The role of corporate governance on shariah non-compliant risk: Evidence from Southeast Asia

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Abstract

Shariah non-compliance risk is a unique feature in Islamic finance. Non-compliance with Shariah principles can lead to loss of income in the short-run and reputation risks in the short term. Since the overall governance and Shariah governance framework determines the status of Shariah compliance risk, this paper examines the relationship between the board of directors, shariah committee and shariah non-compliant risk. This paper empirically investigates, for the first time, how the structure of the board and shariah committee affects shariah non-compliance risk in Malaysia and Indonesia over the period 2010-2015. The results show that an independent board demands an additional and extensive shariah audit from a large and active shariah committee in order to certify their monitoring function as well as to protect the shariah law, resulting in higher shariah non-compliant income. We also find that a larger and active shariah committee is associated with effective monitoring, which, in turn, helps to reduce shariah non-compliant risk. Collectively, the results suggest that strong corporate governance reduces bank risk taking. The findings are of potential interest to policy makers, professionals and boards of directors, especially on issues relating to shariah non-compliance risk and the mandating of corporate governance practices.
1. Introduction

The topic of risk and corporate governance in banks has received significant attention from regulators, bank managers, customers and academics due to the nature of high leverage, great opacity and the complexity of banking assets and activities, especially following the recent financial crisis. Evidence suggests that banks with poor governance engage in excessive risk-taking and do so even more during a crisis (Kirkpatrick, 2009; Chen and Lin, 2016; Díaz and Huang, 2017). Potentially, the risk exposure may be different and more complex when the agency relationship and governance setting deviate from their conventional form.

There are significant differences between conventional and Islamic banks. Firstly, the aim of the Islamic bank is to adhere the shariah law (Islamic Law) and as such maximise shareholder value in a shariah compliant manner (Safieddine, 2009). In particular, Islamic banks are prohibited from taking and charging interest (riba), being involved in speculation (gharar), and using different instruments such as derivatives. Secondly, the governance setting includes an element of shariah governance with the shariah supervisory committee playing a key role in assisting the board of directors and management to ensure that shariah law is adhered throughout the business operations (Choudhury and Haque, 2006). Lastly, the Islamic banks are exposed to a new type of risk known as shariah non-compliance risk in addition to the credit, market, operational and liquidity risks.

This paper examines the relationship between corporate governance and shariah non-compliance risk in Malaysian and Indonesian Islamic banks in Southeast Asia. These two countries are among the most progressive in the development of the Islamic financial services industry (IFSB, 2016). Moreover, they represent the majority of Islamic banks in the Southeast Asian region that includes Singapore, the Philippines, Thailand and Brunei.

This study contributes to the growing literature on the study of corporate governance and bank risk exposure. To our knowledge, this paper is among the first to examine shariah non-compliance risk and corporate governance that includes features of the shariah committee. Our study is closely related to that of Mollah and Zaman (2015) who examine the relationship between the shariah committee and performance. We expand the governance structure of the shariah committee used in the literature by including additional variables such as meeting frequency and shariah committee compensation. Secondly, previous studies on corporate governance and bank risk-taking have mostly focused on individual risk such as credit risk, market risk, interest rate risk and insolvency risk or the interaction among the risk category. However, no existing studies have examined shariah non-compliance risk which is only relevant to Islamic financial institutions. Thus, we compliment the work of Chen and Lin (2016), Aebi et al (2012) Vallascas et al (2017) and Laeven and Levine (2009) by adding another dimension to the governance and risk literature.

To fill these gaps, we provide empirical evidence on the board of directors, shariah committee and shariah non-compliance risk. In this study, we do not only look at the individual characteristics of the board (related to board size and the independence of the director) and shariah committee (size, meeting frequency and compensation) but also at the overall corporate governance index and interaction terms between independent board and shariah committee characteristics. We performed our investigation using data on Islamic
banks from Malaysia and Indonesia over the period 2010 - 2015. Based on 127 bank-year observations, our findings suggest that an independent board is associated with higher shariah non-compliant income. The additional findings on the interaction terms between the independent board and shariah committee’s characteristics (size and meeting frequency) suggest that an independent board demands an additional and extensive shariah audit from a large and active shariah committee in order to certify their monitoring function. The more the shariah audit effort is demanded by the independent board, the higher the possibilities of discovering shariah non-compliant activities/transactions. The results also indicate that the larger size and higher frequency of shariah committee meeting reduces the shariah non-compliance risk. Furthermore, we find no consistent evidence to suggest that the size of the board and shariah committee compensation affect the shariah non-compliance risk. Overall, our analysis shows that the banks with strong corporate governance environments reduce shariah non-compliant risk. These results are robust to various model specifications and tests.

The remainder of this paper is organized as follows. Section two describes the background and hypotheses development. Section three presents the data and models specification. Section four reports the empirical finding and section five concludes.

2. Background and hypotheses development

2.1 Operational risk, shariah non-compliance risk and governance

The Basel Committee on Banking Supervision defines operational risks as risks that are associated with failures of internal processes, people, and/or systems or the impact from external events (BCBS, 2005). In Islamic banks, the definition of operational risk also includes any other possible losses that arise from shariah non-compliance and the failure to perform their fiduciary responsibilities (IFSB, 2005). Shariah non-compliance risk can be defined as ‘the risk arising from Islamic banks’ failure to comply with the Shariah rules and principles determined by the Shariah board or the relevant body in the jurisdiction in which the Islamic bank operates’ (IFSB 2005). The failure to comply with shariah law in all aspects of the Islamic bank’s operation and management will result in the transaction being declared as void and, thus, income from such activities/products cannot be recognised in the books and is therefore given away as charity.

