Corporate governance and *Shariah* non-compliant risk in Islamic banks: evidence from Southeast Asia

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Abstract

Purpose – *This study aims to investigate the relationship between corporate governance and* Shariah *non-compliant risk (SNCR) that is unique for Islamic banks. The study examines the roles of* Shariah *committee along with the board of directors in mitigating SNCR.*

Design/methodology/approach – *The paper empirically investigates the implications of characteristics of board of directors and* Shariah *committee on the SNCR by using a sample of 29 full-fledge Islamic banks from Malaysia and Indonesia over the period 2007-2017. All data is hand collected from the Islamic banks' annual reports with the exception of country-level data collected from the World Bank database.*

Findings – *The results show that banks with a smaller board size and higher proportion of independent board members are likely to have lower SNCR. The findings also indicate that the financial expertise and higher frequency of* Shariah *committee meetings reduces the SNCR. Collectively, the analysis shows that banks with strong corporate governance environments reduce SNCR.*

Practical implications – *The findings of the study shed light on the relationship between corporate governance practice,* Shariah *committee characteristics and SNCR. The results can be used by different stakeholders such as policymakers, boards of directors and senior management of Islamic banks to mitigate SNCR.*

Originality/value – *This study extends the literature on corporate governance and risk-taking by including additional dimensions of governance and risk type. The corporate governance mechanism at the board level is complemented by including the* Shariah *committee characteristics and SNCR which is relevant to Islamic financial institutions is examined.*

Keywords *Malaysia, Indonesia, Islamic bank, Corporate governance,* Shariah *committee,* Shariah *governance,* Shariah *non-compliant risk*

Paper type *Research paper*

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. First, the aim of the Islamic bank is to maximise shareholder value by adhering to the *Shariah* law (Islamic law) (Grais and Pellegrini, 2006a, 2006b, Safieddine, 2009). In particular, Islamic banks are prohibited from taking and charging interest (*riba*), getting involved in excessive risk

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(*gharar*) and using different instruments such as derivatives. Second, the governance setting includes an additional element of *Shariah* governance with the *Shariah* committee (SC) playing a key role in assisting the board of directors (BODs) and management to ensure that *Shariah* law is adhered to throughout the business operations (Ahmed, 2011a, Choudhury and Hoque, 2006). Finally, Islamic banks are exposed to a new type of risk known as *Shariah* non-compliance risk in addition to the traditional 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, Islamic Financial services Board, 2017). 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 SC. Though the concept of *Shariah* non-compliant risk (SNCR) has been recognised, we are aware of only one empirical paper that examines the impact of *Shariah* non-compliant income assets, equity and income of Islamic banks. Our study is closely related to that of Mollah and Zaman (2015) who examine the relationship between the SC and performance. We expand the governance structure of the SC used in the literature by including additional variables such as financial expertise, meeting frequency and SC compensation. Furthermore, previous studies on corporate governance and bank risk-taking have mostly focussed on traditional risks such as credit risk, market risk, interest rate risk and insolvency risk or the interaction among the risk categories. However, no existing studies have examined *Shariah* non-compliance risk which is only relevant to Islamic financial institutions. Thus, we complement the work of D'Amato and Gallo (2019), Yeh (2017), Vallascas *et al.* (2017), Chen and Lin (2016), Aebi *et al.* (2012) 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 BODs, SC and *Shariah* non-compliance risk. In this study, we examine the impact of individual characteristics of the board (related to board size, independence directors, meeting frequency and compensation) and SC (size, financial expertise, meeting frequency and compensation) on the *Shariah* non-compliance risk. We performed our investigation by using data on Islamic banks from Malaysia and Indonesia over the period 2007-2017. Based on 183 bank-year observations, we find that the smaller board and a higher proportion of independent non-executive directors are associated with lower SNCR. There is a possibility that the smaller board and independent board using their oversight function demands additional and extensive *Shariah* audit to certify their monitoring role and mitigate the reputational losses. In addition to these findings, we also report several new results. We find that the level of SC monitoring on SNCR is driven by the members that equipped with financial expertise and higher frequency of meetings. Overall, our analysis suggests that the banks with effective board and SC reduce SNCR. These results are robust to various model specifications and tests.

The remainder of this paper is organised as follows. Section 2 provides an overview of the *Shariah* principles and risks, and Section 3 describes the background literature and hypotheses development. Section 4 presents the data and models specification. Section 5 reports the empirical findings, and Section 6 concludes.

2. *Shariah* principles, Islamic banking and risks

Starting in the 1970s, from an urge to provide financial services to Muslims who would not deal with interest due to religious beliefs, Islamic banking has become a significant sector in

many jurisdictions. The key distinguishing feature of Islamic banks is the adherence to *Shariah* rules and principles. The Islamic guidelines prohibit engaging in sinful activities such as alcohol, pornography, casinos, pork-related products, etc., (El-Hawary *et al.*, 2004; Ullah *et al.*, 2018; Usmani, 1999). At the contract level, Islamic commercial law forbids *riba* (literally meaning 'excess'), *gharar* (legal ambiguity or excessive risk) and *maysir* (gambling) in transactions. While *riba* is usually translated as interest, it has wider connotations such as prohibition of sale of debt. Similarly, contemporary derivatives (forwards, futures, swaps, etc.) are not permissible as they have elements of both *riba* and *gharar* (Ayub, 2007, Usmani, 1999).

A firm is considered *Shariah*-compliant if it satisfies two criteria. First, qualitative business activity screening eliminates companies that are involved in products and services that are considered prohibited such as alcohol, pornography, casinos, pork-related products, conventional financial institutions, etc. Companies that pass the qualitative screening are further evaluated using the second quantitative financial screening criteria which identify the permissible benchmarks and exclude companies with unacceptable levels of conventional debt, liquidity and impermissible income (BinMahfouz and Ahmed, 2014; Derigs and Marzban, 2008; Nisar and Khatkhatay, 2006; Obaidullah, 2005)[1]. Any impermissible income such as interest earnings is "cleansed" by deducting it from the income of the firm and donating the proceeds to charity.

Since interest-bearing transactions are proscribed by Islamic law, Islamic banks use alternative permissible contracts. The key contracts used by Islamic banks can be broadly classified as sale, leasing, and partnerships. The sale based contracts create debt and include *murabahah* (cost-plus or mark-up sale), *bai-muajjal* (price-deferred or credit sale), *salaam* (object-deferred or pre-paid sale), *istisna* (construction/manufacturing contract). Although these contracts create debt, their underlying risk features are different than interest based loans since the former also entails market risks and are illiquid as they cannot be sold (Abedifar *et al.*, 2013; Aggarwal and Yousef, 2000). While leasing contracts (*ijarah*) are structured as operating leases or hire-purchase schemes, partnerships contracts of *mudarabah* and *musharakah* are profit-loss sharing (PLS) whereby the returns on investments are contingent on the performance of underlying assets or projects (Ayub, 2007; Usmani, 1999).

