DOES INTERNAL CORPORATE GOVERNANCE MECHANISM CONTROL FIRM RISKS? EVIDENCE FROM INDONESIA THREE HIGH RISK SECTORS

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Abstract

Purpose - *This paper aims* at examining impact of corporate governance towards firm risks for a sample of Indonesian firms in agriculture, mining, and property industries. *This study highlights* the impact of four indicators of internal mechanism of corporate governance: board size, board independence, board gender, and board ownership on three measurements of firm risks: total risk, asset return risk, and idiosyncratic risk.

Design/methodology/approach – *Panel data analysis is conducted using data of 62 companies of agriculture, mining, and property industries listed in Indonesia Stock Exchange (IDX) from 2013 to 2017. Pooled OLS with hetero-corrected is the statistical approach to test the hypotheses.*

Findings – *The result indicates that board size and board gender insignificantly influence firm risks. While board independence gives varied impacts towards firm risks: it is positive influence towards asset return risk, insignificant towards idiosyncratic risk, and negative towards total risk. Other interesting results are found in board ownership that has insignificant influence towards asset return risk, but influences idiosyncratic and total risk negatively.*

Practical implications –*Firms should incorporate corporate governance, especially the effective roles of board independence and board ownership since they serve as tools in reducing firm risks. Moreover, investors may have better understanding on corporate governance and factors that are influencing firm risks. Therefore, this study can assist them in order to make a good investment decision.*

Originality/value - *This study is* notably the first to use comprehensively three measurements of firm risks in Indonesia. Risks can come from internal and external, which the company should understand about the various kinds of risks the company facing. Total risk measures both the internal and external risks, while asset return risk gives another perspective using overall market perception about the equity and assets of the company. Lastly, this study also measures internal risk, which is the only risk that can be controlled and minimised by the board of the company.

Keywords Firm risk, idiosyncratic risk, asset return risk, total risk, corporate governance

Paper type Research paper

1. Introduction

Looking at high-risk industries in Indonesia, mining, agriculture, and property industries are included in the category. Mining, agriculture, and property industries are very sensitive toward changes in the global macroeconomic (Indonesia Investments, 2018). Factors such as economics, politics, regulation changes, technology, market situation, and nature can interfere the business. Mining industry has been an important sub-sector of industry since 1970, and has gained continuous attention both domestically and internationally. Indonesia has been not only the biggest producer of coal, copper, gold, tin, and nickel, but also the biggest exporter of palm oil in agriculture industry (Indonesia Investment, 2018). Generally, larger plantations produce goods like rubber and palm oil that are mainly for export while smaller ones focus on satisfying the food demand of the locals. In Indonesia property industry has low share price due to slow

recovery from Asian Financial Crisis in 2009 which causes the property demand less than the supply. Moreover, the purchasing power of buying house in Indonesia is weak (DBS Bank, 2016).

Risk-taking is fundamental in running business. Following the financial crisis in 2008, firms have turned attention towards risk management. It is in line with ACCA (2012) which highlighted that the board is responsible in managing the risk. Futher, board has two important roles: as a risk-taking decider and as an internal control mechanism. As a risk-taking decider, the board must comprehend the proper level of risk exposure to the company and be willing to take in order to accomplish the objectives. Whereas, internal control mechanism is a part of corporate governance to ensure the risks managed properly. After the crisis, a large number of investors lost confidence in investing in the companies. To cope with such situation, the companies have attempted to increase the confidence of investors by developing the corporate governance appliance, which comes along with risk governance.

In terms of firm risk measurement, most of the previous researches used total risk and idiosyncratic risk (Alam & Shah, 2013; Haider & Fang, 2016; Lee et al., 2016; Lenard et al., 2014; Mathew et al., 2018; Pathan, 2009; Sila et al., 2016; Sun & Liu 2014). Total risk is known to be the combination of systematic and idiosyncratic risk. This risk identifies all of the risk factors from both external risk in systematic risk and internal risk in idiosyncratic risk. Meanwhile, asset return risk is another way to assess firm risk which covers market capital ratio in the measurement. Market capital ratio is defined as the market value of equity to market value of total assets (Flannery & Rangan, 2008). The ratio helps determine the percentage of shareholders company's assets and assess the ability of the company to sustain over a long period. Businesses such as agriculture, mining, and property industry are better to have shareholders instead of debt holders due to uncertainties; therefore, using market value may represent the overall market perception about the equity and assets of the company. Since these two risks are hard to be controlled by the company, the company needs to minimize the risk from within. Idiosyncratic risk is the risk that specific to the firm. Idiosyncratic risk includes the corporate culture, operating strategy, financial policy, and investment strategy. This risk is the risk that company can control.