To ensure that operations and products comply with the shariah and to mitigate shariah non-compliance risks, Islamic banks institute shariah governance regimes. IFSB (2009) provides the guidelines of a robust shariah governance framework to include four key elements: issuance of shariah pronouncements by a shariah supervisory board or committee; ensuring compliance with Shariah pronouncements by an in-house shariah compliance unit; internal shariah compliance review and audit carried out by an internal shariah review/audit unit; and the conducting of an annual external shariah compliance audit to ensure the internal shariah audit is carried out properly. Shariah non-compliant income represents shariah non-compliance risk since the revenue from these activities is excluded from the bank’s income and is given to charity. Since the costs are incurred but no revenue is generated, this results in net-losses on these transactions for the bank.
There are two possible channels through which internal control and auditing can impact shariah non-compliant income which is a proxy for shariah non-compliant risk. The shariah non-compliant income is closely associated with an independent shariah audit since it results from the internal shariah auditing work. The more the shariah audit effort is demanded, the higher the possibility of shariah non-compliant activities/transactions being discovered. Alternatively, there is also the possibility of higher shariah non-compliant income or higher shariah non-compliant risk arising due to a poor internal control environment. The banks that are bound by a strong internal control environment will probably have a lower shariah non-compliant risk. In other words, strong corporate governance in terms of internal controls reduces shariah non-compliant risk, leading to lower shariah non-compliant income. Since there is an absence of accurate measures for shariah audit effort (e.g. audit hours) and no previous studies have examined or used this proxy, in this paper it is assumed that better governance mechanisms in terms of internal control and auditing are associated with lower shariah non-compliant risk.

Furthermore, there are direct and indirect links between the board of directors, shariah committee and shariah non-compliant risk. The principal roles of the shariah committee are to advise and make recommendation to the board with regards to shariah matters. Thus, we might expect the shariah committee to have a direct relationship with shariah non-compliant risk due to the nature of their duties in dealing with shariah matters. Furthermore, authoritative guidance requires the shariah committee to organise an independent shariah audit to ensure that all procedures and contract documentations are fully compliant with shariah law (IFSB, 2009). Under the indirect link, an effective board of directors will first review the overall recommendation of the shariah committee before accepting any proposal since the board of directors is accountable for all their sub committees’ actions. In relation to shariah non-compliant risk, it is reasonable to expect that an effective board demands an additional and extensive independent shariah audit from the shariah committee in order to certify their monitoring function as well as to protect the shariah law. Failure to constrain the shariah non-compliant risk may incur reputational damage, increase future legal risk exposure and disappoint shareholders. According to Chapra and Ahmed (2002), a large percentage of Islamic financial institutions’ capital providers including shareholders and investors are extremely concerned that their funds are invested in a shariah-compliant manner.

Collectively, in order to mitigate non-compliance risk, the Islamic banks are expected to have an adequate system and control including good governance. Better corporate governance is expected to reduce the banks’ risk due to the anticipated involvement of the effective board of director and its subcommittees. The shariah committee is one of the main organs in ensuring the overall bank’s operations are fully governed by shariah law. However, given that the board of directors has a right to appoint and remove the shariah committee members, their role is equally crucial in promoting a higher degree of shariah compliance. In other words, the performance of shariah committee is founded in the practices and attitudes of the entire board of directors. Therefore, in this paper, while the demand for an effective shariah committee is recognised, the monitoring roles of the board is argued to be the more important mechanism by which to ensure that shariah law is implemented and protected.

2.2 The effectiveness of board and shariah committee
Evidence suggests that several characteristics of the board of director and its subcommittees may influence their effectiveness in monitoring roles, including the size of the board/committee, the composition of independent directors, the frequency of meetings, and compensation (John and Senbet, 1998; Canyon and He, 2011). Each of these characteristics is now reviewed.

According to De Andres and Valleslado (2008), there is a trade-off between advantages and disadvantages in terms of human capital, monitoring, coordinating, and control issues with regards to the size of the board. A larger board size contributes more to human capital but is less effective due to the problems of coordination and process that, in turn, contribute to weak monitoring. Furthermore, evidence from prior studies have shown that smaller boards are more effective as directors can communicate better on themselves and they are easier to manage (Yermek, 1996; Eisenberg et al., 1998, Mollah and Zaman, 2015). These factors promote a more resourceful conversation. Based on these, we might expect that smaller boards are more efficient in constraining shariah non-compliant risk.

Non-executive directors are associated with the responsibility of monitoring managers and thereby reducing agency costs that arise from the separation of ownership and control in day-to-day company management (Fama and Jensen, 1983; Brennan and McDermott, 2004). Prior studies indicate that an independent board is an effective monitoring safeguard (Carcello et al., 2002; Xie et al., 2003). The higher independence of non-executive directors on boards is expected to induce a more effective monitoring function which then leads to lower shariah non-compliant risk. Our study also considers the interaction effect of independent non-executive directors with the shariah committee’s characteristics. This interaction effect may reflect the ability of the board to work together with their subcommittee and to oversee the monitoring and collaboration functions between them.

Consistent with the argument for an effective size of board of directors’ literature, too small a committee size may reflect an insufficient number of directors able to serve the committee and thereby reducing the effectiveness of monitoring (Vafeas, 2005). This is probably due to the inability of individual director to perform their duties efficiently as the committee’s assignments are spread across a small number of directors. In addition, when a committee is too large, the performance of the directors may decline due to the problems of coordination and process and therefore weaken the monitoring function (Jensen, 1993; Vafeas, 2005). Since the size of board’s subcommittees is relatively smaller than the size of the board of director, evidence from audit committee sizes literature suggests that firms with larger audit committees are more effective in monitoring management (Chen and Zhou, 2007). Therefore, it could also be argued that the larger the size of the shariah committee, the more effective they are in monitoring shariah matters.

In board of directors’ studies, Conger et al. (1998) suggests that more frequent board meetings improve a board’s effectiveness as the meetings are a key dimension of board operations (Vafeas, 1999). In addition, the firms with a higher number of audit committee meetings experience less financial restatement (Abbott et al., 2004) and are associated with lower incidences of earnings management (Xie et al., 2003). These studies suggest that audit committees who meet regularly during the financial year are linked to effective monitoring. The more frequently they meet, the more efficiently they discharge their oversight
responsibilities. Borrowing from the literature, we expect an inverse relationship between the shariah committee meeting and shariah non-compliant risk.