The dominant Islamic banking model uses PLS (*mudarabah*) based savings/investment accounts on the liability side and multiple financing tools on the assets side (Ahmed 2011b; Ali, 2012). Using *Shariah* principles in banking operations changes the nature of risks of financial products and introduces some new unique risks. For example, although in principle the depositors using PLS based accounts are expected to share the risks of performance of the underlying assets, paying negative or lower returns compared to the market rates could lead to withdrawal risks. The overall risk profile of the assets portfolio depends on its composition and type of contracts used for financing. Since the financial products are based on sale, leasing or partnership contracts, risk-return features of these instruments change as market risks become an integral part of the banking book along with credit risks. While Islamic banks can use different modes of financing, fixed-income contracts (*murabahah* and *ijarah*) form the bulk of financing (Ali, 2012; Chong and Liu, 2009; Khan, 2010).

The Basel Committee on Banking Supervision (BCBS) defines operational risks as risks that are associated with failures of internal processes, people and/or systems or the impact from external events (BCBS, Basil Committee on Banking Supervision, 2009). In Islamic banks, the definition of operational risk also includes any risks arising from applying *Shariah* and the failure to perform their fiduciary responsibilities (IFSB, Islamic Financial services Board, 2005). A unique operational risk in Islamic banks is the *Shariah*SNCR which is 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, Islamic Financial services Board, 2005). *Shariah* non-compliant income is used as a proxy for *Shariah* non-compliance risk (SNCR) (Oz *et al.*, 2016). *Shariah* non-compliance can result from different sources such as selling unapproved products or violations of terms approved by SC in products and processes (Ginena, 2014; Oz *et al.*, 2016). The failure to comply with *Shariah* law in Islamic bank's operation and management results in the transaction being declared as void and, thus, income from such activities/products is not recognised in the bank's books and is given to charity. As the revenue from these activities is excluded from the bank's income but the costs are incurred, this results in net-losses on these transactions for the bank.

Although the direct impact of SNCR is loss of income, there can also be other implications. Given the fiduciary role that an Islamic bank plays in managing the funds of depositors, *Shariah* non-compliance can be construed as a breach of contractual obligations of adhering to *Shariah* principles (Ginena, 2014). Furthermore, *Shariah* non-compliance risk can also result in reputational risk. The Basel Committee on Banking Supervision (BCBS, Basil Committee on Banking Supervision, 2009: p. 19) defines reputational risk as:

> [...] the risk arising from negative perception on the part of customers, counterparties, shareholders, investors, debt-holders, market analysts, other relevant parties or regulators that can adversely affect a bank's ability to maintain existing, or establish new, business relationships and continued access to sources of funding

In the case of Islamic banks, a unique reputational risk arises due to *Shariah* non-compliance (Abdullah *et al.*, 2011; Archer and Abdullah, 2007). Not only can the depositors and investors lose confidence in banks due to losses arising from *Shariah* non-compliance, but there is a possibility that a segment of them who use Islamic banks for religious convictions would withdraw their funds or close their accounts due to reputational reasons. In a survey carried out in three countries, Chapra and Ahmed (2002) find that large percentage depositors and investors of Islamic financial institutions' would move their accounts to other banks if there are consistent violations of *Shariah* over a period.

3. Related literature and hypotheses development

3.1 Agency theory, governance and Shariah non-compliant risk in Islamic banks

The dominant theory of corporate governance focuses on reducing the agency costs (monitoring costs, bonding costs and residual loss) arising from asymmetric information and conflicting interests between shareholders and managers (Jensen and Meckling, 1976; Fama and Jensen, 1983; Hart, 1995; Shleifer and Vishny, 1997). As managers working on the basis of self-interest can produce results that are detrimental to the interests of shareholders, agency theory suggests instituting governance mechanisms to create incentive structures that reduce agency costs and align managers' actions with the interests of the shareholders.

The implications of agency theory for governance hold for Islamic banks also since shareholders and managers have asymmetric information and divergent interests. However, the goal of maximising profits by applying *Shariah* principles to create additional agency issues and challenges that raise distinctive governance concerns[2]. PLS-based contracts on the liability side of Islamic banks change the agency relationships between the bank and depositors whereby the bank acts as an agent for depositors to provide *Shariah*-compliant services (Archer and Karim, 2009, 2012; Mansour and Bhatti, 2018). Neither do depositors have any information on how managers use their funds nor do they have any control which the shareholders have through the BODs. As most of the depositors expect the business and transactions to conform to their religious beliefs, *Shariah* governance becomes an integral part of the governance architecture of Islamic banks (Malkawi, 2013; Grais and Pellegrini, 2006a, 2006b).

To create confidence among the stakeholders and maintain the integrity of Islamic financial institutions, international standard setting bodies such as IFSB, Islamic Financial services Board (2009) have issued *Shariah* governance standards. IFSB, Islamic Financial services Board's (2009) *Guiding principles on Shariah governance systems for institutions offering Islamic financial services* identify four key elements of a robust *Shariah* governance framework: issuance of Shariah pronouncements by a SC; 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 *Shariah* compliance audit to ensure the internal *Shariah* audit is carried out properly. A vital component of the governance framework is an independent SC consisting of *Shariah* scholars who are well versed in Islamic commercial law. One of the key functions of the SC is to issue *Shariah* pronouncements that are implemented throughout the institution and their violation leads to *Shariah* non-compliance risk.

Agency problems arise in Islamic banks due to divergent goals of the BOD, managers and SC. The aim of shareholders is to maximise the net-present value by increasing returns and expanding business by attracting more customers in the longer term. As most of the customers deal with Islamic banks due to religious reasons, this can be done by ensuring that banking operations adhere to *Shariah* principles. As indicated, *Shariah* non-compliance can lead to loss of income in the short-run and affect reputation adversely on the longer term. The BCBS asserts that the governance framework in banks should have oversight on reputational risk and should incorporate it in the bank's risk management processes (BCBS, Basil Committee on Banking Supervision, 2009, 2015). As indicated above, reputational risk related to *Shariah* non-compliance can potentially lead to loss of clients who engage with Islamic banks due to religious reasons. To mitigate loss of income in the short term and loss of business in the long term the BOD of Islamic banks would need to institute a credible *Shariah* governance framework for the growth and stability of the bank.

Compensations packages and private information held by managers can create incentives for focussing on a short-term performance that may not be in the long-term interests of the shareholders (Narayanan, 1985; Fahlenbrach and Stulz, 2011). One way in which short-term returns can be increased by managers is to take risks that are not recognised by the system (Diamond and Rajan, 2009), which in case of Islamic banks would include SNCR. Remuneration and bonuses paid to managers in Islamic banks based on annual performances create incentives for increasing the short-term profitability. Applying *Shariah* pronouncements of SC, however, can hinder the goals of profitability as the rules limit the markets and products that Islamic banks can serve. Ullah *et al.* (2018) report that tension can exist between Islamic bank's managers, who have incentives to increase profitability, and *Shariah* rulings of SC, that restrict profitable activities. The dominance of the managers in operational decision making and their drive to profitability can result in dilution of *Shariah* principles and increase SNCRs, particularly when *Shariah* compliance and controls functions are weak.

