



## Shariah Supervisory Board and Shariah Compliance Risk: Empirical Evidence from Indonesia

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### Abstract

This study examines the effect of educational level, educational background in Shariah/Islamic law/Islamic law jurisprudence, cross-membership, and tenure of Shariah supervisory board (SSB) members, as well as market competition on Shariah compliance risk. The research sample is 14 full-fledged Islamic banks (IB) from Indonesia during the 2009-2020 observation period. The data analysis method uses panel data analysis with a fixed effect model or a random effect model with a robust standard error approach. We found that cross-membership, educational background, and tenure of SSB have a positive effect on Shariah compliance risk. Also, we show that banks that have high market power take high Shariah compliance risks. This study supports the upper echelons theory, overboarding hypothesis, human capital resource theory, and competition-fragility hypothesis in explaining the role of SSB on shariah compliance risk. This study is helpful for regulators and IB owners in determining the qualifications of SSB members, including education level, educational background, cross-membership, and tenure, because these SSB attributes affect the effectiveness of SSB in controlling shariah compliance risk.

**Keywords:** Competition-fragility Hypothesis, Experience, Knowledge, Shariah Compliance Risk, Shariah Supervisory Board.

**JEL Classification :** G4, G31, G32, M410.

### 1. Introduction

The study of Shariah compliance risk in Islamic banks (IB) is the main concern of researchers (Mukhibad et al., 2023). There are two main reasons for this statement. First, an IB was established to provide products and services that are Shariah-

compliant (Aribi and Arun, 2015). Islamic law, as the basis for IB operations, prohibits transactions related to interest (*riba*), *gharar* (legal ambiguity or excessive risk), *maysir* (gambling), and providing financing or investment to companies producing/distributing haram products (alcohol, tobacco, etc.). This situation causes IB to have complex operations (Trinh et al., 2020) because IBs are required to provide a competitive return, shariah-compliant returns with current regulatory infrastructure tailored towards conventional banks (CB) operations (Safiullah and Shamsuddin, 2018).

Second, IBs face complex risks and tend to have more significant risks than CBs (Mukhibad and Setiawan, 2022). Investment instruments available in the market (i.e., derivatives, options, bonds) are not halal (Siddiqui, 2008). Meanwhile, IBs are facing demands from customers to be able to provide more competitive returns than CBs. This encouragement allows IBs to make non-halal investments to improve their performance.

Third, the risk study on IB by researchers focused more on general risks (risks that CBs also face), not related to unique IB operations, including credit, insolvency, liquidity, and market risk (Mukhibad and Setiawan, 2022; Mukhibad et al., 2022). The limited previous research on shariah compliance risk motivated Basiruddin and Ahmed (2019) and Mukhibad et al. (2022) to focus their studies on shariah compliance risk in IB.

In explaining the Shariah compliance risk, Basiruddin and Ahmed (2019) use the variable number of members, number of meetings, and compensation from the board of directors (BOD) and SSB. Their study found that IBs with small BOD members and a higher proportion of independent BOD members tend to have lower Shariah compliance risks. Meanwhile, financial expertise and a higher frequency of SSB meetings reduce shariah compliance risks (Basiruddin and Ahmed, 2019).

In the corporate governance structure of IB by regulators, the board responsible for ensuring that IB operates according to Shariah is the SSB (Nurkhin et al., 2018; Mukhibad et al., 2023). SSB is mandated to provide advice and recommendations to directors and supervise banking activities to comply with Shariah principles (Law of the Republic of Indonesia Number 21 of 2008). Moreover, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOFI) states that the SSB is entrusted with directing, reviewing, and supervising Islamic financial institutions' activities. The fatwas (legal opinions) and board rulings need to be binding. Following Mukhibad et al. (2023) and Mukhibad et al. (2022), this study emphasizes the role of SSB attributes in reducing the shariah compliance risk. To explain the role of SSB, the evaluation of the

individual characteristics of SSB is very substantial. The reason is that the individual characteristics of SSBs affect their effectiveness in carrying out their duties.

Mukhibad et al. (2023) use the number of members, educational level, cross-membership, expertise in finance/banking/accounting fields, and gender of SSB to explain the effectiveness of SSB. Mukhibad et al. (2022) added the factors of SSB experience and the educational background of SSB in Islamic law jurisprudence/shariah to explain the effect of SSB attributes on shariah compliance. Mukhibad et al. (2023) used a sample of 102 fully-fledged IBs from 27 countries. They reported that cross-membership and economic/finance/accounting expertise of SSB members had a positive impact on shariah compliance. However, the number of SSB members negatively influences Shariah compliance. Mukhibad et al. (2022) report that the number of SSB members has a positive effect on Shariah compliance. However, the SSB's educational background in Islamic law jurisprudence/shariah has a negative effect on shariah compliance.

