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## Do corporate and Sharia compliance governance affect enterprise risk management implementation?

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### Abstract

The growth of Sharia banking assets in Indonesia greatly influenced by the scalability of Sharia banking businesses, which is supported by an increase in good corporate governance. The banking industry in general functions very closely with risk. This means that banks acutely need a risk-based management approach that is now being developed by the regulator with an integrated approach through Enterprise Risk Management (ERM). Other specific aspects of governance in Sharia banking include governance for compliance with Sharia aspects (Sharia compliance governance). The method used in this study is multiple regression analysis. We intended to examine the influence of general and Sharia governance mechanisms that exist in Indonesian Sharia banking with the level of ERM implementation. We indicated that the presence of the risk management committee, independent audit committee, and Sharia compliance audits positively and significantly affect ERM implementation. This study expected to be beneficial especially to provide input on governance policies for both banks and regulators.

### Abstrak

Pertumbuhan aset perbankan syariah di Indonesia sangat dipengaruhi oleh skalabilitas bisnis perbankan syariah, yang didukung oleh peningkatan tata kelola perusahaan yang baik. Industri perbankan pada umumnya berfungsi sangat erat dengan risiko. Ini berarti bahwa bank sangat membutuhkan pendekatan manajemen berbasis risiko yang sekarang sedang dikembangkan oleh regulator dengan pendekatan terintegrasi melalui Enterprise Risk Management (ERM). Aspek spesifik lain dari tata kelola dalam perbankan syariah termasuk tata kelola untuk kepatuhan dengan aspek syariah (tata kelola kepatuhan syariah). Metode yang digunakan dalam penelitian ini adalah analisis regresi berganda. Kami bermaksud menguji pengaruh mekanisme tata kelola umum dan syariah yang ada di perbankan syariah Indonesia dengan tingkat implementasi ERM. Kami menunjukkan bahwa kehadiran komite manajemen risiko, komite audit independen, dan audit kepatuhan syariah secara positif dan signifikan mempengaruhi implementasi ERM. Studi ini diharapkan bermanfaat terutama untuk memberikan masukan tentang kebijakan tata kelola untuk bank dan regulator.

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## 1. Introduction

The ASEAN Economic Community (AEC), which is a manifestation of the liberalization of the ASEAN trade market in 2015, implies the necessity of infrastructure readiness for competitiveness in Indonesia in all sectors, including the banking sector. In terms of infrastructure readiness and competitiveness, Indonesia ranks 36th below Malaysia, which is ranked 23<sup>rd</sup> and is still far behind Singapore, which is ranked 3<sup>rd</sup> (Scwab, 2018).

Referring to the assessment of the Islamic Financial Country Index (2019) by Global Islamic Financial Report (GIFR), Indonesia ranked 1st in terms of its leadership and potential in the global Islamic banking and finance industry. Indonesia surpassed Malaysia, which occupied the 1<sup>st</sup> rank for the previous three years. The assessment of the GIFR index ranking considers criteria for the number of Islamic banks, the number of non-Islamic financial institutions, and the size of Islamic financial assets. Indonesia can optimally be projected to rank first in the next few years in light of the pace of its institutional expansion and accelerated growth in Islamic banking assets. In addition, the increasing role of the Indonesian Islamic financial industry as a global player can also be seen from the list of Top 10 Fastest Growing Islamic Windows among Banks with More than \$500M in Assets, created by *The Banker*; three out of ten banks on the list are from Indonesia (*The Banker*, 2019).

The Islamic banking industry as part of the national banking industry is highly regulated in view of the role and responsibility of its development as an intermediary to the public and government. As a good corporate citizen, it is necessary to have infrastructure and mechanisms of good and integrated corporate governance. The implementation of good governance in Islamic banking is reflected in the principles of overall governance for the achievement of sustainable business objectives, taking into account the application of risk management and compliance with Sharia aspects of governance.

Indonesia itself was affected by the Asian financial crisis on 1997-1998, thus resulted in the provisions concerning bank health by Banking regulator and supervisors. However, it is also a necessity for the banking industry to ordain risk management to finesse any potential risk that may ascend (Karyani et al., 2019). The application of risk management is one of the mechanisms that must be applied in governance in order to control management activities so as to minimize the occurrence of fraud practices. Meizaroh & Lucyanda, (2011) found that the implementation and disclosure of Enterprise Risk Management (ERM) was one of the signals given by the company that it had applied the principle of transparency. Hoyt & Liebenberg (2011) also found that ERM allows companies to provide this information financially and non-financially to outsiders about the risk profile and also serves as a signal of their commitment to risk management. The implementation of ERM can assist management in managing the company's risk profile, both in terms of financial and non-financial aspects in an integrated and transparent manner. Moreover, in terms of the implementation concerning the corporate governance and Sharia compliance on Sharia banks towards ERM, Sharia compliance is found to help strengthen the corporate governance positive effect on ERM implementation (Elamer, Ntim & Abdou, 2017). ERM implementation can be reflected to its ERM disclosure (Rasid, Isa & Ismail, 2014). Withal, one of the five pillars of good corporate governance is transparency (Magalhães & Al-Saad, 2013). Transparency of a company can be measured from its disclosure, hence the ERM disclosures are expected to help build a strong governance framework (Grassa & Matoussi, 2014).

Research on ERM and Sharia compliance governance within Indonesia has not been conducted significantly (Claessens, 2006 in Grassa & Matoussi, 2014). However, Islamic banks as intermediary institutions that run the principles of bank management using Islamic principles have specificity in governance, because of the existence of Sharia compli-

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ance, which is important for depositors as *shahibul maal* or investors.

This research is expected to differ with the previous ones in terms of the mix between general corporate governance and Sharia governance, new variable regarding Sharia governance measurement (the Sharia controller unit), and also because of the lack of research linking the ERM and Sharia governance in Indonesia. Using the multiple regression analysis, this research specifically seeks to test the following problems: (i) what are the characteristics of corporate governance that influence the level of ERM implementation in Islamic banks in Indonesia? (ii) What are the characteristics of Sharia governance that influence the level of ERM implementation in Islamic banks in Indonesia?

