordan, Yemen, Syria, Turkey, Tunisia, Lebanon, and Egypt. ENTRY is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001). SRIGHT is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism (La Porta et. al. (1998)). RLAW is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.



**Table 1.5: Assessing efficiency of Islamic banks across different size groups**

Dependent variable	High total assets LNCAP	Low total assets LNCAP	All Islamic banks LNCAP	All Islamic banks LNCAP
INCOMEVOL	-0.168a [1.56]	0.056* [1.74]	0.037* [1.75]	0.765 [1.35]
LARGEBANKS			-0.142*** [-3.59]	-0.726** [-2.28]
INCOMEVOL*LARGEBANKS			<b>-0.434*</b> <b>[-1.76]</b>	<b>-0.370*</b> <b>[-1.91]</b>
ISFINANCE	0.005 [0.10]	0.003 [0.09]	0.021 [0.90]	0.006 [0.15]
PLS	0.040 [0.93]	0.062 [1.18]	0.038 [1.24]	0.061 [1.25]
SIZE	-0.364 [-1.37]	-0.184a [-1.59]	-0.161a [-1.52]	-0.119 [-1.09]
ROA	1.114** [2.38]	0.372 [1.37]	0.691*** [2.78]	0.523* [1.87]
REALESTLOAN	0.194 [1.05]	-0.098 [-1.32]	-0.013 [-0.17]	-0.065 [-0.89]
LIQUIDITY	0.259* [1.91]	-0.118 [-1.11]	0.016 [0.19]	-0.033 [-0.33]
OVERHEAD	-0.774 [-1.29]	0.062 [0.21]	0.081 [0.27]	0.055 [0.17]
DIVERSIFICATION	0.030 [0.73]	0.083* [1.77]*	0.058a [1.61]	0.071 [1.45]
MENA	0.145a [1.67]	0.015 [0.19]	0.047 [0.66]	0.187* [1.70]
GDPG	0.013 [0.98]	-0.004 [-0.37]	0.002 [0.28]	-0.021a [-1.53]
INFLATION	0.007*** [4.74]	-0.003 [-1.41]	0.003* [1.86]	0.002 [0.86]
DEPINS	-0.126** [-2.23]	-0.238*** [-2.92]	-0.027 [-0.36]	-0.054 [-0.55]
ENTRY	0.038*** [3.15]	0.031 [0.83]	0.027 [1.37]	-0.051a [-1.60]
SRIGHT	-0.035a [-1.64]	0.016 [0.69]	-0.056** [-2.48]	0.022 [0.89]
RLAW	0.089*** [10.35]	0.055*** [3.29]	0.039*** [2.84]	0.055*** [3.23]
ISFINANCE*LARGEBANKS				-0.010 [-0.15]
PLS*LARGEBANKS				0.025 [0.43]
SIZE*LARGEBANKS				-0.059*** [-3.99]
ROA*LARGEBANKS				0.423 [0.87]
REALESTLOAN*LARGEBANKS				0.265a [1.51]
LIQUIDITY*LARGEBANKS				0.277* [1.93]
OVERHEAD*LARGEBANKS				-0.749 [-1.22]
DIVERSIFICATION*LARGEBANKS				-0.020 [-0.35]
MENA*LARGEBANKS				-0.068

				[-0.89]
GDPG*LARGEBANKS				0.039*
				[1.95]
INFLATION*LARGEBANKS				0.002
				[0.88]
DEPINS*LARGEBANKS				-0.146*
				[-1.92]
ENTRY*LARGEBANKS				0.114***
				[3.49]
SRIGHT*LARGEBANKS				-0.034
				[-1.33]
RLAW*LARGEBANKS				0.025
				[1.28]
Country fixed effects	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Constant	-0.540***	0.290	0.040	0.744***
	[-3.72]	[0.93]	[0.21]	[2.80]
Observations	441	441	882	882
Adjusted R-squared	0.489	0.291	0.485	0.516

This table presents the regression of capital buffer on asset risk and control variables across Islamic banks of differing sizes. Partitions are based on annual medians of total assets. The dependent variable LNCAP is the capital buffer calculated as logarithmic transform of tier 1 regulatory capital to total assets. INCOMEVOL is firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. LARGEBANKS is set to one when total assets of an Islamic bank are above the annual median, and to zero otherwise. SIZE is the natural logarithm of (1 + total assets) of each bank. ROA is net income divided by the average total assets. REALESTLOAN is loans and leases divided by total assets. LIQUIDITY is liquid assets scaled by deposit and short term funding. OVERHEAD is non-interest expense divided by average total assets. DIVERSIFICATION is non-interest income divided by total operating income. GDPG is a country's annual percentage growth rate of GDP at market prices based on constant local currency. INFLATION is change of customer price index (CPI) from year to year. DEPINS is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise (Demirguc-Kunt et al. (2008)). MENA is an indicator variable that sets to one when Islamic banks are located in the Middle East and North Africa (MENA), and to zero otherwise. In the sample, MENA includes Saudi Arabia, Bahrain, Qatar, Kuwait, Emirates, Jordan, Yemen, Syria, Turkey, Tunisia, Lebanon, and Egypt. ENTRY is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001). SRIGHT is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism (La Porta et. al. (1998)). RLAW is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm- level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 1.6: Assessing efficiency of Islamic banks before and after the financial crisis period**

Dependent variable	After-crisis LNCAP	Pre-crisis LNCAP	All periods LNCAP	All periods LNCAP
INCOMEVOL	0.475** [2.18]	0.328** [2.18]	0.389*** [2.68]	0.264** [2.25]
POST			-0.255** [-2.08]	0.158 [0.55]
INCOMEVOL*POST			<b>0.204</b> <b>[0.86]</b>	<b>-0.019</b> <b>[-0.07]</b>
ISFINANCE	-0.004 [-0.11]	0.072** [2.16]	0.033 [1.26]	0.083** [2.43]
PLS	-0.089 [-0.11]	0.010 [0.22]	-0.038 [-1.16]	0.002 [0.05]
SIZE	-0.284* [-1.73]	-0.146a [-1.53]	-0.176** [-2.26]	-0.139a [-1.63]
ROA	0.872** [2.24]	0.450a [1.51]	0.866*** [3.26]	0.468 [1.45]
REALESTLOAN	0.131 [0.77]	0.000 [0.00]	0.028 [0.28]	0.004 [0.05]
LIQUIDITY	-0.014 [-0.12]	-0.165* [-1.96]	-0.051 [-0.66]	-0.172** [-2.07]
OVERHEAD	0.666* [1.93]	-0.105 [-0.35]	0.147 [0.51]	-0.046 [-0.16]
DIVERSIFICATION	0.101* [1.92]	-0.014 [-0.32]	0.035 [0.93]	-0.014 [-0.32]
MENA	-0.359** [-2.36]	0.188 [1.30]	-0.019 [-0.25]	0.111 [0.70]
GDPG	0.004 [0.70]	0.034 [1.20]	0.003 [0.39]	0.025 [0.72]
INFLATION	0.002 [0.71]	-0.000 [-0.08]	0.004** [2.06]	0.001 [0.60]
DEPINS	-0.196*** [-3.58]	-0.133 [-0.93]	0.036 [0.41]	-0.042 [-0.32]
ENTRY	0.018 [1.16]	0.073 [1.28]	0.019 [0.85]	0.050* [1.78]
SRIGHT	0.023 [1.19]	0.050 [1.42]	-0.047* [-2.32]	0.034 [1.15]
RLAW	0.070*** [4.80]	0.023 [1.16]	0.026* [1.85]	0.016 [0.73]
ISFINANCE*POST				-0.099** [-2.18]
PLS*POST				-0.080a [-1.48]
SIZE*POST				-0.041** [-2.41]
ROA*POST				0.487 [0.93]
REALESTLOAN*POST				0.220* [1.93]
LIQUIDITY*POST				0.183 [1.41]
OVERHEAD*POST				0.474 [1.39]
DIVERSIFICATION*POST				0.103a [1.64]

MENA*POST				-0.177***
				[-2.66]
GDPG*POST				-0.023
				[-0.62]
INFLATION*POST				0.004
				[1.38]
DEPINS*POST				0.055
				[1.06]
ENTRY*POST				-0.025
				[-1.08]
SRIGHT*POST				-0.008
				[-0.43]
RLAW*POST				0.027**
				[2.03]
Country fixed effects	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Constant	-0.127	-0.195	0.146	0.017
	[-0.54]	[-0.59]	[0.77]	[0.08]
Observations	391	491	882	882
Adjusted R-squared	0.489	0.423	0.463	0.500

This table presents the regression of capital buffer on asset risk and control variables for the sample of Islamic banks during global financial crisis. The sample is split to pre-crisis period (up to and including 2007) and post crisis period (2008 or after). The dependent variable LNCAP is the capital buffer calculated as logarithmic transform of tier 1 regulatory capital to total assets. INCOMEVOL is firm-specific standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. POST is set to one when year is 2008-2012 and zero otherwise. SIZE is the natural logarithm of (1 + total assets) of each bank. ROA is net income divided by the average total assets. REALESTLOAN is loans and leases divided by total assets. LIQUIDITY is liquid assets scaled by deposit and short term funding. OVERHEAD is non-interest expense divided by average total assets. DIVERSIFICATION is non-interest income divided by total operating income. GDPG is a country's annual percentage growth rate of GDP at market prices based on constant local currency. INFLATION is change of customer price index (CPI) from year to year. DEPINS is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise (Demirguc-Kunt et al. (2008)). MENA is an indicator variable that sets to one when Islamic banks are located in the Middle East and North Africa (MENA), and to zero otherwise. In the sample, MENA includes Saudi Arabia, Bahrain, Qatar, Kuwait, Emirates, Jordan, Yemen, Syria, Turkey, Tunisia, Lebanon, and Egypt. ENTRY is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth et al. (2001). SRIGHT is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism (La Porta et. al. (1998)). RLAW is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm- level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

## **CHAPTER 2: Accounting conservatism in Islamic banking**

### **1. Introduction**

In this paper, we explore how reported accounting numbers are shaped by Islamic or Shariah rules that govern Islamic banks. Under Shariah law, all activities of Islamic banks, at least in theory, have to be based on profit-loss sharing arrangement or PLS. Major funding of Islamic banks comes from PLS where profits are shared at a predetermined ratio while the losses are born exclusively by the depositors, or investment account holders. Therefore, reporting is very important in Islamic banks, as investment account holders require greater information to monitor their investment.

We seek deep understanding into the nature of financial reporting incentives created by Shariah in Islamic banks. We mainly focus on financial reporting incentives related to accounting conservatism, which is an important and widely studied property of a firm's financial reporting. To this end, we investigate the concept of accounting conservatism in Islamic finance and empirically analyze relations between key characteristics of bank-, country-, and economy-level institutions and one dimension of accounting conservatism, the asymmetric recognition of economic gains and losses into earnings.

Islamic banks are placed in a position where they are expected to play a significant role in equitable redistribution of wealth in society and attaining social justice. One of the most important tools for many Muslims for ensuring wealth redistribution and transfer the wealth from rich to poor is Zakah or Islamic tax (Badawi, 1979). In fact, Zakah is one of the major "Pillars" in Islam that all Muslims are obligated to pay. Islamic banks are not exception. Islamic banks, as separate legal entities, are also obligated to pay Zakah in order to maintain social justice and fair distribution of wealth, which in turns indicates

that financial reporting is correspondingly more likely to be influenced by such payment. Due to Zakah obligation, many Islamic accounting scholars cast doubt on the relevance of conservatism concept for Islamic banks' financial reporting. Gambling and Karim (1991) state that the key motivation for financial reporting is the provision of information relevant for Zakah, and argue that adherence to the concept of conservatism would lead to understatement of earnings that could be subject to Zakah. Thus, they conclude that this concept is not relevant for Islamic financial reporting. Khan (1994) supports the view that conservatism is inappropriate for the purposes of Zakah computation and its objectives.

From regulatory perspective, Accounting and Auditing Organization for Islamic Financial Institutions (hereafter AAOIFI), which is the regulatory body that set accounting, auditing, ethics, as well as Shariah standards for Islamic financial institutions, including banks, keeps silent in the definition of conservatism concept and does not mention it in the AAOIFI standards.

To overcome the dilemma of conservatism and its relevance in Islamic finance, some researchers view conservatism for Islamic business differently. Haniffa and Hudaib (2001) argued that what is meant in Islamic accounting by the conservatism principle is not the selection of the accounting techniques that has the least favorable impact on owners but more towards the selection of accounting techniques with the most favorable impact on society i.e. better to overestimate funds “ anti-conservative” for Zakah purposes.

To test the concept of conservatism in Islamic accounting, we first use Basu (1997) model on a sample of 35 purely Islamic banks that adopted AAOIFI financial reporting

guidelines from 11 countries over 2005-2013, we find that returns of Islamic banks are highly and positively correlated with their earnings, which suggests that conservatism concept in Islamic accounting is the same as in conventional accounting. We also apply Ball and Shivakumar (2005) model which use accounting data instead of market data. The finding indicates that Islamic banks speed recognizing loss while delay gain recognition. This result confirms Basu's finding and suggests that accounting conservatism is the same under Islamic finance as well as under conventional counterpart.

In further analysis, we address whether Islamic bank is less or more conservative than conventional bank. Prior literature argues that firms have incentive to use conservative accounting to defer income and reduce the present value of tax. This incentive, on average, leads to understatement of net asset (Shackelford and Shevlin (2001); Watts, 2003). Together with corporate tax, Islamic banks are required to pay Zakah, this would suggest that Islamic banks have more incentive to report conservatively than conventional banks. Moreover, religious individuals are commonly viewed as more risk averse than non-religious individuals (Miller, 2000; Diaz, 2000; and Miller and Hoffman, 1995), and managers of religious influenced firms are less likely to be the target of a class action lawsuit (McGuire et al., 2012; and Grullon et al., 2010). To avoid the asymmetric penalties that accompany litigation (Watts, 2003), we forward that one mechanism available to managers for avoiding litigation is to conservatively report accruals so as to understate income and net assets. Given that Islamic banks are governed by Shariah rules, we predict that Islamic banks would be more conservative than conventional banks. Consistent with our predication, we document, using Ball and Shivakumer (2005) model,

that Islamic banks recognize bad news faster and recognize good news slower relative to conventional banks. This would suggest that Islamic banks report more conservatively compared to conventional banks.

This study contributes to the growing literature in Islamic banking and finance. Prior research in Islamic banking mainly focuses on exploring key differences between Islamic and conventional banks in term of stability, efficiency, and profitability. For instance, recent study by Beck, Demirgüç-Kunt, and Merrouche (2013) find few significant differences in business orientation between Islamic and conventional banks. Also, they find some evidence that Islamic banks are less cost-effective, but have a higher intermediation ratio, higher asset quality and are better capitalized. Our paper is different in that we focus on the issue of financial reporting as it gains particular concern of regulators and practitioners especially after the global financial crisis.

Furthermore, this paper complements the arguments of Watts (2003). Watts (2003) explicates four distinct channels that may influence conservatism: (1) contracting; (2) litigation; (3) regulation; and (4) taxation. While we will relate Islamic influences to the contracting, litigation, and tax explanations, our test does not claim to be directly testing these alternating theories. This analysis illustrates that the relative impact of Shariah rules on the level of conservatism when we compare conservatism in Islamic vs. conventional banks.

The rest of the paper is organized as follows. Section 2 describes the conceptual framework of the paper, including a discussion of alternative explanations for conservatism, Islamic tax obligation, and the conceptual justification for anti-conservatism approach within Islamic finance. Section 3 develops hypotheses. Section 4



describes our data and research design and Section 5 presents our empirical results. Section 6 discusses further analysis. Section 7 summarizes the paper

## **2. Literature review**

This section first discusses the underlying structure of accounting conservatism mainly from the perspective of its determinants to provide an understanding of accounting conservatism. Then, discuss Islamic tax obligation and Islamic view of conservatism.

### **2.1. Underlying structure of accounting conservatism**

The concept of conservatism is viewed as requiring higher verification standards for recognizing good news than for recognizing bad news (Basu 1997; Watts 2003; Nichols, Wahlen, and Wieland, 2009), i.e., asymmetric timeliness of recognition of earnings decreases versus earnings increases in accounting income. Timely recognition of earnings decreases and delays in recognizing earnings increases will directly impact profitability and capital ratios, which, in turn, could determine the intensity of monitoring by regulators because these measures are used by regulators to identify troubled banks.

Watts (2003) provides four explanations for the existence of accounting conservatism, which offer significant benefits to the users of financial information. These benefits include improving contracting efficiency, minimizing firms' litigation and tax costs, and enabling accounting and industry regulators to minimize economic instability and avoid criticism.

Under contracting explanation, accounting conservatism is an efficient contracting mechanism for reducing agency costs. The use of conservative accounting numbers in contracts among different parties to the firm reduces information asymmetries and moral

hazard problems derived from agency conflicts. Conservatism imposes a higher standard of verification to recognize good news in earnings rather than bad news, which in turn reduces the managers' opportunity to overstate earnings. These restrictions reduce the probability of managerial expropriation of shareholders' resources or the excessive distribution of resources to shareholders at the expense of debt holders (Khan and Watts, 2009). Previous empirical studies support these arguments (Ahmed et al., 2002; Ahmed & Duellman 2007; Nikolaev, 2010; Qiang, 2007). For instance, Ahmed et al. (2002) documented that accounting conservatism plays an important role in mitigating the bondholder-shareholder conflicts over dividend policy by reducing the risk to bondholders that the firm will pay excessive dividends to shareholders.

The litigation hypothesis claims that firms use conservative reporting to avoid or minimize litigation risks. Firms, and their auditors, are more likely to be sued for overstatements of earnings and net assets than for understatements. Thus, as conservatism understates a firm's net assets, the firm's litigation risk is reduced. Prior studies document that litigation risk are associated with more conservative accounting (Basu, 1997; Lobo and Zhou, 2006). Basu (1997) presents some of the strongest evidence of this association by showing that in periods of high auditor litigation, firms report more conservatively. The converse was also found to be true. The results suggest that periods of higher litigation risk generally exhibit greater accounting conservatism, as firms preemptively attempt to reduce future litigation costs.

Furthermore, Watts (2003) contends that the links between taxation and reporting can generate conservative reporting. Generally, firms report lower financial earnings to reduce their income tax liabilities. When there is a high correlation between book and tax

earnings, a firm will be more likely to report conservative financial earnings to reduce tax obligations. Finally, Watts (2003) notes that conservative accounting enables standard setters and regulators to minimize economic instability and avoid criticism. These bodies are likely to face more criticism if firms overstate their net assets than if they understate them.