The model developed by Mukhibad et al. (2023) and Mukhibad et al. (2022) explains the effect of SSB on shariah compliance, ignoring the market competition. Customers can choose bank products in a perfectly competitive market according to their preferences. IB operates to provide shariah-compliant banking products and services. However, IB customers tend to be rational-oriented and pay little attention to Shariah compliance when determining bank product choices. In addition, IB operates in a dual-banking system where IB and CB compete for the same market. Banks can act as price takers in this competition to maintain performance (Allen et al., 2000). Thus, competition affects bank credit risk-taking (Louhichi et al., 2019). Following Mukhibad et al. (2022), we add market competition factors using the Lerner index to the model to explain the effect of SSB attributes on shariah compliance risk.

In the board demographic study, board tenure may predict the effectiveness of its duties. The tenure of a firm's board is an aggregate measure and is a proxy for both the level of the board's specific firm knowledge as well as the extent of board independence (Valenti and Horner, 2020). SSB is a unique board on IB and a multi-layer board in IBs (Nomran and Haron, 2019). Therefore, evaluating the impact of tenure on board outcomes can also be applied to SSBs. The longer an SSB is on a firm's board, the more familiar SSB becomes with the resources and capabilities of the firm, and the better able SSB is to assess business decision-making and improve both the quality of counselors and monitoring mechanisms

for directors. A long tenure of boards within a company will have higher business knowledge and be more likely to make effective decisions to raise firm performance (Reguera-Alvarado and Bravo, 2017).

On the contrary, long-tenured boards may become closer to directors, and as a result, the development of their tasks can be compromised (Vafeas, 2003). It may develop friendships with the directors, reducing board monitoring and the protection of shareholders' interests (Mollah et al., 2021). The importance of the role of board tenure, empirical evidence on SSB tenure, and firm outcomes is scarce. The second contribution of the study is to extend the literature that investigates the link between SSB tenure and Shariah compliance risk.

The rest of the paper proceeds as follows. The literature review and hypothesis development are introduced in Section 2. Section 3 provides the data, measurement variables, and data analysis methods. Section 4 presents the empirical results. Section 5 discusses, and Section 7 is the robustness test. The last section is a conclusion.

## 2. Literature Review

### 2.1 Shariah Compliance Risk

IBs differ from CBs in their functions, structure, objectives, principles, operations, and governance (Mukhibad et al., 2022). This difference is because IB uses shariah/Islamic law as the basis for bank operations. Shariah has to restrain IBs from all kinds of operations that involve *riba* (interest), *gharar* (excessive uncertainty), and *maysir* (gambling) (Tarique et al., 2021). Shariah/Islamic law also prohibits IB from providing financing to companies producing/distributing illicit products (alcohol, tobacco, etc.) (Ahmed, 2010). Thus, Shariah compliance is the main guarantee that directors must provide to stakeholders.

IB regulators appointed SSB as a multi-layer governance structure in IBs (Nomran and Haron, 2019). SSBs, besides the board of directors (BOD), work together to provide consulting and monitoring services to directors to carry out IB operations and contribute to the sustainability of stakeholders' interests. Law of the Republic of Indonesia number 21 of 2008 regulates the provisions regarding SSB as follows:

1. The IB must designate a person as a member of the SSB.
2. The SSB is appointed by shareholders' meetings on the recommendation of the Indonesian Ulema Council.
3. The SSB has the task of providing advice and suggestions to the directors and supervising the bank's activities so that they comply with shariah principles.

Abdul-Baki and Uthman (2017) state that the operation of IBs to provide shariah-compliant products faces major challenges along with a profit-oriented business environment. Studies from Ismal (2011) and Aysan et al. (2018) reinforce this argument because customers of IBs will withdraw their deposits if IBs do not receive income from their financing, the interest of CB increases, and the return for deposits decreases.

This challenge is getting more prominent because of customer demands for IBs to provide competitive returns for deposits, accompanied by investment instruments on the market suitable for CB (Mukhibad and Setiawan, 2022). IB cannot take advantage of investment instruments available on the market (i.e., derivatives, options, bonds) because these instruments are not halal (Siddiqui, 2008). IBs must adjust to comply with IBs' requirements to conduct law-abiding Islamic transactions (Safiullah and Shamsuddin, 2018). Thus, IB faces a high Shariah compliance risk.