## 2. Hypotheses Development

### Indonesian Islamic banking

Indonesia ranked first on the Islamic Financial Country Index (IFCI) by GIFR in 2019. The report stated that Indonesia achieved that position due to its leadership and potential in global Islamic Banking and Finance (IBF). Two factors that led to this improvement include the highest level of political support, through which President Joko Widodo personally chairs the National Islamic Finance Committee (Komite Nasional Keuangan Syariah or KNKS) to promote Islamic finance in Indonesia and the regulatory developments by Financial Services Authority (Otoritas Jasa Keuangan or OJK) to create level-playing field for IBF in the country.

Nugraheni (2018) stated that the size of the Sharia Supervisory Board (SSB) and the position of SSB members in the Sharia National Board (DSN-MUI) have a positive effect on Islamic banks' social performance. Social performance investigated in that research includes the benefaction to economic refinement, to society and the social environment, to their stakeholders, and to the education of human resources. The larger size of the SSB member-

ship indicates that the members have higher knowledge and experience, thus implying that they have better networks and connections as well as the expertise. However, the position of SSB members in DSN-MUI may increase SSB concerns regarding Islamic banks' social contributions.

Indonesia uses the decentralized model for its Sharia governance model. Under this method, Islamic banks have their own Sharia boards (SBs), which are independent of Central Banks (Hamza, 2013). The purpose of the SBs is to decide regarding the conformity of the products offered. Hamza (2013) also states that the decentralized model may cause differences in Sharia law interpretation by each Islamic bank, and it may be difficult to manage the existing conflicts of interest properly. This condition can be destructive to the credibility of the Islamic banking industry; thus, more coordination is needed among Islamic banks.

### Enterprise Risk Management

Chen et al. (2019) delved the ramification of ERM adoption on firm value and cost and revenue efficiencies. Their study is based on the financial industry in Taiwan as one of the foremost emerging markets in Asia. Chen et al. (2019) find that ERM adoption increases firm value due to the strong internal risk control regarding their operations. Furthermore, ERM increases cost and revenue efficiency. Mayhap, this could be driven by the ERM adoption; hence, firms do not devote superfluous expenses to finessing idiosyncratic risk.

Rahma & Almilia (2018) hypothesize that public ownership, the risk management committee (RMC), bank size, leverage, and board of commissioners influence the risk management disclosure. However, after testing, only three of those aforementioned factors were found to affect risk management disclosure: risk management committee, leverage, and the board of commissioners. Rahma & Almilia (2018) argue that the existence of a risk management committee may enhance the assess-

ment and supervision of risks faced by the company and provide encouragement to carry out risk disclosures. Furthermore, the higher the leverage of a company, the greater the demand for them to disclose the information to stakeholders. Lastly, a greater capacity for monitoring and information provision could be generated from a larger number of board of commissioners. Hence, it can improve the ERM implementation.

The study of Husaini et al. (2013) revealed that the total number of board commissioner members positively affects the ERM as measured by the ERM Index. A higher number of board members brings more opportunity to exchange information and knowledge, especially when it comes to managing the risk. Meanwhile, the size of the audit committee and the size of the independent board of commissioner's members do not significantly affect the ERM.

The risk management committee (RMC), external auditor reputation, and concentrated ownership are a few factors that affect the ERM (Handayani & Yanto, 2013). The assessment and supervision of risk could be enhanced by the existence of risk management committee, and the high background varieties of RMC members could help strengthen the risk profile. The external auditor's reputation will help stakeholders to trust the company's report, and the highly concentrated ownership may draw certain pressure away from certain parties regarding risk management.

Nowadays, risk management has developed from an attenuate, insurance-based perspective to a holistic, all risk comprehensive aspect, regularly denoted as Enterprise Risk Management. Committee of Sponsoring Organizations of the Treadway Commission (COSO) established the COSO ERM Integrated Framework 2004 to purvey model framework for ERM. This measurement is applied in this study because albeit the ERM has numerous references originated from the same fundamental idea, COSO 2004 has become a world-level template

(Desender & Lafuente, 2011). Thus far, this study will use COSO 2004 referred to the one employed by Desender & Lafuente, (2011).

### **Corporate governance and Sharia compliance governance**

Islamic banks are discovered to possess higher risk-adjusted cost efficiency when likened to the conventional banks regarding the risk-adjusted efficiency and corporate governance (Safiullah & Shamsuddin, 2019). However, the Islamic banks possess smaller risk-adjusted profit efficiency. This is because the cost-efficiency of Islamic banks is scantily sensitive than that of conventional banks to the oversight for risks. Another advantage among Islamic banks is that SSB members with greater academic qualifications and reputation could bestow to meliorating both cost and profit efficiency.

Another research is also conducted on 34 Islamic banks from 10 countries regarding corporate governance and operational risk voluntary disclosure (Neifar & Jarboui, 2018). They found that the presence of independent directors and concentrated ownership structure helps increase operational risk disclosure for several reasons. First, the independence of the directors is helpful for decision-making and to avoid conflict of interest; second, the highly concentrated ownership structure means that there may be certain parties with influence who will demand higher transparency and disclosure. Moreover, when 94 Islamic banks and 94 conventional banks are compared concerning its risk and corporate governance, it is ascertained a few differences regarding risk of both bank types (Safiullah & Shamsuddin, 2018). First, Islamic banks retain larger liquidity risk, shown by the high number of loan-to-deposit ratio, which depicts a higher dependence on non-deposit funds to abet lending growth and liquidity demand. Second, Islamic banks bear smaller credit and insolvency risk. This may be caused by the religious orientation of Islamic banks'

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debtors, who cogitate defaulting on loans as an unrighteous act. However, both banks face the same operational risk.

Another study suggests that general corporate governance and Sharia compliance governance will help strengthen the disclosure of risks in banks (Elamer et al., 2017). This indicates that banks usually show greater commitments in implementing the corporate and Sharia governance towards the risk disclosure. The result also shows that corporate governance, when utilized as moderating variable, will help strengthen the relationship between Sharia governance to risk disclosure.

Other studies obtained by Zadeh et al. (2016). They measured the risk disclosure practices amidst listed firms in Malaysia by dividing it into three parts (financial risk, non-financial risk, and risk management framework). The result shows that, during a period of 11 years (2001-2011), the value of risk disclosures from all firms kept growing. These results suggest that accounting regulations, regulatory bodies, and rules together with proposals issued by accounting organizations influence the increase concerning the risk information sentences disclosed. Research conducted in Indonesia by Dewany (2015) concluded that the quality of Islamic banks' Good Corporate Governance (GCG) has a good rating and is in consonance with the Circular Letter of Bank Indonesia No. 12/13/DPbS 2010. That study found that GCG implementation has a positive effect on IB's capital (measured by the capital adequacy ratio [CAR]). This is due to the optimal management of funds; thus the availability of capital is at an ideal level.