To go further, corporate governance has strong bond with internal mechanism as the characteristics of corporate governance, such as board of directors, reflects the internal mechanism (Li et al., 2012). The internal mechanism is known to be limited yet important dimension of corporate governance (Dedu & Chitan, 2013). The board has the role to supervise the company and to control the risks faced by the company properly for the sake of both the investor and stakeholders. Some possible ways to improve the function of corporate boards are by gaining the independence level, enhancing the oversight roles, and applying more effective practices. Among the internal corporate governance attributes, the board composition--board size, board independence, and board gender, and board leadership structure like board ownership are the most affecting factors. This internal mechanism can be used in order to minimize the idiosyncratic risk. Therefore, total risk and asset return risk can be reduced.

Using the samples from agriculture, mining, and property industries over the years 2013 to 2017, this study finds that the corporate governance components have mixed results of significant and insignificant impacts toward measures of firm risk. Board size and board gender have insignificant influence toward firm risk. Board independence has significantly negative influence toward total risk, positive influence towards asset return risk, and insignificant influence towards idiosyncratic risk. Whereas, board ownership has significantly negative influence toward total risk and idiosyncratic risk, but insignificant towards asset return risk.

This study is notably the first study that investigates the impact of board size, board independence, board gender, and board ownership, which are the internal mechanism of corporate governance, towards firm risk. The firm risks are measured using three measurements, namely total risk, asset return risk, and

idiosyncratic risk in Indonesia. The corporate governance used is related to internal rather than external as internal is more suitable to measure the level of risk-taking.

2. Literature review and hypothesis
2.1 Corporate governance
Agency and stewardship theory used in this study is to explain the role of internal corporate governance mechanisms in controlling firm risk.

Agency Theory. Jensen and Meckling first initiated agency theory in 1976. The theory lies in the agency connection shaped between agents and principal. The shareholders (Nyberg *et al.*, 2010) delegate agents or the directors that control and organize the firm. As a reward, agents earn remuneration, bonus, and compensation, whereas principals are the owner of the company and supply the funds for the company. However, the distinction between ownership and control will possibly foster an agency issue of conflict goals between the shareholders who own the firm and the directors who run the firm (Nyberg *et al.*, 2010). Directors, as the party that has responsibility to run the company, have a susceptibility to optimize their own interests at every opportunity by misapplying the firm's resources, at the expense of shareholder or called agency costs. The directors elevating the turnover at the expense of profitability in order to be paid in higher remuneration (Rajablu, 2016). Additionally, the agency problem will create asymmetric information between the directors and shareholders (Agyei-Mensah, 2010). Directors who day to day operate the company will have better information about the company rather than shareholders since shareholders are not controlling daily activity of the company. Therefore, asymmetric information affects the shareholder because they are not able to make fine decisions from the performance of the manager. Hence, the firm is being harmed (Siagian *et al.*, 2013). To reduce the agency problem, monitoring the directors shall be conducted by shareholders to make the interest of both parties meet. It is in line with the objective of corporate governance which is to ensure the directors to conduct the best interest of the shareholders and demand the director to disclose crucial information (Siagian *et al.*, 2013).

Stewardship Theory. Companies have a number of stakeholders, and the primary ones are shareholders, employees, creditors, customers, and government respectively. The pure agency relationship describes the relationship between company and managers in an incomplete contract including every business aspect decision due to the substantial uncertainty and information imbalance (Subramanian, 2018). Stewardship theory, introduced by Donaldson and Davis in 1989, states that giving more authority and power to the board to act as responsible steward to manage the company (Haider & Fang, 2016). This theory is contradictory with agency theory as the agent puts the interest of shareholder rather than the agent's self-interest. Managers, as the agents, are highly dedicated and are more likely to serve the organisation completely (Davis *et al.*, 2007). In other word, the agent attempts to achieve the shareholder's goal to maximize the shareholder's wealth without looking at how much ownership the agent owns (Subramanian, 2018).