## **2.2 Agency Conflict in Islamic Banks**

Mukhibad et al. (2022) have developed a fourth type of agency conflict in IB. This conflict is produced from type 1 agency conflict, between agent and principal; the second type, between majority and minority owners; and the 3rd type, between the owner and the creditor. This agency conflict occurs because one party takes advantage of its power to enact policies that can enhance its own interests and endanger the interests of other parties. In agency conflict type 4, this conflict occurs if the IB director makes investments or product schemes with low Shariah compliance (Mukhibad et al., 2023). Zainuldin et al. (2018) state that IBs are also likely to encounter additional agency problems if, in any case, managers deviate from their duty to ensure shariah compliance on IB's transactions.

AAOIFI in governance standard number 1 states that the SSB is an independent board that directs, reviews, and supervises bank operations to comply with principles and Shariah law. The quality of supervision from the SSB is needed to reduce agency conflict. The role of SSB to reduce agency conflict is to certify (ex-ante) and monitor (ex-post) all financial contracts, transactions, and further activities of the bank on behalf of shareholders, stakeholders, and clients to ensure that the contract complies with Shariah (Alman, 2012). Researchers use various ways to prove the role of SSB in reducing agency conflict. Safiullah and Shamsuddin (2018) expand Shariah compliance indicators by avoiding the director's excessive risk policy. The results of their research found that supervision from SSB can avoid risks. Mukhibad et al. (2022) and Muhammad et al. (2021)

use the disclosure of annual reports as Shariah compliance and report that SSB influences accountability through increasing disclosure of annual reports.

### **2.3 Hypothesis Development**

Evaluation of the effectiveness of SSB in carrying out the duty to ensure Shariah compliance on IB's transactions can be based on the individual characteristics of SSB members. One of SSB's individual characteristics and supporting IB operations according to Shariah is SSB's expertise in Shariah, which is the educational background of SSB members. Regulators require expertise in Shariah as the main requirement to become a member of the SSB. IB regulators in Indonesia issued Bank Indonesia regulation number 6/24/PBI/2004, stating that the requirement to become a member of the SSB is to have knowledge and experience in the shariah muamalah and expertise in the field of banking and or finance. However, this SSB capability indicator is not clearly regulated in this regulation. So, the Financial Services Authority requires a recommendation from the Indonesian Ulema Council as an indicator that SSB members know Shariah. However, Mukhibad et al. (2022) and Mukhibad et al. (2022) use the educational background in Islamic law/shariah/Islamic law jurisprudence as an indicator to measure SSB knowledge and expertise in Shariah. Academic background is an indicator of expertise because it follows the upper echelons theory that education is a good proxy for measuring knowledge (Hambrick and Mason, 1984).

H1: The educational background of Shariah/Islamic law/Islamic law jurisprudence of SSB members has a negative influence on the Shariah compliance risk.

The upper echelons theory was introduced by Hambrick and Mason (1984), stating that educational background may yield rich but complex information and indicate a person's knowledge and skill base (Hambrick and Mason, 1984). Based on the upper echelons theory, a highly educated management team is associated with a high predisposition for information processing and competence in strategic decision-making (Hambrick and Mason, 1984). The educational level is an intellectual competence and professionalism proxy (Mukhibad et al., 2022).

Darmadi (2013) proved the upper echelons theory by demonstrating the educational background of Chief Executive Officers (CEOs) on financial performance in 160 listed firms and found that the academic background of CEOs influences financial performance. Muhammad et al. (2021), using a sample of IBs in Asia and the Gulf Cooperation Countries (GCC), found that the educational level of SSB has a positive influence on shariah compliance.

H2: The educational level of SSB members has a negative influence on Shariah compliance risk.

Following Nomran et al. (2018) and Nomran et al. (2017), cross-membership is an indicator that can improve SSB abilities and expertise. Cross-memberships are SSB that sit on more than one board in other entities. Based on the Resources Dependence Theory (RDT), IB can connect with the external environment through the interlocks of SSB. This is because cross-membership can enable the SSB interlocks to monitor the external bank and disseminate information about these banks (Nomran et al., 2018). In addition, cross-membership allows SSB members to discuss with SSB members and directors of other banks, thereby increasing their knowledge and experience (Mukhibad and Setiawan, 2022). In addition, SSB interlocks generate a reputation effect because SSBs sitting with other IBs are considered to have extraordinary experience and capabilities to increase the performance of IBs. Some researchers claim that cross-memberships of the SSB members may have a positive impact on the board's performance (Alman, 2012), reducing risk (Mukhibad and Setiawan, 2022), improving the performance (Nomran et al., 2017), and enhancing shariah compliance (Mukhibad et al., 2023). H3: Cross-membership of SSB members has a negative effect on Shariah compliance risk.