Therefore, Sharia risks can be fractionalized into four groups, those are people, processes, systems, and external events (Ginena, 2014). Non-compliance in Sharia implementation may result in non-material and material loss. The material loss can occur in the form of fund withdrawals, higher cost to attract deposits, liquidity issue, and financial instability. Thus, Islamic banks are envisaged to comply with the Sharia law to avoid these sort of risks.

More researches regarding corporate governance, especially independence audit committee, are also conducted. External independence audit committee is found as one of the effective monitoring mechanism (Hussain, Alkdai & Hanefah, 2012; Salloum, Azzi, & Gebrayel, 2014). Extant audit committee independence can facilitate decision and enhance information asymmetry, hence resulting in better governance than the one with less independent audit committee (Hussain et al., 2012). Additionally, independent audit committee preserves their reputation by ensuring high quality of report. The high quality report could also come from better disclosure. Thus the audit committee's independence is expected to better the report's disclosure.

### Corporate governance on ERM implementation

Indonesia requires Islamic banks to have at least one independent commissioner on the Board of Commissioners (Circular Letter of Bank Indonesia No.12/13/DPbS 2010). This is intended to avoid conflict of interest aim to ensure good corporate governance. The presence of a representative from an independent party on the board of directors and commissioners should promote control, thus limiting the managerial opportunism (Fama & Jensen, 1983). In line with this reasoning, Neifar & Jarboui (2018) agree that the greater independence of directors and commissioners will improve the risk disclosure and transparency. Thus the following hypothesis is tested:

$H_{1a}$ : independent commissioners positively affect ERM implementation

Commissioners oblige to overlook the ERM implementation and attest that the risk management program is effectively enacted (Husaini et al., 2013). A company with a large board size enhances the opportunity for information and expertise exchange (Desender, 2010). Whilst the management is liable

for managing the risk, the commissioners board still have an obligation to make sure the environment is conducive enough to implement the ERM system. In addition, it is expected to improve the ability to recognize and manage risk, hence increasing the quality level of ERM implementation. Therefore, the hypothesis is as follows:

$H_{1b}$ : the number of board of commissioners positively affects ERM implementation

The founding of the Risk Management Committee (RMC) is due to the broad responsibility of the audit committee (Handayani & Yanto, 2013). The RMC is expected to supervise and manage the company's risk, therefore increasing the reputation and value of the firm. The consequence of the RMC is the broader level of ERM disclosure and will also strengthen the ERM implementation (Maruhun et al., 2018). Furthermore, the existence of RMC reflects that the company invests on more time, resources, and expertise to evaluate the internal control, thus able to anticipate the possible future risks (Meizaroh & Lucyanda, 2011). Hence, the next hypothesis is:

$H_{1c}$ : a risk management committee positively affects ERM implementation

Banking regulation in Indonesia (Circular Letter of Bank Indonesia No. 11/33/PBI/2009 & POJK No. 55/POJK 03/2016) stated that there should be at least three independent parties in the audit committee. The independence of the audit committee is a keystone of the audit committee's effective performance (Chariri et al., 2017; Uzliawati et al., 2012). The existence of an independent audit committee that is free from all conflicts of interest can contribute to the decline of the information's asymmetry between insiders and outsiders (Neifar & Jarboui, 2018). Therefore, it will help raise the disclosure of unbiased financial information, especially

regarding a company's risk. An audit committee will help identify fraudulent action, thus promoting better ERM implementation. Therefore, the following hypothesis is proposed as follows:

$H_{1d}$ : an independent audit committee positively affects ERM implementation

The research by Safiullah & Shamsuddin (2018) revealed that a member of an independent audit committee with a good background can help decrease the risk faced by Islamic banks. Good backgrounds are measured in this study in terms of high academic qualifications and the high reputations of the members. Subsequently, a good background and expertise in finance can also culminate an effective monitoring (Salloum et al., 2014). These backgrounds are considered helpful in assessing and supervising risk management. Additionally, the regulation regarding Sharia bank in Circular Letter of Bank Indonesia No. 11/33/PBI/2009 indicates that there should be audit committee with backgrounds in finance and Sharia. Thus, the hypothesis is concluded as follows:

$H_{1e}$ : financial and/or Sharia backgrounds of independent audit committee members positively affect ERM implementation.

### **Sharia compliance governance on ERM implementation**

IFSB-10 enunciated that The Islamic Financial Services Board (IFSB) is available to facilitate the Sharia compliance of Islamic banks. This compliance includes the presence of Sharia controllers in Islamic banks. The Sharia controller units' main responsibilities are to check the control and compliance procedures of the bank. With the help of the Sharia controller unit, Sharia banks are expected to become more compliant and also able to fulfill the implementation of Sharia law on banks' risk management (Pfeffer & Salancik, 1978). Thus far, with the pres-

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ence of a Sharia controller, compliance, especially regarding risk management, will also increase. Therefore, the hypothesis proposed is thus:

$H_{2a}$ : Sharia controller units positively affect ERM implementation.

The capacity of the Sharia Supervisory Board or *Dewan Pengawas Syariah* (DPS) is to ensure that all levels of management, including engaging inputs and producing and pricing outputs, are in line with Islamic principles (Safiullah & Shamsuddin, 2019). The DPS is also motivated religiously to comply with the function regarding the pursuit of meliorating the efficiency of Sharia banks (Pfeffer & Salancik, 1978). Overall, DPS has high influence on decision making regarding Islamic banks' risk (Frag, Mallin, & Ow-Yong, 2018; Grassa & Matoussi, 2014). Safiullah & Shamsuddin (2018) and Mollah & Zaman (2015) found that a larger DPS size may lower Islamic banks' risk due to increased oversight ability. Thus, the next hypothesis proposed is:

$H_{2b}$ : the size of the Sharia Supervisory Board positively affects ERM implementation.

The Islamic Financial Services Board (IFSB) released a guiding principle regarding Sharia governance systems (IFSB-10). Annually, there will be a Sharia compliance review or audit to corroborate that Sharia conformity has been satisfied. Compliance of Islamic banks regarding Sharia rules means they must also have good risk management; this is due to the Sharia Board for Islamic Banks' requirement to manage risk prudently and professionally. Therefore, the last hypothesis is:

$H_{2c}$ : a Sharia compliance audit positively affects ERM implementation.