## 2.2. Islamic tax and conservatism in Islamic banks

Zakah or Islamic tax is one of the major “Pillars” in Islam that all Muslims, including Islamic financial institutions, are obligated to pay in order to maintain social justice and fair distribution of wealth. Islamic banks, as separate legal entities, are also required to pay Zakah on its earnings. According to tax explanation of conservatism indicated above, this indicates that financial reporting in Islamic banks is correspondingly more likely to be influenced by such payment. This link between accounting financial reporting and Zakah has stimulated wide-ranging discussion among Islamic scholars as well as academics.

Due to Zakah obligation, many Islamic accounting scholars cast doubt on the relevance of conservatism concept for Islamic banks’ financial reporting. Gambling and Karim (1991) state that the key motivation for financial reporting is the provision of information relevant for Zakah, and argue that adherence to the concept of conservatism would lead to understatement of earnings that could be subject to Zakah. Thus, they conclude that this concept is not relevant for Islamic financial reporting. Khan (1994) supports the view that conservatism is inappropriate for the purposes of Zakah computation and its objectives.

Accounting and Auditing Organization for Islamic Financial Institutions (hereafter

AAOIFI) is an independent, non-profit organization that prepares accounting, auditing, governance, ethics, and Shariah standards for Islamic financial institutions. In principle, AAOIFI approach is not to develop new standards specifically to Islamic institutions but to adapt conventional accounting and auditing standards, mainly IFRS, and adjust some standards to be legally consistent with Islamic law particularly interest prohibition and Zakah a requirement. However, AAOIFI is being silent in the conservatism concept and this concept is not mentioned in the AAOIFI standards as well.

### **3. Hypotheses development**

Islamic banks are placed in a position where they are expected to play a significant role in equitable redistribution of wealth in society and attaining social justice. One of the most important tools for many Muslims for ensuring wealth redistribution and transfer the wealth from rich to poor is Zakah (Badawi, 1979). As indicated above, this religious duty influences the financial reporting practices of Islamic banks and creates some doubts on the relevance of conservatism in Islamic finance. To overcome this dilemma, some researchers view conservatism for Islamic business differently. For instance, Haniffa and Hudaib (2001) argue that what is meant in Islamic accounting by the conservatism principle is not the selection of the accounting techniques that has the least favorable impact on owners but more towards the selection of accounting techniques with the most favorable impact on society i.e. better to overestimate funds “ anti-conservative” for Zakat purposes. Therefore, Islamic banks recognize earning increase (gain) on timely basis while recognizing earnings decrease (loss) with delays. Our primary hypothesis is the following,

H1: Islamic banks recognize earning increase (gain) on timely basis while recognizing earnings decrease (loss) with delays.

#### 4. Research design

Our first measure of conservatism is based on Basu's (1997) earnings-return model, which regresses earnings on returns and allows the return coefficient to vary with the sign of the return. This model uses positive (negative) stock returns to capture good (bad) economic news. Specifically, Basu (1997) estimates the following regression model:

$$\begin{aligned} \text{Earnings}_{i,t} = & \alpha_0 + \alpha_1 \text{Returns}_{i,t} + \alpha_2 \text{Dummy}_{i,t} + \alpha_3 \text{Returns}_{i,t} * \text{Dummy}_{i,t} + \alpha_4 \text{Size}_i + \alpha_9 \\ & \text{M/B}_{i,t-1} + \alpha_5 \text{Leverage}_{i,t-1} + \gamma_1 \text{DI}_{k,t} + \gamma_2 \text{CRights}_{k,t} + \gamma_3 \text{InfSharing}_{k,t} + \gamma_4 \text{Rlaw}_{k,t} + \gamma_5 \\ & \text{Culture}_{k,t} + \gamma_6 \text{LegalSystem}_{k,t} + \gamma_7 \text{LogGdp}_{k,t} + \varepsilon_{i,k} \end{aligned} \quad (1)$$

Where:

$\text{Earnings}_{i,t}$  = Net income for year t divided by market value of equity for year t-1

$\text{Returns}_{i,t}$  = Annual returns compounded from 9 months before year-end t to three months after year end t.

$\text{Dummy}_{i,t}$  = An indicator that equals one if Returns is negative and zero otherwise.

In Equation (1),  $\alpha_3$  captures asymmetric timeliness with respect to bad news versus good news and hence is the measure of conservatism. Under this model, earnings would be highly sensitive in reflecting publicly available bad news than good news, implying positive coefficient of  $\alpha_3$ . For Islamic banks, we would expect that earnings would have low or no sensitivity in reflecting bad news, implying negative or no significant coefficient of  $\alpha_3$ .

In separate regressions, we control for firm size (Size), market-to- book (M/B), and leverage (Leverage) to ensure that these important firm characteristics are not driving our

findings. Size is measured as natural logarithm of market value of equity of year  $t$ . Market value of equity is negatively associated with conservatism, as it likely proxies for lower information asymmetry (LaFond and Watts, 2008). M/B is the ratio of market value of equity to book value of equity at the end of year  $t-1$ . M/B reflects past asymmetric timeliness and growth options, both of which negatively affect future asymmetric timeliness of earnings (Roychowdhury and Watts, 2007). We include Leverage, which is total liabilities divided by total assets at the end of year  $t-1$ , to control for debt holders' demand for conservatism.

Our second measure of conservatism is based on Ball and Shivakumar (2005) model that examines earnings increases and decreases as proposed by Nichols, Wahlen, and Wieland (2009). The following equation will be estimated;

$$\begin{aligned} \Delta NI_{i,t} = & \alpha_0 + \alpha_1 D\Delta NI_{i,t-1} + \alpha_2 \Delta NI_{i,t-1} + \alpha_3 \Delta NI_{i,t-1} * D\Delta NI_{i,t-1} + \alpha_4 Size_i + \alpha_5 Size_i * \\ & D\Delta NI_{i,t-1} + \alpha_6 Size_i * \Delta NI_{i,t-1} + \alpha_7 Size_i * \Delta NI_{i,t-1} * D\Delta NI_{i,t-1} + \gamma_1 DI_{k,t} + \gamma_2 CRights_{k,t} \\ & + \gamma_3 InfSharing_{k,t} + \gamma_4 Rlaw_{k,t} + \gamma_5 Culture_{k,t} + \gamma_6 LegalSystem_{k,t} + \gamma_7 LogGdp_{k,t} \\ & + \varepsilon_{i,k} \end{aligned} \quad (2)$$

Where  $i$  denotes bank  $i$ ,  $k$  denotes country  $k$  and  $t$  denotes the time period.

$\Delta NI_t$  denotes the change in net income from year  $t - 1$  to  $t$ , scaled by total assets at the end of  $t - 1$ , and  $D\Delta NI_{t-1}$  denotes an indicator variable that equals 1 if  $\Delta NI_t$  is negative and 0 otherwise. In essence, model (2) is an auto-regression of earnings changes, which is a regression of current period change in earnings  $\Delta NI_t$  on prior period change in earnings,  $\Delta NI_{t-1}$  that is augmented by permitting the auto-regressive relation to differ for positive and negative values of  $\Delta NI_{t-1}$ . The model also controls for the effects of differences in Size, which is measured as natural logarithm of total assets at the end of year  $t$ , on the

estimated auto-regressive relations. Additionally, equation (2) includes several country-level variables, country and year indicators to control for country and time fixed effects, respectively. We also estimate the model with robust standard errors clustered by bank and country level.

Under conditional conservatism, as discussed in Nichols, Wahlen, and Wieland (2009), we expect asymmetry in the timeliness of recognition of earnings decreases versus increases in accounting income. Economic gains must meet a higher verification threshold to be recognized in accounting income, so earnings increases are likely to be less timely and more persistent, implying  $\alpha_2$  should be positive. As for loss, we expect a lower verification threshold and therefore more timely recognition of earnings declines than gains. Consequently, we predict a negative value for  $\alpha_3$  in equation 2 .

However, our basic prediction is that Islamic banks have an anticonservative financial reporting practice where the banks recognize earnings increase on more timely bases than earnings decrease, implying a positive value for  $\alpha_3$  across a sample of Islamic banks, indicating negative earnings changes are less transitory than positive changes, consistent with accounting income incorporating losses more slowly than gains. This is the opposite of what accounting conservatism predicts.

For both equations (1) and (2), we Follow Kanagaretnam, Lim, Lobo (2014) and employ a number of country level variables to control for country characteristics that may influence bank financial reporting. Demircuc-Kunt and Detragiache (2002) argue that banks in countries with explicit deposit insurance have higher risk taking incentives, which in turn have higher accounting performance, particularly in the short- run during growth period. Thus, we control for explicit deposit insurance (DI) in a country using

data from Demirguc-Kunt, Kane, and Laeven (2008). We control for creditor rights (CRights) and information sharing (InfSharing) because Houston, Lin, C., Lin, P., and Mae (2010) show that stronger creditor rights (CRights) promote greater bank risk-taking and higher accounting performance, and greater information sharing (InfSharing) among creditors reduces information asymmetries and enhances transparency.

We also control for the influence of national culture on accounting conservatism. Kanagaretnam, Lim, and Lobo (2014) document that banks in a country with high uncertainty avoidance cultures tend to report more conservatively than banks in a country with high individualism type of culture. Using Hofstede (2001) classification of culture, the countries in the sample fall into two dimensions, power distance and uncertainty avoidance. In high power distance societies, decisions are more centralized and managers have greater influence, which may result in higher risk taking and lower reporting conservatism while banks in high uncertainty-avoidance societies have a preference for less risk and more likely to have higher accounting conservatism. We add Culture as a dummy variable that set to one if a country has higher uncertainty avoidance type of cultures and zero otherwise, using data from Hofstede (2001).

Prior literature argues that the quality of law enforcement, legal, and economic institutions affect financial reporting incentives and thus the level of conservatism applied to financial statements in different countries (Ball, Robin, and Sadka, 2008; Bushman and Piotroski 2006). In a country where the enforcement law is strong, investor protection laws and the ability to enforce laws are high. Strong protection for investors' rights is associated with greater transparency, higher quality disclosure of firm specific information, and more developed accounting standards, which make earnings are more



value relevant (Ali and Hwang 2000; Ball, Kothari, and Robin, 2000; Hung 2001), the extent of earnings management is lower (Leuz, Nanda, and Wysocki, 2003), and more firm-specific information is incorporated into stock prices (Kim and Shi 2010; Moreck, Yeung, and Yu, 2000).

Prior evidence also documents that common law countries generally have stronger legal protection of investors than do civil law countries (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998). Bushman and Piotroski (2006) empirically analyze the relation between a country-legal system and the asymmetric recognition of economic gains and losses into earnings. They find that common law countries may be more inclined toward conservative accounting. From above discussion, we, therefore, conjecture that banks in countries with strong investor protections reflect bad news in reported earnings numbers in a more timely fashion than firms in countries characterized by weak investor protections. Lastly, we control for economic well-being of the country, measured as the natural log of Gross Domestic Product per capita in constant 2000 U.S. dollars, denoted as LogGdp, because countries with different income levels are subject to different economic shocks and sources of volatility, which likely affect bank financial reporting. Details on variable definition are reported in Appendix A2.

## **5. Sample and descriptive statistics**

### **5.1 Sample selection**

To test Basu model, we collect all bank-years with available monthly equity returns from Bloomberg over 2005-2013 to calculate annualized returns compounded from nine months before year-end  $t$  to three months after year end  $t$ . We merge the resulting data with BankScope, a global database with data on both listed and non-listed banks, to obtain bank financial information and identify banks' type. For Ball and Shivakumar

(2005) model, we utilize data entirely from the BankScope database. From all banks in the sample, we only retain banks that adopt IFRS in their financial reports practices. As for Islamic banks, we only select banks that are explicitly stated in the annual report that they adopt AAOIFI financial reporting. Then, we eliminate banks with missing control variables and missing macroeconomic data that obtain from World Banks Survey.

For both tests, we use a sample that comprises only countries with both conventional and Islamic banks, which allows us to control for any unobserved time-variant effect by introducing country-year dummies. We also double-check the categorization of Islamic banks in Bankscope with information from Islamic Banking Associations and country-specific sources. Our main analysis over the period 2005–2013 includes 143 banks across 13 countries, out of which 35 are Islamic banks (see Appendix B2) and the final sample of Basu's (Ball and Shivakumar) test consists of 769 (1235) observations, out of which 206 (267) observations are for Islamic banks. Appendix C2 provides details on the sample selection.

## 5.2. Descriptive statistics

Table 2.1 describes all variables for the sample of Islamic, conventional, and both sets of banks. We provide descriptive statistics for conventional banks as we test for the difference of conservatism between Islamic and conventional banks in further analysis section. All continuous variables are winsorized at 1% and 99%. Panel A describes the variables used in Basu model. The mean (median) Earnings is 11% (10%) for the whole sample. Earnings in Islamic banks on average is significantly lower than conventional banks. The average earnings is 7% and 13% for Islamic banks and conventional banks, respectively. The mean (median) Returns is -7% (-11%). Panel A also reveals that conventional banks are significantly larger, have higher M/B ratio, and more leverage

than Islamic banks. The average Size, M/D, and Leverage for the whole sample is 9%, 1.5, and 78%, respectively.

Panel B presents the descriptive statistics for variable used in Ball and Shivakumar (2005) model. The mean (median) change in income is 0.5% (0.2%) of total assets and, on average, 32% of the whole sample banks report a decline in earnings. Islamic banks have, on average, a change in Income of 1% to total assets while conventional banks have 3% average change in income to total assets. In term of Size, the average size for the sample is 8.5 with conventional banks being significantly larger than Islamic banks, which are consistent with prior study (Beck, Dermiguc-Kunt, and Merrouche, 2013). Islamic banks are small as compared to conventional banks because most of Islamic banks have started their operations recently.

In panel C, we report descriptive statistics for country level variables utilized in Ball and Shivakumar (2005) as the sample is larger than the Basu sample. Rlaw, LegalSystem, and LogGdp are significantly higher for the sample of Islamic banks in comparison to conventional banks sample. These figures reveal that Islamic banks, on average, are located in countries with higher tradition for law, countries with civil legal law, and countries with high economic growth.

Table 2.2 provides correlations between key variables for the pooled sample. Panel A presents Pearson correlation for Basu model while Panel B present the correlation for Ball and Shivakumar model. In Panel A, Islamicdummy is negatively correlated with earnings, size, market to book, leverage, and deposit insurance. On the other hand, Islamicdummy is positively correlated with Creditors' rights and enforcement law or Rlaw. Consistent with Basu (1997), Earnings is positively correlated with Returns, which

indicate the sensitivity of earnings to returns. The Panel also shows that Earnings is positively correlated with Size, and Leverage, InfSharing and DI while it is negatively correlated with M/B, Crights, and Rlaw.

Panel B of Table 2.2 provides Pearson correlations for variables used in Ball and Shivakumar (2005) model. Islamicdummy is positively correlated with  $\Delta NIt$ ,  $\Delta NIt-1$ , Rlaw, LegalSystem, and LogGdp while it is negatively correlated with Size, DI, and InfSharing. These correlations highlight the importance of controlling for bank and country level variables when testing the conservatism in cross country setting

## **6. Empirical results**

Table 2.3 presents the results for our hypothesis. Panel A documents Basu tests for Islamic banks controlling for countries and years fixed effects in each column. Column 1 and 2 present the association between Earnings and Returns across the sample of Islamic banks using bank-level and country-level control variables, respectively. The results show that there is positive and significant association between Earnings and Returns at 1% level. This indicates, contrary to our expectation, that earnings in Islamic banks is timelier or highly sensitive in reflecting publicly available bad news than good news. The results also reveal that conservatism in Islamic finance does not differ from that in conventional finance. In columns 3 and 4, we split the sample based on the sign of returns into; positive and negative returns and re-estimate Basu model across these two samples. The results show that there is positive and significant association between Earnings and negative Returns while there is no association between Earnings and positive Returns. Following prior studies, we run Basu model for the entire sample of Islamic banks controlling for bank level variables and country characteristics respectively. The results are hold (see column (5) and (6)). The results overall, contrary to our

expectation, reveals that earnings of Islamic banks are very sensitive to bad news which indicate that Islamic banks recognize bad news faster than good news.

In Panel B of Table 2.3, we present the results for Ball and Shivakumar (2005) model controlling for country and time fixed effects. Columns 1 and 2 examine the timelier recognition in earnings decrease or increase across Islamic banks, controlling for bank-level and country-level variables, respectively. Our main predication is that Islamic banks report earnings increase faster than earnings decrease. Contrary to our expectation, the coefficients on  $\Delta NI_{t-1} * D\Delta NI_{t-1}$  ( $\alpha_3$ ) is negative and significant, at 5 % level, indicating that Islamic banks are timelier in reporting earnings declines compared with reporting earnings increases. These results indicating that Islamic banks report lower earnings to decrease their tax burden, or Zakah, which contradicting their main objective of helping social welfare.

## **7. Further analysis**

### **7.1 Conservatism in Islamic vs. conventional banks**

From above analysis, we find that accounting conservatism in Islamic accounting is defined as what it is under conventional accounting, which is viewed as recognizing earnings decreases on timely basis while recognizing earnings increases with delay. Existing studies on Islamic banks investigate the difference between Islamic banks and conventional counterparts from different perspectives. It will be interesting to see whether Islamic banks report more or less conservatively compared to conventional banks.

In this section, we address whether Islamic bank is less or more conservative than conventional bank. Prior literature argues that firms have incentive to use conservative

accounting to defer income and reduce the present value of tax. This incentive, on average, leads to understatement of net asset (Shackelford and Shevlin (2001); Watts, 2003). Together with corporate tax, Islamic banks are required to pay Zakah, this would suggest that Islamic banks have more incentive to report conservatively than conventional banks. Moreover, religious individuals are commonly viewed as more risk averse than non-religious individuals (Miller, 2000; Diaz, 2000; and Miller and Hoffman, 1995), and managers of religious influenced firms are less likely to be the target of a class action lawsuit (McGuire et al., 2012; and Grullon et al., 2010). To avoid the asymmetric penalties that accompany litigation (Watts, 2003), we forward that one mechanism available to managers for avoiding litigation is to conservatively report accruals so as to understate income and net assets. Given that Islamic banks are governed by Shariah rules, we predict that Islamic banks would be more conservative than conventional banks. We therefore formulated our hypothesis as follow;

H2: Due to Zakah obligation, Islamic banks tend to be more conservative than conventional counterparts.