Board size, board independence, board gender, and board ownership are four internal governance mechanism components designed to mitigate the agency conflicts between boards and shareholders (Mathew *et al.*, 2018). Schäuble (2018) argues that board ownership, a part of internal corporate governance mechanism, can mitigate agency costs. Corporate boards hold responsibility for monitoring the quality of information in the financial statements. Consequently, they control the behaviour of senior managers to make sure that their actions are in line with the interests of stakeholders. Corporate governance acts as a significant part in determining the success of a business and company's transparency and accountability (Rajablu, 2016). Corporate governance analyses the strategy and transparency of ways the organization manages the company's resources. Siagian *et al.* (2013) argue that corporate governance manages a better control and direction; therefore, managers make a decision for the sake of the stakeholders and shareholders. By applying this governance mechanism, agency problem can be

mitigated. Moreover, the purpose of agency cost is to synchronize the interest between board and shareholder. Therefore, having good corporate governance is important. This study focus on examining four corporate governance mechanism components, namely board size (BS), board independence (BI), board gender (BG), and board ownership (BO).

2.2 Firm Risk

At the time an investor invests on companies, there must be risks that should be taken. The return is unpredictable whether it can be higher or lower than the anticipated one. Risk may be inescapable if not the investor owns gilts. In general, firm risks can be explained as total risk, which consists of systematic and unsystematic risk (Haider & Fang, 2016). Besides, firm risk can be explained by asset return risk and idiosyncratic risk (Pathan, 2009).

Total Risk is divided into two parts, namely systematic and unsystematic risk. Systematic risk is also popular as market risk or inherent risk, whereas unsystematic risk is also known as firm-specific or idiosyncratic risk. There is a difference between these two risks. Idiosyncratic risk can be diversified away, while systematic risk cannot be diversified away (Mathew *et al.*, 2018). Total risk represents the market's perception about the risks inherent in the firm's assets and liabilities. And not only regulators but also firm executives monitor this risk frequently (Pathan, 2009).

Asset return risk is employed as another alternative to discover firm risk (Pathan, 2009). Asset return risk (ARR) is calculated as the standard deviation of daily stock returns times the ratio of market value of equity to market value of total assets times square root trading days in each fiscal year (Flannery & Rangan, 2008; Pathan, 2009). By using the proportion of market value of equity divided by market value of total assets, this ratio can gauge the health of the company. The ratio helps determine the percentage of company's assets owned by shareholders and measure the ability of the company to sustain the business for a long period. Businesses such as agriculture, mining, and property industry are better to have shareholders instead of debtholders due to uncertainties; therefore using market value may represent the overall market perception about the equity and assets of the company.

Idiosyncratic risk is risk that is specific to the firm, to a particular company and stock. Idiosyncratic risk is also popular as unsystematic risk or firm-specific risk. For example, when the company generates high income, the company can justify high stock price, and vice versa. Unsystematic risk is the risk that is not related to the market and can be diversified away. From the perspective of investors, the unsystematic risk can be reduced as investors diversify the portfolios. While, boards who have large equity stakes are exposed to both systematic and unsystematic risk. Therefore, the boards are more likely to manage the unsystematic risk. The issue is the boards cannot increase shareholder value by controlling unsystematic risk as external investors can reduce the systematic risk by diversifying the portfolios (Bartram *et al.*, 2011). Idiosyncratic risk can be calculated using standard deviation of the residuals from the market model regression (Pathan, 2009; Sila *et al.*, 2016).

3.   Hypothesis development

The board of directors in companies are responsible for making decisions to achieve the companies' goals, while some decisions contain inherent risk bearing (Zhu and Weyant, 2003; Mathew et al., 2016). Wood and Zaichwosky (2004) state that the board's decisions must reveal the needs of the shareholders as the investors in the company who have different risk appetites. Therefore, mitigating the corporate risks is not the main purpose of risk management, but it is more about how to select the appropriate type of risk along with its level (Mathew et al., 2016).

3.1 Board size and firm risk

Among the corporate governance components that influence firm risks, it seems that internal governance mechanism related to the board is more relevant. Reffering to Haider and Fang (2016), the larger the board size, the less risk the firm is taking due to better monitoring. Moreover, company that applies good corporate governance is expected to perform better since the decisions of the board of commissioners give a crucial contribution to the governance. The larger the board, the wider the perspectives are contributed (Haider & Fang, 2016). However, Sun and Liu (2014) argued that board size related positively to firm risk because small board size is more cooperative, efficient and decisive. While, Lee *et al.* (2016) found that board size insignificantly affects firm risk. Therefore, the hypotheses are:

H1a: Board size has impact towards total risk.