In light of the *Shariah* governance framework outlined in IFSB, Islamic Financial services Board (2009), there are two channels through which *Shariah* non-compliant income which is a proxy for SNCR can be mitigated. The first channel directly involves of SC and the *Shariah* compliance function and the second relates to the indirect role of the BOD in carrying out the *Shariah* audit role. Strengthening the *Shariah* compliance function which includes *Shariah* pronouncements by a SC and ensuring compliance with *Shariah* pronouncements by an in-house *Shariah* compliance unit or department. The role of the SC directly relates to the *Shariah* compliance function whereby they advise and make recommendations to the BOD with regards to *Shariah* matters. A stronger internal compliance environment is likely to reduce the *Shariah*-compliant risk *ex-ante*. Thus, we might expect the SC to have a direct relationship with SNCR due to the nature of their duties in the oversight of *Shariah* compliance function through the in-house *Shariah* compliance unit (IFSB, Islamic Financial services Board, 2009). In

jurisdictions that do not have any legal/regulatory requirements for *Shariah* governance, Islamic banks institute SC to gain trust of their customers (Alkhamees, 2012).

While the *Shariah* compliance unit works closely with the SC to ensure that the *Shariah* pronouncements are implemented in the products and operations of the bank, the relationship between *Shariah* audit unit and SC is not well-defined. For example, whereas IFSB, Islamic Financial services Board (2009) maintains that *Shariah* audit unit should report to SC, the regulatory guidelines on *Shariah* governance issued by the central bank, Bank Negara Malaysia (BNM) require *Shariah* audit to report to Board Audit Committee (BNM, Bank Negara Malaysia, 2010). The guidelines also assert that Board Audit Committee should determine the role of *Shariah* audit upon consultation with the SC and the *Shariah* audit findings should be reported to both committees. Furthermore, all *Shariah* non-compliant events should be reported to the board and BNM. Although there are no detailed regulatory guidelines on *Shariah* governance in Indonesia with regards to auditing, the organisational structure of Bank Muamalat shows *Shariah* Audit function under Internal Audit Division (Bank Muamalat, 2016).

The BOD's role of mitigating SNCR works through the indirect link of *Shariah* auditing. Since the high-quality BODs have more reputational capital, they are expected to be more concerned with reputational losses and maybe excessively involved in the banks' operations including the assessment of *Shariah* risk. Therefore, it is reasonable to expect that an effective board demands an additional and extensive independent *Shariah* audit from the *Shariah* bodies including the SC to certify their monitoring function as well as to protect the *Shariah* law. Failure to constrain the SNCR may incur reputational damage, increase future legal risk exposures and disappoint the shareholders. As indicated, a large percentage of Islamic financial institutions' investors and depositors are extremely concerned that their funds are used in a *Shariah*-compliant manner (Chapra and Ahmed, 2002). As the BODs oversee the *Shariah* non-compliance risk through *Shariah* auditing function, we expect high-quality directors might demand more monitoring from the SC including more *Shariah* audit.

The implication of an additional layer of *Shariah* governance on the overall governance quality is complementary. Collectively, 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 BOD and its subcommittees. The SC is one of the main bodies in ensuring the overall bank's operations are fully governed by *Shariah* law which is one of the objectives of Islamic banks. By presiding over the *Shariah* compliance function and certifying the products as *Shariah*-compliant, the SC provides credibility to the operations of Islamic banks for one of the key stakeholders, the depositors. However, given that the BODs has a right to appoint and remove the SC members, its role is equally crucial in promoting a higher degree of *Shariah* compliance. In other words, the performance of SC is founded in the practices and attitudes of the entire BODs. Therefore, in this paper, while the demand for an effective SC is recognised for the *Shariah* compliance function, the monitoring and auditing roles of the board are argued to be the more important mechanisms to ensure that *Shariah* law is implemented and protected.

In terms of agency costs, the expenditures related to *Shariah* governance systems would be related to monitoring costs and the losses of income from SNCR can be considered as a residual loss. The monitoring costs include expenditures incurred on staff in the *Shariah* departments/units within the institution and additional costs of SC. SC is an independent body with members paid fixed fees that are not contingent on the performance of banks they serve. With the rapid growth in Islamic finance globally, however, the number of *Shariah* scholars who can have the appropriate knowledge on finance and satisfy the growing needs of the industry is limited. Given the scarcity, scholars with better reputation

are sought after but they are expensive[3]. Islamic financial institutions are willing to pay higher remuneration for well-known scholars as it improves recognition and credibility on the one hand and enhances the goodwill and brand image on the other hand (Rammal, 2015). Even after incurring the monitoring costs, any remaining *Shariah* non-compliant income would constitute "residual loss", as it cannot be distributed to shareholders (and depositors)[4].

3.2 The effectiveness of the board and Shariah committee

Evidence suggests that several characteristics of the BOD and it sub-committees 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; Conyon and He, 2011; Mayur and Saravanan, 2017; De Vita and Luo, 2018). Each of these characteristics is now reviewed.

According to De Andres and Vallelado (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 or board subcommittee contribute 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 has shown that smaller boards are more effective as directors can communicate better on themselves and they are easier to manage (Yermack, 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 and smaller SC are more effective in constraining SNCR.

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) and is more likely to be associated with lower firm risk (Chong *et al.*, 2018; Mathew *et al.*, 2018). Since the ultimate goal of Islamic banks is to adhere to *Shariah* law, then the higher independence of non-executive directors on boards is expected to be more sensitive to the regulatory compliance, and act more conservatively toward the SC to mitigate legal liability or reputational losses from bank default. As a result, we expect more independent non-executive on board reduced the *Shariah* non-compliance risk.

In BODs' studies, Conger *et al.* (1998) suggest that more frequent board meetings improve a board's effectiveness as the meetings are a key dimension of board operations (Vafeas, 1999). Active boards that meet more frequently are more likely to perform their duties in accordance with shareholders' interests (Vafeas, 1999) and to put more effort into monitoring the integrity of the management. In the audit committee literature, 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 the 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. Thus, we expect an inverse relationship between the meeting frequency of board and SC with SNCR.

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 BOD and SC with a

higher level of the compensation package are more efficient in constraining the SNCR. For the latter, this is because higher compensation packages are associated with reputable board and *Shariah* scholars who command more respect and can provide better oversight on the *Shariah* compliance function.