To test second hypothesis, we first attempt to extend Basu model by introducing dummy variable *Islamicdummy*, that take value of one if a bank is an Islamic bank and zero otherwise, in equation (1). However, we don't find any results (refer to Table 2.4, Panel A). Prior studies argue that conservatism measured using a Basu-type regression is noisy (Dietrich et al. 2007). Such an approach may be appropriate if stock returns capture true economic income equally well across countries over a one-year window and if good and bad economic news is reflected to the same degree in stock returns within the one-year window. Therefore, Givoly and Hayn (2000) suggest using accounting data to

measure conditional conservatism instead of relying on stock market price that is not influenced by different processes that contribute to determine stock price in different countries, including different levels of market efficiency.

Ball and Shivakumar (2005) model is a better alternative for testing conservatism in cross-country setting. We therefore extend equation (2) by introducing dummy variable Islamicdummy that take value of one if a bank is an Islamic bank and zero otherwise. Thus, we will estimate the following model;

$$\begin{aligned} \Delta NI_{i,t} = & \alpha_0 + \alpha_1 D\Delta NI_{i,t-1} + \alpha_2 \Delta NI_{i,t-1} + \alpha_3 \Delta NI_{i,t-1} * D\Delta NI_{i,t-1} + \alpha_4 Islamicdummy + \alpha_5 \\ & Islamicdummy * D\Delta NI_{i,t-1} + \alpha_6 Islamicdummy * \Delta NI_{i,t-1} + \alpha_7 Islamicdummy * \Delta NI_{i,t-1} * \\ & D\Delta NI_{i,t-1} + \alpha_8 Size_i + \alpha_9 Size_i * D\Delta NI_{i,t-1} + \alpha_{10} Size_i * \Delta NI_{i,t-1} + \alpha_{11} Size_i * \Delta NI_{i,t-1} * \\ & D\Delta NI_{i,t-1} + \gamma_1 DI_{k,t} + \gamma_2 CRights_{k,t} + \gamma_3 InfSharing_{k,t} + \gamma_4 Rlaw_{k,t} + \gamma_5 Culture_{k,t} + \gamma_6 \\ & LegalSystem_{k,t} + \gamma_7 LogGdp_{k,t} + \varepsilon_{i,k} \end{aligned} \quad (3)$$

Where  $i$  denotes bank  $i$ ,  $k$  denotes country  $k$  and  $t$  denotes the time period. Variable definition is in Appendix A2. We would expect that Islamic banks recognize earnings decrease faster than conventional banks do. Consequently, we predict a negative value for  $\alpha_7$ , the coefficient on  $\Delta NI_{i,t-1} * D\Delta NI_{i,t-1} * Islamicdummy$  in equation 3.

Panel B of Table 2.4 presents the results for H2. To have a comprehensive view on the results, we present the estimation results of Ball and Shivakumar (2005) for Islamic banks only in column (1) and (2) controlling for bank and country variables respectively. Columns 3 and 4 show the estimation results across conventional banks. Consistent with prior literature, the coefficients on  $\Delta NI_{i,t-1} * D\Delta NI_{i,t-1}$  ( $\alpha_3$ ) is negative and significant, at 5 % level, indicating that conventional banks are timelier in reporting earnings declines compared with reporting earnings increases. To test H2, we introduce dummy variable,

Islamicdummy and re-estimate Ball and Shivakumar model across both type of banks using partially and fully interacted model. Columns 5 and 6 present the results. Consistent with our predication, fully interacted model reveals that Islamic banks report earnings more conservatively than conventional banks. The coefficients on Islamicdummy \*  $\Delta NI_{t-1}$  \*  $D\Delta NI_{t-1}$  ( $\alpha_3$ ) is negative and significant, at 5 % level, in fully interacted model indicating that Islamic banks report earnings decrease faster than conventional banks, which means that Islamic banks are more conservative than conventional counterparts.

## 8. Summary and Conclusions

This paper explores how Islamic law or Shariah shapes reported accounting numbers in Islamic banks. Our main objective is to gain deeper understanding into the nature of financial reporting incentives created by Shariah with respect to accounting conservatism. In this paper, we focus on one dimension of revealed accounting conservatism—the asymmetric recognition of economic gains and losses into reported earnings (i.e., conditional conservatism).

Summarizing, we find that Islamic banks reflect bad news in reported earnings faster than good news, after controlling for bank and country levels. This indicates that Islamic banks take the same accounting conservatism approach as conventional banks. This would also suggest that Shariah does not play significant roles in term of financial reporting. In further analysis, we find that Islamic banks report more conservatively than conventional banks. We claim that Islamic banks use conservatism in reporting income to lower tax as the banks have Islamic tax obligations in addition to corporate tax. This finding is also relate to litigation explanation of conservatism as managers in Islamic



banks would be more Islamic influenced, more risk- averse, and have more incentive to underestimate earnings by reporting more conservatively.

## References

- Adnan, M., Gaffikin, M., 1997. The Sharia, Islamic Banks and Accounting Concepts and Practices. Accounting, Commerce and Finance: The Islamic Perspective, International Conference, Sydney.
- Ahmed, A., Morton, R., Schaefer, T., 2002. The role of Accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. *The Accounting Review*, 77(4): 867-890.
- Ali, A., Hwang, L., 2000. Country-specific factors related to financial reporting and the relevance of accounting data. *Journal of Accounting Research*, 38, 1-21.
- Ball R., Shivakumar, L., 2005. Earnings quality in U.K. private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83–128.
- Ball, R., Kothari, S. P., Robin, A., 2000. The effect of international institutional factors on properties of accounting earnings, *Journal of Accounting and Economics*, Vol. 29, No. 1, pp. 1-51.
- Ball, R., Robin, A., Sadka, G., 2008. Is financial reporting shaped by equity markets or by debt markets? An international study of timeliness and conservatism. *Review of Accounting Studies*, 13, 168-205
- Ball, R., Robin, A., Wu, J., 2003. Incentives versus standards: properties of accounting income in four East Asia countries. *Journal of Accounting and Economics* 36 (1–3), 235–270.
- Basu, S., 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24 (December), 3–37.
- Beck, T., Dermiguc-Kunt, A., Merrouche, O., 2013. Islamic vs. Conventional Banking: Business Model, Efficiency and Stability, *Journal of Banking and Finance*, 37, 433-447.
- Bushman, R.M. and Piotroski, J.S., 2006. Financial Reporting Incentives for Conservative Accounting: the Influence of Legal and Political Institutions. *Journal of Accounting and Economics*, Vol. 42, No 1-2, pp. 107-148.
- Demirguc-Kunt, A., Detragiache, E., 2002. Does deposit insurance increase banking system stability? An empirical investigation. *Journal of Monetary Economics* 49 (7): 1373–1406.

Demirguc-Kunt, A., Kane, E., Laeven, L., 2008. Determinants of deposit-insurance adoption and design. *Journal of Financial Intermediation* 17 (3): 407–438.

Diaz, J., 2000. Religion and Gambling in Sin-City: A Statistical Analysis of the Relationship between Religion and Gambling Patterns in Las Vegas Residents. *The Social Science Journal*, Vol. 37, pp. 453–58.

Dietrich, J.R., K.A. Muller, and E.J. Riedl. 2007. Asymmetric timeliness tests of accounting conservatism. *Review of Accounting Studies* 12 (1): 95-124.

Djankov, S., C. McLiesh, and A. Shleifer. 2007. Private credit in 129 countries. *Journal of Financial Economics* 84 (2): 299-329.

Gambling, T.E., Karim, R.A.A., 1991. *Business and Accounting Ethics in Islam* (1st Ed.). Mansell Publishing Limited, London.

Givoly, D., and C. Hayn. 2000. The changing time series properties of earnings, cash flows and accruals: has financial reporting become more conservative? *Journal of Accounting and Economics* 29 (3): 287-320.

Grullon, G., Kanatas, G., and Weston, J., 2010. Religion and Corporate (Mis)Behavior. Working Paper (Rice University).

Haniffa, R., Hudaib, M., 2001. A conceptual framework for Islamic accounting: The Shari'a paradigm. Paper of the International Conference on Accounting, Commerce & Finance: The Islamic Perspective. New Zealand.

Hofstede, G. 2001. *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations*. Thousand Oaks, CA: Sage Publications.

Houston, J.F., Lin, C., Lin, P., Mae, Y., 2010. Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics* 96 (3): 485-512.

Hung, M. 2001. Accounting Standards and Value Relevance of Financial Statements: An International Analysis. *Journal of Accounting and Economics* 30 (3), 401-420.

Kanagaretnam, K., Lim, C., Lobo, G. (2014). Influence of National Culture on Accounting Conservatism and Risk Taking in the Banking Industry. *Accounting Review* 89, 1115–1149

Khan, M., 1994. Accounting Issues and Concepts for Islamic Banking. Paper presented at the International Conference on Developing Accounting Standards for Islamic Banks, London: IIBI.

Kim, J.B., Shi H., 2010. Voluntary IFRS adoption and stock price synchronicity: Do analyst following and institutional infrastructure matter? Working paper, Hong Kong Polytechnic University.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. W., 1998. Law and finance. *The Journal of Political Economy* 106 (6): 1113-1155.

LaFond, R., Watts, R., 2008. The information role of conservatism. *The Accounting Review* 83, 447-478.

Leuz, C., Nanda, D., Wysocki, P., 2003. Earnings management and investor protection: an international comparison, *Journal of Financial Economics*, Vol. 69, No 3, pp. 505-527.

Maali, B., Casson, P., Napier, C., 2006. Social Reporting by Islamic Banks. *ABACUS*, 42(2), 266-289.

McGuire, S., Omer, T., and N. Sharp, N., 2012. The Impact of Religion on Financial Reporting Irregularities. *The Accounting Review*, Vol. 87, pp. 645-73.

Miller, A. S., and Hoffman, J. P., 1995. Risk and Religion: An Explanation of Gender Differences in Religiosity. *Journal for the Scientific Study of Religion*, Vol. 34, pp. 63-75.

Miller, A., 2000. Going to Hell in Asia: The Relationship between Risk and Religion in a Cross-Cultural Setting. *Review of Religious Research*, Vol. 40, pp. 5-18.

Morck, R., Yeung, B., Yu, W., 2000. The information content of stock markets: Why do emerging markets have synchronous stock price movement? *Journal of Financial Economics* 58, 215-260.

Nichols, C., Wahlen, J., Wieland, M., 2009. Publicly traded versus privately held: implications for conditional conservatism in bank accounting. *Review of Accounting Studies* 14 (1): 88-122.

Roychowdhury, S., Watts, R., 2007. Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting. *Journal of Accounting and Economics* 44, 2-31.

Shackelford, D., Shevlin, T., 2001. Empirical tax research in accounting. *Journal of Accounting*

and Economics 31, 321–387.

Watts, R. 2003. Conservatism in accounting Part I: Explanations and implications. *Accounting Horizons* 17 (3): 207-221.

Watts, R.L., Zimmerman, J.L., 1986. *Positive accounting theory*, New Jersey, Prentice Hall.

## Appendix A2: Variable definitions

Variable	Definition	Data Source
<b>Basu (1997) model</b>		
Earnings	Net income for year t divided by market value of equity for year t-1.	BankScope
Returns	Annual returns compounded from 9 months before year-end t to three months after year end t.	Bloomberg
Dummy	An indicator that equals one if Returns is negative and zero otherwise.	
Size	Natural logarithm of market value of equity for year t.	Bloomberg
Leverage	Total liabilities at the end of year t divided by total assets at the end of year t-1.	BankScope
M/B	The ratio of market value of equity to book value of equity at the end of year t-1.	Bloomberg
<b>Ball and Shivakumar (2005) model</b>		
$\Delta NIt$	Change in net income from year t-1 to year t divided by total assets at the end of year t-1.	BankScope
$\Delta NIt-1$	Change in net income from year t-2 to year t-1 divided by total assets at the end of year t- 2.	BankScope
$D\Delta NIt-1$	An indicator that equals one if $\Delta NIt-1$ is negative and zero otherwise.	
Size	Natural logarithm of total assets at the end of year t.	BankScope
<b>Country-level control variables</b>		
DI	An indicator variable that equals one if the country has explicit deposit insurance and zero otherwise.	Demirguc-Kunt et. al (2008)
CRights	Index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4.	La Porta et. al. (1998)
InfSharing	Information sharing index that equals 1 if either a public registry or a private bureau operates in the country, 0 otherwise	Djankov et. al. (2007)
Rlaw	An index that ranges from 0 to 10, with higher values indicating greater law enforcement.	La Porta et. al. (1998)
Culture	An indicator that equals one if a country has higher uncertainty avoidance cultures and zero otherwise	Hofstede (2001)
LegalSystem	An indicator that equals one if the legal origin is code law, zero otherwise.	La Porta et. al. (1998)
LogGdp	Natural logarithm of GDP per capita, in constant to US dollars.	WorldBank

### Appendix B2: Banking sector type in sample countries

<b>Country</b>	<b>Islamic banks</b>	<b>Conventional banks</b>
Bahrain	4	5
Bangladesh	4	23
Iraq	1	1
Jordan	1	10
Kuwait	6	6
Pakistan	2	16
Qatar	1	5
Saudi Arabia	4	7
Sudan	1	0
Syria	1	7
Turkey	2	12
United Arab Emirates	7	14
United Kingdom	1	2
Total	35	108

## Appendix C2: Sample Selection Criteria

	Data source	Firm-years
<b><u>Basu (1997) model</u></b>		
Firm-years with data for monthly stock returns	Bloomberg	1328
Firm-years with data for firm-level control variables	Bloomberg & BankScope	1091
Firm-years with data for country-level control variables:		
Contracting environment	Demirguc-Kunt et. al. (2008)& La Porta et. al. (1998) & Djankov et al. (2007) & Hofstede (2001)	769
Macroeconomic factors	World Bank	769
Final Sample:		769
Final Sample - Islamic Banks Only		206
Final Sample - Conventional Banks Only		563
<b><u>Ball and Shivakumar (2005) model</u></b>		
Firm-years with data for earnings	BankScope	1555
Firm-years with data for firm-level control variables	BankScope	1390
Firm-years with data for country-level control variables:		
Contracting environment	Demirguc-Kunt et. al. (2008)& La Porta et. al. (1998) & Djankov et al. (2007) Hofstede (2001)	1235
Macroeconomic factors	World Bank	1235
Final Sample:		1235
Final Sample - Islamic Banks Only		267
Final Sample - Conventional Banks Only		968



**Table 2.1: Descriptive statistics****Panel A: Bank- level data for Basu (1997) model**

Variable	Bank type	No. Obs.	Mean	S.d.	Min	P5	P25	P50	P75	P90	P95	Max
Earnings	Islamic	206	0.073	0.151	-0.283	-0.162	0.008	0.074	0.145	0.227	0.273	0.988
	Conventional	563	0.133*	0.147	-0.283	0.007	0.066	0.106	0.170	0.248	0.307	0.988
	All	769	0.117	0.150	-0.283	-0.071	0.054	0.099	0.167	0.243	0.301	0.988
Returns	Islamic	206	-0.097	0.462	-0.820	-0.746	-0.367	-0.121	0.053	0.392	0.658	1.864
	Conventional	563	-0.055	0.454	-0.820	-0.647	-0.358	-0.098	0.133	0.486	0.798	1.864
	All	769	-0.066	0.456	-0.820	-0.658	-0.358	-0.108	0.085	0.463	0.790	1.864
Dummy	Islamic	206	0.631	0.484	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
	Conventional	563	0.657	0.475	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
	All	769	0.650	0.477	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
Size	Islamic	206	7.324	2.226	0.867	3.765	6.181	7.691	8.870	9.909	10.198	11.220
	Conventional	563	8.874*	1.534	0.867	6.570	7.780	8.806	10.141	10.910	11.225	11.710
	All	769	8.459	1.876	0.867	5.594	7.435	8.498	9.796	10.790	11.138	11.710
M/B	Islamic	206	1.266	1.199	0.000	0.000	0.503	0.877	1.698	2.745	3.890	6.456
	Conventional	563	1.574*	0.993	0.114	0.617	0.977	1.297	1.871	2.632	3.445	6.456
	All	769	1.491	1.060	0.000	0.438	0.863	1.222	1.835	2.633	3.659	6.456
Leverage	Islamic	206	0.553	0.375	0.000	0.000	0.099	0.774	0.873	0.905	0.915	0.959
	Conventional	563	0.869*	0.049	0.559	0.794	0.849	0.877	0.897	0.913	0.928	0.959
	All	769	0.784	0.242	0.000	0.000	0.831	0.866	0.893	0.911	0.927	0.959

**Panel B: Bank- level data for Ball and Shivakumar (2005) model**

Variable	Bank type	No. Obs.	Mean	S.d.	Min	P5	P25	P50	P75	P90	P95	Max
$\Delta NIt$	Islamic	267	0.010	0.061	-0.293	-0.038	-0.004	0.002	0.014	0.051	0.082	0.509
	Conventional	968	0.003	0.020	-0.173	-0.017	-0.002	0.002	0.007	0.014	0.023	0.193
	All	1235	0.005	0.033	-0.293	-0.020	-0.002	0.002	0.008	0.018	0.035	0.509
$\Delta NIt-1$	Islamic	267	0.010	0.061	-0.293	-0.040	-0.004	0.003	0.015	0.047	0.082	0.509
	Conventional	968	0.004	0.020	-0.150	-0.017	-0.002	0.002	0.007	0.015	0.027	0.193
	All	1235	0.005	0.033	-0.293	-0.022	-0.002	0.002	0.008	0.019	0.038	0.509
$D\Delta NIt-1$	Islamic	267	0.315	0.465	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	Conventional	968	0.318	0.466	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	All	1235	0.317	0.466	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Size	Islamic	267	7.774	1.726	3.721	4.187	6.812	7.873	8.987	9.951	10.381	11.220
	Conventional	968	8.644*	1.556	0.867	6.181	7.455	8.674	9.933	10.743	11.072	11.710
	All	1235	8.456	1.634	0.867	5.819	7.296	8.464	9.785	10.627	10.995	11.710

**Panel C: Country- level data**

Variable	Bank type	No. Obs.	Mean	S.d.	Min	P5	P25	P50	P75	P90	P95	Max
DI	Islamic	267	0.273	0.447	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	Conventional	968	0.461*	0.499	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	All	1235	0.420	0.494	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
CRights	Islamic	267	1.906	1.187	0.000	0.000	1.000	2.000	3.000	3.000	3.000	4.000
	Conventional	968	1.767	1.061	0.000	0.000	1.000	2.000	3.000	3.000	3.000	4.000
	All	1235	1.797	1.091	0.000	0.000	1.000	2.000	3.000	3.000	3.000	4.000
InfSharing	Islamic	267	0.614	0.488	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
	Conventional	968	0.723*	0.448	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
	All	1235	0.700	0.459	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
Rlaw	Islamic	267	7.094*	1.704	2.500	3.030	6.780	8.330	8.330	8.330	8.330	8.570
	Conventional	968	6.560	1.679	2.500	3.700	5.180	6.780	8.330	8.330	8.330	8.570
	All	1235	6.676	1.698	2.500	3.700	5.180	6.780	8.330	8.330	8.330	8.570
Culture	Islamic	267	0.286*	0.485	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	Conventional	968	0.303	0.433	0.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000

