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

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

Abstract

Purpose - This paper aims to examine impact of corporate governance towards firm risk 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 risk: total risk, asset return risk, and idiosyncratic risk.

Design/methodology/approach – Panel data analysis is conducted using a sample of 62 companies from 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 risk. However, board independence shows negative influence toward total risk, positive influence toward asset return risk, and insignificant influence toward idiosyncratic risk. While, board ownership shows negative influence toward total risk as well as idiosyncratic risk, and insignificant influence toward asset return risk.

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 risk. Moreover, investors may have better understanding on corporate governance and factors that are influencing firm risk. Therefore, this study can assist them in order to make a good investment decision.

Originality/value - This study is the first to use comprehensive three measurements of firm risk in Indonesia. Risk can come from internal and external which the company should understand about the various kind of risk facing the company. Total risk measures both the internal and external risk. While, asset return risk give another perspective using overall market perception about the equity and assets of the company. Lastly, this study also measures internal risk, as it 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). Therefore, either economic, political, regulatory changes, technology, market situation, or nature caused event can influence the business. Mining industry is an important sub-sector of industry from 1970. It gained renewed attention both domestically and internationally. Besides, Indonesia is currently a major producer of coal, copper, gold, tin, and nickel (Indonesia Investment, 2018). The country remains the leading global exporter of thermal coal. While, agriculture industry that produces palm oil contributed as the largest export in Indonesia. Naturally, the larger plantations produce goods that are mainly for export while the smaller ones have their focus on satisfying the food demand of the locals. The larger plantations produce things like rubber and palm oil. Property industry in Indonesia has low share price due to slowly recovery from Asian Financial Crisis in 2009. This causes the demand for property is less than the supply. In addition, the purchasing power in buying house in Indonesia is weak (DBS Bank, 2016).

Risk-taking is fundamental in running business. Moreover, following the financial crisis in 2008, firms are turning attention toward risk management. It was highlighted that the board is responsible in managing the risk (ACCA, 2012). Board has two important roles, such as risk-taking decider and internal control mechanism. As risk-taking decider, the board must comprehend the appropriate level of risk exposure to the company is willing to take in order to achieve the objectives. While, internal control mechanism is a part of corporate governance where should ensure that risks are managed appropriately. After the crisis, a large number of investors lose confidence in investing in the companies. The companies have attempted to increase the confidence of investors by developing the corporate governance appliance, which include risk governance.

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3 In terms of firm risk measurement, most of 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. Asset return risk is an alternative to measure firm risk. Asset return risk includes 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 to determine the percentage of company's assets owned by shareholders and measure the ability of the company to survive 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. These two risks are hard to be controlled by the company. Therefore, the company need 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.

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17 Corporate governance can be explained from internal mechanism (Li *et al.*, 2012). The internal mechanism is shown from the characteristics of corporate governance, such as board of directors. Internal mechanism is known to be limited yet important dimension of corporate governance (Dedu & Chitan, 2013). The board has the role to oversee the company and control the risk facing to the company properly on behalf of the investor and stakeholders. Improving the function of corporate boards, such as by gaining the independence level, enhancing the oversight roles, applying practices that are more effective. Among internal corporate governance attributes, the board composition, such as board size, board independence, and board gender and board leadership structure, such as 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 as well.

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27 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 impact toward measures of firm risk. Board size and board gender has insignificant influence toward firm risk. Board independence has significant negative influence toward total risk, positive influence toward asset return risk, and insignificant influence toward idiosyncratic risk. Board ownership has significant negative influence toward total risk and idiosyncratic risk, while insignificant toward asset return risk.

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34 This study is the first study that examines the impact of board size, board independence, board gender, and board ownership, which is the internal mechanism of corporate governance, toward firm risk. Firm risk is measured using three measurements; those are 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

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43 Agency and stewardship theory are used in this study to explain the role of internal corporate governance mechanisms in controlling firm risk.