Agency theory suggests that one way to monitor an agent’s behaviour is through their compensation contracts, enabling the interest between principal and agent to be perfectly aligned (Jensen and Meckling, 1976). Consistent with the proposition of agency theory, the empirical evidence from archival studies suggests that executive/director compensations improve their monitoring ability and thus lead to an increase in firm performance (Mengistae and Xu, 2004; Chen et al., 2011; Newton, 2015). We argue that the shariah committee with a higher level of compensation package is more efficient in constraining the shariah non-compliant risk.

In addition to the studies of the individual characteristics of governance (e.g. size, independence, meetings and compensation), there are also studies that combine all characteristics into a corporate governance composite index (Aggarwal et al., 2016; Col and Errunza, 2015). We also incorporate the corporate governance index in our study in order to investigate further the impact of corporate governance on shariah non-compliant risk. We expect an inverse relationship between corporate governance index and shariah non-compliant risk.

3. Data and model specification

The initial sample of Malaysian and Indonesian Islamic banks consists of 16 and 12 Islamic banks respectively. There are 168 bank-year observations from the period 2010 to 2015. All of these banks offer full-fledged Islamic products and services. We exclude 41 observations because of the data on shariah non-compliant income and corporate governance variables were unavailable. Table 1 summarizes the derivation of our sample which consists of 127 bank-year observations.

All data is hand collected from the Islamic banks' annual reports with the exception of GDP growth which is gathered from https://knoema.com/. The annual report is used because it is widely available and public information by virtue of the regulated disclosure rule under the regulatory bodies of Bank Negara Malaysia and Bank Indonesia. These annual reports are available and downloadable from the individual Islamic banks' websites.

In order to examine the relationship between the board of directors, shariah committee and the shariah non-compliant risk, the following model is employed:

\[
\text{Ln } \text{Shariah non-comp. inc} = a_0 + \beta_1 \text{Ln_board size} + \beta_2 \text{Board ind} + \beta_3 \text{Ln_SC size} + \\
\beta_4 \text{Ln_SC meeting} + \beta_5 \text{Ln_SC compensation} + \beta_6 \text{Ln_asset} + \\
\beta_7 \text{Leverage} + \beta_8 \text{Ln_age} + \beta_9 \text{GDP} + \epsilon
\]

Where;

Dependent variable:

\[
\text{Ln } \text{Shariah non-comp. inc} = \text{the natural log of shariah non-compliant income;}
\]
Hypothesis variables:

\[\text{Ln\_board size} = \text{the natural logarithm of total assets};\]
\[\text{Board ind} = \text{coded 1 if the percentage of independent directors is greater than the sample median, 0 otherwise};\]
\[\text{Ln\_SC size} = \text{the natural logarithm of shariah committee members};\]
\[\text{Ln\_SC meeting} = \text{the natural logarithm of shariah committee meetings during a year};\]
\[\text{Ln\_SC compensation} = \text{the natural logarithm of shariah committee compensation};\]

Control variables:

\[\text{Ln\_asset} = \text{the natural logarithm of total assets};\]
\[\text{Leverage} = \text{the proportion of debts to total assets};\]
\[\text{Ln\_age} = \text{the natural logarithm of bank age};\]
\[\text{GDP} = \text{country gross domestic product};\]
\[\text{Year dummy}\]

As indicated, the non-compliant income is a proxy for shariah non-compliance risk.\(^1\) In addition to the hypothesis variables, we control for the effects of other variables that have been found in prior literature to affect the bank’s risk (see Chen and Lin, 2016; Vallascas et al, 2017) – the natural log of total assets (\(\text{Ln\_asset}\)), the proportion of debts to total assets (\(\text{Leverage}\)), the natural log of bank age (\(\text{Ln\_age}\)) and the country GDP (\(\text{GDP}\)). We argue that as bank size increases (\(\text{Ln\_asset}\)) and is highly leveraged (\(\text{Leverage}\)), the banks’ business operations will be more complex and the banks may need to put more effort into dealing with shariah non-compliant risk. Thus, we expect these variables to be positively associated with shariah non-compliant income. As the age of the bank increases (\(\text{Ln\_age}\)), they may gain more experiences in dealing with shariah risk, resulting in a lower shariah non-compliant risk. Thus, the present study predicts a negative relationship between the age of the bank and shariah non-compliant income. We also control for the economic performance of each country, which the country’s GDP is a proxy of. We argue that higher country GDP increases the capacity of countries to rescue the Islamic bank, resulting in lower shariah non-compliant risk. We expect a country’s GDP to be negatively related with shariah non-compliant risk.

To allow for tests in which we investigate further the effects of corporate governance, we also construct the corporate governance index. Our corporate governance index (\(\text{CG index}\)) is comprised of attributes that capture the size of the board, independent directors, size of the shariah committee, number of shariah committee meetings, and shariah committee compensation. By construction, the bank with a higher score of \(\text{CG index}\) should have a greater ability in constraining shariah-non compliant activities, hence lowering the shariah non-compliant risk. Therefore, we predict the \(\text{CG index}\) to be negatively associated with shariah non-compliant risk.

\[\text{CG index} = \sum (\text{Board size1, Board ind, SC size1, SC meeting1, SC compensation1})\]

\(^1\) The banks that reported zero shariah non-compliant income is set to one dollar to allow for log transmission. Since the Indonesian banks operate with a two-tier board structure, thus board independence refers to the number of independent board of commissioners. Meanwhile, the board size is the total number of board of commissioners and board of directors.
Where:

- Board size\(_1\) = coded 1 if the size of board is less than the sample median, 0 otherwise;
- SC size\(_1\) = coded 1 if the size of shariah committee is more than the sample median, 0 otherwise;
- SC meeting\(_1\) = coded 1 if the number of shariah committee meeting during a year is more than sample median; 0 otherwise;
- SC compensation\(_1\) = coded 1 if the shariah committee compensation is more than sample median; 0 otherwise.