One of the most discussed issues in the CG studies is tenure, which implies that the SSB sits for a long time as a member of the board. Recent literature has led to two contradictory impacts of board tenure. First, board tenure enhances board experience and knowledge (Valenti and Horner, 2020), and they will be more likely to make effective decisions in order to raise firm performance (Reguera-Alvarado and Bravo, 2017). A longer tenure accords the board the advantage of experience within the bank, more profound business arguments and knowledge, and broader access to and networking with all the stakeholders (Wijayanti et al., 2020). This hypothesis supports the human capital resource theory that board tenure is likely to influence strategy and is critical to firm innovation (Valenti and Horner, 2020).

Second, board tenure increases the closeness of the board to the CEO, and this reduces board independence (Valenti and Horner, 2020) and, as a result, the development of their tasks can be compromised (Vafeas, 2003). The friendships among boards and directors have had an impact on reducing board monitoring and the protection of shareholders' interests (Mollah et al., 2021). Along with this negative argument, Miller (1991) argued that experience renders boards with a long tenure indifferent to environmental changes. A recent study on tenure led to

the conclusion of an unclear relationship between tenure and the performance of SSB. Mukhibad and Setiawan (2022) report the negative impact of SSB tenure on liquidity risk, strategic risk, and return rate risk. On the contrary, Anisykurlillah et al. (2020) and Mukhibad et al. (2022) did not find a relationship between SSB tenure on financial statement quality and zakah performance.

H4: Tenure of SSB members influences Shariah compliance risk.

IB's big challenge is implementing Shariah principles and rules in bank operations. The first reason for this statement is that the IB operating community is rational, profit-oriented, and tends not to pay attention to aspects of shariah compliance (see Ismal (2011) and Aysan et al. (2018)). Demands from the public for IBs to provide competitive returns allow IBs to offer returns for depositors that are the same as conventional bank interest, and further increase the shariah compliance risk. Thus, market competition factors can affect bank risk-taking.

Recent literature develops two opposite effects of market competition: fragile market competition and stable market competition (Louhichi et al., 2020). The competition-fragility view assumes that more competition makes banks more fragile because high competition erodes market power, reducing bank performance (Noman et al., 2017). In contrast, the competition-stability view implies that high competition promotes the financial stability of banks because high market power enjoys lower competition in the loan market, which encourages them to set high-interest rates for borrowers, which in turn increases their (borrowers') risk-taking tendency and default risk (Noman et al., 2017). Mukhibad et al. (2022) and Louhichi et al. (2019) have provided evidence that market competition influences bank risk-taking. Studies on market competition in IBs lead to a fragile market competition hypothesis because low competition is a tendency for banks to practice monopoly and dominate the market. These conditions cause decreased Shariah compliance risk (Mukhibad et al., 2022).

H5: Market competition has a negative influence on Shariah compliance risk.

#### **4. Methods and Materials**

This study uses a full-fledged sample of Islamic banks in Indonesia with a 12-year observation period (2009-2020). However, three banks do not report non-halal income, so we excluded these three banks. In addition, two banks converted from CBs to IBs in the current year, so we used unbalanced data with 118 units of analysis.



The independent variable of this study is Shariah compliance risk as measured by the non-halal income ratio (NHIR). This NHIR is measured by the ratio of non-halal income to total income from bank financing (Basiruddin and Ahmed, 2019). A high NHIR indicates a bank has a high shariah compliance risk.

Independent variables use four SSB attributes: educational background in Shariah/Islamic law/Islamic law jurisprudence, educational background in economics/finance/accounting, cross-membership, and tenure. Educational background in shariah/Islamic law/Islamic law jurisprudence of SSB members (SSBSYARIAH) is measured by the ratio of SSB members who have an educational background in shariah/Islamic law/Islamic law jurisprudence to all SSB members (Mukhibad et al., 2022). Educational background in accounting/finance/economics of SSB members (SSBFINANCE) is measured by the ratio of SSB members who have an educational background in accounting /finance/economics to all SSB members.