LegalSystem	All	1235	0.230	0.447	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	Islamic	267	0.625*	0.485	0.000	0.000	0.000	1.000	1.000	1.000	1.000	1.000
	Conventional	968	0.249	0.433	0.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000
LogGdp	All	1235	0.276	0.447	0.000	0.000	0.000	0.000	1.000	1.000	1.000	1.000
	Islamic	267	9.855*	1.184	6.543	6.927	9.681	10.281	10.646	10.847	10.907	11.444
	Conventional	968	9.342	1.249	5.995	7.401	8.383	9.484	10.448	10.712	10.907	11.444
	All	1235	9.453	1.252	5.995	7.136	8.448	9.807	10.523	10.727	10.907	11.444

This table provides descriptive statistics for variables used in conservatism tests. Panel A reports descriptive statistics for bank- level variables used in Basu (1997) model for the Islamic sample of 206 yearly observations, the conventional banks sample of 563 yearly observations, and the entire sample of 769 observations over the period 2005-2013. Earnings is net income for year  $t$  divided by market value of equity for year  $t-1$ , data from BankScope database. Returns is annual returns compounded from 9 months before year-end  $t$  to three months after year end  $t$ , data from Bloomberg. Dummy is an indicator that equals one if Returns is negative and zero otherwise. Size is natural logarithm of market value of equity for year  $t$ , data from Bloomberg. M/B is the ratio of market value of equity to book value of equity at the end of year  $t$ , data from Bloomberg. Leverage is total liabilities at the end of year  $t$  divided by total assets at the end of year  $t$ , data from BankScope database. Panel B reports descriptive statistics for bank- level variables used in Ball and Shivakumar (2005) model for the Islamic sample of 267 yearly observations, the conventional banks sample of 968 yearly observations, and the entire sample of 1235 observations over the period 2005-2013.  $\Delta NIt$  is change in net income from year  $t-1$  to year  $t$  divided by total assets at the end of year  $t-1$ , data from BankScope database.  $\Delta NIt-1$  is change in net income from year  $t-2$  to year  $t-1$  divided by total assets at the end of year  $t-2$ , data from BankScope database.  $D\Delta NIt-1$  is an indicator that equals one if  $\Delta NIt-1$  is negative and zero otherwise, data from BankScope database. Size is natural logarithm of total assets at the end of year  $t$ , data from BankScope database. Panel C reports descriptive statistics for country-level data used in Ball and Shivakumar (2005) model. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals one if either a public registry or a private bureau operates in the country, zero otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). Culture is an indicator that equals one if a country has higher uncertainty avoidance cultures and zero otherwise (Hofstede (2001)). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)). LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). \* denotes significance at the 5% level for the difference on mean value.

**Table 2: Correlation**

Panel A: Correlation matrix for variables used in Basu (1997) model

	Earnings	Returns	Dummy	Islamicdummy	Size	M/B	Leverage	DI	CRights	InfSharing	Rlaw	LegalSystem	LogGdp
Earnings	1												
Returns	<b>0.077</b>	1											
Dummy	0.003	<b>-0.724</b>	1										
Islamicdummy	<b>-0.175</b>	-0.041	-0.024	1									
Size	<b>0.136</b>	<b>0.115</b>	-0.028	<b>-0.366</b>	1								
M/B	<b>-0.082</b>	<b>0.268</b>	<b>-0.179</b>	<b>-0.129</b>	<b>0.198</b>	1							
Leverage	<b>0.157</b>	-0.011	<b>0.100</b>	<b>-0.576</b>	<b>0.537</b>	<b>0.201</b>	1						
DI	<b>0.163</b>	0.016	<b>0.119</b>	<b>-0.201</b>	-0.062	<b>-0.146</b>	<b>0.076</b>	1					
CRights	<b>-0.255</b>	<b>0.076</b>	<b>-0.132</b>	<b>0.159</b>	<b>0.159</b>	<b>0.173</b>	<b>-0.109</b>	<b>-0.462</b>	1				
InfSharing	<b>0.214</b>	-0.049	0.068	-0.049	0.059	<b>-0.117</b>	0.067	<b>0.166</b>	<b>0.180</b>	1			
Rlaw	<b>-0.314</b>	<b>0.098</b>	<b>-0.175</b>	<b>0.166</b>	<b>0.208</b>	<b>0.196</b>	<b>-0.143</b>	<b>-0.447</b>	<b>0.373</b>	<b>-0.632</b>	1		
LegalSystem	-0.027	<b>0.139</b>	<b>-0.167</b>	-0.062	<b>0.131</b>	-0.043	-0.067	<b>-0.166</b>	<b>0.258</b>	-0.049	0.024	1	
LogGdp	<b>-0.214</b>	<b>0.182</b>	<b>-0.260</b>	<b>0.149</b>	<b>0.326</b>	<b>0.139</b>	<b>-0.183</b>	<b>-0.463</b>	<b>0.354</b>	<b>-0.412</b>	<b>0.808</b>	<b>0.363</b>	1

Bold text indicates significance at the 0.05 level or better.

This table presents Pearson correlations between the main variables. All correlations are computed with entire sample of 769 observations. Earnings is net income for year t divided by market value of equity for year t-1, data from BankScope database. Returns is annual returns compounded from 9 months before year-end t to three months after year end t, data from Bloomberg. Dummy is an indicator that equals one if Returns is negative and zero otherwise. Islamicdummy is an indicator variable that take one if a bank is an Islamic bank and zero otherwise, data from BankScope database. Size is natural logarithm of market value of equity for year t, data from Bloomberg. M/B is the ratio of market value of equity to book value of equity at the end of year t, data from Bloomberg. Leverage is total liabilities at the end of year t divided by total assets at the end of year t, data from BankScope database. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals 1 if either a public registry or a private bureau operates in the country, 0 otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)). LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively

Panel B: Correlation matrix for variables used in Ball and Shivakumar (2005) model

	$\Delta NIt$	$\Delta NIt-1$	$D\Delta NIt-1$	Islamicdummy	Size	DI	CRights	InfSharing	Rlaw	LegalSystem	LogGdp
$\Delta NIt$	1										
$\Delta NIt-1$	-0.032	1									
$D\Delta NIt-1$	-0.002	<b>-0.384</b>	1								
Islamicdummy	<b>0.082</b>	<b>0.077</b>	-0.003	1							
Size	<b>-0.083</b>	-0.042	<b>-0.061</b>	<b>-0.219</b>	1						
DI	-0.016	-0.004	<b>0.131</b>	<b>-0.156</b>	<b>-0.085</b>	1					
CRights	-0.022	-0.033	-0.005	0.053	<b>0.200</b>	<b>-0.448</b>	1				
InfSharing	-0.034	-0.032	0.048	<b>-0.098</b>	0.035	<b>0.225</b>	<b>0.156</b>	1			
Rlaw	0.031	0.019	<b>-0.113</b>	<b>0.129</b>	<b>0.264</b>	<b>-0.599</b>	<b>0.376</b>	<b>-0.572</b>	1		
LegalSystem	0.030	0.018	0.007	<b>0.116</b>	-0.004	<b>0.069</b>	<b>-0.091</b>	0.002	<b>0.219</b>	1	
LogGdp	0.047	<b>0.057</b>	<b>-0.172</b>	<b>0.169</b>	<b>0.350</b>	<b>-0.572</b>	<b>0.228</b>	<b>-0.271</b>	<b>0.682</b>	<b>-0.152</b>	1

Bold text indicates significance at the 0.05 level or better.

This table presents Pearson correlations between the main variables. All correlations are computed with entire sample of 1235 observations.  $\Delta NIt$  is change in net income from year t-1 to year t divided by total assets at the end of year t-1, data from BankScope database.  $\Delta NIt-1$  is change in net income from year t-2 to year t-1 divided by total assets at the end of year t-2, data from BankScope database.  $D\Delta NIt-1$  is an indicator that equals one if  $\Delta NIt-1$  is negative and zero otherwise, data from BankScope database. Size is natural logarithm of total assets at the end of year t, data from BankScope database. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals 1 if either a public registry or a private bureau operates in the country, 0 otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)).

LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 2.3: Conservatism in Islamic banks**

Panel A: Basu (1997) model

Dependent variable	Entire sample Earnings	Entire sample Earnings	Negative sample Earnings	Positive sample Earnings	Entire sample Earnings	Entire sample Earnings
Returns	0.111* [1.77]	0.063 [0.72]	0.241*** [4.35]	-0.030 [-0.85]	0.050 [0.61]	0.050 [0.61]
Dummy		0.037 [0.92]			0.015 [0.43]	0.015 [0.43]
<b>Returns*Dummy</b>		<b>0.240*** [3.10]</b>			<b>0.216*** [2.73]</b>	<b>0.216*** [2.73]</b>
Size					0.046** [2.49]	0.046** [2.47]
M/B					-0.022 [-1.32]	-0.023 [-1.31]
Leverage					-0.104** [-2.03]	-0.105** [-2.02]
DI						-0.125*** [-3.94]
CRights						0.031 [0.65]
InfSharing						-0.072 [-0.35]
Rlaw						-0.060 [-0.96]
LegalSystem						-0.074* [-2.01]
LogGdp						-0.009 [-0.16]
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.059** [2.48]	0.060** [2.51]	0.124*** [3.78]	0.034 [1.41]	0.002 [0.08]	0.580*** [3.74]
Observations	206	206	130	76	206	206
Adjusted R-squared	0.332	0.356	0.461	0.670	0.406	0.403

This table provides regression results for Basu (1997) model across Islamic banks over the period 2005-2013. The dependent variable is Earnings is net income for year t divided by market value of equity for year t-1, data from BankScope database. Returns is annual returns compounded from 9 months before year-end t to three months after year end t, data from Bloomberg. Dummy is an indicator that equals one if Returns is negative and zero otherwise. Size is natural logarithm of market value of equity for year t, data from Bloomberg. M/B is the ratio of market value of equity to book value of equity at the end of year t, data from Bloomberg. Leverage is total liabilities at the end of year t divided by total assets at the end of year t, data from BankScope database. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals one if either a public registry or a private bureau operates in the country, zero otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)). LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

Panel B: Ball and Shivakumar (2005) model

Dependent variable	$\Delta NIt$	$\Delta NIt$
$\Delta NIt-1$	0.216 [1.80]*	0.216 [1.80]*
$D\Delta NIt-1$	-0.039 [-1.50]a	-0.039 [-1.49]a
$\Delta NIt-1 * D\Delta NIt-1$	-0.414 [-2.17]**	-0.414 [-2.17]**
Size	-0.004 [-0.99]	-0.004 [-1.00]
Size* $\Delta NIt-1$	0.004 [1.35]	0.004 [1.34]
Size* $NIt-1$	-0.294 [-1.79]*	-0.294 [-1.79]*
Size* $\Delta NIt-1 * D\Delta NIt-1$	0.497 [1.98]*	0.497 [1.99]*
DI		0.004 [0.40]
CRights		-0.010 [-1.89]*
InfSharing		0.012 [0.40]
Rlaw		0.006 [1.57]a
Culture		0.008 [1.35]
legalSystem		0.019 [0.84]
logGdp		0.001 [0.06]
Country fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Constant	0.020 [0.74]	-0.040 [-0.52]
Observations	267	267
Adjusted R-squared	0.166	0.162

This table presents regression results for Ball and Shivakumar (2005) model for a sample of Islamic banks. The dependent variable is  $\Delta NIt$  is change in net income from year t-1 to year t divided by total assets at the end of year t-1, data from BankScope database.  $\Delta NIt-1$  is change in net income from year t-2 to year t-1 divided by total assets at the end of year t-2, data from BankScope database.  $D\Delta NIt-1$  is an indicator that equals one if  $\Delta NIt-1$  is negative and zero otherwise, data from BankScope database. Size is natural logarithm of total assets at the end of year t, data from BankScope database. Panel C reports descriptive statistics for country-level data used in Ball and Shivakumar (2005) model. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals one if either a public registry or a private bureau operates in the country, zero otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). Culture is an indicator that equals one if a country has higher uncertainty avoidance cultures and zero otherwise (Hofstede (2001)). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)). LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm and country level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 2.4: Conservatism in Islamic banks vs. conventional banks**

Panel A: Basu (1997) model

Dependent variable	Islamic banks Earnings	Islamic banks Earnings	Conventional banks Earnings	Conventional banks Earnings	Entire sample Earnings	Entire sample Earnings
Returns	0.050 [0.61]	0.050 [0.61]	0.020 [0.62]	0.019 [0.59]	0.047 [1.21]	0.019 [0.62]
Dummy	0.015 [0.43]	0.015 [0.43]	0.010 [0.73]	0.011 [0.76]	0.021 [1.43]	0.010 [0.71]
Returns*Dummy	0.216*** [2.73]	0.216*** [2.73]	0.110** [2.14]	0.106** [2.01]	0.087a [1.64]	0.111** [2.19]
Islamicdummy					-0.013 [-0.51]	0.245 [1.17]
Returns*Dummy*Islamicdummy					<b>0.067</b> <b>[1.30]</b>	<b>-0.011</b> <b>[-0.11]</b>
Returns*Islamicdummy						0.068 [0.80]
Dummy*Islamicdummy						0.024 [0.74]
Size	0.046** [2.49]	0.046** [2.47]	0.014** [1.98]	0.014** [1.98]	0.014** [2.14]	0.010a [1.60]
M/B	-0.022 [-1.32]	-0.023 [-1.31]	-0.026* [-1.83]	-0.023* [-1.81]	-0.014a [-1.59]	-0.023** [-2.04]
Leverage	-0.104** [-2.03]	-0.105** [-2.02]	0.011 [0.07]	-0.008 [-0.05]	-0.014 [-0.38]	0.032 [0.20]
DI		-0.125*** [-3.94]		0.073 [1.33]	0.060 [1.37]	0.058a [1.52]
CRights		0.031 [0.65]		0.093 [1.25]	0.027 [0.71]	0.051 [1.28]
InfSharing		-0.072 [-0.35]		-0.334 [-1.14]	-0.242 [-1.44]	-0.219 [-1.34]
Rlaw		-0.060 [-0.96]		-0.064a [-1.52]	-0.043* [-1.91]	-0.046* [-1.90]
LegalSystem		-0.074* [-2.01]		0.107 [0.97]	0.180** [2.13]	0.109a [1.57]
LogGdp		-0.009 [-0.16]		0.140 [1.38]	0.092a [1.62]	0.099* [1.67]
Size*Islamicdummy						0.034** [2.13]
M/B*Islamicdummy						0.006 [0.32]
Leveage*Islamicdummy						-0.136 [-0.80]
DI*Islamicdummy						-0.077** [-2.27]
CRights*Islamicdummy						0.010 [0.63]
InfSharing*Islamicdummy						-0.141** [-2.05]
Rlaw*Islamicdummy						-0.045** [-2.02]
Legalsystem*Islamicdummy						-0.067 [-1.22]
LogGdp*Islamicdummy						-0.002 [-0.09]
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.002	0.580***	0.174a	-0.756	-0.550	-0.373
	[0.08]	[3.74]	[1.48]	[-1.06]	[-1.38]	[-0.84]
Observations	206	206	563	563	769	769
Adjusted R-squared	0.406	0.403	0.195	0.199	0.248	0.261

This table provides regression results for Basu (1997) model across a sample of Islamic banks, conventional banks, and both type of banks over the period 2005-2013. The dependent variable is Earnings is net income for year t divided by market value of equity for year t-1, data from BankScope database. Returns is annual returns compounded from 9 months before year-end t to three months after year end t, data from Bloomberg. Dummy is an indicator that equals one if Returns is negative and zero otherwise. Isalmicdummy is an indicator variable that set to one if a bank is an Islamic banks and zero otherwise. Size is natural logarithm of market value of equity for year t, data from Bloomberg. M/B is the ratio of market value of equity to book value of equity at the end of year t, data from Bloomberg. Leverage is total liabilities at the end of year t divided by total assets at the end of year t, data from BankScope database. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization. The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals one if either a public registry or a private bureau operates in the country, zero otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)). LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm- level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.