The SC knowledge and experience are important elements in ensuring the effectiveness of their monitoring function. Borrowing from board and audit committee literature, directors that are financially literate can effectively assess the nature and the appropriateness of accounting choices, constrain the aggressiveness of accounting policies and provide incentives to avoid the risk of litigation (Agrawal and Chadha, 2005; DeFond and Francis, 2005; Krishnan and Visvanathan, 2008). A SC that is financially literate can address issues relating to financial statements and assess the *Shariah* review and *Shariah* audit works more efficiently. In addition, the appointment of SC members with accounting and financial expertise improves the oversight function of the committees and thus provides a credible signal to the investors that the banks aspire to a higher quality of *Shariah* audit. We expect that SC with accounting and financial expertise complements the knowledge of other *Shariah* scholars in understanding of financial statements, which enables them to access the policies and issues related to financial reporting including risk assessment and management.

In sum, based on the proposition of agency theory, concerning to monitoring roles and evidence from prior literature, we posit that a BODs with a smaller size, more independent directors, more frequent meetings and higher compensation would be an effective board. Similarly, the SC with a smaller size, equipped with accounting and financial expertise, more active and receiving higher compensation would be considered more effective. It is argued that the BODs and SC with these characteristics are more effective in constraining the SNCR to safeguard their reputation, to avoid legal exposure and to promote shareholders' interests.

4. Data, main variables and model specification

The paper examines the role of corporate governance on SNCR in Islamic banks of Indonesia and Malaysia. Islamic banking in Indonesia started in 1992 with the establishment of Bank Muamalat Indonesia. The Islamic banking assets constitute 5.78 per cent of the total banking assets with 13 Islamic banks and 21 commercial banks with Islamic business units operating among a total of 118 banks in 2017 in the country (IMF 2017 and OJK 2017). Islamic banking started in Malaysia with the enactment of Islamic Banking Law in 1983 and the establishment of Bank Islam Malaysia Berhad in the same year. with a supportive legal and regulatory environment, Islamic banking sector has grown significantly in the country with 16 Islamic banks compared to 27 conventional banks. With a share of 30 per cent of the total banking assets in 2017, the Islamic banking sector has become systemically significant in the country (BNM, Bank Negara Malaysia, 2018, IFSB, Islamic Financial services Board, 2017).

Recognizing that most stakeholders deal with the Islamic banks for *Shariah*-compliant financial service, some countries have enacted laws and regulations that require having in place a credible *Shariah* governance framework to protect their rights. Both Islamic Financial Services Act 2013 and the *Shariah* governance guidelines of the central bank (BNM) in Malaysia cover details on *Shariah* governance, compliance and audit functions in Islamic banks. Similarly, the Islamic Banking Act 2008 in Indonesia mandates Islamic financial institutions to have SC to deal with *Shariah* issues in banking operations. Though not providing details as in the case of Malaysia, the regulations outline the powers, scope and responsibilities of the SC which include providing *Shariah* opinions on the overall operations and monitoring compliance of bank operations with the rulings issued by national sharia council (Bank Indonesia, 2004).

4.1 Sample and data

Our initial sample consists of 29 full-fledged Islamic banks in Malaysia and Indonesia with 220 bank-year observations from the period 2007 to 2017. The sample of banks in the paper includes all Islamic banks from both countries during the period of study[5]. We exclude 37 observations because the data on *Shariah* non-compliant income and corporate governance variables are unavailable. The final sample consists of 183 bank-year observations. Table I summarises our sample selection process.

All data is hand collected from the Islamic banks' annual reports with the exception of country-level data (i.e. GDP growth) collected from the World Bank database. 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 BNM and Bank Indonesia. These annual reports are available and downloadable from the individual Islamic banks' websites.

4.2 Measuring Shariah non-compliance risk

Our proxy of SNCR is the *Shariah* non-compliant income. We use two alternative measures. The first measure is the natural log of *Shariah* non-compliant income, assuming that a higher *Shariah* non-compliant income indicates the higher *Shariah* non-compliance risk. The banks that reported zero *Shariah* non-compliant income is set to one dollar to allow for log transmission. The second measure is a dummy variable. We set to 1 if the bank indicates positive *Shariah* non-compliant income and set to 0 if bank reports zero *Shariah* non-compliance income. We seek the likelihood of incidents of *Shariah* non-compliance activities, assuming the positive *Shariah* non-compliant income indicates the presence of SNCR[6].

4.3 Measuring corporate governance

We focus our analysis on the bank's corporate board and SC variables. For boards of directors, we select four essential features of boards' governance, i.e. board size, composition of independent non-executive directors, meeting frequency and compensation. All characteristics were extensively studied the bank risk-taking literature (Vallascas *et al.*, 2017; Berger *et al.*, 2014). We define board size as the natural log of number of directors on the board. The board independence is measured by a percentage of independent directors to total board size[7]. The BOD s' meetings is defined as the natural log of meeting frequency and the board compensation is measured by the natural log of total compensation received by the directors.

For SC, we focus on the size of the committee, number of committee members with accounting and financial expertise, number of meetings per annum and the compensation. The corporate governance literature suggests that these characteristics served important roles in measuring the effectiveness of board subcommittee (Brick and Chidambaran, 2010). We define the SC's' size as the natural log of number of members sitting in SC. The SC's financial expertise is measured by the number of members with accounting and financial qualification and experience, including all forms of formal education, professional

Table I Summary of sample construction

Description	*Malaysia*	*Indonesia*	*Pooled*
Islamic bank	16 banks	13 banks	
Initial sample (2007-2017)	122	98	220
Excluded			
Unavailability of *Shariah* non-compliant income and corporate governance data	29	8	37
Final sample	93	90	183

qualification and work experience related to accounting and finance. The SC meeting is measured by the natural log of meeting frequency. Finally, we use the natural log of total SC's' compensations as a measurement of quality of members ability in monitoring the SNCR.

4.4 Model specification

To examine the relationship between the boards of directors, SC and the SNCR, the following models are employed:

$$\begin{aligned} SNCI = {} & \alpha_0 + \beta_1 BOD\_size + \beta_2 BOD\_ind + \beta_3 BOD\_meeting \\ & + \beta_4 BOD\_compensation + \beta_5 SC\_size + \beta_6 SC\_act.expertise \\ & + \beta_7 SC\_meeting + \beta_8 SC\_compensation + \beta_9 ASSET + \beta_{10} AGE \\ & + \beta_{11} GDPGR + \varepsilon \end{aligned} \quad (1)$$

The dependent variable is *Shariah* non-compliant income *(SNCI)* representing SNCR. As indicated, there are two measures of *SNCI*, namely *SNCI_log,* and *SNCI_logit*. The variables of interest include *BOD_size, BOD_ind, BOD_meeting, BOD_compensation, SC_size, SC_act.expertise, SC_meeting*, and *SC_compensation*.