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45 *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 separation of ownership and control will guide an agency issue where there is a possibility for conflict of 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 maximize their own interests opportunistically by misapplying the firm's resources. Commonly, 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 operates the company will have a better information about the company rather than shareholders since shareholders are not controlling daily activity of the company. Therefore, asymmetric information costs the shareholder because they

cannot make precise decisions from the performance of the manager. Hence, the firm is being harmed (Siagian *et al.*, 2013). In order to reduce the agency problem, monitoring of the directors is supposed to be conducted by shareholders to align the interest of both parties. The aim of corporate governance is to ensure that the directors will conduct the best interest of the shareholders and obliged the director to disclose crucial information (Siagian *et al.*, 2013).

Stewardship Theory. Companies have many stakeholders, and the primary ones are shareholders, employees, creditors, customers, and government. The pure agency relationship describes the relationship between company and managers is an incomplete contract covering every aspect of business decision due the significant uncertainty and information asymmetries (Subramanian, 2018). Stewardship theory, which was 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 mechanisms components designed to mitigate the agency conflicts between boards and shareholders (Mathew *et al.*, 2018). Schäuble (2018) argues that board ownership, as part of internal corporate governance mechanism, is able to mitigate agency costs. Corporate boards are responsible for monitoring the quality of information contained in the financial statements, thus they control the behaviour of senior managers in order to guarantee that their actions are associated 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 making for the goal 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 examines one of corporate governance mechanisms, which is a board size (BS), board independence (BI) and board gender (BG), and board ownership (BO).

2.2 Firm Risk

At the time the investor invest 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 own gilts. In general, firm risk 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, which are systematic and unsystematic risk. Systematic risk is also known 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. On the other hand, systematic risk cannot be diversified away (Mathew *et al.*, 2018). Total risk reflects the market's perception about the risks inherent in the firm's assets and liabilities. Both regulators and firm executives frequently monitor this risk (Pathan, 2009).

Asset return risk is used as the alternative to find 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 of 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 to determine the percentage of company's assets owned by shareholders and measure the ability of the company to survive over 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. In other word, idiosyncratic risk is specific to a particular company and stock. Idiosyncratic risk is also known 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 unsystematic

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3 risk by diversifying the portfolios (Bartram *et al.*, 2011). Idiosyncratic risk can be measured using standard deviation of
4 the residuals from the market model regression (Pathan, 2009; Sila *et al.*, 2016).
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7 **3. Hypothesis development**

8 **3.1 Board size and firm risk**

9 In terms of corporate governance components that have influence to firm risk, it is likely that internal governance
10 mechanism related to the board will be more relevant. According to Haider and Fang (2016), the larger the board size,
11 the less risk the firm is taking due to better monitoring. In addition, company that applies good corporate governance
12 is expected to have better performance. Besides, the decisions of the board of commissioners give a crucial contribution
13 to the governance. The larger the board, the wider the perspectives are contributed (Haider & Fang, 2016). However,
14 Sun and Liu (2014) argued that board size is positively related to firm risk because small board size is more cooperative,
15 efficient and decisive. While, Lee *et al.* (2016) found that board size is insignificantly affecting firm risk. Therefore, the
16 hypotheses are:

17 *H1a: Board size has impact toward total risk.*

18 *H1b: Board size has impact toward asset return risk.*

19 *H1c: Board size has impact toward idiosyncratic risk.*
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22 **3.2 Independent directors and firm risk**