### 3. Method, Data, and Analysis

This study used unbalanced panel data and multiple regressions method run through the statistical tool, STATA. This research aims to com-

prehensively examine the relationship between the quality of accounting information and bond ratings. For these steps, this research will: (i) choose a sample of all Islamic banks in Indonesia in the form of full commercial banks (full pledged) and Sharia branch offices and in the form of Sharia business units (Unit Usaha Syariah or UUS). (ii) Select an Islamic bank that has complete financial statements and corporate governance (CG) data during the observation period, from 2009 to 2017. Incomplete issuers' financial statements are also issued such as short forms that are not accompanied by report notes financial statements, financial reports are not complete or even do not exist, or the CG report is incomplete.

After selecting a sample, the next step is to collect financial statements to calculate the variables used in the research model. The main variable is the level of ERM implementation. Apart from the main variables, the research model also used several control variables.

The research has ten independent variables and seven control variables. All of the variables used in this study are as Tables 1, 2, and 3.

Samples were collected using purposive sampling of data and information on annual reports of Islamic banks in Indonesia, which included not only Sharia Commercial Banks (BUS) but also Sharia Branch Offices and Sharia Business Units (Unit Usaha Syariah or UUS). Research using panel data was processed using multiple regression analysis. In this research, there are 297 observations used. 126 of the observations are from 14 Sharia Commercial Banks and the remaining 171 observations are from 19 Sharia Business Units. In this research, there is no observation data dropped.

The data used were analyzed through several tests: descriptive statistics test, classic assumption tests, goodness of fit tests, endogeneity test, Pearson-correlation test and hypothesis testing. The model of this research is:

$$ERM = \beta_0 + \beta_1 KI_{it} + \beta_2 DKSIZE_{it} + \beta_3 RMC_{it} + \beta_4 KAI_{it} + \beta_5 BKAI_{it} + \beta_6 SCU_{it} + \beta_7 DPSSIZE_{it} + \beta_8 SCAUD_{it} + \beta_9 AGROWTH_{it} + \beta_{10} SGROWTH_{it} + \beta_{11} ROE_{it} + \beta_{12} ROA_{it} + \beta_{13} SIZE_{it} + \beta_{14} AGE_{it} + \beta_{15} KAP_{it} + \varepsilon_{it} \quad (1)$$

## 4. Results

### Descriptive statistical analysis

Sugiyono (2010) states that the role of statistics in data analysis through the description of the data without making the general conclusion for it is called descriptive statistics. This process uses the data and research variables to depict the results and

answer the research questions. Descriptive statistics are generated into the value of average (mean), standard deviation values, maximum values and minimum values of the data. The result of the descriptive statistics in Table 1.

Table 4 is a descriptive statistic of the data generated from this study. The data used is unbalanced panel data. The table above depicts that the ERM possesses an average value of 0.467 with a standard deviation of 0.200. The number shows that the ERM data from companies in the banking industry, especially the Islamic banking sector, have a variation of the data that is not much different. In addi-

**Table 1.** Operationalization of corporate governance variables

Corporate Governance (CG)	Measurement indicator
<b>Dependent Variable</b>	
Level of ERM implementation – ERM Index (ERM) →Based on COSO 2004	<u>Number of ERM disclosure items</u> Total ERM disclosure items
<b>Independent Variables</b>	
Independent commissioner (KI)	The percentage of independent commissioners
Board of commissioners (DKSIZE)	The size of the board of commissioners
Risk management committee (RMC)	The existence of RMC
An independent party on the audit committee (KAI)	The presence of external independent parties in the audit committee
Background of Independent Audit Committee (BKAI)	Financial and/or Sharia background of independent audit committee

**Table 2.** Operationalization of Sharia compliance governance variables

Sharia Compliance Governance	Measurement indicator
<b>Dependent Variable</b>	
Level of ERM implementation – ERM Index (ERM) →Based on COSO 2004	<u>Number of ERM disclosure items</u> Total ERM disclosure items
<b>Independent Variables</b>	
Sharia Controller Unit (SCU)	The existence of Sharia controller as part of compliance in Islamic banks
Sharia Supervisory Board (DPSSIZE)	The number of DPS members and the existence of the dual role of DPS chairman on the board
Sharia Compliance Audit (SCAUD)	The existence of Sharia compliance audits

**Table 3.** Operationalization of control variables

Control	Measurement indicator
Asset growth (AGROWTH)	Percentage of asset growth, year-on-year
Sales growth (SGROWTH)	Percentage of sales growth, year-on-year
Return on equity (ROE)	ROE ratio of the banks
Return on asset (ROA)	ROA ratio of the banks
Company's size (SIZE)	Ln(Asset)
Company's age (AGE)	Company's age
Public accounting firm (KAP)	Auditor's Reputation (Big4 or Non-Big4)



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tion, the data also shows that the average Islamic banking in Indonesia only meets 46.7% of the enterprise risk management dimension that companies need to report. The largest ERM value was owned by Bank BTN (UUS) during the period 2010-2017, valued at 0.858. Bank BTN is a state-owned bank in Indonesia. Meanwhile, the lowest ERM value owned by several banks such as Bank Sinarmas (UUS), Bank BNI Syariah, Bank Aceh Syariah, and BPD Kalimantan Timur (UUS), each has a value of 0.00. The low value is caused by several factors, namely the unavailability of data from the bank's annual reports in a certain period until the bank has not been established during the observation period.

Subsequently, Table 4 shows that the average value of the KI variable is 0.670 with a standard deviation of 0.181. The variable has a slight variation, with an average number of commissioners' independence in Indonesian Islamic banking at 67%. The highest number of commissioners' independence is 100% on 48 observations. On the other hand, the lowest value of commissioners' independence was owned by Bank Aceh Syariah in 2013.

DKSIZE has an average of 4.217 with a standard deviation of 0.925. The data portrayed that the average Islamic bank in Indonesia put four

people on the board of commissioners. Bank Permata (UUS) in 2010-2019 and Bank CIMB Niaga (UUS) in 2017 had the highest number on the board of commissioners, specifically nine people. Meanwhile, the DKSIZE of BPD Kalimantan Timur (UUS), BPD Nusa Tenggara Barat (UUS), and BPD Sumatra Utara (UUS) were unknown during the period of 2012-2015.