We control for the effects of other variables that have been found in prior literature to affect the bank's risk (Chen and Lin, 2016; Vallascas *et al.*, 2017) – the natural log of total assets *(ASSET)*, the natural log of bank age *(AGE)* and the country GDP growth *(GDPGR)*. We argue that as bank size increases *(ASSET),* the banks' business operations will be more complex and the banks may need to put more effort into dealing with SNCR. Thus, we expect these variables to be positively associated with *Shariah* non-compliant income. As the age of the bank increases *(AGE),* they may gain more experiences in dealing with *Shariah* risk, resulting in a lower SNCR. 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, with the country's *GDPGR* serving as its proxy.

5. Empirical findings

5.1 Descriptive statistics

Table II 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 II presents the hypothesis variables before the variables are transformed. The mean (median) of *Shariah* non-compliant income *(SNCI)* for 183 bank-years is US$33,217 (US$4792). As a comparison to the economic magnitude of the amount of *SNCI,* we provide the mean (median) ratio of *SNCI* to total asset: 0.00171(0.00036); *SNCI* to net income: 0.94958 (0.0311) and *SNCI* to equity: 0.01742 (0.00329). Even though the amount of *SNCI* is relatively very small compared to the total assets, net income and equity of the sample, it may possibly effect the institutional reputation in the long run since the amount of *SNCI* indicates the incidence of SNCR. In the sample, there are 46 bank-year observations (i.e. 12 banks) that report zero *Shariah* non-compliant income, constituting 25.14 per cent of the observations indicating zero *Shariah* non-compliant activities/transactions. With respect to the corporate governance variables, we find that the mean (median) of board size is 7.52 (7) and 65 per cent 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 per cent of them are independent directors. This comparison implies that Islamic banks in Malaysia and Indonesia have higher representation of independent and non-independent directors compared to the firms in Singapore 22 years ago. The mean (median) BOD's

Table II Descriptive statistics ($N = 183$)

Variables	*Min.*	*Lower Quartile*	*Mean*	*Median*	*Upper Quartile*	*Max.*	*SD*
Panel A: Raw data							
Total SNCI (US$)	0	0	33217.54	4792.21	27851.7	2200000	164788.4
% SNCI to total assets	0	0	0.00171	0.00036	0.00169	0.0259	0.00343
% SNCI to net income	−0.630	0	0.94958	0.0311	0.221	86.1	6.69959
% SNCI to equity	0	0	0.01742	0.00329	0.0207	0.373	0.03807
No. of BOD size	4	6	7.51912	7	8	13	1.83626
No. BOD meeting	2	7	11.72678	11	15	45	5.88644
Total BOD compensation (US$)	15900	425000	943786.8	681500	1000000	4700000	831151.9
No. of SC size	2	2	3.77595	3	5	9	1.603249
No. of SC with accounting & financial expertise	0	0	1.04371	1	2	5	1.180543
No. of SC meeting	2	8	12.55738	12	15	33	5.354031
Total SC compensation (US$)	2018.8	36668	72628.69	55563.5	91214.2	633333	66215.12
Panel B: Transformed data							
SNCI_log	1	1	7.03450	8.47475	10.2346	14.5908	3.93737
SNCI_logit	0	1	0.74863	1	1	1	0.43498
BOD_size	1.38629	1.79176	1.98860	1.94591	2.07944	2.56495	0.24073
BOD_ind	0.14287	0.428571	0.65444	0.571429	0.875	0.88888	0.23814
BOD_meeting	0.69314	1.94591	2.34848	2.39790	2.70805	3.80666	0.48207
BOD_ compensation	9.67168	12.9554	13.4565	13.436	13.814	15.3631	0.76427
SC_size	0.69314	0.693147	1.23475	1.09861	1.60944	2.19722	0.44053
SC_act.expertise	0	0	0.27124	0	0.69314	1.60944	0.44025
SC_meeting	0.69314	2.07944	2.44434	2.48491	2.70805	3.49651	0.42159
SC_ compensation	2.50399	10.4883	10.8516	10.9135	11.4082	13.3588	0.98202
ASSET	17.4374	20.1561	21.2241	21.5189	22.3082	23.6729	1.41752
AGE	1	1.60944	1.99680	2.07944	2.48491	3.52636	0.77668
GDPGR	−1.51353	5.00667	5.31701	5.29391	6.00672	7.42485	1.13582

Note: The variables are defined in Appendix

meeting is 11.73 (11) times and the compensation is US$943,786 (US$681,500) during a year. The mean size of the SC is 3.78, which is relatively consistent with the figure reported in Mollah and Zaman (2015) who report the mean size of the SC as 4.17. The mean (median) of SC member with accounting and financial expertise is 1.04 (1). The average frequency of SC meetings is 12.56 times a year and their yearly mean (median) compensation is US$72,628 (US$55,563).

In Panel B in Table II, 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 7.03 (8.47); board size at 1.99 (1.95); board independence at 0.65 (0.57), board meeting 2.35 (2.40), board compensation 13.46 (13.44), SC size at 1.23 (1.10); SC with accounting and financial expertise 0.24 (0), SC meetings at 2.44 (2.49), SC compensation at 10.85 (10.91); total assets at 21.22 (21.52) and the bank's age at 2.00 (2.08). The means of GDP growth for Malaysia and Indonesia are 4.87 per cent and 5.46 per cent, respectively. However, the mean (median) GDP growth for both countries is 5.31 per cent (5.29 per cent) from the year 2007 to 2017.

Table III contains a correlation matrix of the variables used in the paper. In general, the overall correlation matrix shows that each of the variables is moderately inter-correlated with one and another except for variables *SNCI_log* and *SNCI_logit* with correlation coefficient of 89 per cent. However these correlation coefficients are not critical because these dependent variables are associated with different model specifications.

5.2 Empirical results

In Table IV, we report our regression results of pooled OLS, GLS, and logistic regressions. The F statistics for all models are significant at $p < 0.001$, suggesting that the models are statistically valid.

As expected the *BOD_size* is significant and positively associated with SNCR, suggesting that banks with smaller board size experience lower SNCR. There is a possibility that a smaller board contributes to effective communication and there is less likely of a communication breakdown. The effective communication of smaller boards is consistent with the previous studies by Yermack (1996) and Eisenberg *et al.* (1998). This finding suggests that when board members communicate effectively, they reduce the incidence of misunderstanding and consequent errors and that they are more sensitive to the *Shariah*-compliant issues.