We modify Model (1) as follows:

\[
\text{Ln}_{\text{Shariah non-comp. inc}} = \alpha_0 + \beta_1 \text{Ln}_\text{board size} + \beta_2 \text{Board ind} + \beta_3 \text{Ln}_\text{asset} + \\
\beta_4 \text{Leverage} + \beta_5 \text{Ln}_\text{age} + \beta_7 \text{GDP} + \varepsilon
\]  
(2)

\[
\text{Ln}_{\text{Shariah non-comp. inc}} = \alpha_0 + \beta_1 \text{Ln}_\text{SC size} + \beta_2 \text{Ln}_\text{SC meeting} + \beta_3 \text{Ln}_\text{SC compensation} + \\
\beta_4 \text{Ln}_\text{asset} + \beta_5 \text{Leverage} + \beta_6 \text{Ln}_\text{age} + \beta_7 \text{GDP} + \varepsilon
\]  
(3)

\[
\text{Ln}_{\text{Shariah non-comp. inc}} = \alpha_0 + \beta_1 \text{Ln}_\text{board size} + \beta_2 \text{Board ind} + \beta_3 \text{Ln}_\text{SC size} + \\
\beta_4 \text{Ln}_\text{SC meeting} + \beta_5 \text{Ln}_\text{SC compensation} + \beta_6 \text{Board ind}*\text{Ln}_\text{SC size} + \beta_7 \text{Board ind}*\text{Ln}_\text{SC meeting} + \\
\beta_8 \text{Ln}_\text{asset} + \beta_9 \text{Leverage} + \beta_{10} \text{Ln}_\text{age} + \beta_{11} \text{GDP} + \varepsilon
\]  
(4)

\[
\text{Ln}_{\text{Shariah non-comp. inc}} = \alpha_0 + \beta_1 \text{CG Index} + \beta_2 \text{Ln}_\text{asset} + \beta_3 \text{Leverage} + \beta_4 \text{Ln}_\text{age} + \beta_5 \text{GDP} + \varepsilon
\]  
(5)

In Model (2) and (3), we group the corporate governance variables into board variables (\text{Ln}_\text{board size} and \text{Board ind}) and shariah committee variables (\text{Ln}_\text{SC size}, \text{Ln}_\text{SC meeting} and \text{Ln}_\text{SC compensation}), respectively. In Model (4), we include the interaction terms between the independent board and shariah committee variables, namely (i) \text{Board ind}*\text{Ln}_\text{SC size} and (ii) \text{Board ind}*\text{Ln}_\text{SC meeting}. The interaction term is developed to examine whether the independent board attributes have complementary or substitutive effects on shariah committee variables (size and meeting) in reducing the shariah non-compliant risk. The control variables remain the same in all models.
4. Empirical findings

4.1 Descriptive statistics

Table 3 reports the descriptive statistics for shariah non-compliant income, hypothesis variables and related control variables containing minimum, lower quartile, mean, median, upper quartile, maximum and standard deviation. Panel A in Table 3 present the hypothesis variables before the variables are transformed. The mean (median) of shariah non-compliant income for 127 bank-years is $246,521 ($21,957). With respect to the corporate governance variables, we find that the mean (median) of board size is 7.61 (7) and 51% of them are independent. As compared to Mak and Li (2001) who report the mean (median) for 147 Singapore Listed firms for the fiscal year 1995 as 8.04 (8), 57% of them are independent directors. This comparison implies that the firms in Singapore in the last 22 years ago are more likely to be dominated by independent directors while Islamic banks in Malaysia and Indonesia have an almost balanced representation of independent and non-independent directors. The mean size of the shariah committee is 3.7, which is relatively consistent with the figure reported in Mollah and Zaman (2015) who report the mean size of the shariah committee as 4.17. The average frequency of shariah committee meetings is 12.93 times a year and their yearly mean compensation is $90,421.

In Panel B in Table 3, we present the hypothesis variables and related control variables in the natural logarithm form and ratio. The mean (median) of these variables include: shariah non-compliant income at 8.44 (9.99); board size at 2.00 (1.94); board independence 0.22, shariah committee size 1.23 (1.09); shariah committee meetings at 2.48 (2.77); shariah committee compensation at 11.09 (11.03); overall corporate governance index at 2.16 (2.00); total assets at 21.31 (21.54); leverage at 0.88 (0.91); the bank’s age at 1.83 (1.79); and the GDP at 5.56 (5.55).

Table 4 contains a correlation matrix of the variables used in the paper. In general, the overall correlation matrix shows that each of the variables are moderately inter-correlated with one and another except for variables \( \text{Ln\_SC compensation} \) and \( \text{CG index} \) with \( \text{Ln\_DC meeting} \) (correlation coefficients of 66% and 64%, respectively). The highest correlation coefficients between \( \text{Ln\_SC compensation} \) and \( \text{CG index} \) are not critical because these variables are associated with different model specifications. The \( \text{Ln\_SC size} \) is significantly correlated with all the variables except the GDP.