23 Independent directors are believed to be better monitors of managers because the board does not have connection
24 with the management by birth or marriage, major shareholders, employees of affiliated company and representatives
25 of the company that have important dealings with the subject company. In order to be effective, it was mentioned that
26 at least 30% of the board should be composed of independent non-executive director (Deloitte, 2014). Outsider director
27 helps the board to do its role effectively. Therefore, board independence has a crucial role to lower the agency cost.
28 The presence of more outsider board of commissioner may obstruct the indulgence of the firm in riskier projects as
29 they are concerned with the volatility of the returns. According to Alam & Shah (2013), the association of board
30 independence and firm risk is negative. The more outsider board of commissioner may hold up the indulgence of the
31 firm in riskier projects as they are concerned with the volatility of the returns. While, Alam and Shah (2013); Sun and
32 Liu (2014); Lee *et al.* (2016) found that board independence is insignificantly affecting firm risk. As a result, board
33 independence has an important role to lower the agency cost. Therefore, authors hypothesized that:
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35 *H2a: Board independence has impact toward total risk.*

36 *H2b: Board independence has impact toward asset return risk.*

37 *H2c: Board independence has impact toward idiosyncratic risk.*
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40 **3.3 Board gender diversity and firm risk**

41 Gender composition can be explained as the proportion of man and woman on the board (Mathew *et al.*, 2018). Increase
42 in women present in the organization is due to the scandal occurred related to corporate governance, such as: Enron,
43 Lehman Brother, and WorldCom (Sener & Karaye, 2014). There have been debates about gender composition in
44 organizations to improve good corporate governance (Plessis *et al.*, 2012). First, they reasoned that diversity in terms
45 of skills promotes better understanding of the marketplace. Second, diversity increases creativity and innovation, as
46 attitudes and beliefs tend to vary with demographic variables. Third, diversity produces more effective problem solving,
47 as different views are considered when making a decision (Lenard *et al.*, 2014). Prior studies conducted by Lenard *et al.*
48 (2014) and Mathew *et al.* (2018) found that there is a negative relationship between gender diversity and firm risk.
49 Female characteristics are known to be more careful in taking decision, therefore the company is taking lower risk or
50 known as risk averse. Thus, low risk taking can be implicated as less competitive in the industry. On the other side,
51 Sila *et al.* (2016) found that there is no significant relationship between female board members and firm risk, the study
52 was done in the US between 1996 and 2010. Therefore, hypothesized that:
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54 *H3a: Board gender has impact toward total risk.*

55 *H3b: Board gender has impact toward asset return risk.*
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H3c: Board gender has impact toward idiosyncratic risk.

3.4 Board ownership and firm risk

Board ownership can be defined as 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 significant role in firm's risk taking. Managerial equity ownership reduces the agency problem and helps to align 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 regard may hold back the managers to indulge in risky projects. On the other hand, board members may take risky project in order to give stakeholders high return. Board members cater for their careers and avoid risk-taking, sometimes even those risks are avoided that could have potentially increased the value of the firm. According to Alam and Shah (2013), board ownership has positive influence toward firm risk. Moreover, Pathan (2009) also found that board ownership has positive influence toward firm risk. In addition, Haider and Fang (2016) found a positive relationship of board ownership toward firm risk. Hence, this study expects:

H4a: Board ownership has impact toward total risk.

H4b: Board ownership has impact toward asset return risk.

H4c: Board ownership has impact toward 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).

In order to achieve the aim of this study, panel data regression that combine time series and cross section data by utilizing Gretl is done through a collection of secondary data, testing of hypothesis, and identification of correlation. The sample firms involve agriculture, mining, and property industry in Indonesia Stock Exchange from 2013 until 2017, as shown in Table 1. This study uses secondary data as the source, which is gained from the information published by the company, such as from annual reports, Bloomberg, and other reliable sources.

Table I Summary of the sample observed

<i>Sampling Criteria</i>	<i>No. of Companies</i>
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

Eventually, as seen in Table I, total sample observed that meets the criteria in this research is 310 firm-year observations in the period 2013 until 2017.