Panel B: Ball and Shivakumar (2005) model

Dependent variable	Islamic banks $\Delta NIt$	Islamic banks $\Delta NIt$	Conventional banks $\Delta NIt$	Conventional banks $\Delta NIt$	Entire sample $\Delta NIt$	Entire sample $\Delta NIt$
$\Delta NIt-1$	0.216*	0.216*	0.351a	0.334	0.873	-0.281
	[1.80]	[1.80]	[1.45]	[1.35]	[1.16]	[-1.29]
$D\Delta NIt-1$	-0.039a	-0.039a	0.002	0.002	-0.005	0.001
	[-1.50]	[-1.49]	[0.14]	[0.16]	[-0.37]	[0.05]
<b><math>\Delta NIt-1 * D\Delta NIt-1</math></b>	<b>-0.414**</b>	<b>-0.414**</b>	<b>-0.350*</b>	<b>-0.351*</b>	-1.641a	0.337
	<b>[-2.17]</b>	<b>[-2.17]</b>	<b>[1.81]</b>	<b>[1.82]</b>	[-1.56]	[0.42]
Islamicdummy					0.004	-0.038
					[0.88]	[-1.24]
Islamicdummy* $D\Delta NIt-1$					-0.011	-0.047a
					[-1.24]	[-1.65]
Islamicdummy* $\Delta NIt-1$					0.177	2.509**
					[0.90]	[2.04]
<b>Islamicdummy*<math>\Delta NIt-1 * D\Delta NIt-1</math></b>					<b>0.227</b>	<b>-0.452**</b>
					<b>[0.63]</b>	<b>[-2.40]</b>
Size	-0.004	-0.004	0.001	0.001	0.001	0.000
	[-0.99]	[-1.00]	[1.08]	[1.30]	[0.83]	[0.06]
Size* $D\Delta NIt-1$	0.004	0.004	-0.001	-0.001	0.000	-0.001
	[1.35]	[1.34]	[-0.58]	[-0.60]	[0.02]	[-0.36]
Size* $NIt-1$	-0.294*	-0.294*	0.026	0.025	-0.127	0.016
	[-1.79]	[-1.79]	[0.85]	[0.78]	[-1.36]	[0.58]
Size* $\Delta NIt-1 * D\Delta NIt-1$	0.497*	0.497*	-0.139*	-0.141*	0.106	-0.138a
	[1.98]	[1.99]	[-1.70]	[-1.69]	[0.85]	[-1.64]
DI		0.004		-0.002	-0.004	-0.012
		[0.40]		[-0.42]	[-0.70]	[-1.41]
CRights		-0.010*		0.010***	0.004*	0.005*
		[-1.89]		[4.08]	[1.73]	[1.85]
InfSharing		0.012		-0.028***	-0.019*	-0.025**
		[0.40]		[-2.68]	[-1.83]	[-2.60]
Rlaw		0.006a		-0.010***	-0.003	-0.006**
		[1.57]		[-4.98]	[-0.79]	[-2.05]
Culture		0.008		-0.017	0.003	0.001
		[1.35]		[-0.62]	[0.54]	[0.01]
LegalSystem		0.019		-0.010***	-0.004	-0.009**
		[0.84]		[-3.52]	[-0.94]	[-2.57]
LogGdp		0.001		0.008**	0.007a	0.008**
		[0.06]		[2.06]	[1.60]	[2.11]
Size*Islamicdummy						-0.001
						[-0.37]
Size* $D\Delta NIt-1$ *Islamicdummy						0.005a
						[1.56]
Size* $NIt-1$ *Islamicdummy						-0.312*
						[-1.85]
Size* $\Delta NIt-1 * D\Delta NIt-1$						0.635***
*Islamicdummy						[2.70]
DI*Islamicdummy						0.005
						[0.66]
CRights*Islamicdummy						-0.006**
						[-2.14]
InfSharing*Islamicdummy						0.014*
						[1.95]
Rlaw*Islamicdummy						0.009***
						[2.72]
Cuture*Islamicdummy						0.011

Legalsystem*Islamicdummy						[1.27] 0.010a
LogGdp*Islamicdummy						[1.59] -0.002 [-0.56]
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.020 [0.74]	-0.040 [-0.52]	-0.005 [-1.11]	-0.002 [-0.05]	-0.038 [-0.68]	-0.013 [-0.32]
Observations	267	267	968	968	1235	1235
Adjusted R-squared	0.166	0.162	0.315	0.319	0.169	0.194

This table present regression results for Ball and Shivakumar (2005) model for a sample of Islamic, conventional, and both banks. The dependent variable is  $\Delta NIt$  is change in net income from year t-1 to year t divided by total assets at the end of year t-1, data from BankScope database.  $\Delta NIt-1$  is change in net income from year t-2 to year t-1 divided by total assets at the end of year t- 2, data from BankScope database.  $D\Delta NIt-1$  is an indicator that equals one if  $\Delta NIt-1$  is negative and zero otherwise, data from BankScope database. Islamicdummy is an indicator variable that set to one if a bank is an Islamic bank and zero otherwise. Size is natural logarithm of total assets at the end of year t, data from BankScope database. Panel C reports descriptive statistics for country-level data used in Ball and Shivakumar (2005) model. DI is an indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. CRights is an index aggregating the following creditor rights: absence of automatic stay in reorganization, requirement for creditors' consent or minimum dividend for a debtor to file for reorganization, secured creditors are ranked first in reorganization, and removal of incumbent management upon filing for reorganization The index ranges from 0 to 4 (La Porta et. al. (1998)). InfSharing is Information sharing index that equals one if either a public registry or a private bureau operates in the country, zero otherwise (Djankov et al. (2007)). Rlaw is an index that ranges from 0 to 10, with higher values indicating greater law enforcement, data from La Porta et. al. (1998). Culture is an indicator that equals one if a country has higher uncertainty avoidance cultures and zero otherwise (Hofstede (2001)). LegalSystem is an indicator that equals one if the legal origin is code law, zero otherwise (La Porta et. al. (1998)). LogGdp is natural logarithm of GDP per capita, in constant to US dollars (WorldBank). All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm and country level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

## **CHAPTER 3: Roles of Shariah governance and bank risk-taking**

### **1. Introduction**

There is broad consensus that bank excessive risk-taking coupled with the failure of regulatory frameworks to prevent such risk taking was responsible for the recent global financial crisis. The causes of such risk-taking were many and complex, but there is general agreement in the banking industry, public sectors, and academia that failures of bank corporate governance, such as lax board oversight and flawed executive compensation practices, played an important role (Erkens, Hung, and Matos, 2012; Kirkpatrick, 2009; Sharfman, 2009). Literature on Islamic banking and finance reveals that although many conventional banks failed during the crisis, Islamic banks did not announce substantial write-offs but have been rather resilient during the financial crisis (Hasan and Dridi, 2010; Chapra, 2009, 2010; Green, 2010; Perry, 2011). Perry (2011) suggests that elements in the governance systems of Islamic banks may have protected them from the problems faced by conventional banks. Academics and policy makers, therefore, have drawn a considerable attention of how the governance structure of Islamic banks differs from that of conventional banks that helps Islamic banks to tackle the crisis. There are significant differences between Islamic banks and conventional banks. Islamic banks are expected to contribute to the achievement of social justice by adhering to Islamic rules or Shariah, especially those relating to fairness and equal distribution of income. Islamic banks provide Shariah compliant finance and have Shariah Supervisory Board (SSB) at the top of their governance. Under Shariah law, Islamic banks are prohibited from charging interest payment, are not allowed to engage in speculation, and are based on a profit and loss sharing (PLS) contract (Beck, Demirgüç-Kunt, and

Merrouche, 2013). The institution of SSB is a key feature of Islamic banks to help ensure compliance with the principles of Shariah and contribute to social justice. SSB represents an additional layer of governance. In addition to the regular boards of directors and routine executive and other operational committees, SSB acts as an independent control mechanism to certify that all financial contracts, transactions, and further activities of the bank are compliant with Shariah. Therefore, SSB works as an additional layer of monitoring and oversight as well as a constraint on operation. SSB might restrain board of directors and management from engaging in aggressive risk taking activities (Mollah and Zaman, 2015).

Islamic finance relies on the notion of PLS thus risk sharing where no one can claim any compensation without incurring any risk. Under PLS scheme; depositors' funds will be pooled into a common fund to be used by the bank without any control rights for depositors. The bank decides how to invest the funds from investment-deposit accounts. The ex-ante rate of return on investment (interest rate premium) in conventional banks is replaced by an uncertain ex-post rate of return that must follow the principle of PLS. Moreover, such deposits are not guaranteed in capital value and do not yield any fixed or guaranteed rate of return. In the event banks record losses, depositors or investment account holders (IAHs) may lose part or all of their investment deposits, except in cases of negligence or misconduct by the bank.

Due to risk-sharing contracts that created between Islamic banks and IAHs, lack of deposit insurance and any governance rights for IAHs, Islamic banks are presented with opportunities to extract benefits at the expense of IAHs' interests by taking more risky investment (Abdel Karim, 2001; Abdel Karim and Archer 2002). Therefore, SSB

function is also to protect the interests of IAHs from excessive risk-taking on the asset side of an Islamic bank (El-Hawary 2007, Van Greuning and Iqbal 2007, Grais and Pellegrini 2006, Warde 2010, Deloitte 2010).

Given the significance of studying bank risk-taking, and the specific roles of SSB in Islamic financial institutions. This study examines whether “multi-layer” corporate governance model in Islamic banking is associated with risk taking behaviors. Given concerns about the relationship between governance structure and bank risk-taking (Pathan, 2009), we, particularly, focus on the roles of Shariah boards and their characteristics on affecting bank risk-taking.

Using a sample of 70 Islamic banks from 18 countries for the period 2000-2011, we find that SSB has a significant effect on risk-taking activities of Islamic banks. Specifically, the results show that large size of SSB is positively associated with Islamic bank risk-taking. Also, busy scholars in SSB are positively associated with risk-taking behaviors. Considering foreign scholars, the study reveals that foreign scholars sit in SSB are negatively associated with risk-taking. Findings for large SSB and busy scholars indicate that if Shariah board is less effective in monitoring bank’s Shariah compliance, then there will be greater risk-taking because managers’ have reasons to prefer more risk (Abdel Karim, 2001; Abdel Karim and Archer, 2002). Moreover, the results for foreign scholars show that if SSB concerns more about reputations and job security, then Islamic banks would exhibit less risk because foreign scholars have reason to be more effective in monitoring bank risk-taking.

In further analysis, we investigate whether SSB rulings (internal vs. external) have an influence on the relation between SSB characteristics and bank risk-taking. Shariah

governance is ruled internally at institution level in countries that are member of the Gulf Corporation Council or (GCC) where it is ruled externally, at state level, in other countries. We test the association between SSB structure and risk-taking across banks in GCC vs. others and the results indicate that most of our findings come from banks in GCC where Shariah governance ruled at bank-level. Further analysis also provides that SSB size, foreign, and busy scholars significantly impact bank risk taking only after crisis period while only top-ranked scholars sit in the SSB influences bank risk taking before crisis. Overall findings shed light on current practices and emphasize the need for well-functioning Shariah boards that work with board of directors and management to better realize the goals of Islamic banks in practice.

This study contributes to the emerging literature on Islamic finance. While there is an abundant literature on risk taking and corporate governance in conventional banking industry, little is known on the governance of Islamic banking. The literature on Islamic banking provides theoretical contributions about the uniqueness of Islamic banks due to Shariah governance (Chowdhury and Hoque, 20006; Lewis, 2005, Safieddine, 2009) and there is a lack of empirical studies on the governance of Islamic banking. Up until recently, research by Hassan and Mollah (2014) and Matoussi and Grassa (2012) examine the association between corporate governance and performance in Islamic banks vs. conventional banks. They also investigate the role of SSB on bank performance and find that SSB has no association with banks' performance and such boards are pronounced as the weak parameter in Islamic banks governance system as their monitoring ability is minimum. However, Mollah and Zaman (2015) find that SSB positively impact Islamic bank's performance, which provides support to the positive

contribution of Shariah governance in Islamic banks. We aim in this study to add some value in the existing literature by producing empirical evidence between the structure of Shariah governance and firm value, risk taking in particular, for the Islamic banks. In addition, this study utilizes multiple measures of bank-risk taking in a single study, which is not the case in Islamic banking literature.

The reminder of the paper is structured as follows. Section 2 presents a literature review of academic literature on shareholders incentives, Shariah supervisory boards, and risk taking leading to the hypotheses development. Section 3 specifies Sample, variable measurement, and descriptive statistics. Section 4 provides the empirical results while Section 5 shows the robustness of the results. Finally, Section 6 concludes the paper.

## **2. Related literature and hypotheses development**

### **2.1. Shareholders incentives, Shariah Supervisory boards and bank risk-taking**

Bank shareholders, like in any corporate firm, have a preference to excessive risk taking behaviors due to moral hazard problems, limited liability, and convex pay-off (Galai and Masulis, 1976; Jensen and Meckling, 1976; and John et al., 1991). Because of higher level of information asymmetry in banking, the dispersed and unsophisticated debt holders, including depositors, can not prevent the shareholders from more risk taking by initiating complete debt contracts on an ex-ante basis (Dewatripont and Tirole, 1994). In addition, the existence of deposit insurance and the perceived ‘too- big-to-fail’ policy contribute to bank shareholders ‘moral hazard problem’ by encouraging more bank risk-taking (Galai and Masulis, 1976; Jensen and Meckling, 1976; Merton, 1977). Bank shareholders have even stronger incentives for ‘excessively’ risky investments that potentially benefit themselves at the expense of the deposit insurance fund and the taxpayers who back. Nevertheless, John et al. (1991) have concluded that risk-adjusted

deposit insurance premium and risk-adjusted capital fail to mitigate the moral hazard problem and control banks' risk taking incentives fully.

Shareholders in Islamic banking, however, don't not only concern about maximizing their wealth but also concern that their funds are invested in a Shariah-compliant manner (Chapra and Ahmed, 2002). Therefore, while agency problems in conventional banks arise when managers deviate from their duty to maximize shareholders' wealth, any divergence by managers of Islamic financial institutions from placing all supplied funds in Shariah-compliant investments creates an additional source of agency problems. This type of agency issue may affect a bank's credibility, as well as its ability to attract investors. Chapra and Ahmed (2002) provide some evidence that almost 86 per cent of depositors in Bahraini Islamic banks and almost 95 per cent in Sudanese Islamic banks are prepared to withdraw their funds if those banks failed to operate in accordance with Shariah.

To mitigate such unique agency issue faced by Islamic financial institutions, The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) and the Islamic Financial Services Board (IFSB), the main regulatory bodies that set standards for Islamic financial institutions, require Islamic banks to initiate Shariah supervisory boards (SSB) as an additional layer within banks governance to reassure stakeholders that the institution's activities comply fully with Shariah law (Abdel Karim and Archer, 2002; Islamic Financial Services Board, 2005b). SSB acts as an independent control mechanism that mainly certifies and monitors all financial contracts, transactions, and further activities of the bank are compliant with the Shari'ah. In particular, they advise the managers and the boards of directors, provide input to Islamic banks on



Shariah matters, set Shariah related rules and principles, and oversee compliance to ensure that policies and procedures are in conformity with Shariah (Safeiddine, 2009).

Shariah governance standards that set by AAOIFI and IFSB refer to the appointment, composition, and tasks of the SSB. These standards require mainly independence, competence, confidentiality, consistency, and disclosure. According to the AAOIFI, the SSB should consist of at least three members who are recommended by the board of directors before they are appointed by the shareholders of an Islamic bank (Dar and Presley 2000, El-Hawary et al. 2007). SSB members play monitoring role to insure Shariah compliance. Thus, they communicate information to the shareholders whenever managers have incentive to deviate from Shariah compliance and take more risky investment. The SSB members are morality and ethics driven rather than greed, so that the belief is that they report truthfully to the shareholders. Moreover, the appointment and election process of SSB members make them more dependent on shareholders particularly when the members are interested in being reelected (Rammal, 2006, Farook and Farooq, 2011).

## 2.2. Hypotheses development

The effectiveness with which a bank board monitors bank managers and limits their opportunistic behavior depends upon its constructs such as board size and composition. In this study, we look at how the characteristics and composition of the SSB influence overall risk taking behavior of Islamic banks. We rely on prior literature to determine most influential characteristics of bank board that impact managerial risk taking incentives. We examine SSB determinants including the number of total scholars, percentage of oversees scholar set on the board, and the seats held by top twenty ranked Shari'ah scholars.

### 2.2.1. SSB Size and bank risk taking

Prior literature argues that increase board size is negatively related to firm specific measure. According to Jensen (1993), increasing board size is related to free-riding problems and longer durations for making decisions. Cheng (2008) also argue that there are coordination problems with larger board size and the need for compromises. Pathan (2009) empirically examines the relation between board size and bank risk taking behaviors and he finds that larger board size is associated to lower bank risk taking behavior.

We would expect that the monitoring effectiveness of individual bank SSB on risk-taking in Islamic banks decrease with a higher number of SSB members. Shariah scholars' opinion depends on interpretation and justification that differs from one member to another. With larger SSB members, we would expect that it might be difficult to reach an agreement on one legal issue because what it is considered permissible to one member might be not to another. It also takes more time and effort to achieve a decision agreement between SSB members, which make the board less effective on monitoring managements. Therefore, we would hypothesize the following;

H1: Large Shariah supervisory board is positively related to risk-taking behavior of Islamic banks.

### 2.2.2 SSB membership and bank risk-taking

Prior literature provides inconclusive evidence on whether the benefit outweigh the cost of numerous and simultaneous board memberships. While the costs likely result from decreasing effectiveness of monitoring and thus of corporate governance, there may be beneficial effects from having board members that gain more experience or reputation (Ferris et al. 2003, Fich and Shivadasani 2006). DeAngelo (1981) argues that auditors

with more clients have “more to lose” by failing to report an issue.

Due to multiple memberships of SSB, we expect that this concentration influence the effectiveness of SSB members on monitoring managerial behaviors. Board members with multiple positions are usually busy and are more likely to devote less time and effort for each board, which negatively influence their monitoring effectiveness. We would assume that the costs associated with decreasing effectiveness of monitoring bank risk taking outweigh the benefits of gaining more experience or solidifying members’ reputations. Thus, we conjecture the following hypothesis:

H2: Busy members in Shariah supervisory board are positively related to risk-taking behaviors of Islamic banks.

### 2.2.3 SSB Oversees and bank risk-taking

Prior literature suggests that outside directors perform better than those internal for conflict resolution and mitigation of agency costs and moral hazard problems. According to Fama (1980) and Fama and Jensen (1983), outside independent directors, contribute positively to effective control of managers in consideration of their incitement to exercise control. Board director’s incitement to act in the interest of the company generally derives from the reputation that they would have on the market in terms of corporate control. Fama (1980) argues that outside director’s act in the interest of the company in order to get new mandates. However, prior study define outsider or independent director as those who work on part time bases, are not former employees, does not have immediate family members, or does not have any significant business tie with the firm.

All members of SSB is required to be independent who works on part time bases and his directorship is the only business relationship with the bank. Thus, independence is not an issue for SSB members. However, 30 percentage of SSB members are from outside

the country which we expect it to influence the monitoring effectiveness of such board. We may argue that overseas members of SSB are usually not familiar with country culture and have less social connections with the firm. This makes these members more concerned about job security, compensation, and their reputation which in turn leads them to be more effective on monitoring managers' risk-taking incentives. According to the above discussion, we would expect the following,

H3: Foreign members in Shariah supervisory board are negatively related to risk-taking behaviors of Islamic banks.

### **3. Sample, variable measurement and descriptive statistics**

#### **3.1 Sample**

The initial sample examined in this study consists of an unbalanced panel of report data from Islamic banks listed in Bankscope database, a global database with data on both listed and non-listed banks, to construct financial data. We double-check the categorization of Islamic banks in Bankscope with information from Islamic banking associations and country-specific sources. We then collected the corporate governance data, including Shariah supervisory board variables, from the annual reports of these banks and use data from World Bank Survey to account for macroeconomic factors across countries. The final sample consists of 330 observations for 96 Islamic banks across 21 countries and over the period of 2000-2011 (see Appendix A3).

#### **3.2. Measures of bank risk**

Multiple proxies of bank risk are selected to show whether characteristics of Shariah supervisory board have any impact on the bank risk-taking. The two primary measures of bank risk-taking include asset return risk proxies by volatility of net interest income ( $\text{NetIntIncomevol}$ ) and volatility of net income ( $\text{NetIncomevol}$ ), and insolvency risk ( $Z$ -

score). Following Hodder, Hopkins, and Wahlen (2006), NetIntincomevol is computed as the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period where Netincomevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Following Boyed, Graham, and Hewitt (1993), Z-score for each fiscal year is computed as the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Higher NetIntincomevol and Netincomevol indicate more risk while higher Z-score means less risk. Thus, we will use the inverse form,  $1/Z\text{-score}$ , so as to make the interpretation of the signs of coefficients comparable.