Table III Correlation matrix ($N = 127$)

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
SNCI_log	1.000												
SNCI_logit	**0.890**	1.000											
BOD_size	**0.256**	*0.170*	1.0000										
BOD_ind	**−0.345**	**−0.389**	−0.045	1.0000									
BOD_meeting	−0.079	0.081	*−0.158*	−0.054	1.0000								
BOD_compensation	*0.198*	*0.154*	**0.404**	0.028	−0.090	1.000							
SC_size	−0.119	**−0.269**	−0.069	**0.570**	−0.032	0.093	1.000						
SC_act.expertise	*−0.234*	*−0.127*	−0.045	**−0.203**	0.067	**−0.213**	**0.274**	1.000					
SC_meeting	*−0.213*	*−0.220*	*0.125*	**−0.342**	0.017	0.035	**−0.366**	*−0.162*	1.000				
SC_compensation	−0.064	−0.109	0.121	**0.276**	0.049	**0.327**	**0.401**	0.084	−0.097	1.000			
ASSET	−0.033	**−0.212**	**0.198**	**0.458**	−0.000	**0.332**	**0.551**	**0.337**	**−0.194**	**0.409**	1.000		
AGE	**0.243**	*0.152*	**0.255**	0.110	0.121	**0.516**	**0.368**	0.074	−0.091	**0.242**	**0.558**	1.000	
GDPGR	0.020	*0.051*	−0.055	−0.057	0.023	0.095	−0.095	−0.011	−0.039	*0.08*	−0.08	−0.052	1.0000

Notes: Correlation in bold are significant at $p < 0.001$ and in italic are significant at $p < 0.05$. The variables are defined in Appendix

Table IV Regression results

Variables	*Pooled OLS SNCI_log*	*Pooled Logit SNCI_logit*	*GLS SNCI_log*	*Logistic SNCI_logit*
BOD_size	4.661*** (1.259)	3.583*** (1.359)	4.046*** (1.297)	3.944* (2.077)
BOD_ned	−10.79*** (1.891)	−8.521*** (2.379)	−9.987*** (1.912)	−9.514*** (3.586)
BOD_meeting	−0.506 (0.543)	−0.918 (0.635)	−0.421 (0.565)	−0.488 (1.152)
BOD_compensation	−0.516 (0.455)	−0.178 (0.461)	−0.416 (0.464)	−0.257 (0.836)
SC_size	3.711*** (1.166)	2.148* (1.297)	3.401*** (1.190)	2.178 (2.124)
SC_act.expertise	−2.333*** (0.836)	−2.018** (0.958)	−2.046** (0.854)	−2.061* (1.082)
SC_meeting	−1.473** (0.668)	−1.641** (0.768)	−1.302* (0.696)	−1.407* (0.723)
SC_compensation	−0.363 (0.290)	−0.674 (0.452)	−0.358 (0.293)	−0.503 (0.808)
ASSET	−0.426 (0.385)	−0.716* (0.420)	−0.437 (0.404)	−1.485* (0.861)
AGE	1.364** (0.594)	1.519** (0.637)	1.418** (0.633)	2.791** (1.378)
GDPGR	0.372 (0.366)	0.410 (0.485)	0.334 (0.356)	0.136 (0.604)
Constant	17.52* (9.242)	23.80*** (9.189)	16.85* (9.594)	38.48** (19.14)
Year dummy	Yes	Yes	Yes	Yes
Observations	183	183	183	183
R-squared	0.407	−57.035	0.406	−52.973

Notes: The variables are defined in Appendix. *, **, *** denote significance at 10%, 5% and 1% levels, respectively

The *BOD_ind* is significant and negatively related to SNCR. This finding is consistent with the proposition of agency theory that suggests the independence non-executive director is an essential quality that contributes to a committee's effective monitoring function (Fama and Jensen, 1983). The independent board is expected to provide unbiased assessment and judgement and to be able to monitor management effectively. This result suggests that the higher proportion of independence non-executive directors on boards motivate them to be more sensitive to the *Shariah* regulatory compliance. They act more conservatively toward the SC's action and thus, reduced the SNCR. The likely cause for their action is to fulfil the fiduciary role of complying with *Shariah* and mitigate the reputational risks that can arise from non-compliance.

We also document the inverse relationship between SC with financial expertise and SNCR. The financial expertise assists the SC to have access to resources that contribute to the superior ability to understand and interpret the business activities and risk assessment effectively. The finance and accounting knowledge and experience of SC complement the *Shariah* scholars understanding of financial statements and issues related to risk assessment and management. In other words, by having appropriate experience and knowledge in accounting and finance, is likely to improve SC' performance and judgement especially with regards to *Shariah*-compliant risk.

We find that the coefficient of *SC_meeting* is significant and negatively related to SNCR. This result suggests that a higher frequency of SC meetings leads to lower SNCR. This is consistent with the argument that when SC meets more frequently, they reduce the likelihood of SNCR because regular meetings allow the *Shariah* members to identify and resolve potential problems, particularly those that are related to the *Shariah*-compliant. This finding consistent with the prior study that suggests board sub-committee who meet regularly during the financial year are linked to effective monitoring (Abbott *et al.*, 2004; Xie *et al.*, 2003). The more frequently they meet, the more effective they discharge their oversight responsibilities.

The other corporate governance variables seem to provide inconsistent results or suggest insignificant relationships with SNCR across pooled OLS, GLS and logistic regressions. In particular, the *SC_size* is positive and significant with SCNR in most of the different estimators except in logistic regression. There is no evidence that board meeting, board compensation and *Shariah* compensation are associated with SNCR. The results of all the

control variables are insignificant except for *AGE* that suggests positive relationship with SNCR. As the age of the bank increases, they may gain more complex business models which overweight the collective knowledge that they have and thus increased the *Shariah* risk non-compliant risk.

5.3 Additional analysis and robustness tests

We conduct several additional analysis and robustness tests as follows. First, we provide new definitions for board and SC variables to see whether alternative definitions affect the main results. We define *BOD_ned1* as the natural log of independent non-executive directors; the *SC_act.expertise1* as dummy variable – coded 1 if at least one member of SC equipped with accounting and financial expertise and 0 if otherwise; SC_meeting1 as dummy variable – coded 1 if the percentage of SC meeting during a year is more than sample median and 0 if otherwise; *SC_compensation1* as the ratio of SC compensation to SC size and *SC_compensation2* as the ratio of SC compensation to total asset. The results of GLS and logistic regressions as reported in Table V are qualitatively similar, suggesting the primary findings are robust to the alternative definitions of board and SC variables.

Second, we add more control variables (e.g. *ROA, ROE* and *LEVERAGE*) on the different models to test whether the inclusion of these variables would affect the primary results. None of these control variables is significant with SNCR. The main findings hold even with the inclusion of these additional control variables in Model 2 and Model 3 as reported in Table V.

Third, we run the GLS and Logistic regressions on the two sub-samples –large and small banks as reported in Table VI. We split the sample into two subsets of data at the median of *ASSET* (a proxy for bank size) to observe if size effects exist. The banks that have *ASSET* above the median are identified as large banks and the banks that have *ASSET* below the median are identified as small banks. Most of the results are consistent with those obtained from the main analyses except for some of variables either significant under GLS or Logistic model in the large or small banks. For example, the *BOD_size* is insignificant under the logistic regression for small bank. However, in general the results are very similar in terms of the signs and significance to those reported in Table IV. The conclusions from the main findings are held.