Further, the existence of RMC is seen at an average of 0.960, which means that 96% of the observed Islamic banks have a Risk Management Committee. Moreover, the variable number of the Sharia supervisory board members in Table 4 shows that it has an average of 2.447 and a standard deviation of 0.595. This indicates that Islamic banks in Indonesia have approximately two people on the Sharia supervisory board, with a number of Sharia supervisory board that does not differ significantly between companies. Among 137 of 284 observations had the highest number of board of commissioners, specifically three people.

The BKAI variable has an average of 0.073 and a standard deviation worth of 0.172 as portrayed in Table 4. These data explain that, on average, only 7% of the independent audit committees in Indonesian Islamic banking have a background in account-

**Table 4.** Descriptive analysis results

Variables	N	N (Full Pledge Sharia Banks)	N (Sharia Business Units)	Mean	Std. Dev.	Min	Max
ERM	297	126	171	0.467	0.200	0.000	0.858
KI	271	118	153	0.670	0.181	0.000	1.000
DKSIZE	272	118	154	4.217	1.690	2.000	9.000
RMC	272	118	154	0.960	0.197	0.000	1.000
KAI	283	118	165	0.902	0.200	0.000	1.000
BKAI	283	118	165	0.073	0.172	0.000	0.667
SCU	281	116	165	0.406	0.492	0.000	1.000
DPSSIZE	284	119	165	2.447	0.595	0.000	3.000
SCAUD	280	117	163	0.371	0.484	0.000	1.000
AGROWTH	291	121	170	0.299	0.488	-0.228	4.898
SGROWTH	291	121	170	1.029	11.487	-0.819	195.347
ROE	294	123	171	0.106	0.251	-3.533	1.229
ROA	294	123	171	0.015	0.021	-0.172	0.095
SIZE	297	120	169	15.866	1.468	11.477	19.381
AGE	297	126	171	6.633	4.488	0.000	26.000
KAP	270	126	154	0.430	0.496	0.000	1.000

ing, banking, and Islamic banking. The banks with largest value regarding this variable are BPD Jakarta (UUS), Bank Mega Syariah, and Bank BTPN Syariah, worth 67%. Bank Jabar Banten Syariah, Bank Muamalat Syariah, and Bank Panin Dubai Syariah have the smallest BKAI value of 0%.

Furthermore, the KAI variable has an average value of 0.902. This can be explained by the fact that the average Islamic bank in Indonesia has 90% independent parties on its audit committee. Likewise, the standard deviation of this variable is worth 0.200, showing that the difference in the number of independent parties on the audit committee between Islamic banks in Indonesia is not significant. The biggest value of the KAI variable is 1, or 100%, in Bank BII Syariah, Bank BTN (UUS), Bank Jabar Banten Syariah, and several other banks. On the other hand, the lowest value of this variable is 0, which is demonstrated by Bank Panin Dubai Syariah. Afterwards, based on the average value, only 40.6% observed data have the Sharia Controller Unit in place, with the standard deviation of 0.492. Likewise, only 37.1% of the observations have their own Sharia Compliance Audit. This variable possesses a standard deviation of 0.484.

Moreover, the average asset growth of Islamic banks in Indonesia written in Table 4 is 0.299, and the sales growth is 1.029, year on year. The largest asset growth of 4.898 and the largest sales growth of 195.347 are both owned by Bank Sinarmas (UUS) in 2010. Subsequently, Islamic banks' average values of ROE and ROA are 0.106 and 0.015, respectively. The biggest ROE of 1.229 is held by Bank Sinarmas (UUS) in 2009, and the highest ROA of 0.095 is held by Bank BTPN Syariah in 2013. The next variables, SIZE and AGE, have the average values of 15.866 and 6.633. The largest bank is Bank BTN Syariah in 2017, and the oldest one is Bank Muamalat Syariah. Lastly, the variable of external auditor reputation, KAP, has an average value of 0.430. This means that 43% of the observations use Big 4 external auditors.

### **Classical assumption test and goodness of fit test**

Initially, the normality test is performed on the data by looking at its skewness and kurtosis value. Winsorized treatment are performed on the abnormal variables. The winsorizing is done based on the empirical rules (Hald, 1998 in Lusk, Halperin & Heilig, 2011). AGROWTH, SGROWTH, ROE, and ROA are treated with this winsorizing based on the empirical rule. Subsequently, the multicollinearity is executed by looking at the value of VIF and 1/VIF. The test exhibits that there is no multicollinearity between the independent variables, since the VIF value is under 10 and the 1/VIF value is over 0.10. Afterward, the heteroscedasticity test is done, which shows that the  $\text{prob} > \chi^2$  value is 0.0902, thus implying that there is no heteroscedasticity. Lastly, the autocorrelation test is performed, which shows a  $\text{prob} > F$  value of 0.000, thus implying an autocorrelation. To solve this problem, the function of Driscoll-Kraay standard errors is utilized on the regression for hypothesis test (Hoechle, 2007).

Moreover, after the classical assumption tests are performed, the goodness of fit test is done. The statistical result shows that the Fixed Effect (FE) model is suitable for this research. However, Gujarati & Porter (2009) stated that using FE regression on a research with few dummy variables can reduce a research's accuracy due to the fact that a dummy is not a real number. Additionally, Lechner, Rodriguez-Planas, & Kranz (2016) stated the OLS model is more suitable for unbalanced data panel than FE model. This research itself use four dummy variables and unbalanced panel data, thus considering those, this research will utilize the OLS model.

### **Endogeneity test**

The endogeneity issue in this research is considered by ensuring the possibility of an antipodal effect on whether ERM invigorates corporate governance and Sharia compliance (Karyani et al., 2019). The results of the endogeneity test in Table 5.

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The test result shows that independent audit committee and Sharia controller units can be affected by ERM implementation. But this problem might not happen in this research because a research need to consider a dynamic endogeneity (Wintoki et al., 2012). Howbeit, in this specific research, it can be also argued that ERM implementation does not affect these two variables because in order to obtain the ERM scores, audit committee and Sharia controller units are parts of the scoring framework. Thus far, this endogeneity results can be overlooked in this research.

### Pearson-correlation test

The Pearson-correlation test is utilized to see the correlation between each variable in this study.

The results of the Pearson-correlation test in Table 6a and 6b.

Based on the results above, BKAI, SCU, SCAUD have significant relation to the ERM. Background of independent audit committee and existence of Sharia Controller Unit have positive relation to the ERM, means that the better the background of independent audit committee and the existence of Sharia Controller Unit can help improve the ERM implementation on banks.