4.2 Measures

The dependent variable is firm risk that divided into three variables consisted of total risk, asset return risk, and idiosyncratic risk. Corporate governance, as the independent variable, is measured using the internal governance mechanism that described into four indicators, board size, board independence, board gender, and board ownership. Control variable is variable controlled to assess the relationship between independent variables and dependent variables (Lind *et al.*, 2015). Control variables that may affect the dependent variables are considered in the model. The proper use of control variables are crucial because control variables are able to produce effective replications. On

the other hand, 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 commissioners 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 would like to show whether corporate governance has an impact towards firm risk. A details examination is conducted to see the correlation between the CG and firm risk. Regression models are formulated as follows.

$$TotR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(size)_{it} + \alpha_7 Growth_{it} + \alpha_8 Per_{it-1} + \varepsilon_{it} \quad (5)$$

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

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

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 provides the descriptive statistics of each variable, explaining further on the minimum, maximum, mean, and standard deviation value.

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 the maximum number of board members in the sample is 10 people, a minimum of 2 people, and a median of 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 can be seen that the number of board ownership in this sample is relatively small; the maximum value is only 0.67 per cent. It is also seen 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

In assessing panel data, determining the estimation model is important. Using the Gretl software, after plotting with OLS method, the best panel data model could be estimated using three tests; F Test, Breusch-Pagan Test, and Hausman Test. As there are three regressions, the tests are run three times. Below are the detailed results for each test:

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	0.067		0.173		0.051		
p-value (F)	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 need 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 looking at full collinearity variance-inflation factor (VIF) values. When conducting the classical assumption test, it is indicated that the model has heteroscedasticity issue. Therefore, the author uses OLS with heteroscedasticity-corrected. From table v, the results shows respectively

that random effect, random effect, and fixed effect. However, fixed effect cannot be used, as there is 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	

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

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 is a, b and c. a represents total risk, b represents asset return risk, and c represents idiosyncratic risk. First hypothesis stated that board size has impact towards total risk, asset return risk, and idiosyncratic risk. The analysis resulted that board size has insignificant relationship toward 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. This result is contradictory with Mathew *et al.* (2018) and Pathan (2009) that found board size is negatively related to asset return risk.

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3 Second hypothesis stated that board independence has impact towards total risk, asset return risk, and idiosyncratic
4 risk. Table IX shows that board size has negative relationship toward total risk, thus **H2a is accepted**. This result is
5 consistent with previous study conducted by Mathew *et al.* (2018); Pathan (2009); Haider and Fang (2016) that board
6 independence is negatively related to total risk. Table IX also shows that board independence has positive impact
7 towards asset return risk. This result is inconsistent with previous study conducted by Mathew *et al.* (2018) and Pathan
8 (2009) that found board independence is negatively related to asset return risk. Moreover, the existence of independent
9 board members is insignificant towards idiosyncratic risk. This result is consistent with Alam and Shah (2013); Sun and
10 Liu (2014); and Lee *et al.* (2016) that found board independence has no significant impact towards idiosyncratic risk.

11 Third hypothesis stated that board gender has impact towards total risk, asset return risk, and idiosyncratic risk. The
12 analysis resulted that board size has insignificant relationship toward total risk, asset return risk, and idiosyncratic risk.
13 **Hence, hypothesis 3a, b and c are rejected**. This result is consistent with Sun and Liu (2014); Sila *et al.* (2016) that
14 found board independence has no significant influence toward total risk. However, this result is inconsistent with
15 previous study conducted by Mathew *et al.* (2018) and Pathan (2009) that board gender is negatively related to asset
16 return risk. Another previous studies conducted by Mathew *et al.* (2018); Pathan (2009); and Lenard *et al.* (2014) found
17 that board gender is negatively related to idiosyncratic risk, and it was contrast to the result in this study.
18