**Table 1.** Measurement Variables

Variables	Abbreviation	Description	References
1. Shariah compliance risk	SCR	$SCR_{i,t} = \frac{\sum non - halal\ income_{i,t}}{\sum financing\ income_{i,t}} \times 100$ <p>High SCR scores indicated high Shariah compliance risk.</p>	Mukhibad et al. (2022); Basiruddin and Ahmed (2019)
2. The educational background in Shariah/Islamic law/Islamic law jurisprudence of SSB members.	SSBSHARIAH	Dummy: score one if the SSB has at least one educational background in Shariah/Islamic law/Islamic law jurisprudence; score zero otherwise.	Mukhibad et al. (2022); Bukair and Abdul-Rahman (2013)
3. Educational level of SSB members.	SSBEDU	The percentage of scholars who have a PhD degree.	Nomran et al. (2018)
4. Cross-membership of SSB	SSBCROSS	The average score of cross-membership of SSB.	Mukhibad et al. (2023)
5. Tenure of SSB	SSBTENURE	The number of months the SSB has been in that position.	Anisykurlillah et al. (2020)
6. Market competition	LERNER	$Lerner_{i,t} = \frac{Price_{i,t} - MC_{i,t}}{Price_{i,t}}$ <p>Price<sub>i,t</sub> is the price of banking outputs for bank i at time t,</p>	Alam et al. (2019)

		MC is the marginal cost for bank <i>i</i> at time <i>t</i> . The Lerner index is averaged over time under the study for each bank <i>i</i> . Lerner takes values between 0 and 1. Scores tend toward 0, meaning a purely competitive market and no pricing power otherwise. Scores tend toward 1, which means a low competitive market, reflecting a high markup of price above marginal cost, a high markup of price above marginal cost, the banks have monopoly power, and the market power is increased.	
7. Deposit Fund Ratio	DEPOSIT	The percentage of deposit funds to total assets	Abdul-rahman et al. (2017)
8. Total Assets	SIZE	Natural logarithm of total assets	Mukhibad et al. (2022)
9. Pandemic COVID-19	COVID	Dummy, score 1 if the COVID-19 pandemic period; Score 0 otherwise	Mukhibad et al. (2022)

All data are collected by hand for annual reports published on each bank's official website. Model feasibility analysis used variable inflation factors (VIF) for the multicollinearity test, the Wooldridge test for the autocorrelation test, and the modified Wald test for heteroskedasticity.

The data analysis technique uses panel data regression with a fixed effect model or a random effect model approach. The selection of the model used in answering the hypothesis is based on the Breusch and Pagan Lagrangian multiplier test for selecting the common effect model (CEM) and the random effect model (REM). If this test produces a probability result of less than 0.05, then the recommended model is REM; otherwise. The second test is the Hausman test, where the probability results are less than 0.05, so the recommended model is the fixed effect model (FEM), and vice versa.

We developed the following research models:

$$SCR_{i,t} = \beta_0 - \beta_1 SSBSHARIAH_{i,t} - \beta_2 SSBEDU_{i,t} - \beta_3 SSBCROSS_{i,t} - \beta_4 SSBTENURE_{i,t} - \beta_5 LERNER_{i,t} + CONTROL + \varepsilon$$

In this model,  $\alpha$  is the intercept,  $i$  and  $t$  correspond respectively to IBs and years. The dependent variable is Shariah compliance risk, representing SCR. The independent variables include SSBSHARIAH, which refers to educational background in shariah/Islamic law/Islamic law jurisprudence of SSB members, SSBEDU refers to the educational level of SSB members, SSBCROSS refers to cross-membership of SSB, SSBTENURE refers to tenure of SSB, and LERNER refers to market competition. CONTROL refers to a set of control variables with three proxies (DEPOSIT, SIZE, and COVID), and  $\varepsilon$  refers to the error term.

## 5. Results

### 5.1 Descriptive Analysis

Table 2 shows that the average ROA is 0.037%, with a minimum of 0.00 to a maximum of 0.164%. The average SSBEDU is 0.548%, with a minimum of 0.00 and a maximum of 1. The sample has an SSB with a doctoral degree of 0.548%. The average SBSSHARIAH is 0.993%, with a minimum of 0.000 and a maximum of 1.000. This score shows that 99.30% of banks have at least 1 SSB member with shariah education. Table 2 also shows that the average SSBCROSS is 2.296, with a minimum of 0.00 and a maximum of 5.5. The sample of SSB members serving as SSB in other Islamic institutions is 2.296. The average SSBTENURE is 4.363 years. The minimum score of SSB tenure is 0.017 years, and the maximum is 9.092 years.

Table 2 also shows that the sample has a Lerner average of 0.107, with a minimum of 0.004 and a maximum of 0.857. This score shows high inter-bank competition. Lerner shows the numbers 1 to 0, where the number 1 shows weak competition and a monopoly situation, and vice versa (Salma and Younes, 2014). Table 2 states that the conventional panel unit root tests, such as the Fisher-type test proposed by Choi (2001), are used to test for the stationarity of variables. In summary, there is mixed evidence of the integration properties of the variables in our dataset.