### Hypothesis test

The multiple regression analysis is employed to test the hypotheses in this research. The results of hypothesis test in Table 7.

**Table 5.** Results of endogeneity test

Independent	Dependent							
	KI	DKSIZE	RMC	KAI	BKAI	SCU	DPSSIZE	SCAUD
ERM	-0.0168	0.9330	0.1372	0.2035**	-0.0386	-0.9023***	0.4290	-0.3176
AGROWTH	0.0130	0.3724	0.1288**	0.0289	0.0317	0.1306	0.1058	0.0667
SGROWTH	-0.0471	-0.3647	-0.1294***	0.0283	-0.0332	0.0741	-0.1320	0.0396
ROE	-0.0807	-1.8800	-0.4386***	0.5254***	0.1599	-1.5848***	1.2236**	-0.685*
ROA	0.3078	21.4554***	3.1307***	-1.4361	-1.0407	0.3462	-1.0546	-2.1461
SIZE	0.0427***	-0.2437***	0.0082	-0.0099	-0.0108	0.0993***	-0.0001	0.0145
AGE	-0.0111***	0.0745***	0.0064**	0.0015	0.0108***	0.0499***	0.0285***	0.0368***
KAP	0.1012***	1.8480***	-0.0272	-0.0409	0.0158	-0.0619	0.1372*	-0.1042
Cons.	0.1474	6.1968***	0.7311***	0.9173***	0.1867	-0.9228**	1.8745***	0.1702

Note: significance level at 10% (\*), 5% (\*\*), 1% (\*\*\*)

**Table 6a.** Results of Pearson-correlation test

Variables	ERM	KI	DKSIZE	RMC	KAI	BKAI	SCU	DPSSIZE
ERM	1.0000							
KI	0.0194**	1.0000						
DKSIZE	0.2230	-0.4481	1.0000					
RMC	0.2117	0.0428**	0.1220	1.0000				
KAI	0.0873	0.0166**	0.0568*	-0.0363**	1.0000			
BKAI	0.096*	0.1211	-0.1495	0.0899*	-0.0158**	1.0000		
SCU	0.0758*	0.0794*	-0.0654*	0.1277	-0.031**	0.3682	1.0000	
DPSSIZE	0.2646	-0.0933*	0.1789	0.0204**	0.2437	0.0322**	-0.0902*	1.0000
SCAUD	0.0805*	0.0516*	-0.1776	0.0306**	-0.0261**	0.4721	0.6602	-0.1524
AGROWTH	-0.2649	-0.1447	0.1124	-0.0916*	-0.0104**	-0.0354**	0.0066***	-0.0899*
SGROWTH	-0.2344	-0.091*	0.0068***	-0.0845*	-0.0036***	0.0309**	-0.0112**	-0.1188
ROE	-0.1125	0.0493**	-0.0477**	-0.0124**	0.2473	0.0329**	-0.1737	0.1367
ROA	-0.2056	0.0253**	-0.0102**	0.0257**	0.1050	-0.0245**	-0.2333	0.0558**
SIZE	0.5399	0.1486	0.0247**	0.1626	0.0827*	0.1011	0.2057	0.3022
AGE	0.5270	-0.1191	0.2063	0.2145	0.074*	0.2393	0.3868	0.3322
KAP	0.3081	-0.2680	0.5539	0.013**	-0.1075	0.0521*	0.1152	0.1214

Note: significance level at 10% (\*), 5% (\*\*), 1% (\*\*\*)

**Table 6b.** Results of Pearson-correlation test

Variables	SCAUD	AGROWTH	SGROWTH	ROE	ROA	SIZE	AGE	KAP
SCAUD	1.0000							
AGROWTH	-0.0165**	1.0000						
SGROWTH	-0.0241**	0.5742	1.0000					
ROE	-0.0458**	-0.0031***	-0.0565*	1.0000				
ROA	-0.1764	0.0756	-0.0665*	0.6326	1.0000			
SIZE	0.0815*	-0.3163	-0.2614	0.1304	0.0357**	1.0000		
AGE	0.2683	-0.2148	-0.1675	0.0117**	-0.0807*	0.5608	1.0000	
KAP	0.0087***	0.1876	0.1395	-0.1874	-0.1473	0.1809	0.1884	1.0000

Note: significance level at 10% (\*), 5% (\*\*), 1% (\*\*\*)

The adjusted R-squared of 0.5231 means that the ERM variable can be elucidated by the corporate governance variables, Sharia compliance variables, and control variables with a value of 52.31%. In the hypothesis development section, all variables are expected to have positive effects on the ERM. However, some of the results showed the contrary. Initially, KI, DKSIZE, RMC, BKAI, and DPSSIZE have no significant effect on the ERM. Subsequently, SCU negatively affects ERM implementation. Additionally, the control variables show mixed results. AGROWTH, GROWTH, ROE, and ROA do not affect the ERM, while SIZE, AGE, and KAP positively affect ERM implementation.

**Table 7.** Results of hypothesis test

Prob > F	0.0000	
Adjusted R-Squared	0.5231	
Dependent Variable: ERM		
Independent Variables	Coef.	Sig.
KI	0.028	0.648
DKSIZE	0.002	0.579
RMC	0.083	0.125
KAI	0.090	0.060*
BKAI	0.028	0.347
SCU	-0.103	0.000***
DPSSIZE	0.010	0.685
SCAUD	0.036	0.010*
AGROWTH	-0.023	0.488
SGROWTH	-0.025	0.467
ROE	-0.401	0.104
ROA	-0.252	0.777
SIZE	0.047	0.000***
AGE	0.012	0.006***
KAP	0.050	0.015**
Cons.	-0.473	0.03**

Note: significance level at 10% (\*), 5% (\*\*), 1% (\*\*\*)

## 5. Discussion

### Corporate governance on ERM implementation

Few variables of corporate governance, the proportion of independent commissioner (KI), the size of commissioner's board (DKSIZE), the presence of risk management committee (RMC), and the background of the independent audit committee (BKAI) do not affect ERM implementation based on the test conducted. This research shows contrasting results from the study by Neifar & Jarboui (2018). However, this outcome aligns with the research of Al-Maghzom, Hussainey, & Aly (2016). The presence of an independent commissioner may enhance accountability and extend risk disclosure. However, on the other hand, the combination of an independent commissioner and corporate insiders may generate different opinions when it comes to decision making, hence raising new problems. Both of those factors can collide and cause the KI to have no effect on the ERM implementation. Also, the financial report is the responsibility of the company's management. Therefore, independent commissioners who are not part of the management do not have the authority to make financial reports that align with the ERM dimensions.