4.2 Multivariate results

In Table 5, we report our regression results from estimating Model (1) to (5) on the full sample and two sub-samples - large and small banks. We split the pooled sample into two subsets of data at the median of \( \text{Ln\_assets} \) (proxy for bank size) to observe if size effects exist. The banks that have that have \( \text{Ln\_assets} \) above the median are identified as large banks and the banks that have \( \text{Ln\_assets} \) below the median are identified as small banks. The F statistics for all models are significant at \( p<0.001 \), suggesting that the models are statistically valid. All models are estimated using a least square regression with robust standard error to control for heteroscedasticity.
The \textit{Ln\_board size} is insignificant with shariah non-compliant risk across a full sample and sub samples. However, the \textit{Board\_ind} is significant and positively related to shariah non-compliance income. The independent board demands an additional and extensive shariah audit in order to certify their monitoring function, thus increasing the shariah-non compliant income. The more shariah audit effort is demanded, the higher the possibility that shariah non-compliant activities/ transactions will be discovered. This argument is valid since in Model 4 (full sample and large bank), the interaction terms (\textit{Board\_ind*Ln\_SC meeting} and \textit{Board\_ind*Ln\_SC size}) are significant and positively related to shariah non-compliant risk. The significant interaction terms indicates that there is a complementary relationship between independent board and shariah committee characteristics. There is a possibility that banks with a higher number of independent directors is associated with the more effective monitoring function of the board, which subsequently induces the large and active shariah committee to demand a more independent shariah audit. Thus, this increases the shariah non-compliant income accordingly. For the small banks, we do not find an independent board to be associated with shariah non-compliant income.

The \textit{Ln\_SC size} is significant and negatively related to shariah non-compliant risk across all samples. This may suggest that the banks with larger shariah committee size are likely to have less shariah non-compliance risk. The larger size of the shariah committee improves the shariah oversight function of the committee since the complexity of bank operations are being divided among the shariah members. Therefore, each individual member of shariah committee is more effective in constraining the shariah non-compliant risk.

The number of shariah meetings is found to be significant and negatively related to shariah non-compliant risk across full samples and small banks. The negative relationship may suggest that more frequent shariah committee meetings allow the shariah members to identify and resolve potential problems related to shariah matters, thus reducing shariah non-compliant risk. However, this finding does not extend to larger banks. The shariah committee compensation is significant and negatively associated to shariah non-compliant risk only for small banks and this finding is not hold in both full sample (except in model 1) and large banks.

In model (5), the corporate governance index is significant and negatively related to shariah non-compliant risk. As predicted, the banks with a strong corporate governance are more likely to have lower shariah non-compliance risk. This result is consistent with Chen and Lin, (2016) and Diaz and Huang (2017) who argue that corporate governance is able to reduce the exposure of bank risk-taking.

The results for all the control variables are insignificant with shariah-non compliant risk except the \textit{Leverage} and \textit{GDP} in the large bank. The \textit{leverage} is significant and positively related to shariah non-compliant risk, suggesting that banks with higher leverage are likely to have higher shariah non-compliant risk due to the increased complexity of business operations and activities. The \textit{GDP} is significant and negatively related with shariah non-compliant risk. This weak relationship is no longer significant in a full sample and sub-sample of a small bank.

4.3 Additional analysis and robustness tests
This section further investigates the results obtained in the primary analysis. The purpose of additional analyses is to provide reasonable assurance that the main findings are robust to the specifications of various models. The results are presented in Table 6.

4.3.1 Alternative test variable
The primary results suggest that an independent board, shariah committee size, shariah committee meeting and corporate governance index are significantly related to shariah non-compliant risk. The present study provides new definitions for board and shariah committee variables to see whether alternative definitions affect the main results. The new definitions are as follows:

i. \textit{Ln}_\textit{board size} is now defined as a dichotomous variable, \textit{Board size1}, and coded as 1 if the size of board is less than the sample median; 0 otherwise;

ii. \textit{Board ind} is now defined in the dichotomous version, \textit{Board ind1}, and coded 1 if the percentage of independent directors is greater than the sample median; 0 otherwise;

iii. \textit{Ln}_\textit{SC size} is also defined as a dichotomous variable, \textit{SC size1}, and coded 1 if the size of the shariah committee is more than the sample median; 0 otherwise;

iv. \textit{Ln}_\textit{SC meeting} is also defined as a dichotomous variable, \textit{SC meeting1} = coded 1 if the number of shariah committee meetings during a year is more than the sample median; 0 otherwise;

v. \textit{Ln}_\textit{SC compensation} is also defined as a dichotomous variable, \textit{SC compensation1} = coded 1 if the shariah committee compensation is more than sample median; 0 otherwise.

vi. \textit{CG index} is now defined as \textit{CG index1}:

\[
\text{CG index1} = \sum (\text{Board size2}, \text{Board ind2}, \text{SC size1}, \text{SC meeting2}, \text{SC compensation2})
\]

Where,

\text{Board size2} = \text{coded as 1 if the board size is between 7 to 9, 0 otherwise;}

\text{Board ind2} = \text{coded as 1 if the percentage of independent directors in the sample is more than 60%, 0 otherwise;}

\text{SC size1} = \text{coded 1 if the size of shariah committee is more than the sample median, 0 otherwise;}

\text{SC meeting2} = \text{coded 1 if the number of shariah committee meetings during a year is more than the sample mean, 0 otherwise;}

\text{SC compensation2} = \text{coded 1 if the compensation of shariah committee is more than the sample mean, 0 otherwise.}

Panel A, Table 6 reports the results of these alternative test variables. In summary, the primary findings are robust to the alternative definitions of board and audit committee variables. Our results remain in line with the full sample analysis.

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2 The additional analyses and the robustness tests have been performed on the pooled sample and are analyzed using the OLS regression unless stated otherwise.

3 Lipton and Lorsch (1992) recommend the ideal size for a board should not exceed eight or nine directors. Jensen (1993) claims that when a board has beyond seven or eight members, it is less effective due to the problems of coordination and process which, in turn, contribute to weak monitoring. Thus, we assume that the ideal board size is in between seven to nine members.
4.3.2 Additional control variable

In addition to the control variables included in the main model, there are several variables that are argued to influence the determinants of bank risk. These variables are return on assets (ROA) and ratio of equity to total assets (EA). The present study tested whether the inclusion of these variables would affect the primary results. None of these control variables are significant with shariah non-compliant risk. In general, the main findings reported in Panel B, Table 6 hold even with the inclusion of these additional control variables.