H1b: Board size has impact towards asset return risk.

H1c: Board size has impact towards idiosyncratic risk.

3.2 Independent directors and firm risks

Independent directors are likely to have better monitors on managers because the board does not have connection with the management by birth or marriage, major shareholders, employees of affiliated company and representatives of the company that have important dealings with the subject company. In order to be effective, it was mentioned that at least 30% of the board should be composed of independent non-executive director (Deloitte, 2014). Outsider director helps the board to do its role effectively. Therefore, board independence has a crucial role to lower the agency cost. The presence of more outsider board of commissioner may block the act of the firm in riskier projects as they care of the unsteady returns. According to Alam & Shah (2013), the association of board independence and firm risk is negative. The more outsider board of commissioner may hold up the act of the firm in riskier projects as they consider the unsteady returns. While Sun and Liu (2014) and Lee *et al.* (2016) found that board independence is insignificantly affecting firm risk. As a result, board independence has an important role to lower the agency cost. Therefore, authors hypothesize that:

H2a: Board independence has impact towards total risk.

H2b: Board independence has impact towards asset return risk.

H2c: Board independence has impact towards idiosyncratic risk.

3.3 Board gender diversity and firm risks

Gender composition can be described as the proportion of man and woman on the board (Mathew *et al.*, 2018). Increase of women presence in the organization is due to the scandal occurred related to corporate governance, such as Enron, Lehman Brother, and WorldCom (Sener & Karaye, 2014). There have been debates about gender composition in organizations to improve good corporate governance (Plessis *et al.*, 2012). First, they reasoned that diversity in terms of skills encourages better understanding of the marketplace. Second, diversity enhances both creativity and innovation since attitudes and beliefs tend to vary with demographic variables. Third, diversity likely offers more effective problem solving, as different views are considered when making a decision (Lenard *et al.*, 2014). Prior studies conducted by Lenard *et al.* (2014) and Mathew *et al.* (2018) discovered that there is a negative relationship between gender diversity and firm risk. Since female characteristics tend to be more careful in taking decision, the company is taking lower risk known as risk averse. Thus, low risk taking can be implicated as less competitive in the industry. On the other hand, Sila *et al.* (2016) which study was done in the US between 1996 and 2010, stated that there is no distinctive relationship between female board members and firm risk. Therefore, here are the hypotheses

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H3a: Board gender has impact towards total risk.

H3b: Board gender has impact towards asset return risk.

H3c: Board gender has impact towards idiosyncratic risk.

3.4 Board ownership and firm risks

Board ownership is the number of shares owned by board of commissioners on the company divided by total outstanding shares (Mathew *et al.*, 2018). Board ownership plays a crucial role in firm's risk taking. Managerial equity ownership reduces the agency problem and helps to synchronise the interests of the managers and owners (Alam & Shah, 2013; Musallam, 2015; Saravanan *et al.*, 2016). As well, Pergola and Gilbert (2014) stated when the board members do not own large number of shares in the company; the board has little power to overcome the firm's control to align the interest between principal and agent. Lesser ownership in this situation may hold back the managers to involve in risky projects. On the other hand, board members may take risky project in order to give stakeholders high return. Board members are highly concerned with their careers and avoid risk-taking, even sometimes those avoided risks highly potentially increase the value of the firm. According to Alam and Shah (2013), board ownership influences firm risk positively. Similarly, Pathan (2009) also discovered positive influence of board ownership towards firm risk. Strengthening two mentioned studies, Haider and Fang (2016) stated a positive relationship of board ownership toward firm risk. Hence, this study expects:

H4a: Board ownership has impact towards total risk.

H4b: Board ownership has impact towards asset return risk.

H4c: Board ownership has impact towards idiosyncratic risk.

4. Research methodology

4.1 Source of data and sample

The type of data used in this research is quantitative data. Quantitative data incorporates numerical figures expressing certain quantity, amount or scale (Lind *et al.*, 2015).

To achieve the objectives of this study, panel data regression that combines time series and cross section data by utilizing Gretl is done through collectting secondary data, testing hypothesis, and identifying correlation. The sample firms involve agriculture, mining, and property industry in Indonesia Stock Exchange from 2013 until 2017, as shown in Table 1. The secondary data, which is gained from the information published by the company, like annual reports, Bloomberg, and other reliable sources, is employed as the source in this study.