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

6. Conclusion, suggestion and limitation

It is found that corporate governance has mixed results towards firm risk. Board independence has negative significant correlation toward total risk, positive correlation toward asset return risk, and insignificant toward idiosyncratic risk. While, board ownership has negative significant correlation toward total risk and idiosyncratic risk, while insignificant toward asset return risk. Board size has insignificant correlation toward 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 related to personal quality. Board gender has insignificant correlation toward total risk, asset return risk, and idiosyncratic risk. These results might happened 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%. In the case of data observed, the small number of female 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 risk. However, board independence increases asset return risk. Independent board members' decisions depend on the quality and completeness of information. As the independent board obtain poor information, accurate decision regarding risk-taking may not be achieved. Hence, uncertainty becomes higher. Risk-seeker investors demand uncertainty, therefore, companies prefer to obtain funding from shareholders rather debtholders. While, 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, but smaller board does not indicates the 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 consistent with the stewardship theory. Board ownership in organizations encourages boards to control their opportunistic attitudes. The insignificant impact of board ownership toward asset return risks 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%. Moreover, there is no regulation that stated minimum number of shares should be owned by the board. Risk-seeking investors tend to the high risk-taking, or risk averse investors consider to the low risk-taking.

Firms should be aware on the result showed that corporate governance and firm risk has negative relationship. Corporate governance is the system how the company governs which shown in the annual report to communicate with all shareholders that company has fulfilled stakeholders' interest. Towards society, companies 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 that has significant influence toward 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 listed in Indonesia Stock Exchange which have available data in 2013-2017. Future studies can try to observe the impact of corporate governance on firm risk in different industries and update the observed periods in order to provide new evidences.

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3 messages

Corporate Governance <onbehalf@manuscriptcentral.com>

Sun, Feb 24, 2019 at 6:24 AM

Reply-To: G.Eweje@massey.ac.nz

To: elsyehat@petra.ac.id, elsyehat@gmail.com

23-Feb-2019

Dear Saarce,

Your manuscript entitled "DOES INTERNAL CORPORATE GOVERNANCE MECHANISM CONTROL FIRM RISK? EVIDENCE FROM INDONESIA THREE HIGH RISK SECTORS" has been successfully submitted online and is presently being given full consideration for publication in the Corporate Governance.

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With best regards,
Gabriel Eweje
Editor, Corporate Governance

Saarce Elsyeh Hatane <elsyehat@petra.ac.id>
To: josua <josuat@petra.ac.id>, Ferry JIE <f.jie@ecu.edu.au>

Sun, Feb 24, 2019 at 7:21 AM

Dear All

This is the journal i mentioned in my previous email.

[Quoted text hidden]

Josuat <josuat@petra.ac.id>

Sun, Feb 24, 2019 at 8:39 AM

To: Saarse Elsy Hatane <elsyehat@petra.ac.id>

tiba" dia jadi rajin :-)

Foo?

[Quoted text hidden]

Response to comments Manuscript ID CG-02-2019-0071

Comments:

(There are no comments.)

Additional Questions:

1. Originality: Does the paper contain new and significant information adequate to justify publication?: Paper theme and title is relevant and contemporary
2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Literature review is nicely done. Suggest to enhance literature study a little more.

Author response: There are some previous studies added in:

Part 3 Hypotheses Development.

The board of directors in company is in charge of appointing decisions to achieve company's goals, while some decisions contain inherent risk bearing (Zhu and Weyant, 2003; Mathew *et al.*, 2016). Wood and Zaichwosky (2004) stated that the board's decision 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 primary purpose of risk management, but it is more on how to pick the appropriate risk along with its level (Mathew *et al.*, 2016).

Part 3.1:

Chakraborty *et al.* (2018), the larger the number of board members, the fewer risks the firm has due to better monitoring.

Part 3.2:

Chakraborty *et al.* (2018), the association of board independence and firm risk is negative. Zhang *et al.* (2018) argued that board independence positively influence the asset return risk due to the ability of the independent directors in inducing the executors to initiate risky projects.