### 3.3. Measures of explanatory variables

We consider three variables to account for Shariah supervisory board characteristics; SSBNo, SSBforeign, and SSBtop20. We define SSBNo as the number of Shariah scholars in SSB. Prior research considers independent directors in the board as a factor that influence bank risk. However, all members are required by AAIFIO and IFSB to be independent. Each member works as a part time employee, has no ownership or family relation to the bank. Thus, we consider an alternative factor of the board, which is SSBforeign that is measured as the percentage of total scholars who are foreigners. SSBtop20 is measured as the percentage of Shariah scholars with top 20 ranking. We use information from Ünal (2011) report that ranks scholars of SSB according to the number of positions they hold in Islamic banks' board.

Following prior literature, we also control for board of directors variables that influence bank risk taking behaviors. We control for the size of board of directors

(BODNo) that is defined as the natural logarithm of total number of directors in the board. Cheng (2008) and Pathan (2009) find that board size is negatively related to bank risk taking due to more coordination cost and free riding problem in large board. A dummy variable (CEOduality) is also used to control for CEO influence over the board decisions. CEOduality equals one if the CEO also chairs the board and zero otherwise. Pathan (2009) finds that CEO power, measured by CEOduality, has negative influence on bank risk taking. The reason is that most of CEOs' wealth is concentrated in their non-diversifiable human capital. Thus, risk averse CEOs are expected to protect their wealth and job internally by selecting safe investment (Smith and Stulz, 1985). Also, when CEO chairs the board, he restricts the information flow to other board directors and hence reduces board's independent oversight of manager (Fama and Jensen, 1983; Jensen, 1993).

We control for other bank level variables including bank size (Size), charter value (Charter), financial leverage (Capital), asset portfolio (Loan), and liquidity (Liquidity). Size is measured as the natural logarithm of total assets at the end of fiscal year. Consistent with portfolio theory, Demsetz and Stranhan (1997) find that asset size negatively affects firm-specific risk. Moreover, Boyd and Runkle (1993) found bank size is negatively related to the volatility of asset returns. Asset size affects risk both because larger banks tend to be better diversified than smaller banks and because larger banks engage in different types of activities than smaller banks affects risk. We control for banks' franchise or charter value as prior studies find that banks with more franchise value (greater profit making potential) take less risk. Franchise value works to reduce moral hazard problem by increasing the cost of financial distress and thereby lowering shareholders' desired level of risk (Demsetz, Saidenberg, and Stranhan, 1997). Charter

value of a bank is the present value of a bank's future economic profits when considered as a going concern and it is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets.

Prior literature also shows that capital asset ratio is negatively related to bank risk-taking. Banks with higher capital to asset ratio reduce the risk-taking incentives as the bank's shareholders place more of their personal wealth at risk in a bank (Kim and Santomero, 1994 and Laeven and Levine, 2009). Capital is measured as the total equity divided by total assets. We also include Loan ratio to account for a bank's loan portfolio. It is calculated as the total loan to total assets and we expect positive relation to bank risk. Prior study also shows that higher liquidity may help in mitigating risk-taking incentives. Acharya and Naqvi (2012) show that when banks have huge amounts of liquidity, bank managers may take more risk by aggressively lowering the lending rate to increase loan volumes in order to enhance their own compensation. More liquid banks may lower lending standards because bank managers' compensation could be partially based on the volume of loans that is used as a benchmark for managerial performance or alternatively long-term risks may not be considered for managers' compensation.

Risk-taking incentives of banks also depend on institutional and legal factors of the country's environment. The literature suggests that deposit insurance schemes may increase bank's incentives to take risks. Thus, We include DepIns as a dummy variable that take a value of one if there is explicit deposit insurance and zero otherwise. Data was obtained from Demirgüç-Kunt and Sobaci (2000). We control for law and order in different countries (Rlaw) using data from La Porta et al. (1998). In countries with strong traditions of rule of law, managers might have reduced incentives to engage in risky

investments. We also use measure of shareholders' rights (Srights) from La Porta et al. (1998) to control for extent of monitoring by shareholders. Managers in countries with stronger shareholders' rights may choose to riskier but value enhancing investment policy. A bank with strong shareholder rights is expected to take more risks. Keeley (1990) suggests that bank risk-taking is related to the degree of competition between banks; anticompetitive restrictions endow banks with market power and increase the value of the bank's charter. Therefore, such restriction reduces banks' incentives to take risk. We introduce Entry as a measure of legal and administrative restrictions on bank entry that we obtain from a database provided by Barth, Caprio, and Levine (2001).

Moreover, we account for a demographic factor in sample countries. We include Religion as a dummy variable that equals one if 90% or more of the population is Muslims and zero otherwise. We expect negative relation to bank risk taking as Shariah prevents excessive risk taking and managers in Islamic banks also work to maintain society confidence. GDPgrowth is also included to account for countries development. Appendix B3 defines all variables in detail.

### 3.4 Empirical models and estimation methods

#### 3.4.1 Empirical models

The following regression equation is formulated to test empirically the three main hypotheses that relate SSB characteristics to bank risk taking.

$$\ln(\text{Risk})_{i,t} = \alpha + \beta_1 \ln(\text{SSBNo})_{i,t} + \beta_2 (\text{SSBforeign})_{i,t} + \beta_3 (\text{SSBtop20})_{i,t} + \delta_1 \ln(\text{BODNo.})_{i,t} + \delta_2 (\text{CEOduality})_{i,t} + \zeta_1 (\text{Size})_{i,t} + \zeta_2 (\text{Charter})_{i,t} + \zeta_3 (\text{Capital})_{i,t} + \zeta_4 (\text{Loan})_{i,t} + \zeta_5 (\text{Liquidity})_{i,t} + \gamma_1 (\text{DepIns})_{j,t} + \gamma_2 (\text{Rlaw})_{j,t} + \gamma_3 (\text{Srights})_{j,t} + \gamma_4 (\text{Religion})_{j,t} + \gamma_5 (\text{Gdpgrowth})_{j,t} + \varepsilon_{i,t}, \quad (1)$$

where subscripts  $i$  denotes individual bank,  $t$  time period, and  $\ln$  is the natural logarithmic.  $\beta$ ,  $\delta$ ,  $\zeta$ , and  $\gamma$  are the parameters to be estimated and  $\varepsilon$  is the idiosyncratic



error term. We also include year and country dummies to control for year and country fixed effects. The definition of the variables in the regression equation (1) is summarized in Appendix B3.

### 3.4.2. Estimation method

We estimate equation (1) using generalized least square (GLS) random effect (RE) following Baltagi and Wu (1999) and ordinary least square (OLS). In the presence of unobserved bank fixed-effects, panel fixed-effect (FE) is commonly suggested (Wooldridge, 2002). However, such FE estimation is not suitable for this study for several reasons. First, the time-invariant parameter like Religion cannot be estimated with fixed-effect as it would be absorbed or wiped put in “within transformation” or “time-demeaning” process in FE. Second, the structure variables of Shariah board and board of directors do not vary much over time, where the fixed-effect estimation would be imprecise as FE requires significant variations of the variable value to produce consistent and efficient estimates (Wooldridge, 2002). Therefore, using fixed-effect estimations would lead to massive loss of the degrees of freedom (Baltagi, 2005). Thus, GLS RE or OLS is proposed for this study as an alternative to FE estimation.

### 3.5. Descriptive statistics and correlation matrix

Table 3.2 presents the descriptive statistics for the various Shariah supervisory board structure, board structure, bank level variables, and country level variables. The mean (median) of SSBNo is 3.58 (4.00) with a minimum of 1 and a maximum of 8. The mean (median) percentage of foreigner members in Shariah board is 0.25 (0.00). Thirty-six percent of the sample banks have Shariah members with top20 ranking. The mean (median) of BODNo is 8.68 (9.00) with a minimum of 2 and a maximum of 20. Six percent of the banks' sample CEOs was board chairs.

Turning to the descriptive statistics of bank risk measures of Table 3.2. The mean (median) of NetIntincomevol is 1.2% (0.7%) while the mean (median) of Netincomevol is 2% (0.7%). The mean (median) Z-score for the sample Islamic banks is 2.89 (2.88). Refer to Table 3.2 for details on summary statistics of other bank and country specific variables used in the model.

Table 3.3 presents the Pearson's correlation matrix between variable. The correlation coefficients between SSB and bank risk measures are largely in consistent with the expectation except with SSBforeign. SSBtop20 is positively correlated to bank asset risk but no significant correlation with Z-score. The correlation coefficient, however, between SSBforeign is positively related to Netincomevol while there is no significant relation to other risk measures. Also, SSBNo, SSBforeign, and SSBtop20 are positively correlated to Rlaw and negatively correlated to DepIns. This suggests that when a country has strong law enforcements Islamic banks tend to have more scholars, foreigners, and top ranked scholars in SSB while these all are lower when a country has explicit deposit insurance.

With regard to CEO power, the coefficient of CEOduality is positively correlated with both NetIntincomevol and Netincomevol, which indicates that when manager chairs the board, Islamic banks tend to engage more in risking investments. Moreover, Table 3.3 shows larger banks, banks with higher franchise value, or has higher loan financing tend to take less risk as the coefficients on Size, Charter, Loan are negatively and statistically correlated with risk measures. For country level, the coefficient on Religion is negatively correlated with bank risk, which is consisted with the expectation that Islamic banks located in a country that is dominated with Muslims tend to take lower risk.

#### 4. Empirical results

Table 3.4 presents the results of GLS RE estimates of regression equation (1) when either NetIntincomevol, Netincomevol, or 1/Z-score is the dependent variable. The regression equation (1) is well fitted with an overall R-squared of 23.13%, 37.2%, and 23.22% for NetIntincomevol, Netincomevol, and 1/Z-score respectively.

With regards to Shariah supervisory board measures, the coefficient on SSBNo is positive but it is only statistically significant when using NetIntincomevol measure for bank risk. This is consistent with the notion that larger Shariah boards are less effective in monitoring managers' incentive in taking more risk. In addition, the coefficients on SSBforeign, as anticipated, are negative and statistically significant for all bank risk measures. This illustrates that after controlling for other governance mechanisms, bank, and country characteristic, a large percentage of foreigners set in the Shariah board is associated with less bank risk-taking. Foreigners' scholars are more concerns about their reputation and more sensitive to the Shariah compliance. The economic significance of this result is also important. For instance, an increase in SSBforeign by one (sample) standard deviation (using Table 3.2, an increase in SSBforeign of 0.37 points) would lower bank Netincomevol (in logarithmic) by approximately 18.43% percentage points [ $\ln(0.37) * -0.129/\ln(2.0) = 0.1843$ ]. Consistent with the expectation, the coefficients on SSBtop20 are positive with all three measures of bank risk and statistically significant. This suggests that top-ranked Shariah scholars in SSB take more risk. For the economic significance, an increase in the SSBtop20 by one (sample) standard deviation (using Table 3.2, an increase in SSBtop20 of 0.40 points) would increase bank Netincomevol (in logarithmic) by approximately 30.80% percentage points [ $\ln(0.40) * 0.233/\ln(2.0) = 0.3080$ ]. Therefore, the evidence support that more outsider members in Shariah board

involve with less bank risk while more top-ranked scholars in the board relate to more bank risk.

With regard to board of directors, Table 3.4 shows that the coefficients on BODNo are negatively related to all three measures of bank risk, however all estimates are not statistically significant. When considering CEO power, there is some evidence that CEOduality is associated with higher bank risk. The result, however, is only significant with Netincomevol measure of bank risk.

The coefficients on other bank and country characteristics variables offer some important insights. For instance, a statistically significant negative coefficient on Size across three measures of bank risk indicates that as the bank increase in its size, bank's preferences in taking risk decreases. Consistent with [Demirgüç-Kunt and Detragiache \(2002\)](#), explicit deposit insurance in a country provides banks, Islamic banks in this case, with more incentives in taking more risk. The coefficient estimates on DepIns are positively and significantly associated with bank risk taking. Contrary to the expectation, Islamic banks in a country with strong shareholders' rights take lower risk. This illustrates that shareholders in sample country may also concern with Shariah compliance and have preference in taking less risk. Moreover, Islamic banks in a country that is dominated with Muslims prefer taking less risk. The coefficients on Religion are negative and significant across all three measure of risk. This indicates that Islamic banks adjust their risk preference according to the society preference.

## **5. Robustness tests**

Similar to research studies on corporate governance, the reported coefficient estimates in Table 3.4 may be biased as Shariah board structure is in fact endogenously formed. We address this endogeneity concern in two ways.

### 5.1. Ordinary least square (OLS)

To confirm that the causation runs from Shariah board structure to bank risk, we re-estimate model (1) using OLS while replacing the SSB variables with their lag values. The interpretation of the results remains qualitatively the same as those reported in Table 3.4 with the exception of SSBNo. The coefficients on SSBNo are positively and significantly with all measures of bank risk used in this study. This support H1 and it indicates that when there is large number of members sit in SSB, the monitory effectiveness would be low. This makes it easier for CEO to control SSB decision. Results of OLS for model (1) are reported in Table 3.5.

### 5.2. Three-stage least square (3SLS)

Following Pathan (2009), we use 3SLS to eliminate the endogeneity problem from simultaneity bias (if any). We endogenize both SSBNo and SSBforeign given prior studies on board structure determinants (Linck, Netter, and Yang, 2008) by developing the following two regression models, equations (2) and (3) for SSBforeign and SSBtop20 respectively:

$$\ln(\text{SSBNo})_{i,t} = \alpha + \beta_1 \ln(\text{SSBforeign})_{i,t} + \beta_2 \ln(\text{Risk})_{i,t} + \beta_3 (\text{SSBtop20})_{i,t} + \delta_1 \ln(\text{BODNo})_{i,t} + \delta_2 (\text{CEOduality})_{i,t} + \zeta_1 (\text{Size})_{i,t} + \zeta_2 (\text{Charter})_{i,t} + \zeta_3 (\text{Capital})_{i,t} + \zeta_4 (\text{Loan})_{i,t} + \zeta_5 (\text{Liquidity})_{i,t} + \gamma_1 (\text{DepIns})_{j,t} + \gamma_2 (\text{Rlaw})_{j,t} + \gamma_3 (\text{Srights})_{j,t} + \gamma_4 (\text{Religion})_{j,t} + \gamma_5 (\text{Gdpgrowth})_{j,t} + \varepsilon_{i,t}, \quad (2)$$

$$(\text{SSBforeign})_{i,t} = \alpha + \beta_1 \ln(\text{SSBNo})_{i,t} + \beta_2 (\text{SSBtop20})_{i,t} + \beta_3 \ln(\text{Risk})_{i,t} + \delta_1 \ln(\text{BODNo})_{i,t} + \delta_2 (\text{CEOduality})_{i,t} + \zeta_1 (\text{Size})_{i,t} + \zeta_2 (\text{Charter})_{i,t} + \zeta_3 (\text{Capital})_{i,t} + \zeta_4 (\text{Loan})_{i,t} + \zeta_5 (\text{Liquidity})_{i,t} + \gamma_1 (\text{DepIns})_{j,t} + \gamma_2 (\text{Rlaw})_{j,t} + \gamma_3 (\text{Srights})_{j,t} + \gamma_4 (\text{Religion})_{j,t} + \gamma_5 (\text{Gdpgrowth})_{j,t} + \varepsilon_{i,t}, \quad (3)$$

Table 3.6 presents the results for 3SLS estimation of the three equations (1), (2), and (3) in which Risk is proxied by Net income volatility. Column 1 of Table 3.6 shows the effect of SSB structure on bank risk as specified by equation (1). The findings remain the

same as with those reported in Table 3.4. Consistent with Pathan (2009), column 2 of Table 3.6 indicates that the coefficient on Size is significantly positive which indicates that SSB size increase with bank size. Overall, this study shows, after direct control for endogeneity, that large SSB increase bank risk while existence of foreigners in the SSB decrease bank risk.

## **6. Further analysis**

### **6.1 Shariah supervisory boards and bank risk-taking in GCC vs. others**

This section examines the association between Shariah structures and risk-taking for Islamic banks across different geographic location. The structure of Shariah governance of Islamic banks is developed differently when comparing the member states of Gulf Corporation Council (GCC) with others countries, such as Malaysia in particular. In GCC, SSB governance structure is ruled independently on an institutional bank level while it is organized on a state level in others with additional individual SSB in Islamic banks. Therefore, the decentralized or internal approach of SSB in the GCC is more oriented towards the market while the centralized or external approach as in Malaysia is more governance-related in the sense of the Shariah.

To see how different SSB structure approach influence banks risk-taking, we split the sample into two; one where a country is a member in GCC and the other is where a county is not and we run model 2. Column 1,2, and 3 show the results for the association between SSB and bank-risk taking in GCC using volatility of Net interest income, Net income, and Z-score respectively. Overall, findings indicate that only foreign and top-ranked scholars sit in SSB can influence risk-taking activities. The results are consistent with the major finding. Also, column 4 of Table 3.6 indicates that only SSBNo and SSBtop20 positively influence bank risk-taking where a country is not a member in GCC.

Using Netincomevol and 1/Z-score as a proxy for bank risk-taking, however, provide inconsistent results (See columns 5 and 6).

## 6.2. Shariah supervisory boards and bank risk-taking before and after the financial crisis

The recent financial crisis emphasizes the need for further research. In this section, we investigate whether the association between SSB structure and bank risk differs before and after financial crisis. In Table 3.7, we partition the sample into one before the financial crisis, 2000-2007, and other including and after the crisis, 2008-2011. Columns 1, 2, and 3 of Table 3.7 show the results when we run model 1 before crisis period. Findings indicate that only SSBtop20 positively and significantly influence bank risk-taking using different risk measures. For after crisis period, the main results hold only when we use Netincomevol as a measure for bank asset risk (see columns 4, 5, and 6 of Table 3.7).

## 7. Conclusion

This study investigates whether Shariah supervisory board related to bank risk taking. Specifically, how the characteristics of SSB influence managerial risk taking incentives within Islamic banks. Using a sample of 70 banks over the period 2000- 2011 and consistent with the expectation, the results support that large SSB size and busy scholars in SSB are positively relate to bank risk taking while foreign scholars in the SSB negatively relate to bank risk taking. These findings are robust to various bank risk measures including asset risk and idiosyncratic risk. The findings in this study imply that the structure of SSB in Islamic banks is an important determinant of bank risk-taking.

This study also reveals that ruling of Shariah governance play an important role. The association between SSB characteristics and bank risk is more pronounced in countries where Shariah boards are ruled by bank while such an association is weak when the SSB

are ruled at state level. Also, we find that our selected variables of SSB influence bank risk after crisis while only top-ranked Shariah scholars impact bank risk before and after crisis.