Table V GLS and Logistic regressions on the full samples – alternative definitions of corporate governance variables and additional control variables

Variables	*Model 1* *GLS* *SNCI_log*	*Logistic* *SNCI_logit*	*Model 2* *GLS* *SNCI_log*	*Logistic* *SNCI_logit*	*Model 3* *GLS* *SNCI_log*	*Logistic* *SNCI_logit*
BOD_size			3.574** (1.66)	5.718** (2.484)	5.554*** (1.605)	4.771* (2.523)
BOD_ned1			−2.241* (1.146)	−3.181* (1.803)	−2.824*** (0.989)	−2.397* (1.298)
SC_size	1.909 (0.507)	1.634 (0.870)				
SC_act.expertise1	−1.566** (0.606)	−1.216** (0.523)				
SC_meeting	−1.737** (0.779)	−1.645* (0.698)	−1.994** (0.823)	−1.794* (0.624)		
SC_meeting1					−1.642* (0.901)	−2.197* (1.195)
SC_compensation1	−9.815** (4.075)	−4.490 (2.8161)				
SC_compensation2			−8.685 (5.833)	−9.255 (8.808)	−8.685 (5.833)	−9.255 (8.808)
ASSET	−0.791** (0.3751	−1.248*** (0.383)			1.819*** (0.624)	2.690** (1.251)
AGE	2.377*** (0.531)	2.084*** (0.550)	1.824** (0.723)	2.670** (1.190)	−0.760** (0.385)	−1.604** (0.783)
GDPGR	0.468 (0.384)	0.425 (0.387)	0.272 (0.321)	0.086 (0.550)	1.819*** (0.624)	2.690** (1.251)
LEVERAGE			0.009 (0.013)	0.009 (0.014)	0.0122 (0.0151)	0.0163 (0.0183
ROA					22.121 (14.572)	25.220 (21.423)
ROE					−1.418 (2.382)	−1.728 (3.148)
Constant	16.50* (8.519)	24.02*** (7.515)	17.45 (11.93)	37.47* (19.80)	6.486 (8.833)	24.40 (16.17)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	183	183	183	183	183	183
R-squared/ log-likelihood	0.282	−66.971	0.331	−55.862	0.329	−56.346

Notes: The variables are defined in Appendix. *, **, *** denote significance at 10%, 5% and 1% levels, respectively

Table VI The GLS and logistic regressions on the two Sub-samples – large and small banks

	Small banks		*Large banks*	
Variables	*GLS SNCI_log*	*Logistic SNCI_logit*	*GLS SNCI_log*	*Logistic SNCI_logit*
BOD_size	3.656* (2.204)	4.717 (2.455)	3.598* (2.173)	3.520** (1.562)
BOD_ned	−7.209*** (2.35)	−9.518** (3.737)	−10.90*** (3.041)	−7.498** (3.130)
BOD_meeting	−1.793*** (0.671)	0.960 (1.339)	−2.388 (0.888)	−3.617*** (1.075)
BOD_compensation	0.205 (0.521)	1.241 (1.130)	0.148 (1.102)	−0.0701 (0.783)
SC_size	2.880* (1.421)	2.494 (2.539)	0.285 (2.332)	0.308 (1.923)
SC_act.expertise	−0.400*** (0.104)	−0.515* (0.291)	−3.872** (1.515)	−2.763* (1.497)
SC_meeting	−2.680*** (1.013)	−3.303** (1.441)	−1.691* (0.962)	−1.299** (0.617)
SC_compensation	−0.135 (0.294)	0.424 (0.424)	−0.952 (0.593)	−1.079 (0.967)
ASSET	−0.022 (0.443)	−1.424* (0.849)	1.384 (1.553)	2.335* (1.257)
AGE	0.044 (0.615)	1.689 (1.224)	1.014 (1.705)	0.342 (1.051)
GDPGR	1.0701 (0.417)	0.118 (0.373)	0.606 (0.685)	−0.0078 (0.247)
Constant	6.102 (9.657)	7.357 (15.142)	6.016 (33.234)	−25.879 (21.952)
Year dummy	Yes	Yes	Yes	Yes
Observations	92	91	92	91
R-squared/ log-likelihood	0.413	−21.382	0.536	−34.316

Notes: The variables are defined in Appendix. *, **, *** denote significance at 10%, 5% and 1% levels, respectively

Finally, we run the two-stage least-square (2SLS) regression to address possible endogeneity issue. Prior literature suggests that most of the corporate governance variables are endogenous in nature because the firms choose their board or subcommittee members to suit their business operation and environment (Coles *et al.*, 2008; Harris and Raviv, 2008). One of the possible sources of endogeneity that effect the relationship between corporate governance and bank risk-taking is reverse causality or simultaneity (Larcker and Richardson, 2004; Larcker and Rusticus, 2010). In this study, rather than the argument of effective board and SC reduced the SNCR, the SNCR may also affect the effectiveness of board and SC. For example, when the SNCR is lower, there is possibility that the effectiveness level of board and SC will be increased because they are less busy handling risk, and thus have more capacity to focus on strengthening their effectiveness. This reverse causality issue arises because corporate governance variables are *dynamic* (Wintoki *et al.*, 2012; Cicero *et al.*, 2013).

We perform Durbin and Wu-Hausman tests (Durbin, 1954; Wu, 1973; Hausman, 1978) to all our corporate governance variables individually to investigate the presence of endogeneity in our study. Table VII presents the results of the Durbin–Wu–Hausman test. The results suggest that all the variables (*BOD_size; BOD_meeting, BOD_compensation, SC_size, SC_act.expertise, SC_meeting and SC_compensation)* are insignificant except for *BOD_ned* that confirmed the presence of endogeneity. To address this concern, we run instrumental variables (IV) with 2SLS regression consistent with the prior literature (Larcker and Rusticus, 2010; Katmon and Al Farooque, 2017). We employed a two-year lagged value of BOD independent, BOD_ned_{t-2}, as an instrumental variable consistent to Sila *et al.* (2016). This BOD_ned_{t-2} lagged variable is valid to be instrumental variable under the assumption that independent directors may take at least a year to be changed and the board members must be in their roles for some time to have an impact on the SNCR. The BOD_ned_{t-2} has fulfilled the following conditions:

Table VII Durbin, and Wu-Hausman test for endogeneity

	BOD_size	*BOD_ned*	*BOD_meeting*	*BOD_compensation*	*SC_size*	*SC_act.expertise*	*SC_meeting*	*ln_screm*
Durbin (*p*-value)	1.249 (0.263)	4.010 (0.045)**	0.4678 (0.494)	0.098 (0.753)	0.320 (0.571)	0.198 (0.655)	0.4532 (0.501)	0.098 (0.753)
Wu-Hausman F (*p*-value)	1.049 (0.307)	3.437 (0.066)*	0.410 (0.522)	0.081 (0.776)	0.280 (0.597)	0.165 (0.684)	0.377 (0.540)	0.0811 (0.776)

Notes: The variables are defined in Appendix. *, **, *** denote significance at 10%, 5% and 1% levels, respectively

- outside the regression model;
- uncorrelated with regression errors; and
- strongly correlated with endogenous variables[8].