Part 3.3:

women colour the process by bringing a different perspective to the board (Mathisen *et al.*, 2013)

Part 5.4: Second Paragraph:

The result is consistent with the previous study conducted by Zhang *et al.* (2018) who also found that independent directors, who are unfamiliar with intra-firm information, could not limit the executives' risk-taking actions.

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts or other ideas? Has the research or equivalent intellectual work on

which the paper is based been well designed? Are the methods employed appropriate?: Research tools used are adequate

4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: Findings are correctly done.
5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: this paper has good policy implications both for regulatory and businesses.
6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the fields and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: Language needs some editing.

Author response: the revision has been done in order to make the language clearer and readability. Author did the language and grammar checking to the proof reader. The changes can be seen in the track changes For example:

Sentence structure: revised in every paragraph. For example in the first paragraph part 1 introduction: Looking at high-risk industries in Indonesia, mining, agriculture, and property industries are included in the category. They are very susceptible towards changes in the global macroeconomic (Indonesia Investments, 2018). Factors such as economics, politics, regulation changes, technology, market situation, and nature can interfere with the business. The mining industry has been an essential sub-sector of industry since 1970, and has gained constant 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 on the locals. In Indonesia, the property industry has low share price due to a slow recovery from the Asian Financial Crisis in 2009 that causes the property demand less than the supply. Moreover, the purchasing power of buying a house in Indonesia is weak (DBS Bank, 2016).

Acronym

ACCA, Association of Chartered Certified Accountants. → added in the references

Asset Return Risk : ARR

Firm Size: FSize

Board Ownership: BOwn

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

Abstract

Purpose - This paper *aims-intends* to examine *impact-the control* 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 a sample of 62 companies *from-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 gives positive influence towards total 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 total asset return risk, but influences idiosyncratic and total risk negatively.

Practical implications - Firms should incorporate corporate governance, especially the *effective-impactful* roles of board independence and board ownership since they serve as tools in reducing firm risk. Moreover, investors may have a better understanding of corporate governance and factors that are influencing firm risks. Therefore, this study can assist them in order to make the *good-right* 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 *kind-types* of risks facing the company. Total risk measures both the internal and external risk, 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 risks, 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* They are very *sensitive-susceptible* towards changes in the global macroeconomic (Indonesia Investments, 2018). Factors such as economics, politics, regulation changes, technology, market situation, and nature can interfere *with* the business. *The Mining-mining* industry has been an *important-essential* sub-sector of industry since 1970, and has gained *continuous-constant* 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). *Naturally, the larger plantations produce goods like rubber and palm oil that are mainly for export while the smaller ones have their focus on satisfying the food demand of the locals. Generally, larger plantations produce goods like rubber and palm oil that are mainly for export, while smaller ones focus on satisfying the food demand on the locals.* On the other hand, property industry in Indonesia has low share price due to slowly recovery from In Indonesia, the property industry has low share price due to a slow recovery from the Asian Financial Crisis in 2009 *that causes the property demand less than the supply. Moreover, the purchasing power of buying a house in Indonesia is weak. This causes the demand for property is less than the supply. In addition, the purchasing power in buying house in Indonesia is weak.* (DBS Bank, 2016).

Risk-taking is fundamental in running business. Following the financial crisis in 2008, firms *are turning attention have turned attention* towards risk management. *It is in line with* Then, it was highlighted that the board is responsible in *managing the risk* (ACCA, (2012) *which highlighted that the board is responsible for managing the risk.* Further, the *Board-board* has two *important-critical* roles; such 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. *Meanwhile/Whereas,* *the* internal control mechanism is a part of corporate

governance to ensure the risks managed properly/adequately. After the crisis, a large number of investors lost confidence in investing in the companies. To cope with such situation, The-the companies have attempted to increase the confidence of investors by developing the corporate governance appliance, which comes along with include-risk governance.