**Table 2.** Descriptive Statistics

Variables	Mean	Std. Dev.	Min.	Max.	Unit Root Test (P-value)	
					Inverse Normal	Modified inv. chi-squared
SCR	0.037	0.019	0.000	1.614	-4.434 (0.000)	5.95 (0.000)

SSBSHARIAH	0.993	0.081	0.000	1.000	-5.545 (0.000)	12.174 (0.000)
SSBEDU	0.548	0.338	0.000	1.000	-4.284 (0.000)	7.570 (0.000)
SSBCROSS	2.296	1.264	0.000	5.500	-1.906 (0.028)	0.832 (0.2029)
SSBTENURE	4.363	3.611	0.017	9.092	-5.299 (0.000)	16.659 (0.000)
LERNER	0.107	0.337	0.004	0.857	-0.826 (0.204)	2.866 (0.0021)
DEPOSIT	1.450	7.411	0.000	74.076	-2.599 (0.005)	5.608 (0.000)
SIZE	29.741	1.434	24.240	32.474	-7.488 (0.000)	21.304 (0.000)
Covid	0.154	0.362	0.000	1.000	5.442 (1.000)	-3.458 (0.999)

**Source:** Research finding.

Correlation test results between variables to identify a serious correlation between variables in the model (multicollinearity). The correlation between the allowed independent variables is not greater than 0.8. Table 3 shows that the most significant correlation is 0.377. This test shows no serious correlation between variables.

**Table 3.** Correlation between Independent Variables

Variables	1	2	3	4	5	6	7	8	9	
SCR	1	1								
DEPOSIT	2	-0.016	1							
SSBTENURE	3	0.170	-0.309	1						
SSBSHARIAH	4	-0.050	0.019	-0.024	1					
SSBCROSS	5	-0.023	-0.033	0.014	0.182	1				
SSBEDU	6	-0.070	0.168	-0.021	-0.114	0.010	1			
SIZE	7	-0.047	-0.249	-0.189	0.377	0.333	0.089	1		
LERNER	8	0.106	0.031	0.005	0.017	-0.159	-0.158	0.001	1	
Covid	9	-0.124	-0.069	0.283	0.048	-0.035	-0.109	0.140	0.150	1

**Source:** Research finding.

## 5.2 Panel Data Regression Analysis

Table 4 shows that the mean VIF is 1.31. This score is below five and indicates there is no serious correlation between the variables in the model. Wooldridge and the modified Wald test are 0.026 and 895.52, respectively, and the probability score is more than 0.05. The results of these two tests indicate that there are heteroscedasticity and autocorrelation problems in the model. To overcome this problem, following the steps of Mukhibad and Setiawan (2022) and Abdeljawad et al. (2020), we use standard errors that were robust and clustered in years to overcome possible problems of heteroscedasticity and autocorrelation in the

model. The Breusch and Pagan Lagrangian multiplier test yields a chibar2 score of 46.24 and a probability of 0.000. The Hausman test produces a chi2 of 0.91 and a probability score of more than 0.005. The results of these two tests recommend Random-Effects GLS regression as a data analysis method. Table 4 presents the results of the regression test using the Random-Effects GLS method.

**Table 4.** Random-Effects GLS regression

Variables	Coef.	Robust Std. Err.	z	P > z
SSBSHARIAH	-3.669***	0.987	-3.720	0.000
SSBEDU	-1.963**	0.956	-2.050	0.040
SSBCROSS	-0.447*	0.238	-1.880	0.061
SSBTENURE	0.515*	0.283	1.820	0.069
Lerner	0.513***	0.184	2.800	0.005
DEPOSIT	0.053**	0.021	2.570	0.010
SIZE	0.622**	0.273	2.280	0.023
Covid	-1.984**	1.001	-1.980	0.048
_cons	-17.369**	8.018	-2.170	0.030
Mean VIF		1.31		
Wooldridge test		0.026		
Modified Wald test		895.52		
Hausman test		0.91		
Breusch and Pagan Lagrangian multiplier test		46.24***		
R-Sq		0.136		
Prob > chi2		0.000		

**Source:** Research finding.

**Note:** \*\*\*, \*\*, \* denote 1%, 5%, and 10% significance levels, respectively.

### 5.3 Discussion

Table 4 shows that SBSSHARIAH has a coefficient of -3.669 and a probability score of 0.000. These findings indicate that SSB's expertise in Islamic law/shariah/Islamic law jurisprudence has a negative effect on shariah compliance risk. SSB has the duty to provide counseling and supervision of bank operations so that bank operations comply with Shariah. Customer needs and bank products are dynamic, and the director needs approval from SSB. SSB will analyze new bank products that the Council of Scholars has not yet regulated. To carry out this task, SSB requires the knowledge of Islamic law/shariah/Islamic law jurisprudence. SSB's expertise prevents prohibited transactions from being avoided and can

further reduce Shariah compliance risk. This result is in line with the Upper Echelons theory that education is a good proxy for measuring knowledge (Hambrick and Mason, 1984), knowledge of fiqh muamalah obtained by SSB to increase effectiveness in carrying out their duties.