Table I Summary of the sample observed

Sampling Criteria	No. of Companies
Total of agriculture, mining, and property companies	136
Companies listed in 2013-2017	(27)
Companies with incomplete annual report	(44)
Companies with share price 2012-2017	(3)
Total companies as the population	62
Total period (in years)	5
Total sample used in this research (62x5)	310

As seen in Table I, the total samples observed that meet the criteria in this research are 310 firm-year observations in the period of 2013 until 2017.

4.2 Measures

The dependent variable is firm risk with three variables, namely total risk, asset return risk, and idiosyncratic risk. Corporate governance, as the independent variable, assessed using the internal governance mechanisms are described into four indicators--board size, board independence, board gender, and board ownership. Control variable is variable controlled to assess the connection between independent variables and dependent variables (Lind *et al.*, 2015). Control variables that may influence the dependent variables are considered in the model. The proper use of control variables is very crucial because control variables are able to produce effective replications. On the contraty, the inappropriate control variables may trigger false results (Atinc *et al.*, 2011). The summary of variable measurements is provided in Table II.

Table II Variable definitions and data source

Variable(s)	Definitions	Data Source
Board Size (BS)	It represents the total member of board of commissioner in the organization	Annual Report
Board Independence (BI)	It represents the total number of independent commissioner over total number of board of commissioner in the organization	Annual Report
Board Gender (BG)	It represents the percentage of women commissioners in board of commissioners in the organization	Annual Report
Board Ownership (BO)	It represents the number of shares owned by board of commissioners in the organization divided by total number of outstanding shares	Annual Report
Total Risk (TotR)	Standard deviation of daily stock returns (annualized)	Yahoo Finance
Asset Return Risk (AR)	Standard deviation of daily stock returns times the ratio of market value of equity to market value of assets multiplied by $\sqrt{250}$	Yahoo Finance
Idiosyncratic Risk (IdR)	The residual from the market model regression	Yahoo Finance
Leverage (Lev)	Total debt over total assets	Bloomberg
Firm Size (Size)	Market capitalization	Bloomberg
Growth	Capital expenditures over total sales	Bloomberg
Lagged Performance (Per)	The lagged return on assets for the firm	Bloomberg

4.3 Research model

This study intends to show whether corporate governance has an impact towards firm risks. A detail examination is conducted to see the correlation between the CG and firm risks. Regression models are formulated as follows.

$$TotR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{it} + \alpha_5\, Lev_{it} + \alpha_6 \ln(size)_{it} + \alpha_7 Growth_{it} + \alpha_8 Per_{it-1} + \varepsilon it$$

$$(5)$$

$$AR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(size)_{it} + \alpha_7 Growth_{it} + \alpha_8 Per_{it-1} + \varepsilon it \tag{6}$$

$$IdR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(size)_{it} + \alpha_7 Growth_{it} + \alpha_8 Per_{it-1} + \varepsilon it \tag{7}$$

Whereas ε_{it} is the residual, *i* and *t* denote firms and time periods respectively.

5. Research results and analysis

5.1 Sample description

Table III displays the descriptive statistics of each variable; it provides further explaination of the minimum, maximum, mean, and standard deviation value of each variable.

Table III Descriptive Statistics

Variable	Mean	Median	Min	Max	Standard Deviation
Board variables					
BS	4.752	5	2	10	1.609
BI	0.399	0.333	0.2	0.833	0.107
BG	0.098	0.168	0	1	0.167
BO	0.026	0	0	0.067	0.099
Risk Measures					
TotR	1.498	0.491	0.008	10.54	2.39
AR	3.932	3.456	0.046	34.97	3.108
IdR	0.118	0.109	0.046	0.556	0.06
Control variables					
Lev	0.251	0.239	0	0.855	0.178
Size	28.794	29.076	23.747	31.717	1.623
Growth	19.986	7.179	0.029	990.6	66.29
Per	4.3625	3.587	-57.361	34.44	8.133

Table III shows that number of board members in the sample is maximum 10 people, minimum 2 people, and median 5 people. Another thing that needs to be considered is the maximum number of independent board compositions of 83.3 percent of the total number of boards. A standard deviation value less than 1 (variable BI, BG, BO, IDR and LEV) indicates that the data is in the same set. It is obvious that the number of board ownership in this sample is relatively small; its maximum value is only 0.67 per cent. It is also pointed out in Table III that there are companies that have all members of the board with female characters. Idiosyncratic risk in this sample is a type of corporate risk that has the smallest value. Of the three risks observed in this study, asset return risk (AR) is the risk that has the highest value.