## References

- Abdel Karim, R. A., 2001. International accounting harmonization, banking regulation, and Islamic banks, *The International Journal of Accounting*, Vol. 36, 169–93.
- Abdel Karim, R., S. Archer., 2002. *Islamic Finance: Innovation and Growth*, Euromoney Publications, London.
- Acharya, Viral, Hassan Naqvi, 2012, The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle, *Journal of Financial Economics* 106, 349-366.
- Baltagi, B.H., 2005. *Econometric Analysis of Panel Data*. John Wiley and Sons, Chichester.
- Baltagi, B.H., Wu, P.X., 1999. Unequally spaced panel data regressions with AR(1) disturbances. *Econometric Theory* 15, 814–823.
- Barth, J., Caprio, G., Levine, R., 2001. The Regulation and Supervision of Banks around the World: A New Database. *Brookings-Wharton Papers on Financial Services* 183-240.
- Beck, T., Demircug-kunt, A., and Merrouche, O., 2013. Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking and Finance* 37, 433-447.
- Boyd, J.H., Graham, S.L., Hewitt, R.S., 1993. Bank holding company mergers with nonbank financial firms: effects on the risk of failure. *Journal of Banking and Finance* 17, 43–63.
- Boyd, J.H., Runkle, D.E., 1993. Size and Performance of Banking Firms: Testing the Predictions of Theory. *Journal of Monetary Economics* 31, pp. 47-67.
- Chapra, M.U., Ahmed., 2002. *Corporate governance in Islamic financial institutions*, Islamic Research and Training Institute, Islamic Development Bank, Jeddah, IRTI/IDB
- Chapra, U., 2009. Global Financial Crisis; Can Islamic Finance help? A book chapter in *Issues in the International Financial Crisis from the Islamic perspective*. Islamic Economic Research Centre, Saudi Arabia.
- Chapra, U., 2010. *Global Perspective on Islamic Finance*. LSE-Harvard Public lecture on Islamic Finance (February 24)

- Cheng, S., 2008. Board Size and the Variability of Corporate Performance, in: *Journal of Financial Economics*, 87, 157-176.
- Choudhury, M. A., Hoque, M.Z., 2006. Corporate governance in Islamic perspective. *Corporate governance* 6, 116-128
- Dar, H.A., Presley, J.R., 2000. Lack of Profit and Loss Sharing in Islamic Banking: Management and Control Imbalances, *Economic Research Paper No. 00/24*, Loughborough University.
- DeAngelo, L., 1981, Auditor independence, 'low balling', and disclosure regulation, *Journal of Accounting and Economics*, Aug., 113-127.
- Deloitte, 2010. The Deloitte Islamic Finance Leaders Survey in the Middle East: Benchmarking Practices.
- Demirgüç-Kunt, A., Detragiache, E., 2002. Does deposit insurance increase banking system stability? An empirical investigation. *J. Monet. Econ.* 49 (7), 1373–1406.
- Demirgüç-Kunt, A., Sobaci, T., 2000. Deposit Insurance Around the World: A Data Base. The World Bank.
- Demsetz, R. S., Strahan, P. E., 1997. Diversification, size, and risk at bank holding companies. *Journal of Money, Credit, and Banking* 29 (3), 300-313.
- Demsetz, R.S., Saidenberg, M.R., Strahan, P.E., 1997. Agency problems and risk- taking at banks. Working Paper, Federal Reserve Bank of New York.
- Dewatripont, M., Tirole, J., 1994. *The Prudential Regulation of Banks*. MIT Press, Cambridge, MA.
- El-Hawary, D., Grais, W.Iqbal, Z., 2007. Diversity in the Regulation of Islamic Financial Institutions, in: *Quarterly Review of Economics and Finance*, 46, 778-800.
- Erkens, D., Hung, M., Matos, P., 2012. Corporate governance in the 2007-2008 Financial Crisis: Evidence from Financial Institutions Worldwide. *Journal of Corporate Finance* 18, 389-411.
- Fama, E.F., 1980. Agency problems and the theory of the firm. *Journal of Political Economy* 88, 715– 732.

Fama, E.F., Jensen, M.C., 1983. Separation of ownership and control. *Journal of Law and Economics* 26, 301–325.

Farook, S.Z., Farooq, M.O., 2011. Shariah Governance for Islamic Finance: Challenges and Pragmatic Solutions, Working Paper, Bahrain Institute of Banking and Finance.

Ferris, S., Jagannathan, M., Pritchard, A., 2003. Too Busy to Mind the Business? Monitoring by Directors with Multiple Board Appointments, in: *Journal of Finance*, 48, 1087-1111.

Fich, E., Shivadasani, A., 2006. Are Busy Boards Effective Monitors?, in: *Journal of Finance*, 61, 681-724.

Galai, D., Masulis, R.W., 1976. The option pricing model and the risk factor of stock. *Journal of Financial Economics* 3, 53–81.

Grais, W., Pellegrini, M., 2006. Corporate Governance and Shariah Compliance in Institutions Offering Islamic Financial Services, World Bank Policy Research Working Paper 4054.

Green, S., 2010. Global perspective on Islamic finance. LSE-Harvard Public Lecture on Islamic Finance (February 24).

Hasan, M., Dridi, J., 2010. The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study. IMF Working Paper # WP/10/201.

Hassan, K., Mollah, S., 2014. Corporate governance, risk-taking, and firm performance of Islamic banks during global financial crisis. Working paper.

Hodder, L.D., P.E. Hopkins, J.M. Wahlen. 2006. Risk-relevance of fair-value income measures for commercial banks. *The Accounting Review* 81. (March): 337-375.

Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance* 48, 831–880.

Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305–460.

John, K., John, T.A., Senbet, L.W., 1991. Risk-shifting incentives of depository institutions: A new perspective on federal deposit insurance reform. *Journal of Banking and Finance* 15, 895–

915.

Keeley, M.C., 1990. Deposit insurance, risk and market power in banking. *The American Economic Review* 80, 1183–1200.

Kim, D., Santomero, A., 1994. Risk in banking and capital regulation. *Journal of Finance* 43, 1219- 1233.

Kirkpatrick, G., 2009. The Corporate governance lessons from the financial crisis, *Financial Market Trends*, OECD 2009/1, 1-30.

La Porta, R., F. L. De Silanes, A. Shleifer and R. W. Vishny., 1998. Law and finance, *Journal of Political Economy*, Vol. 106(6), 1113-1155.

Laeven, L., R. Levine., 2009. Bank governance, regulation and risk taking, *Journal of Financial Economics*, Vol. 93( 2), 259-275.

Lewis, M.K., 2005. Islamic corporate governance. *Review of Islamic Economics* 9, 5-29.

Matoussi, H., Grassa, R., 2012. Is corporate governance different for Islamic banks? A comparative analysis between the GULF Cooperation Council context and the Southeast Asia context. Working paper

Merton, R.C., 1977. An analytic derivation of the cost of deposit insurance and loan guarantees. *Journal of Banking and Finance* 1, 3–11.

Mollah, S., Zaman, M., 2015. Shariah supervision, corporate governance, and performance; conventional vs. Islamic banks. *Journal of Banking and Finance*, forthcoming.

Pathan, S., 2009. Strong boards, CEO power and bank risk-taking. *Journal of Banking and Finance*, 33, 1340-1350.

Perry, F. V., 2011, The corporate governance of Islamic banks: a better way of doing business? *Michigan State Journal of International Law*, 19(2), 251-277.

Rammal, H.G., 2006. The Importance of Shariah Supervision in Islamic Financial Institutions, in: *Corporate Ownership and Control*, 3, 3, 204-208.

Safieddin, A., 2009. Islamic financial institutions and corporate governance; New insights for agency theory. *Corporate Governance; An International Review* 17, 142-158.

Sharfman, B. S., 2009. Enhancing the efficiency of board decision making; Lessons learned from the financial crisis of 2008. *Delaware Journal of Corporate Law* 34, 813-851.

Ünal, M., 2011. The Small World of Islamic Finance: Shariah Scholars and Governance – A Network Analytic Perspective, v. 6.0, Funds@Work.

Van Greuning, H., Iqbal, Z., 2007. Banking and the Risk Environment, in: Archer, S., Karim, R.A.A. (eds.), *Islamic Finance: The Regulatory Challenge*, John Wiley & Sons, Singapore, 11-39.

Warde, I., 2010. *Islamic Finance in the Global Economy*, Second Edition, Edinburgh University Press, Edinburgh.

Wooldridge, J.M., 2002. *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Cambridge, Massachusetts, London.

### Appendix A3: Islamic banking in sample countries

Country	Islamic banks
Bahrain	16
Bangladesh	4
Egypt	2
Indonesia	2
Jordan	2
Kuwait	3
Lebanon	1
Malaysia	4
Pakistan	2
Qatar	2
Saudi Arabia	4
Sudan	10
Syria	2
Tunisia	1
Turkey	3
United Arab Emirates	5
United Kingdom	3
Yemen	4
Total	70

### Appendix B3: Variable definitions

Variable	Definition
<b><u>Panel A: Dependent variables (Risk)</u></b>	
NetIntincomevol	The standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from BankScope database.
Netincomevol	The standard deviation of annual income, expressed as a percentage of average total assets, and measured over each five-year period. Data from BankScope database.
Z-score	The sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from BankScope database.
<b><u>Panel B: SSB, BOD, and CEO variables</u></b>	
SSBNo	The number of Shariah scholars in Shariah supervisory boards. Data is hand collected.
SSBforeign	The percentage of SSB members who are foreigners. Data is hand collected.
SSBtop20	The percentage of SSB members with top twenty rankings. Data from Ün (2011).
BODNo	The number of directors in Islamic bank's board. Data is hand collected.
CEOduality	A dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected.
<b><u>Panel C: Controls variables</u></b>	
Size	Natural logarithm of total assets at the end of each fiscal year. Data from BankScope database.
Charter	Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from BankScope database.
Capital	Total equity divided by total assets. Data from BankScope database.
Loan	Total loans divided by total assets. Data from BankScope database.
Liquidity	Cash and due from banks scaled by total asset. Data from BankScope database.
DepIns	An indicator variable that equals one if the country has explicit deposit insurance, zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008).
Rlaw	A scale of 1 to 10 for the assessment of the law and order tradition in the country produced by the country risk rating agency International Country Risk (ICR). Lower scores indicate less tradition for law and order. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).
Srights	Index aggregating the following shareholders rights: One share-one vote, proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. The index ranges from 0 to 5. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).
Entry	The sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001).
Religion	An indicator variable that equals one if 90 percent or more of a country population is Muslims, percentage of Muslims and zero otherwise. Data from World Bank Survey.
Gdpgrowth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregate on constant U.S. dollars. Data from World Bank Survey.

**Table 3.1: Descriptive statistics**

	No.	Mean	S.d	Min	P5	P25	P50	P75	P95	Max
NetIntincomeevol	359	0.020	0.045	0.000	0.001	0.004	0.007	0.014	0.109	0.319
Netincomeevol	359	0.012	0.023	0.000	0.001	0.004	0.007	0.012	0.035	0.249
Z- score	359	0.062	0.292	-4.521	0.012	0.031	0.055	0.088	0.245	1.043
SSBNo	359	3.632	1.509	1.000	1.000	3.000	4.000	5.000	6.000	8.000
SSBforeign	359	0.266	0.377	0.000	0.000	0.000	0.000	0.600	1.000	3.000
SSBtop20	359	0.361	0.398	0.000	0.000	0.000	0.250	0.667	1.000	2.000
BODNo	359	8.671	2.789	2.000	4.000	7.000	9.000	10.000	13.000	20.000
CEOduality	359	0.056	0.230	0.000	0.000	0.000	0.000	0.000	1.000	1.000
Size	359	7.007	1.683	2.573	4.314	5.726	7.081	8.148	9.991	10.983
Charter	359	0.851	0.276	0.002	0.134	0.820	0.895	0.942	1.157	2.219
Capital	359	0.207	0.224	0.020	0.048	0.086	0.132	0.217	0.866	0.998
Loan	359	0.459	0.239	0.000	0.030	0.269	0.498	0.637	0.798	0.989
Liquidity	359	0.278	0.182	0.000	0.023	0.151	0.251	0.373	0.628	0.868
DepIns	359	0.092	0.289	0.000	0.000	0.000	0.000	0.000	1.000	1.000
Rlaw	359	6.182	2.019	3.330	3.330	4.200	6.780	8.330	8.330	8.570
Entry	359	7.602	0.906	4.000	6.000	8.000	8.000	8.000	8.000	8.000
Srights	359	0.393	0.881	0.000	0.000	0.000	0.000	0.000	3.000	4.000
Religion	359	0.579	0.494	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Gdp growth	359	0.055	0.043	-0.151	-0.015	0.032	0.056	0.075	0.115	0.262

This table provides descriptive statistics for dependent variable, independent variable, and control variables for the Islamic sample of 359 yearly observations over the period 2000-2011. NetIntincomeevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Netincomeevol is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Z- score is the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from Bankscope database. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBforeign is the percentage of SSB members who are foreigners. Data is hand collected. SSBtop20 is the percentage of SSB members with top twenty rankings. Data from Ünal (2011). BODNo is the number of directors in Islamic bank's board. Data is hand collected. CEOduality is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from Bankscope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from Bankscope database. Capital is total equity divided by total assets. Data from Bankscope database. Loan is total loans divided by total assets. Data from Bankscope database. Liquidity is cash and due from banks scaled by total asset. Data from Bankscope database. DepIns is an indicator variable that sets to one if a country has explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey.



**Table 3.3: Correlation**

	Netincomevol	NetIntincomevol	Z-score	SSB outside	SSB No	SSBtop20	BOD No	CEO duality	Size	Charter	Capital	Loan	Liquidity	Dep Ins	Rlaw	Entry	Srights	Religion	GDP growth
Netincomevol	1.00																		
NetIntincovol	<b>0.80</b>	1.00																	
Z-score	-0.10	-0.06	1.00																
SSBoutsider	<b>0.25</b>	0.07	0.05	1.00															
SSBNo	0.05	-0.04	0.07	<b>0.12</b>	1.00														
SSBtop20	<b>0.33</b>	<b>0.17</b>	0.09	<b>0.47</b>	0.03	1.00													
BODNo	<b>-0.16</b>	-0.10	0.04	<b>-0.36</b>	0.06	<b>-0.24</b>	1.00												
CEOduallity	<b>0.14</b>	<b>0.14</b>	-0.03	<b>-0.11</b>	0.04	-0.05	<b>0.12</b>	1.00											
Size	<b>-0.26</b>	<b>-0.27</b>	-0.04	-0.11	<b>0.36</b>	<b>0.17</b>	0.01	-0.10	1.00										
Charter	<b>-0.52</b>	<b>-0.42</b>	<b>-0.13</b>	<b>-0.35</b>	<b>0.18</b>	<b>-0.26</b>	<b>0.12</b>	-0.03	<b>0.50</b>	1.00									
Capital	<b>0.66</b>	<b>0.48</b>	<b>0.12</b>	<b>0.45</b>	-0.02	<b>0.38</b>	<b>-0.17</b>	0.08	<b>-0.38</b>	<b>-0.77</b>	1.00								
Loan	<b>-0.18</b>	<b>-0.25</b>	-0.08	<b>-0.12</b>	0.08	-0.00	-0.10	<b>-0.12</b>	<b>0.41</b>	<b>0.19</b>	<b>-0.17</b>	1.00							
Liquidity	<b>-0.15</b>	-0.08	-0.01	<b>0.18</b>	-0.09	-0.02	-0.03	-0.00	<b>-0.25</b>	<b>0.13</b>	-0.09	<b>-0.52</b>	1.00						
DepIns	-0.01	-0.01	-0.01	<b>-0.18</b>	<b>-0.28</b>	<b>-0.28</b>	<b>-0.23</b>	-0.08	<b>0.16</b>	0.07	<b>-0.15</b>	<b>0.32</b>	<b>-0.14</b>	1.00					
Rlaw	<b>0.34</b>	<b>0.15</b>	0.05	<b>0.37</b>	<b>0.31</b>	<b>0.63</b>	<b>-0.25</b>	-0.05	<b>0.32</b>	<b>-0.15</b>	<b>0.46</b>	<b>0.11</b>	-0.08	<b>-0.12</b>	1.00				
Entry	0.06	0.06	0.02	0.09	<b>-0.14</b>	0.08	0.07	-0.05	<b>-0.27</b>	<b>-0.13</b>	0.01	<b>-0.20</b>	0.10	<b>-0.12</b>	<b>-0.25</b>	1.00			
Srights	-0.10	-0.08	-0.01	0.07	<b>-0.19</b>	-0.06	-0.07	-0.10	0.02	0.10	-0.06	-0.08	<b>0.32</b>	<b>0.43</b>	-0.01	-0.04	1.00		
Religion	<b>-0.34</b>	<b>-0.18</b>	-0.04	<b>-0.49</b>	<b>-0.30</b>	<b>-0.58</b>	0.26	-0.04	<b>-0.23</b>	<b>0.27</b>	<b>-0.42</b>	-0.05	<b>0.13</b>	0.08	<b>-0.75</b>	<b>0.30</b>	-0.07	1.00	
GDPgrowth	0.00	0.05	0.04	-0.10	0.06	-0.10	<b>0.11</b>	-0.02	0.04	-0.01	0.01	<b>0.11</b>	-0.09	-0.01	0.09	<b>-0.35</b>	<b>-0.17</b>	-0.07	1.00

Bold texts indicate statistically significant at 1% level or better.

This table presents Pearson correlation matrix for main variables. NetIntincomevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from BankScope. Netincomevol is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from BankScope. Z-score is the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from BankScope database. SSBoutsider is the percentage of SSB members who are foreigners. Data is hand collected. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBtop20 is the percentage of SSB members with top twenty rankings. Data from Ünal (2011). BODNo is the number of directors in Islamic bank's board. Data is hand collected. CEOduallity is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from BankScope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from BankScope database. Capital is total equity divided by total assets. Data from BankScope database. Loan is total loans divided by total assets. Data from BankScope database. Liquidity is cash and due from banks scaled by total asset. Data from BankScope database. DepIns is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey.