The panel data test results show that SSBEDU has a coefficient of -1.963 and a probability of 0.05. These results indicate that SSB education has a negative effect on Shariah compliance risk. SSB members with doctoral education will cause the director to reduce bank cooperation with CB, and accordingly reduce non-halal income and reduce shariah compliance risk. This result of research is in line with the upper echelons theory, which is that a highly cognitive board causes the board to be able to provide suggestions and come up with creative ideas in the development of products or policies that are Shariah-compliant. In addition, pressure from regulators and the public to guarantee IB operations are in accordance with Shariah and provide competitive returns, coupled with investment instruments available on the market that are not suitable for IB, has caused IB to launch creative products to meet public demands. A highly educated management team increases board capability to a high predisposition for information processing and competence in strategic decision-making (Hambrick and Mason, 1984), including the capability to provide solutions to public requirements. This result is in line with the result from Muhammad et al. (2021), who report that the educational level of SSB has a positive influence on shariah compliance.

The results of the study show that SSBCROSS has a coefficient of -0.447 and a probability score of 0.061. The results of this study indicate that SSB cross membership has a negative effect on Shariah compliance risk. Based on these results, this study rejects the hypothesis. Based on RDT, there are advantages for the IB to have SSB members sit on more than one board in other entities. First, the SSB enables the SSB interlocks to monitor the external bank and to disseminate the information of these banks (Nomran et al., 2018). Secondly, SSB discusses with SSB members and directors of other banks so as to increase their knowledge and experience (Mukhibad and Setiawan, 2022), and third, SSB has access to resources and connections and gains knowledge from other firms (Salancik and Pfeffer, 1978; Zhou et al., 2018). Cross-membership of SSB generates a reputation effect because SSB, when sitting with another IB, is considered to have extraordinary experience and capabilities to manage the assets of IBs.

In contrast, based on the overboarding hypothesis view, serving on multiple boards can overcommit a director, shirk their monitoring responsibilities for directors, and consequently adversely affect bank performance (Kutubi et al.,

2018). SSB sits at the head of many entities. They share their available time to provide advice and supervise the director. The consequence is a reduction in the quality of supervision. This study is in line with the overarching hypothesis view, which implies that SSB cross membership induces IBs to take on riskier transactions, which can increase the Shariah compliance risk. The low level of supervision and encouragement from IB customers to provide competitive returns is the same as that of CBs, with the potential for directors to adopt policies that do not pay attention to Shariah compliance. Trinh et al. (2020) show that in IBs, sitting in another entity is likely to be associated with lower scrutinizing effectiveness. Studies from Nomran et al. (2018) and Nomran et al. (2017) also show that SSB cross-membership has a negative effect on profitability. Our results provide a positive counterpoint to the negative relationship that exists between cross-membership of SSB and SSB outcomes, and accordingly decrease shariah compliance risk.

The results of the regression test on the SSBTENURE variable yield a coefficient of 0.515 and a probability score of 0.069. The test results show that SSB tenure has a positive influence on Shariah compliance risk. Our results provide a positive relationship between the tenure of SSB and SSB outcome, and accordingly, increase Shariah compliance risk. This research is in line with recent literature that shows that board tenure enhances board experience and knowledge (Valenti and Horner, 2020). Consequently, the board will be more likely to make effective decisions to raise firm performance (Reguera-Alvarado and Bravo, 2017). In addition, this research supports the human capital resource theory that longer tenure gives the advantage of experience, profound business arguments, knowledge, and broader access to and networking with all the stakeholders (Wijayanti et al., 2020), as likely to influence strategy and are critical to firm innovation (Valenti and Horner, 2020). This study supports research findings from Mukhibad and Setiawan (2022), which report the positive impact of SSB tenure on supervision from the SSB and further prevent directors from taking bank risks, consequences of reducing liquidity risk, strategic risk, and return rate risk.

Table 4 shows that LERNER produces a coefficient of 0.513 and a probability score of 0.005. These results indicate that LERNER has a positive influence on Shariah compliance risk. A Lerner index score of 1 tends toward a low competitive market, reflecting that there is a high markup of price above marginal cost, the banks have monopoly power, and the market power is increased (Alam et al., 2019). The results of this study indicate that banks with high market power cause banks to take significant Shariah compliance risks. The results of this

study corroborate the findings of Mukhibad et al. (2022) and Alam et al. (2019). The results are in line with the "competition-fragility" view, which implies that a highly competitive environment induces banks to take on riskier transactions (Alam et al., 2019), which can increase the shariah compliance risk. To derive a high return and maintain their high market power, banks tend to take on riskier transactions through increased cooperation with conventional banks and a further increase in non-halal income.