In terms of firm risk measurement, most of 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-a combination of systematic and idiosyncratic risks. This risk identifies all-of-the/the whole risk factors/aspects from both external risk in systematic risk and internal-inherent risk in the idiosyncratic-risk. Meanwhile, Asset-asset return risk is an-alternative-to/another way to measure-assess the firm risk-Asset return risk includes-that cover market capital ratio in the measurement. The Market-market capital ratio is defined viewed as the market-value-of equity's market value to market-value-of total assets' market value (Flannery & Rangan, 2008). The ratio helps-to determine the percentage of eompany's assets-owned-by shareholders' assets in the company and measure-assess the ability of the company to survive-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. These two risks are hard to be controlled by the eompany/company.-Therefore, the company needs to minimize the risk from within. Idiosyncratic risk is the-risk-that-a controllable risk and specific-exclusive 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.

Furthermore, Corporate-corporate governance can-be-explained-from/has a strong bond with the -internal mechanism as criteria by the board of directors (Li et al., 2012). The internal mechanism is shown-from-the characteristics-of corporate-governance,-such-as board-of-directors.-Internal-mechanism-is known to be limited, yet the important dimension of corporate governance (Dedu & Chitan, 2013). The corporate boards/board have-as the role to-oversee-the company-and-control/in supervising and in controlling the risk facing-to-by the company properly on-behalf-of-the-for the sake of both the investor and stakeholders. Some possible ways to improving-improve the function of the corporate boards are,-such-as by gaining the independence level, enhancing the oversight roles, and applying practices that are more-effective/practices that are more effective. Among the internal corporate governance attributes, the board composition, i.e.,-such-as board size, board-independence, and board-gender, as well as the -and board leadership structure like-the,-such-as board-ownership/board ownership, are the most affecting factors. This internal mechanism can-be-used-in-order-to-minimize/is useful to mitigate the idiosyncratic risk. Therefore, total-risk-and-asset return risk and total risk can be reduced-controlled as well.

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 impact toward measures of firm risk. Board size and board and board-gender has-insignificant influence toward firm-risk/are giving insignificant influence to the firm risks. Board independence has significantly negative influence towards total risk, positive influence toward asset return risk, and insignificant influence toward idiosyncratic risk. Board ownership has significant negative influence toward total risk and idiosyncratic risk, while-but insignificant towards asset return risk.

This study is-notably becomes the first to investigate/the first study that-examines-the impact of board size, board independence, board gender, and board ownership, which is-are the internal mechanism of corporate governance, towards firm risks in Indonesia. The Firm-firm risks is-are measured using three measurements,; those-namely-are total risk, asset return risk, and idiosyncratic risk-in-Indonesia. The corporate governance used is-related/here is closer connection to internal rather than to 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 theories are used in this study-research-to-are explaining the role-part of internal corporate governance mechanisms in controlling firm risks.

Agency Theory. Jensen and Meckling first initiated agency-this theory/concept in 1976. The-theory/it 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 (Nyberg et al., 2010). As a reward, agents earn remuneration, bonus, and

~~compensation~~compensation;- ~~w~~Whereas, principals are the owner of the company and supply the funds for the company. However, the ~~separation~~ ~~distinction of between~~ ownership and control will ~~guide~~ ~~possibly~~ foster an agency issue ~~where there is a possibility for~~ conflict of 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~~ ~~the responsible party in to~~ running the company, have a susceptibility to ~~maximize~~ ~~optimise~~ their own interests ~~at every~~ ~~opportunistically~~ ~~opportunity~~ by misapplying the firm's resources; ~~Commonly~~ 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 ~~do the day to day~~ ~~day-to-day~~ operations, ~~es the company~~ will have a better information about the company rather than shareholders since shareholders are not controlling ~~the~~ daily activity of the company. Therefore, asymmetric information costs the shareholder because they ~~cannot~~ ~~are not able to~~ make ~~precise~~ ~~significant~~ decisions from the performance of the manager. Hence, the firm is being harmed (Siagian *et al.*, 2013). ~~In order to~~ reduce the agency problem, ~~shareholders, throughout corporate governance mechanism,~~ ~~monitor ing~~ of the directors ~~is supposed to be conducted by shareholders to align the interest of both parties.~~ ~~They want to ascertain the directors, as the agents, are conducting the best interests of the principals and to disclosing crucial information~~ ~~The aim of corporate governance is to ensure that the directors will conduct the best interest of the shareholders and obliged the director to disclose crucial information~~ (Siagian *et al.*, 2013).