Subsequently, the insignificant effect from the size of the commissioner's board can also be explained by the observation data; 72% of the observations have DKSIZE of four people, which is be-

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low the average number. Thus this small size of commissioner's board is considered to not be able to motivate or encourage the ERM disclosure enough. Another variable, the existence of the Risk Management Committee (RMC) also has no significant aftereffect on ERM implementation. The possible reason behind this is that even though the RMC purpose is to enhance the assessment and supervision of risks, and later on, to provide encouragement to carry out the risk disclosures, they might not have fully eliminated the information asymmetry regarding the risk (Jia et al., 2019).

The last variables of corporate governance, an independent party on the audit committee (KAI) and background of KAI (BKAI), have positive and significant effects on ERM implementation. This is in accordance with the previous research by Neifar & Jarboui (2018) and Safiullah & Shamsuddin (2018). The presence of an independent audit committee (KAI) will support a decrease in information asymmetry. Hence, it will increase information disclosure, especially risk-related disclosure. Subsequently, the KAI with a background in financial and Sharia (for Islamic banks) helps assess and supervise the company's risk. Also, the more proficient the background of KAI, the better reputation it will get, hence forcing the company to keep up its performance, starting from the risk management implementation. Overall, the ideal implementation of a good corporate governance application can magnify the level of disclosure (Sihombing & Pangaribuan, 2017). Sufficient information disclosure, especially regarding risk management, is important to ensure and provide a guarantee for investors and creditors.

### Sharia compliance governance on ERM implementation

The Sharia Controller Unit (SCU) is found to have a negative effect on ERM implementation. This may be because only 40.6% of the observations have their own SCU, hence it is not mandatory for Is-

lamic banks to establish one. As of 2017, there are only 17 banks that have an SCU, including Bank BII, Bank DKI, Bank Jabar Syariah, Bank Mega Syariah, Bank Muamalat Syariah, Bank Panin Syariah, Bank Permata, Bank Syariah Mandiri, Bank BCA Syariah, Bank BPD Aceh, UUS BPD Jateng, BPD Kepri, BRI Syariah, BTPN Syariah, Bukopin Syariah. Along with this variable, the size of the Sharia board (DPSSIZE) also gives the same result; it negatively and significantly affects the ERM implementation.

On the other hand, the presence of Sharia Compliance Audit (SCAUD) positively and significantly affects ERM implementation. The presence of a Sharia compliance audit is in accordance with IFSB-10 regulation. The purpose of SCAUD is to ensure that Sharia conformity has been satisfied. This positive result of SCAUD in this study then indicates that a bank's Sharia compliance will help increase ERM implementation.

Moreover, the size of the Sharia board (DPSSIZE) does not affect the ERM implementation. This may due to the cause that 52% of the observations do not have Sharia board in place during the establishment period. This means that there is no official supervision yet regarding the Sharia side of the bank. Thus this variable does not have any effect on the ERM implementation.

### Control variables on ERM implementation

AGROWTH and ROE do not have any effect on ERM implementation. Those results align with the study by Waweru & Kisaka (2012). Meanwhile, ROA and SGROWTH negatively and significantly affect ERM implementation. This result is contrary to the research by Hoyt & Liebenberg (2011). This may be due to the fact that a company may devote more focus and resources to the return on the company rather than on its risk management.

Subsequently, the last three control variables, SIZE, AGE, and KAP, positively affect ERM implementation. Larger and more mature companies may force their management to be more transparent

about their risk management and internal control, thus helping the company to be more compliant regarding good corporate governance (GCG), especially in ERM implementation (Waweru & Kisaka, 2012). Additionally, financial reports audited by reputable external auditors are seen as qualified reports and are assumed to have more supervision over their GCG practice (Handayani & Yanto, 2013).

### Robustness test

Another test is conducted to ensure the results of this research, namely the robustness test (Anggani & Widagdo, 2019). These additional tests are run by grouping the observations based on two categories, the size of the commissioners' board (DKSIZE) and the size of the Sharia supervisory board (DPSSIZE). These two variables are selected because both of them exercise the superintendence and guidance functions (Desender, 2010; Husaini et al., 2013; Safiullah & Shamsuddin, 2019). The commissioners' board supervises the corporate governance, meanwhile, the Sharia supervisory board overlooks the Sharia compliance aspect. The DKSIZE is grouped into two, viz. DKSIZE of more than two people and DKSIZE of more than three people.

Moreover, DPSSIZE is grouped into another two, viz. DPSSIZE of more than one person and DPSSIZE of less than three people. The results of the robustness test in Table 8.

Table 8 depicts that few of the variables exhibits different result from the original one. The size of commissioner's board exercised a significant positive result on the group sample of DKSIZE > 3. This indicates that the ERM implementation will be more effective when it is supervised and guided by more than three people on the board of commissioners. Subsequently, the Sharia supervisory board will be more effective to ensure ERM implementation regarding Sharia law when there are less than three people on the board.

However, most of the different results on the robustness test are shown in the sample of DKSIZE>3 and DPSSIZE<3. The possible explanation for this results is that because of the number of the sample on those groups. The sample sizes on those two groups are 144 and 147 observations or only 48.48% and 49.49% from the total observations. Meanwhile the other two groups with closer size to the original one, depicts similar results. Thus this confirmed the result of the original regression.