5.2 Panel data estimation method

To assess panel data, determining the estimation model is important. Employing the Gretl software, after plotting with OLS method, the best panel data model is estimated using three tests, namely F Test, Breusch-

Pagan Test, and Hausman Test. With three regressions, the tests are run three times. The detailed results for each test are as follows.

Table IV Summary of Ordinary Least Square Models

	Dependent: TotR		Dependent: AR		Dependent: IdR		Collinearity (VIF>10,0)
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	
Constant	−0.604	0.819	−0.492	0.879	0.191	0.005***	
BS	0.073	0.44	−0.0163	0.888	0.006	0.018**	1.299
BI	−3.375	0.009***	3.867	0.015**	0.055	0.096*	1.082
BG	0.308	0.703	1.238	0.211	0.013	0.534	1.031
BO	−2.438	0.08*	0.684	0.688	−0.083	0.019**	1.061
Lev	2.588	0.002***	−7.119	0.000***	−0.014	0.491	1.17
Size	0.089	0.369	0.157	0.195	−0.004	0.114	1.444
Growth	0.001	0.8	0.0015	0.556	−0.000	0.942	1.012
Per	−0.018	0.319	0.014	0.551	−0.001	0.227	1.278
Adj. R^2			0.173		0.051		
p-value (F)	0.067 0.007		1.34E-09		0.043		
Heteroskedasticity	0		0		1.23485e-252		

*p<0.10 (weakly significant); **p<0.05 (significant); ***p<0.01 (highly significant).

Table V Summary of Panel Effect Tests

Dependent Variables	Dependent: TotR	Dependent: AR	Dependent: IdR
	p-value	p-value	p-value
Fixed Effect Estimator	1.91919e-101	9.58068e-05	1.9539e-05
Result	Fixed	Random	Fixed
Random Effect Estimator: Breush-Pagan test statistic:	3.00819e-105	0.000488277	0.000219102
Result	Random	Random	Random
Hausman test statistic:	0.578506	0.222627	0.0427411
Result	Random	Random	Fixed

Performing classical assumption test in the regression model is necessary. The classical assumption tests include heteroscedasticity test and multicollinearity test. Heteroscedasticity is a condition when the variances of errors are not the same with all observations (Wooldridge, 2012). Heteroscedasticity is an issue for research. Therefore, the test needs to be conducted in order to test the variability, whether it is equal and exist within the range of a second variable or not. When the p-value is less than 5%, the implication is the model contains heteroscedasticity. If there is heteroscedasticity, pooled OLS with heteroscedasticity-corrected must be conducted to overcome the heteroscedasticity problem. After passing heteroscedasticity test, reliability of variables must be examined by referring to full collinearity variance-inflation factor (VIF) values. When conducting the classical assumption test, it is notified that the model has heteroscedasticity issue. Therefore, the author uses OLS with heteroscedasticity-corrected. From table v, the results show random effect, random effect, and fixed effect respectively. However, fixed effect cannot be used, as there is a heteroscedasticity issue. Besides, using fixed effect estimation may not be suitable because corporate governance variable is time-invariant which implicates that the variable would be absorbed in time demeaning process in fixed effect (Pathan, 2009; Mathew et al., 2018).

Table VI Comparison of Models (Dependent: TotR)

	Pooled OLS with hetero-corrected		Random Effect	
	Coefficient	p-value	Coefficient	p-value
constant	−0.978	0.436	1.983	0.453
BS	−0.039	0.450	0.040	0.591
BI	−2.599	0.000***	0.347	0.641
BG	0.364	0.297	−0.985	0.177
BO	−1.376	0.002***	0.053	0.953
Lev	0.634	0.334	0.669	0.368
Size	0.117	0.022**	−0.029	0.745
Growth	−0.000	0.793	−0.000	0.926
Per	−0.018	0.091*	−0.005	0.472
Adj. R^2	0.111		0.005	
p-value (F)	0.000		0.824	

Table VII Comparison of Models (Dependent: AR)

	Pooled OLS with hetero-corrected		Random Effect	
	Coefficient	p-value	Coefficient	p-value
Constant	−1.749	0.53	−2.242	0.576
BS	0.0499	0.616	−0.036	0.795
BI	4.804	0.006***	3.72	0.039**
BG	1.094	0.125	1.614	0.191
BO	0.839	0.576	−0.302	0.88
Lev	−7.167	0.000***	−6.954	0.000***
Size	0.177	0.084*	0.222	0.1337
Growth	0.002	0.035**	0.001	0.768
Per	0.022	0.322	0.012	0.596
Adj. R^2	0.261		0.17	
p-value (F)	0.000		0.000	

*p<0.10 (weakly significant); **p<0.05 (significant); ***p<0.01 (highly significant).