**Table 3.3: GLS random effect (RE) regression results of Islamic bank risk**

Dependent variable	ln (NetIntincome vol)	ln (Netincome vol)	ln (1/Z-score)
ln(SSBNo)	<b>0.059**</b> [1.97]	0.056 [0.92]	0.255 [1.25]
<b>SSBforeign</b>	<b>-0.076**</b> [-2.07]	<b>-0.129**</b> [-2.18]	<b>-0.318**</b> [-2.14]
<b>SSBtop20</b>	<b>0.076*</b> [1.93]	<b>0.233*</b> [1.73]	<b>0.408a</b> [1.50]
ln(BODNo)	-0.061 [-1.32]	-0.008 [-0.19]	-0.181 [-1.03]
CEOduality	0.039 [0.70]	0.165* [1.71]	0.218 [0.39]
Size	-0.068** [-2.19]	-0.165** [-2.28]	-0.372*** [-3.29]
Charter	0.013 [0.32]	0.130 [1.32]	0.522a [1.59]
Capital	0.167 [0.50]	-0.418 [-0.63]	-1.628* [-1.89]
Loan	-0.076 [-0.49]	-0.336 [-1.05]	-0.178 [-0.32]
Liquidity	0.096 [0.53]	-0.223 [-0.94]	-1.016* [-1.89]
DepIns	0.431** [2.31]	0.898** [2.15]	2.032*** [2.79]
Rlaw	-0.005 [-0.22]	-0.003 [-0.08]	-0.030 [-0.35]
Srights	-0.139* [-1.67]	-0.377* [-1.88]	-0.986*** [-2.80]
Entry	0.003 [0.21]	0.007 [0.14]	0.090 [0.73]
Religion	-0.174* [-1.73]	-0.471** [-2.20]	-1.227*** [-2.79]
Gdpgrowth	0.112 [1.05]	0.347a [1.62]	0.020 [0.02]
Firm fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Constant	0.553** [2.08]	1.211** [2.25]	2.987** [2.37]
Observations	359	359	359
Overall R-squared	0.2313	0.372	0.2322

This table presents the results of the generalized least square random effects estimates of different proxy for bank risk on SSB characteristics and control variables for the sample of Islamic banks with 330 yearly observations over the period 2000-2011. NetIntincomevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Netincomevol is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Z- score is the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from Bankscope database. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBforeign is the percentage of SSB members who are foreigners. Data is hand collected. SSBtop20 is the percentage of SSB members with top twenty rankings. Data from Ünal (2011). BODNo is the number of directors in Islamic bank's board. Data is hand collected. CEOduality is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from Bankscope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from Bankscope database. Capital is total equity divided by total assets. Data from Bankscope database. Loan is total loans divided by total assets. Data from Bankscope database. Liquidity is cash and due from banks scaled by total asset. Data from Bankscope database. DepIns is an indicator variable that sets to one if a country has explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of

law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey. All models include country fixed effects and year fixed effects. Robust t-statistics are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 3.4: OLS regression results of Islamic bank risk**

Dependent variable	ln(NetIntincome vol)	ln(Netincome vol)	ln(1/Z-score)
<b>ln(SSBNo)</b>	<b>0.078**</b> [2.26]	<b>0.141**</b> [2.12]	<b>0.347**</b> [2.45]
<b>SSBforeign</b>	<b>-0.129***</b> [-2.91]	<b>-0.159*</b> [-1.88]	<b>-0.275*</b> [-1.75]
<b>SSBtop20</b>	<b>0.115***</b> [2.83]	<b>0.226**</b> [2.30]	<b>0.363*</b> [1.75]
ln(BODNo)	-0.066 [-1.28]	-0.040 [-0.64]	-0.275* [-1.82]
CEOduality	0.074 [1.16]	0.189 [1.40]	0.355 [1.14]
Size	-0.011 [-0.93]	-0.083*** [-3.07]	-0.275*** [-3.32]
Charter	0.050 [1.10]	0.028 [0.29]	0.688 [1.40]
Capital	0.399** [2.38]	0.828*** [2.70]	-0.613 [-1.00]
Loan	-0.275** [-2.53]	-0.295* [-1.76]	-0.265 [-0.72]
Liquidity	-0.153 [-1.25]	-0.268 [-1.21]	-0.982* [-1.96]
DepIns	<b>0.182**</b> [2.43]	0.093 [0.74]	0.255 [0.81]
Rlaw	-0.018* [-1.79]	-0.047a [-1.61]	-0.029 [-0.54]
Srights	-0.020 [-1.38]	-0.050* [-1.78]	0.142 [1.05]
Entry	-0.006 [-0.51]	-0.014 [-0.54]	0.055 [0.74]
Religion	-0.027 [-0.62]	-0.278*** [-2.76]	-1.022*** [-3.10]
Gdpgrowth	0.122 [0.77]	0.056 [0.22]	-0.544 [-0.34]
Firm fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Constant	0.432** [2.03]	1.009** [2.27]	2.503*** [2.91]
Observations	359	359	359
Adjusted R-squared	0.253	0.511	0.159

This table presents the results of the ordinary least estimates of different proxy for bank risk on SSB characteristics and control variables for the sample of Islamic banks with 359 yearly observations over the period 2000-2011. NetIntincomevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Netincomevol is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Z- score is the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from Bankscope database. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBforeing is the percentage of SSB members who are foreigners. Data is hand collected. SSBtop20 is the percentage of SSB members with top twenty rankings. Data from Ünal (2011). BODNo is the number of directors in Islamic bank's board. Date is hand collected. CEOduality is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from Bankscope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from Bankscope database. Capital is total equity divided by total assets. Data from Bankscope database. Loan is total loans divided by total assets. Data from Bankscope database. Liquidity is cash and due from banks scaled by total asset. Data from Bankscope database. DepIns is an indicator variable that sets to one if a country has explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of law enforcement

in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey. All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. <sup>\*\*\*</sup>, <sup>\*\*</sup>, and <sup>\*</sup> denote significance at the 1%, 5%, and 10% level respectively.

**Table 3.5: Three- stage least square (3SLS) regression results of bank risk**

Dependent variable	Risk	ln(SSBNo)	SSBforeign
SSBforeign	-0.159* [-1.88]	0.146** [2.50]	
ln(SSBNo)	0.141** [2.12]		0.134*** [3.05]
SSBtop20	0.226** [2.30]	-0.455*** [-6.06]	0.284* [1.86]
Risk		0.109** [2.33]	-0.113a [-1.64]
ln(BODNo)	-0.040 [-0.64]	0.069 [1.16]	-0.219*** [-2.65]
CEOduality	0.189 [1.40]	-0.005 [-0.12]	-0.178*** [-2.63]
Size	-0.083*** [-3.07]	0.030* [1.72]	-0.018 [-0.91]
Charter	0.028 [0.29]	-0.137a [-1.54]	-0.158** [-1.99]
Capital	0.828*** [2.70]	-0.389*** [-2.91]	0.452** [2.28]
Loan	-0.295* [-1.76]	0.113 [0.92]	0.072 [0.68]
Liquidity	-0.268 [-1.21]	0.028 [0.17]	0.342** [2.00]
DepIns	0.093 [0.74]	-0.422*** [-3.85]	-0.535*** [-3.75]
Rlaw	-0.047a [-1.61]	-0.033a [-1.51]	-0.099** [-2.30]
Srights	-0.050* [-1.78]	-0.032 [-1.21]	0.069* [1.80]
Entry	-0.014 [-0.54]	0.027 [1.07]	-0.019 [-0.44]
Religion	-0.278*** [-2.76]	0.118* [1.70]	-0.346*** [-2.96]
Gdpgrowth	0.056 [0.22]	-0.584a [-1.55]	-0.054 [-0.12]
Firm fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Constant	1.009** [2.27]	1.652*** [4.38]	1.491** [2.37]
Observations	359	359	359
Adjusted R-squared	0.511	0.581	0.595

This table presents three-stage least squares (3sls) estimates of the system of three regression models for Risk, SSBNo, and SSBforeign respectively. Risk is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBforeign is the percentage of SSB members who are foreigners. Data is hand collected. SSB top20 is the percentage of SSB members with top twenty rankings. Data from Ůnal (2011). BODNo is the number of directors in Islamic bank's board. Date is hand collected. CEOduality is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from Bankscope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from Bankscope database. Capital is total equity divided by total assets. Data from Bankscope database. Loan is total loans divided by total assets. Data from Bankscope database. Liquidity is cash and due from banks scaled by total asset. Data from Bankscope database. DepIns is an indicator variable that sets to one if a country has an explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of

law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey. All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 3.6: Shariah boards and bank risk-taking in GCC vs. others**

Dependent variable	GCC ln(NetInt income vol)	GCC ln (Netincome vol)	GCC ln(1/Z-score)	Other ln(NetInt income vol)	Other ln (Netincome vol)	Other ln(1/Z-score)
ln(SSBNo)	-0.021* [-1.81]	0.004 [0.17]	0.046 [0.99]	<b>0.006***</b> <b>[3.08]</b>	-0.002a [-1.57]	0.004 [0.41]
SSBforeign	<b>-0.041***</b> <b>[-3.43]</b>	<b>-0.050***</b> <b>[-2.67]</b>	<b>-0.108***</b> <b>[-3.00]</b>	-0.002 [-0.68]	0.000 [0.24]	0.008 [0.67]
SSBtop20	<b>0.018**</b> <b>[2.42]</b>	<b>0.035**</b> <b>[2.11]</b>	0.054 [1.38]	<b>0.004*</b> <b>[1.85]</b>	<b>-0.003**</b> <b>[-2.38]</b>	-0.012 [-0.69]
ln(BODNo)	-0.020a [-1.50]	-0.016 [-0.96]	-0.051 [-1.22]	-0.005* [-1.74]	-0.002*** [-2.72]	-0.025*** [-3.11]
CEOduality	-0.004 [-0.31]	-0.006 [-0.24]	-0.036 [-0.62]	-0.000 [-0.08]	0.001 [0.48]	-0.007 [-0.49]
Size	-0.003 [-1.23]	-0.016*** [-2.94]	-0.044*** [-2.77]	-0.001 [-0.57]	-0.000 [-1.05]	-0.002 [-0.25]
Charter	-0.001 [-0.08]	0.000 [0.03]	0.065 [1.21]	0.005 [0.74]	0.021** [2.20]	0.109 [1.02]
Capital	0.031 [1.41]	0.065 [1.39]	-0.076 [-0.87]	0.004 [0.60]	0.038*** [3.02]	-0.265* [-1.97]
Loan	-0.066** [-2.61]	-0.093** [-2.29]	-0.191** [-2.06]	0.000 [0.13]	-0.002 [-1.03]	-0.008 [-0.40]
Liquidity	-0.029 [-1.25]	-0.058 [-1.36]	-0.216*** [-2.67]	0.006 [1.38]	-0.004 [-1.13]	-0.034 [-1.11]
DepIns	0.000 [.]	0.000 [.]	0.000 [.]	0.007*** [2.79]	-0.008*** [-4.44]	-0.102*** [-3.73]
Rlaw	-0.010* [-1.89]	-0.005 [-0.69]	-0.029 [-1.19]	0.001a [1.53]	-0.003*** [-6.46]	-0.014*** [-2.84]
Srights	0.000 [.]	0.000 [.]	0.000 [.]	0.000 [0.21]	-0.000 [-0.36]	0.026* [1.72]
Entry	-0.004** [-2.10]	0.000 [0.01]	-0.000 [-0.00]	-0.004* [-1.94]	0.009*** [6.35]	0.121*** [5.80]
Religion	0.012a [1.55]	0.000 [.]	0.000 [.]	0.004 [0.90]	<b>-0.015***</b> <b>[-8.82]</b>	<b>-0.078***</b> <b>[-4.28]</b>
Gdpgrowth	-0.029 [-0.79]	-0.010 [-0.14]	-0.181 [-0.62]	0.015 [0.75]	0.009 [1.02]	0.012 [0.10]
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.266** [2.40]	0.252** [2.27]	0.821** [2.42]	0.029* [1.80]	-0.047*** [-4.36]	-0.696*** [-5.57]
Observations	152	152	161	207	207	198
Adjusted R-squared	0.358	0.516	0.167	0.233	0.721	0.532

This table presents the results of the ordinary least estimates of different proxy for bank risk on SSB characteristics and control variables across Islamic banks with different geographic location. Partitions are based on whether a country is a member of Gulf Cooperation Council, GCC, or not. NetIntincomevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Netincomevol is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Z- score is the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from Bankscope database. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBforeign is the percentage of SSB members who are foreigners. Data is hand collected. SSBtop20 is the percentage of SSB members with top twenty rankings. Data from Ünäl (2011). BODNo is the number of directors in Islamic bank's board. Date is hand collected. CEOduality is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from Bankscope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from Bankscope database. Capital is total equity divided by total assets. Data from Bankscope database. Loan is total loans divided by total assets. Data from Bankscope database. Liquidity is cash and



due from banks scaled by total asset. Data from Bankscope database. DepIns is an indicator variable that sets to one if a country has explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey. All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.

**Table 3.7: Shariah boards and bank risk-taking before and after the financial crisis**

Dependent variable	Before crisis ln(NetInt incomevol)	Before crisis ln (Netincome vol)	Before crisis ln(1/Z-score)	After crisis ln(NetInt incomevol)	After crisis ln (Netincome vol)	After crisis ln(1/Z-score)
ln(SSBNo)	0.031 [0.49]	-0.034 [-0.35]	0.213 [1.27]	0.030 [0.61]	<b>0.220**</b> <b>[2.09]</b>	<b>0.051**</b> <b>[2.10]</b>
SSBforeign	-0.027 [-0.59]	0.035 [0.33]	0.116 [0.52]	<b>-0.120a</b> <b>[-1.62]</b>	<b>-0.206*</b> <b>[-1.75]</b>	-0.031 [-1.14]
SSBtop20	<b>0.161**</b> <b>[2.49]</b>	<b>0.269*</b> <b>[1.83]</b>	<b>0.590**</b> <b>[2.27]</b>	0.045 [0.76]	<b>0.246**</b> <b>[2.14]</b>	0.010 [0.31]
ln(BODNo)	-0.046 [-0.66]	-0.080 [-1.07]	-0.109 [-0.63]	-0.069 [-0.85]	-0.032 [-0.37]	-0.041* [-1.79]
CEOduality	-0.004 [-0.12]	-0.045 [-0.54]	0.156 [0.97]	0.215 [1.31]	0.334 [1.13]	0.032 [0.36]
Size	0.052* [1.82]	0.076a [1.66]	0.085 [0.97]	-0.038*** [-3.17]	-0.134*** [-4.45]	-0.042*** [-4.05]
Charter	0.013 [0.24]	-0.018 [-0.23]	0.205 [0.92]	0.086 [1.24]	-0.012 [-0.08]	0.063 [0.69]
Capital	0.823*** [2.96]	2.072*** [4.34]	1.483** [2.03]	0.210 [1.04]	0.387 [1.23]	-0.156a [-1.55]
Loan	-0.122 [-0.89]	0.077 [0.41]	0.038 [0.12]	-0.396a [-1.55]	-0.571* [-1.95]	-0.132** [-1.99]
Liquidity	0.141 [1.04]	0.205 [0.83]	-0.973* [-1.74]	-0.476* [-1.97]	-0.657* [-1.92]	-0.131a [-1.53]
DepIns	0.000 [.]	0.000 [.]	-0.308 [-0.87]	0.028 [0.25]	0.039 [0.48]	-0.110** [-2.14]
Rlaw	-0.056** [-2.09]	-0.082a [-1.61]	-0.155* [-1.81]	0.003 [0.17]	-0.029 [-1.17]	-0.002 [-0.26]
Srights	-0.024 [-0.67]	-0.007 [-0.09]	0.250 [1.04]	-0.022 [-0.99]	-0.053* [-1.94]	0.006 [0.47]
Entry	-0.062** [-2.02]	-0.090a [-1.49]	-0.080 [-0.69]	0.017 [0.81]	-0.002 [-0.07]	-0.005 [-0.48]
Religion	0.124* [1.85]	0.245* [1.87]	0.144 [0.40]	-0.036 [-0.37]	-0.187a [-1.52]	-0.099*** [-2.64]
Gdpgrowth	-0.189 [-0.60]	-0.172 [-0.30]	-0.046 [-0.03]	0.222 [0.74]	0.096 [0.22]	-0.213 [-1.01]
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.378 [1.42]	0.349 [0.98]	1.125 [1.38]	0.609a [1.59]	1.631*** [3.01]	0.613*** [3.19]
Observations	197	197	173	162	162	186
Adjusted R-squared	0.372	0.597	0.065	0.226	0.579	0.356

This table presents the results of the ordinary least estimates of different proxy for bank risk on SSB characteristics and control variables across Islamic banks during global financial crisis. The sample is split to pre-crisis period (up to and including 2007) and post crisis period (2008 or after). NetIntincomevol is the standard deviation of annual net interest income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Netincomevol is the standard deviation of annual net income, expressed as a percentage of average total assets, and measured over each five-year period. Data from Bankscope. Z- score is the sum of annual returns on average assets ratio plus capital asset ratio for each firm divided by the standard deviation of firm annual returns divided by average asset over each five-year period. Data from Bankscope database. SSBNo is the number of Shariah scholars in Shariah supervisory boards. Data is hand collected. SSBforeign is the percentage of SSB members who are foreigners. Data is hand collected. SSBtop20 is the percentage of SSB members with top twenty rankings. Data from Ünäl (2011). BODNo is the number of directors in Islamic bank's board. Date is hand collected. CEOduality is a dummy variable that equals one if CEO chairs the board and zero otherwise. Data is hand collected. Size is natural logarithm of total assets at the end of each fiscal year. Data from Bankscope database. Charter is Keeley's Q (Keeley, 1990) which is calculated as the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets. Data from Bankscope database. Capital is total equity divided by total assets. Data from Bankscope database. Loan is total loans divided by total assets. Data from Bankscope database. Liquidity is cash and

due from banks scaled by total asset. Data from Bankscope database. DepIns is an indicator variable that sets to one if a country has explicit deposit insurance and to zero otherwise. Data from Demirgus-Kunt, Kane, and Laeven (2008). Rlaw is a scale from 1-10 to measure the quality of law enforcement in a country, produced by the risk-rating agency International Country Risk (ICR). Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Entry is the sum of 8 sub-indices related to administrative entry requirements imposed by supervisors, as further described in Barth, Caprio, and Levine (2001). Srights is an index from 1-5 to aggregate the following shareholders' rights: One Share-One Vote, Proxy by mail, shares blocked before meeting, cumulative voting, and oppressed minorities mechanism. Data from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). Religion is an indicator variable that equals one if the percentage of Muslims in a country is 90% or more and zero otherwise. Data from World Bank Survey. Gdpgrowth is a country's annual percentage growth rate of GDP at market prices based on constant local currency. Data from World Bank Survey. All models include country fixed effects and year fixed effects. Robust t-statistics adjusted for firm-level clustering are reported in brackets. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level respectively.