4.3.3 Two-stage least square (2SLS)

To eliminate the endogeneity problem from simultaneity bias (if any), we perform 2SLS regression. Following Brick and Chidambaran (2010), the instrumental variables (IV) are the lagged values of the endogenous variables.⁴ We used the lagged value of Board Ind1, Ln_SC size, Ln_SC meeting as instrumental variables. The results are presented in Panel C, Table 6. Compared with the main finding, the results of 2SLS regressions are relatively consistent with the main findings on the full sample.

5. Conclusion

This study represents an initial attempt to study the relationships between corporate governance and shariah non-compliant risk. Although the corporate governance literature is quite developed, no prior study examines the link between corporate governance mechanism and shariah non-compliant risk in Islamic banks. Also, to the extent that the finance literature has examined corporate governance mechanisms at the board level, this study extends the literature by including the shariah committee characteristics (size, meeting frequency and compensation). We perform our investigation on Islamic banks from Malaysia and Indonesia over the period 2010 to 2015.

The empirical results indicate that independent board demands an additional and extensive shariah audit from a large and active shariah committee in order to certify their monitoring function as well as to protect the shariah law, resulting in higher shariah non-compliant income. The results also indicate that the larger size and higher frequency of shariah committee meetings reduces the shariah non-compliant risk. Collectively, our analysis shows that banks with strong corporate governance environments reduce shariah non-compliant risk. These results are robust to various model specifications and tests.

Being the first paper to explore shariah non-compliance risk in Islamic banks, the findings should be of potential interest to different stakeholders such as policy makers, professionals,

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⁴ The IV must fulfill the following conditions: (1) outside the regression model, (2) uncorrelated with regression errors and (3) strongly correlated with endogenous variables. To ensure the IV is valid, the present study estimated the reduced form equations on the first stage of 2SLS regression and examined the significance level of the endogenous variables. The t-statistic should be at least 3.3 (Adkins and Hill, 2007: 249-250). All the IVs meet the suggested criterions. Since the Board ind is a dummy variable, it is changed to a continuous version, Board Ind1, which is defined as the proportion of independent directors on board.
the boards of directors and academics, especially on issues relating to corporate governance practice and shariah non-compliant risk. They may use the findings as a parameter to estimate how the characteristics of the board and shariah committee may influence bank risk-taking as well as in planning strategies to mitigate future losses with regards to shariah non-compliant risk. There is a need to carry out further research to extend our study and explore more on the other effective characteristics of board and shariah committees, especially with a board with shariah knowledge and a shariah committee with financial expertise. This expertise will assist them to have access to resources that contribute to the superior ability to understand and interpret the business activities and risk even better.
**Table 1**
Summary of sample construction

<table>
<thead>
<tr>
<th>Description</th>
<th>Malaysia</th>
<th>Indonesia</th>
<th>Pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islamic bank</td>
<td>16 banks</td>
<td>12 banks</td>
<td></td>
</tr>
<tr>
<td>Initial sample (2010-2015)</td>
<td>96</td>
<td>72</td>
<td>168</td>
</tr>
</tbody>
</table>

Excluded:

Unavailability of shariah non-compliant income and corporate governance data

<table>
<thead>
<tr>
<th></th>
<th>Malaysia</th>
<th>Indonesia</th>
<th>Pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final sample</td>
<td>70</td>
<td>57</td>
<td>127</td>
</tr>
</tbody>
</table>

**Table 2**
Description of variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definitions and coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln _Shariah non-comp. inc =</td>
<td>the natural log of shariah non-compliant income;</td>
</tr>
<tr>
<td>ln_board size =</td>
<td>the natural logarithm of total assets;</td>
</tr>
<tr>
<td>Board Ind =</td>
<td>coded as 1 if independent board is more than the sample median; 0 otherwise;</td>
</tr>
<tr>
<td>ln_SC size =</td>
<td>the natural logarithm of shariah committee members;</td>
</tr>
<tr>
<td>ln_SC meeting =</td>
<td>the natural logarithm of shariah committee meetings during a year;</td>
</tr>
<tr>
<td>ln_SC compensation =</td>
<td>the natural logarithm of shariah committee' compensation during a year;</td>
</tr>
<tr>
<td>Board size1 =</td>
<td>coded 1 if the size of board is less than the sample median, 0 otherwise;</td>
</tr>
<tr>
<td>Board ind1 =</td>
<td>the percentage of independent directors to total board size;</td>
</tr>
<tr>
<td>SC size1 =</td>
<td>coded 1 if the size of shariah committee is more than the sample median, 0 otherwise;</td>
</tr>
<tr>
<td>SC meeting1 =</td>
<td>coded 1 if the number of shariah committee meeting during a year is more than sample median; 0 otherwise;</td>
</tr>
<tr>
<td>SC compensation1 =</td>
<td>coded 1 if the shariah shariah compensation is more than sample median; 0 otherwise</td>
</tr>
<tr>
<td>Board size2 =</td>
<td>coded as 1 if the board size is between to 7 to 9, 0 otherwise;</td>
</tr>
<tr>
<td>Board ind2 =</td>
<td>coded as 1 if the percentage of independent directors in the sample is more than 60%, 0 if otherwise;</td>
</tr>
<tr>
<td>SC meeting2=</td>
<td>coded 1 if the number of shariah committee meeting during a year is more sample mean; 0 otherwise.</td>
</tr>
<tr>
<td>SC compensation2 =</td>
<td>coded 1 if the compensation of shariah committee is more than more sample mean; 0 otherwise</td>
</tr>
<tr>
<td>ln_asset =</td>
<td>the natural logarithm of total assets;</td>
</tr>
<tr>
<td>Leverage =</td>
<td>the proportion of debts to total assets;</td>
</tr>
<tr>
<td>ln_age =</td>
<td>the natural logarithm of bank’ age;</td>
</tr>
<tr>
<td>GDP =</td>
<td>gross domestic product;</td>
</tr>
<tr>
<td>ROA =</td>
<td>return on total assets</td>
</tr>
<tr>
<td>EA =</td>
<td>equity to total assets</td>
</tr>
</tbody>
</table>
Table 3

Descriptive statistics (N=127).