Table VIII Comparison of Models (Dependent: IdR)

	Pooled OLS with hetero-corrected	
	Coefficient	p-value
Constant	0.115	0.029**
BS	0.003	0.146
BI	0.037	0.264
BG	0.001	0.942
BO	−0.053	0.022**
Lev	−0.049	0.009***
Size	−0.001	0.794
Growth	0.000	0.73
Per	−0.000	0.821
Adj. R^2	0.058	
p-value (F)	0.021	

*p<0.10 (weakly significant); **p<0.05 (significant); ***p<0.01 (highly significant).

5.4 Hypothesis and research result

Each hypothesis is divided into three, which are a, b and c. a represents total risk, b represents asset return risk, and c represents idiosyncratic risk. The first hypothesis states that board size has impact towards total risk, asset return risk, and idiosyncratic risk. The analysis result is that board size has insignificant relationship towards total risk, asset return risk, and idiosyncratic risk. **Hence, hypothesis 1a, b and c are not accepted.** This result is consistent with Lee *et al.* (2016) that found board size has insignificant influence toward total risk and idiosyncratic risk. Yet, it is contradictory with those of Mathew *et al.* (2018) and Pathan (2009) that found board size is related negatively to asset return risk.

The second hypothesis states that board independence has impact towards total risk, asset return risk, and idiosyncratic risk. Table IX shows that board size has negative relationship towards total risk, thus **H2a is accepted**. This result is in line with some previous studies conducted by Mathew *et al.* (2018), Pathan (2009) and Haider and Fang (2016) which confirmed that board independence has negative relationship over total risk. Table IX also shows that board independence has positive impact towards asset return risk. The result is inconsistent with previous study conducted by Mathew *et al.* (2018) and Pathan (2009) that found board independence shows negative relationship to asset return risk. Furthermore, the existence of independent board members is insignificant towards idiosyncratic risk. The result is in line with those of Alam and Shah (2013); Sun and Liu (2014); and Lee *et al.* (2016) which found board independence does not affect idiosyncratic risk significantly.

The third hypothesis states that board gender has impact towards total risk, asset return risk, and idiosyncratic risk. The analysis results in a fact that board size has insignificant relationship towards total risk, asset return risk, and idiosyncratic risk. **Hence, hypothesis 3a, b and c are rejected.** The result is in line with one of Sun and Liu (2014) and Sila *et al.* (2016) that found board independence has no significant influence toward total risk. However, this result is not consistent with the result of prior studies conducted by Mathew *et al.* (2018) and Pathan (2009) stating that board gender is related negatively to asset return risk. Other previous studies conducted by Mathew *et al.* (2018); Pathan (2009); and Lenard *et al.* (2014) discovered that board gender shows negative impact to idiosyncratic risk, and it contradicts the result in this study.

The forth hypothesis states that board ownership has negative impact towards total risk and idiosyncratic risk (**H4a and H4c are accepted)**, but insignificant impact towards asset return risk (**H4b is rejected**). These results are inconsistent with the prior studies that found that board ownership has positive impact towards total risk (Mathew *et al.*, 2018; Pathan, 2009; Haider & Fang, 2016; and Sun & Liu, 2014); and also positive impact towards idiosyncratic risk (Mathew *et al.*, 2018; Pathan, 2009; Alam & Shah, 2013; and Sun & Liu, 2014). The result from this study also contradicts the results of Mathew *et al.* (2018) and Pathan (2009) which found board ownership has positive influence toward asset return risk.