#### **5.4 Robustness Test**

Following Mukhibad and Setiawan (2022), we add the income diversity variable in our model for the robustness test. Income diversity measures the income a bank receives from sources other than financing. The magnitude of the bank's income diversity indicates that the bank obtains other sources, not relying on a single financing product to improve bank performance. Hence, income diversity can influence risk-taking (Mukhibad and Setiawan, 2022; Safiullah, 2021; Pennathur et al., 2012).

In this robustness test, we followed the steps for testing the research hypothesis, and our test results are presented in Table 5. The results of this test indicate that all our main variables influence Shariah compliance risk. These findings are in line with the results of the research presented in Table 4.



**Table 5.** Robustness Test with Random-Effects GLS Regression Methods

Variables	Coef.	Robust Std. Err.	Z	P > z
SSBSHARIAH	-2.181**	0.995	-2.190	0.028
SSBEDU	-4.521***	1.146	-3.950	0.000
SSBCROSS	-0.569**	0.233	-2.440	0.015
SSBTENURE	0.662***	0.251	2.630	0.009
Lerner	0.497***	0.149	3.340	0.001
DEPOSIT	0.061***	0.020	2.970	0.003
SIZE	0.892***	0.261	3.420	0.001
Covid	-1.895**	0.823	-2.300	0.021
DIVERINCOME	7.287***	2.091	3.490	0.000
_cons	-25.701***	7.889	-3.260	0.001
Mean VIF		1.31		
Wooldridge test		0.646		
Modified Wald test		242.62***		
Hausman test		1.09		
Breusch and Pagan		53.74***		
Lagrangian multiplier test				
R-Sq		0.268		
Prob > chi2		0.000		

**Source:** Research finding.

**Note:** \*\*\*, \*\*, and \* denote 1%, 5% and 10% significance levels, respectively. We use standard errors that were robust and clustered over years to overcome possible problems of heteroscedasticity and autocorrelation in models. Breusch and Pagan Lagrangian multiplier and Hausman tests recommend the Random-Effects GLS regression.

## 6. Conclusion

The research aims to explain the effect of four SSB attributes: education level, educational background in shariah/Islamic law/Islamic law jurisprudence, cross-membership, and tenure on shariah compliance risk. We also prove the effect of market competition on Shariah compliance. The results showed that the educational level and educational background of SSB in Shariah/Islamic law/Islamic law jurisprudence had a negative effect on Shariah compliance risk. Our research results support the upper echelons theory, which is that a highly educated management team increases SSB's capability to a high predisposition for information processing and competence in strategic decision-making, including

the ability to provide solutions to public requirements to create shariah-compliant products.

We also found that cross-membership of SSB has a positive effect on Shariah compliance risk. This study is in line with the overboarding hypothesis view, which implies that SSB cross membership reduces supervision of SSB quality and induces IBs to take on the riskier transactions, which can increase the shariah compliance risk. The results of the regression test on the SSB tenure variable have a positive influence on shariah compliance risk. This research supports that board tenure enhances board experience, knowledge, profound business arguments, and broader access to and networking with all the stakeholders, as well as the consequences of reducing Shariah compliance risk. Finally, we show that banks that have high market power take high Shariah compliance risks. The results align with the "competition-fragility" view, which implies that a highly competitive environment induces banks to take on riskier transactions, including transactions that can increase the shariah compliance risk.

The practical contribution from the results of this study is that regulators and IBs need to consider the level of education, educational background, and tenure of SSBs when appointing SSB members. Regulators and IB management also need to limit the cross-membership of SSB members because SSBs that sit in multiple entities reduce SSB outcomes and increase Shariah compliance risk. This research makes a theoretical contribution by strengthening the upper echelons theory, overboarding hypothesis, human capital resource theory, and competition-fragility hypothesis in explaining the role of SSB on shariah compliance risk.

The limitation of this study is the limited sample because we only used IB samples in Indonesia. We only use this sample because each IB must comply with the Shariah rules that the scholars of each country have formulated. Shariah originates from qiyas, which the association of scholars decides, and this difference in association allows for differences in fatwas, including in determining the rules that IB may or should avoid. For this reason, we suggest future researchers use the IB sample in other countries by paying attention to the fatwa/rules determined by ulema/religious experts from a country. This method expands the findings of this study.

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