This table presents the descriptive statistics for the full sample the descriptive statistics for the variables used in the models. See Table 2 for variable definitions.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Min.</th>
<th>Lower Quartile</th>
<th>Mean</th>
<th>Median</th>
<th>Upper Quartile</th>
<th>Max.</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: Raw data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shariah non-compliant income ($)</td>
<td>0</td>
<td>1804</td>
<td>246521</td>
<td>21957</td>
<td>49817</td>
<td>5334373</td>
<td>1451435</td>
</tr>
<tr>
<td>No. of board size</td>
<td>4</td>
<td>6</td>
<td>7.61</td>
<td>7</td>
<td>9</td>
<td>12</td>
<td>7.61</td>
</tr>
<tr>
<td>% of Independent board to board size</td>
<td>0.33</td>
<td>0.42</td>
<td>0.51</td>
<td>0.50</td>
<td>0.55</td>
<td>0.87</td>
<td>0.12</td>
</tr>
<tr>
<td>No. of SC size</td>
<td>2</td>
<td>2</td>
<td>3.7</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>1.56</td>
</tr>
<tr>
<td>No. of SC meeting</td>
<td>5</td>
<td>10</td>
<td>12.93</td>
<td>12</td>
<td>16</td>
<td>31</td>
<td>4.84</td>
</tr>
<tr>
<td>SC compensation ($)</td>
<td>15596</td>
<td>41821</td>
<td>90421</td>
<td>61738</td>
<td>105934</td>
<td>750349</td>
<td>90421</td>
</tr>
<tr>
<td>Panel B: Transform data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ln_Shariah non-comp inc</td>
<td>0</td>
<td>7.49</td>
<td>8.44</td>
<td>9.99</td>
<td>10.81</td>
<td>15.48</td>
<td>4.18</td>
</tr>
<tr>
<td>Ln_board size</td>
<td>1.38</td>
<td>1.79</td>
<td>2.00</td>
<td>1.94</td>
<td>2.19</td>
<td>2.39</td>
<td>0.23</td>
</tr>
<tr>
<td>Board ind.</td>
<td>0</td>
<td>0</td>
<td>0.22</td>
<td>0</td>
<td>1.00</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td>Ln_SC size</td>
<td>0.69</td>
<td>0.69</td>
<td>1.23</td>
<td>1.09</td>
<td>1.60</td>
<td>2.19</td>
<td>0.42</td>
</tr>
<tr>
<td>Ln_SC meeting</td>
<td>1.60</td>
<td>2.30</td>
<td>2.48</td>
<td>2.48</td>
<td>2.77</td>
<td>3.40</td>
<td>0.40</td>
</tr>
<tr>
<td>Ln_SC compensation</td>
<td>9.65</td>
<td>10.64</td>
<td>11.09</td>
<td>11.03</td>
<td>11.57</td>
<td>13.52</td>
<td>0.76</td>
</tr>
<tr>
<td>Overall CG Index</td>
<td>0</td>
<td>1</td>
<td>2.16</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>1.16</td>
</tr>
<tr>
<td>Ln_asset</td>
<td>18.39</td>
<td>20.15</td>
<td>21.31</td>
<td>21.54</td>
<td>22.43</td>
<td>24.38</td>
<td>1.48</td>
</tr>
<tr>
<td>Leverage</td>
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<td>0.85</td>
<td>0.88</td>
<td>0.91</td>
<td>0.93</td>
<td>0.94</td>
<td>0.09</td>
</tr>
<tr>
<td>Ln_age</td>
<td>0</td>
<td>1.38</td>
<td>1.83</td>
<td>1.79</td>
<td>2.30</td>
<td>3.43</td>
<td>0.76</td>
</tr>
<tr>
<td>GDP</td>
<td>4.70</td>
<td>5.00</td>
<td>5.56</td>
<td>5.55</td>
<td>6.00</td>
<td>7350</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Table 4

Correlation matrix (N=127)
This table contains the correlation between the variables used in this paper. All correlations
Correlation in bold are significant at p<0.001, in italic are significant at p<0.05 and underline at p<0.01.

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ln_Shariah non-comp inc</td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ln_board size</td>
<td>0.09</td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Board ind.</td>
<td><strong>0.31</strong></td>
<td><strong>0.50</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ln_SC size</td>
<td><strong>-0.24</strong></td>
<td>0.08</td>
<td><strong>-0.05</strong></td>
<td><strong>1.00</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Ln_SC meeting</td>
<td><strong>-0.05</strong></td>
<td><strong>-0.07</strong></td>
<td>0.10</td>
<td><strong>-0.34</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Ln_SC compensation</td>
<td><strong>-0.03</strong></td>
<td>0.10</td>
<td><strong>0.31</strong></td>
<td><strong>0.39</strong></td>
<td><strong>-0.12</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. CG index</td>
<td><strong>-0.25</strong></td>
<td>0.09</td>
<td>0.05</td>
<td><strong>0.66</strong></td>
<td><strong>-0.02</strong></td>
<td>0.49</td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Ln_asset</td>
<td><strong>-0.06</strong></td>
<td>0.18</td>
<td><strong>0.34</strong></td>
<td><strong>0.64</strong></td>
<td><strong>-0.11</strong></td>
<td>0.47</td>
<td><strong>0.59</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Leverage</td>
<td>0.12</td>
<td><strong>0.30</strong></td>
<td>0.27</td>
<td><strong>0.44</strong></td>
<td>0.05</td>
<td><strong>0.23</strong></td>
<td>0.45</td>
<td><strong>0.55</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
</tr>
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<td>10. Ln_age</td>
<td>0.13</td>
<td>0.21</td>
<td><strong>0.29</strong></td>
<td><strong>0.40</strong></td>
<td><strong>-0.09</strong></td>
<td>0.27</td>
<td><strong>0.41</strong></td>
<td><strong>0.59</strong></td>
<td><strong>0.47</strong></td>
<td><strong>1.00</strong></td>
<td></td>
</tr>
<tr>
<td>11. GDP</td>
<td><strong>-0.30</strong></td>
<td>0.10</td>
<td><strong>-0.01</strong></td>
<td>-0.10</td>
<td>0.05</td>
<td><strong>-0.09</strong></td>
<td>-0.15</td>
<td><strong>-0.09</strong></td>
<td><strong>-0.09</strong></td>
<td><strong>-0.28</strong></td>
<td><strong>1.00</strong></td>
</tr>
</tbody>
</table>
### Table 5
Regression results
*t*-statistics in parentheses * significant at p<0.01; ** significant at p<0.05 and *** significant at p<0.001