To ensure the IVs are valid, we estimated the reduced form equations on the first stage of 2SLS regression and examined the significance level of the endogenous variables (Adkins and Hill, 2007: 249-250). We also check the strength of our IV using the F-statistics for the first-stage 2SLS regression following Staiger and Stock (1997). Our F-statistics in the first stage is 62.86, which is higher than 10 (cut-off point). Therefore, we conclude that our IV is valid and reliable to be instrumented in our 2SLS regression. The results of first-stage and second stage of 2SLS regression are presented in Table VIII. The results of 2SLS regressions are relatively consistent with the main findings reported in Table IV.

6. Conclusion

This study represents one of the first attempts to study the relationships between corporate governance and SNCR. Although the corporate governance literature is quite developed, no prior study examines the link between corporate governance mechanism and SNCR which is unique for 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 SC characteristics (size, financial expertise, meeting frequency and compensation). We perform our investigation on Islamic banks from Malaysia and Indonesia over the period 2007 to 2017.

The empirical results indicate that the banks with a smaller board and a higher proportion of independent board are likely to have lower *Shariah* non-compliance risk. The results also indicate that the financial expertise and higher frequency of SC meetings reduce the SNCR. Collectively, our analysis shows that banks with strong corporate governance environments reduce SNCR. 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, the boards of directors and academics, especially on issues relating to corporate governance

Table VIII First and second stage of 2SLS regression models

		SNCI_log
Variables	*First stage*	*Second stage*
BOD_ned/fitted-value		−15.92*** (3.752)
BOD_size	−0.0477 (0. 044)	5.843*** (1.315)
BOD_meet	0.005 (0.0200)	−0.0302 (0.627)
BOD_compensation	0.026 (0.021)	−1.111** (0.557)
SC_size	0.121*** (0.047)	5.140*** (1.770)
SC_act.expertise	−0.110*** (0.030)	−4.147*** (1.210)
SC_meet	−0.018 (0.025)	−1.900** (0.778)
SC_remuneration	−0.018 (0.014)	−1.008** (0.447)
ASSET	0.017 (0. 014)	0.0564 (0.452)
AGE	−0.046** (0.025)	1.103 (0.833)
GDPGR	0.010 (0.021)	−0.925
		− 15.92***
BOD_ned_{t-2}	−0.677*** (0.085)	
Constant	−0.281 (0.350)	30.29*** (10.46)
Year dummies	Yes	Yes
Observations	137	137
R-squared/ log-likelihood	0.84	0.416

Notes: The variables are defined in Appendix. *, **, *** denote significance at 10%, 5% and 1% levels, respectively

practice and SNCR. They may use the findings as guidance to see how the characteristics of the board and SC may influence bank risk-taking as well as in planning strategies to mitigate future losses with regards to SNCR and can potentially enhance reputational risk. There is a need to carry out further research to extend our study and explore more on the roles that *Shariah* bodies play in governance and other effective characteristics of board and SCs.

Notes

1. For example, the Dow Jones Islamic Index uses the following criteria to identify Shariah compliant stocks: total debt/market cap (moving average 24 month) less than 33 per cent; cash and interest bearing securities/ market cap (moving average 24 month) less than 33 per cent; account receivables/market cap (moving average 24 month) less than 33 per cent; and impermissible income should not exceed 5 per cent of total revenue (BinMahfouz and Ahmed, 2014).
2. Other theories also may be relevant for *Shariah* compliance in Islamic finance. Given the nature of Islamic banking model and products, the stakeholders' theory also becomes relevant to explain governance issues in these institutions (Hasan, 2009; Iqbal and Mirakhor, 2004, Grais and Pellegrini, 2006a). The stakeholders' theory considers the interests of other stakeholders in the objectives of firms along with the shareholders' perspectives (Donaldson and Preston, 1995, Freeman and Evan, 1990 and Freeman *et al*., 2004). Furthermore, legitimacy theory which explains the relationship between the organization and society at large in terms of a "social contract" may also be relevant for governance issues in Islamic banks (Suchman, 1995, Chen and Roberts, 2010, Kelton and Yang, 2008).
3. PWC (2009) reports that the number of reputable *Shariah* scholars globally range between 20 to 30 and the best-known scholars are compensated in millions of dollars per year.
4. Jensen and Meckling (1976) define residual loss as the monetary value of reduction in welfare of the principal resulting from the divergence of agent's decisions from that optimal ones that maximize the welfare of the former even after incurring monitoring and bonding costs.
5. Only one bank in Malaysia (Bank Islam Malaysia Bhd.) and four banks in Indonesia (Bank BNI Syariah, Bank BRI Syariah, Bank Muamalat Indonesia and Bank Panin Dubai Syariah) are listed in the respective national stock markets.
6. We have also consider the proxies of SNCI scaled by total asset, net income and total equity in our analysis, however all model indicate insignificant F-statistic. We expect the misspecification of the models are due to the insignificant amount of SNCI as compared to total assets, net income and total equity as well as the small sample size covered in our study.
7. Indonesian banks operate with a two-tier board structure, thus board size is the total number of directors on board of commissioners and board of directors. While, board independence refers to the number of independent board of commissioners.
8. We have also consider other IV for *BOD_ned*, i.e portfolio rank, $BOD\_{quartile\ rank}$ – the rank value is based on the quartile that fall into four equal-size of portfolio (i.e. categories 1-4, based on the lowest to the highest value. Similar to BOD_ned_{t-2}, we estimated the reduced form equations on the first stage of 2SLS regression and examined the significance level of the *BOD_ned*. The IV meets the suggested criterions. The results for 2SLS regression is relatively similar as reported in the main findings.

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Appendix

Table AI Description of variables

Variables	*Definitions and coding*
SNCI_log =	the natural log of *Shariah* non-compliant income
SNCI_logit	coded 1 if the bank report positive *Shariah* non-compliant income and coded 0 if the bank reports zero *Shariah* non-compliant income
BOD_size =	the natural logarithm of total number of directors on the board
BOD_ind =	the percentage of independent director to total board size
BOD_meeting =	the natural logarithm of BOD s' meetings during a year
BOD_compensation =	the natural logarithm of BOD s' compensation during a year
SC_size =	the natural logarithm of SC members
SC_act.expertise =	the natural log of the number of *Shariah* members with accounting and financial qualification and experience
SC_meeting =	the natural logarithm of SC meetings during a year
SC_compensation =	the natural logarithm of SC' compensation during a year
ASSET =	the natural logarithm of total assets
AGE =	the natural logarithm of bank' age
GDPGR =	country GDP growth

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