**Table 8.** Results of robustness test

Variables	DKSIZE > 2		DKSIZE > 3		DPSSIZE > 1		DPSSIZE < 3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
<i>KI</i>	0.036	0.586	0.041	0.693	0.010	0.860	-0.040	0.678
<i>DKSIZE</i>	0.003	0.328	0.021	0.000***	0.000	0.890	0.001	0.675
<i>RMC</i>	0.087	0.124	0.051	0.544	0.071	0.165	-0.025	0.347
<i>KAI</i>	0.093	0.041**	0.146	0.080*	0.129	0.001***	0.126	0.009***
<i>BKAI</i>	0.030	0.385	0.250	0.001***	0.038	0.249	0.039	0.456
<i>SCU</i>	-0.114	0.000***	-0.090	0.059*	-0.105	0.000***	-0.131	0.000***
<i>DPSSIZE</i>	0.012	0.648	0.040	0.301	-0.037	0.126	0.116	0.002***
<i>SCAUD</i>	0.042	0.004***	-0.035	0.311	0.018	0.102	0.083	0.000***
<i>AGROWTH</i>	-0.029	0.284	-0.011	0.717	-0.046	0.171	-0.044	0.231
<i>SGROWTH</i>	-0.021	0.522	-0.056	0.307	-0.036	0.280	-0.047	0.000***
<i>ROE</i>	-0.412	0.105	-0.071	0.700	-0.341	0.112	-0.228	0.282
<i>ROA</i>	-0.243	0.787	-2.972	0.025**	-0.384	0.636	-1.309	0.132
<i>SIZE</i>	0.044	0.000***	0.045	0.000***	0.041	0.000***	0.022	0.001***
<i>AGE</i>	0.012	0.003***	0.005	0.124	0.012	0.003***	0.026	0.000***
<i>KAP</i>	0.044	0.026**	0.033	0.257	0.074	0.000***	0.059	0.007***
<i>Cons.</i>	-0.444	0.031**	-0.568	0.009***	-0.257	0.044**	-0.231	0.038**
<b>R-squared</b>	0.5245		0.6069		0.5274		0.6897	
<b>N</b>	264 observations		144 observations		279 observations		147 observations	

Note: significance level at 10% (\*), 5% (\*\*), 1% (\*\*\*)

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### Sensitivity analysis

Since this research gathered data from both full pledge Sharia banks and Sharia business units, the sensitivity analysis is performed to see the aftermath of corporate governance and Sharia compliance towards ERM implementation on each type of Sharia banks. The results of sensitivity analysis in Table 9.

Table 9 shows that few variables have the same result when tested together and separately based on the type of banks. Those are the presence of Sharia controller units, the existence of Sharia compliance audit, the sales growth, and the size of the banks. However, the remaining variables exhibit different results.

The full pledge Sharia banks' size of commissioners' board negatively affected the ERM implementation, the possible explanation of this may be caused by full pledge Sharia banks only have an average of four commissioners than that on the Sharia business units, which is five people. Meanwhile, the presence of the risk management committee on Sharia business units does not have any

influence on the ERM. Afterwards, independent audit committee on both the full pledge Sharia banks and Sharia business units have no effect on ERM when tested separately, this is the contrary as when it was tested together. Withal, the background of the independent audit committee on Sharia business units has negatively affected the ERM, this is may be caused by the lack of independent audit committee that has proper background on Sharia business units shown by the average value of only 0.40%. Subsequently, the size of the Sharia supervisory board on full pledge Sharia banks bring the negative aftereffect towards the ERM. The reason behind this may be because of the average of Sharia supervisory board's size on full pledge Sharia banks is lower than the one on the Sharia business units, thus indicates that the Sharia supervisory board on the full pledge Sharia banks have not operated effectively.

Lastly, for the control variables, asset growth, ROA ratio, ROE ratio, and auditor reputation on full pledge Sharia banks bring a negative effect on ERM. Meanwhile, the size of the banks on the full pledge Sharia banks has no effect on ERM when examined separately.

**Table 9.** Results of sensitivity analysis

Independent Variables	Dependent Variable: ERM			
	Full Pledge		Sharia Business Unit	
	Coef.	Sig.	Coef.	Sig.
KI	-0.109	0.096*	0.051	0.361
DKSIZE	-0.051	0.000***	0.009	0.192
RMC	0.056	0.077*	0.067	0.107
KAI	0.029	0.342	0.048	0.382
BKAI	0.057	0.145	-0.199	0.002***
SCU	-0.129	0.000***	-0.117	0.000***
DPSSIZE	-0.035	0.007***	0.001	0.979
SCAUD	0.086	0.000***	0.063	0.046**
AGROWTH	-0.070	0.006***	0.031	0.105
SGROWTH	0.019	0.491	0.010	0.702
ROE	-0.188	0.085*	-0.300	0.146
ROA	-1.325	0.003***	-0.446	0.759
SIZE	0.131	0.000***	0.018	0.073*
AGE	0.001	0.804	0.036	0.000***
KAP	-0.066	0.015**	0.043	0.088*
Cons.	-1.231	0.000***	-0.163	0.484
R-Squared		0.8222		0.6962

Note: significance level at 10% (\*), 5% (\*\*), 1% (\*\*\*)

## 6. Conclusion

This research is conducted to ascertain the aftermath of corporate governance and Sharia compliance governance on Enterprise Risk Management implementation. This study used secondary data from Islamic banks during the period of 2009-2017 and unbalanced panel data. The results showed that the variable ERM implementation can be explained by the independent and control variables with a value of 52.31%. This research also shows mixed results from its variables. First, the extent of independent audit committee and Sharia compliance audit positively and significantly affect the ERM implementation in Indonesia's Sharia banking industry. This positive effect of the Sharia compliance audit towards ERM is in line with the result of the independent audit committee. This depicts that most of the supervisory functions are still overseen by the independent audit committee, rather than the Sharia controller units. Third, three more control variables have a positive and significant effect on ERM implementation: Company's size, age, and auditor reputation. In contrast, the presence of the Sharia Controller Unit has negative effects on ERM implementation. Additionally, the proportion of independent commissioner, size of commissioners' board, and the existence of risk management committee, the background of the independent audit committee, size of Sharia supervisory board, asset growth, sales growth, and profitability measured by ROE and ROA ratio do not affect ERM.

This study provides several contributions, firstly as a reference for future studies regarding

enterprise risk management, corporate governance, and Sharia compliance governance. Secondly, for banking industry and investors to help the decision-making regarding risk management. Lastly, the practical implications for the regulator. The practical implications for this study are expected to have clear and sufficient regulations regarding Sharia governance. This is because Sharia regulations from Indonesia's Financial Services Authority (FSA) have not fully complied and referred to the IFSB-10.

The limitations of this research lie in the measurement or proxy of ERM implementation. Since the proxy used in this study is for the general implementation of ERM, the maturity level of ERM cannot be measured along with it. Also, this research only observed the Islamic banking industry. Thus, the results cannot be applied to other industries. Based on these limitations, the suggestion for future studies is to measure the ERM implementation not only from secondary data. Future researchers can also use primary data obtained from interviews and questionnaires among the company employees.

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