Table IX Research from the regressions of corporate governance and firm risk

	TotR				AR				IdR			
	coefficient	std. error	t-ratio	p-value	coefficient	std. error	t-ratio	p-value	Coefficient	std. error	t-ratio	p-value
const	-0.978	1.254	-0.779	0.436	-1.749	2.813	-0.622	0.53	0.115	0.052	2.195	0.029**
BS	-0.039	0.051	-0.756	0.450	0.0499	0.099	0.502	0.616	0.003	0.002	1.457	0.146
BI	-2.599	0.464	-5.595	0.000***	4.804	1.735	2.769	0.006***	0.037	0.033	1.118	0.264
BG	0.364	0.349	1.043	0.297	1.094	0.711	1.54	0.125	0.001	0.019	0.072	0.942
BO	-1.376	0.437	-3.149	0.002***	0.839	1.498	0.56	0.576	-0.053	0.023	-2.295	0.022**
Lev	0.634	0.655	0.969	0.334	-7.167	0.839	-8.546	0.000***	-0.049	0.019	-2.597	0.009***
Size	0.117	0.051	2.297	0.022**	0.177	0.102	1.735	0.084*	-0.001	0.002	-0.262	0.794
Growth	-0.000	0.002	-0.263	0.793	0.002	0.001	2.122	0.035**	0.000	0.000	0.345	0.73
Per	-0.018	0.011	-1.693	0.091*	0.022	0.022	0.992	0.322	-0.000	0.001	-0.227	0.821
p-value	0.111				0.261				0.058			

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6.   Conclusion, suggestion and limitation

It is found that corporate governance has mixed results towards firm risks. Board independence has negative significant correlation towards total risk, positive correlation towards asset return risk, and insignificant towards idiosyncratic risk. Meanwhile, board ownership has negative significant correlation towards total risk and idiosyncratic risk, but insignificant towards asset return risk. Next, board size has insignificant correlation towards all firm risks--total risk, asset return risk, and idiosyncratic risk. Although board size is perceived to be one of the considerations in determining good corporate governance practice, board size cannot indicate the significant influence in this study because personal quality is the key to determine board's corporate success and improve the firm risk-taking decision. This results support the study of Sambasivan *et al*. (2009) that risk-taking attitude of board member is related to personal quality. Board gender has insignificant correlation towards total risk, asset return risk, and idiosyncratic risk. These results might happen because Indonesia's regulator has not set minimum number the company to apply gender diversity on board and board ownership. In overall, the number of female on board is very small as much as 7.9% (Deloitte, 2017). According to the data obtained, the mean of board gender in this study is only 2.6%. Of the data observed, the female small number on board may indicate a symbolic meaning only to get attention from the stakeholders (Wang & Clift, 2009). Moreover, there is no minimum number of women on board on Financial Services Authority's report (2014).

Independent board of commissioners can mitigate total risk. This implies that board independence is able to reduce both external and internal risks. However, board independence increases asset return risk. Independent board members' decisions depend on the quality and completeness of information. As the independent board obtains poor information, accurate decision regarding risk-taking may not be achieved. Hence, uncertainty becomes higher. Since risk-seeker investors demand uncertainty, companies prefer obtaining funding from shareholders rather than debt-holders. Viewed from the business risk perspective, it shows that number of independent directors is not affecting the risk because every director has different enthusiasm in taking risk. Although bigger independent board of commissioners has a good monitoring of the company, it does not mean smaller board has less effective monitoring.

The results for board ownership are inconsistent with agency theory and past studies. The negative impact of board ownership towards total risk and idiosyncratic risk is in line with the stewardship theory. Board ownership in organizations encourages boards to control their opportunistic attitudes. The insignificant impact of board ownership towards asset return risk may due to small number of shares owned by the board in the companies. The mean of board ownership in this study is only 2.6%. Besides, there is no regulation that states minimum number of shares should be owned by the board. Risk-seeking investors tend to the high risk-taking, whereas risk averse investors consider the low risk-taking.

Firms should be aware of the result showed that corporate governance and firm risk have negative relationship. Corporate governance is the system how the company governs, which is shown in the annual report, to communicate with all shareholders that company has fulfilled stakeholders' interest. Towards society, companies have to show financial performance and goals, promote the firm, and meet the regulatory obligations. However, for the corporate governance, only board independence and board ownership have significant influence towards the firm risk. The recommendation for the companies is to pay attention more on the effectiveness of board size and board gender.

This paper is subjected to certain limitations. This study is only limited to analyse the influence of board size, board independence, board gender, and board ownership towards total risk, asset return risk, and idiosyncratic risk. Further researches may use more corporate governance indicators and more measurements of firm risk. Aside from that, this study is limited by using the agriculture, mining, and property industries data from 2013 to 2017 listed in Indonesia Stock Exchange. Future studies can try to

examine the influence of corporate governance on firm risks in different industries and update the observed periods in order to provide new evidences.

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