<table>
<thead>
<tr>
<th>Variables</th>
<th>Full sample (N=127)</th>
<th>Large banks (N=62)</th>
<th>Small banks (N=65)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Ln_board size</td>
<td>-1.81</td>
<td>-1.63</td>
<td>-2.19</td>
</tr>
<tr>
<td></td>
<td>(-0.86)</td>
<td>(0.80)</td>
<td>(-1.04)</td>
</tr>
<tr>
<td>Board ind.</td>
<td>3.35***</td>
<td>4.20***</td>
<td>-12.43</td>
</tr>
<tr>
<td></td>
<td>(3.37)</td>
<td>(4.34)</td>
<td>(-1.97)</td>
</tr>
<tr>
<td>Ln_SC size</td>
<td>-2.85*</td>
<td>-4.573***</td>
<td>-3.77*</td>
</tr>
<tr>
<td></td>
<td>(-2.42)</td>
<td>(-4.17)</td>
<td>(-2.14)</td>
</tr>
<tr>
<td>Ln_SC meeting</td>
<td>-2.02*</td>
<td>-1.807*</td>
<td>-2.83**</td>
</tr>
<tr>
<td></td>
<td>(-2.52)</td>
<td>(-2.13)</td>
<td>(-3.17)</td>
</tr>
<tr>
<td>Ln_SC compensation</td>
<td>-0.43</td>
<td>-0.044</td>
<td>-0.53</td>
</tr>
<tr>
<td></td>
<td>(-0.84)</td>
<td>(-0.09)</td>
<td>(-1.01)</td>
</tr>
<tr>
<td>Board ind*</td>
<td>2.41*</td>
<td>7.72*</td>
<td>(2.18)</td>
</tr>
<tr>
<td>Board SC size</td>
<td>5.17**</td>
<td>2.68*</td>
<td>(2.66)</td>
</tr>
<tr>
<td></td>
<td>(2.18)</td>
<td>(2.60)</td>
<td>(0.55)</td>
</tr>
<tr>
<td>CG index</td>
<td>-1.52***</td>
<td>(-3.68)</td>
<td>-1.44*</td>
</tr>
<tr>
<td></td>
<td>(-3.04)</td>
<td>(-2.27)</td>
<td>(-2.27)</td>
</tr>
<tr>
<td>Ln_asset</td>
<td>-0.38</td>
<td>-0.94*</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>(-0.95)</td>
<td>(-2.66)</td>
<td>(0.18)</td>
</tr>
<tr>
<td>Leverage</td>
<td>5.12</td>
<td>3.37</td>
<td>5.67</td>
</tr>
<tr>
<td></td>
<td>(1.36)</td>
<td>(0.84)</td>
<td>(1.53)</td>
</tr>
<tr>
<td>Ln_age</td>
<td>0.81</td>
<td>0.80</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td>(1.22)</td>
<td>(1.26)</td>
<td>(1.48)</td>
</tr>
<tr>
<td>GDP</td>
<td>-1.37</td>
<td>-1.34</td>
<td>-1.03</td>
</tr>
<tr>
<td></td>
<td>(-1.59)</td>
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</tr>
<tr>
<td>Constant</td>
<td>34.95**</td>
<td>34.15***</td>
<td>16.21*</td>
</tr>
<tr>
<td></td>
<td>(3.11)</td>
<td>(3.84)</td>
<td>(2.32)</td>
</tr>
<tr>
<td>Year dummy</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>32.7%</td>
<td>26.7%</td>
<td>25.5%</td>
</tr>
<tr>
<td>Variables</td>
<td>Panel A: Alternative test variable (N=127)</td>
<td>Panel B: Additional control variables (N=127)</td>
<td>Panel C: 2SLS regression (N=127)</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Ln_board size</td>
<td>1.45</td>
<td>1.48</td>
<td>1.40</td>
</tr>
<tr>
<td></td>
<td>(1.60)</td>
<td>(1.62)</td>
<td>(1.54)</td>
</tr>
<tr>
<td>Board size1</td>
<td>-0.83**</td>
<td>-3.09</td>
<td>-0.83**</td>
</tr>
<tr>
<td></td>
<td>(-3.09)</td>
<td></td>
<td>(-3.07)</td>
</tr>
<tr>
<td>Board ind1</td>
<td>-1.96*</td>
<td>-2.93***</td>
<td>-1.84*</td>
</tr>
<tr>
<td></td>
<td>(-2.36)</td>
<td>(-3.75)</td>
<td>(-2.14)</td>
</tr>
<tr>
<td>Ln_SC size</td>
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<td>-1.88*</td>
<td>-2.00**</td>
</tr>
<tr>
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<td>(-2.42)</td>
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<td>(-2.65)</td>
</tr>
<tr>
<td>SC size1</td>
<td>-1.52</td>
<td>-1.44</td>
<td>-1.36</td>
</tr>
<tr>
<td></td>
<td>(-1.85)</td>
<td>(-1.75)</td>
<td>(-1.65)</td>
</tr>
<tr>
<td>SC meeting1</td>
<td>-0.17**</td>
<td></td>
<td>-1.61***</td>
</tr>
<tr>
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<td>26.96**</td>
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<td>$R^2$</td>
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References