Stewardship Theory. Companies have many stakeholders, and the ~~primary~~ ~~major~~ ones are shareholders, employees, creditors, customers, and government, ~~respectively~~-. The ~~pure~~ ~~genuine~~ agency relationship describes the relationship between ~~company~~ ~~shareholders~~ and managers ~~in~~ an incomplete contract, ~~covering~~ ~~including~~ every aspect of business decision due ~~to~~ the ~~significant~~ ~~substantial~~ uncertainty and information ~~asymmetries~~ ~~imbalance~~ (Subramanian, 2018). Stewardship theory, ~~which was~~ 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 interests of shareholder rather than the agent's self-interests. Managers, as the agents, are highly dedicated and are more likely to serve the organisation completely (Davis *et al.*, 2007). In ~~other~~ ~~another~~ 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 mechanisms components designed to ~~mitigate~~ ~~alleviate~~ the agency conflicts between boards and shareholders (Mathew *et al.*, 2018). Schäuble (2018) argues that board ownership, a ~~s~~ part of internal corporate governance mechanism, ~~is able to~~ ~~can~~ mitigate agency costs. Corporate boards ~~are responsible for monitoring~~ ~~hold responsibility for ensuring the information in financial reports are qualified the quality of information contained in the financial statements,~~ ~~thus~~ ~~Consequently,~~ they control the behaviour of senior managers ~~in order to guarantee that their actions are associated~~ ~~to ensure their actions are according to~~ ~~with~~ the ~~interests of~~ ~~stakeholders'~~ ~~interests~~. Corporate governance acts as a ~~significant~~ ~~substantial~~ part in ~~determining~~ ~~defining~~ the ~~success~~ ~~accomplishment~~ of a business and ~~the~~ 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 making for the goal of~~ ~~decide for the sake of~~ the stakeholders and shareholders (~~Siagian et al., (2013)~~). By applying this governance mechanism, agency problem can be mitigated.

Moreover, the purpose of agency cost is to synchronize the interests between board and shareholder. Therefore, having good corporate governance is ~~important~~ ~~essential~~. This study ~~focus~~ ~~emphasis~~ on examining ~~one of~~ ~~four~~ indicators of corporate governance ~~internal~~ mechanisms, ~~which is~~ ~~namely~~ board size (BS), board independence (BI) and board gender (BG), and board ownership (BO).

2.2 Firm Risk

At the time the investor invest 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 ~~gilt~~s. In general, firm risk 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, ~~which are~~ ~~namely~~, systematic and unsystematic risk. Systematic risk is also ~~known~~ ~~famous~~ as market risk or inherent risk, ~~whereas~~ ~~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~~ ~~On the other hand~~, systematic risk cannot be diversified away (Mathew *et al.*, 2018). Total risk reflects the market's perception about the risks inherent in the firm's assets and liabilities. ~~Both~~ ~~Moreover, not only~~ regulators ~~but also~~ ~~and~~ firm executives ~~frequently monitor~~ ~~observe~~ this risk ~~frequently~~ (Pathan, 2009).

Asset return risk is ~~used~~ ~~employed~~ as ~~the~~ ~~another~~ alternative to find firm risks (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 of 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 ~~to determine~~ ~~settle~~ the percentage of company's assets owned by shareholders and measure the ~~ability~~ ~~capability~~ of the company to ~~survive over a long period~~ ~~maintain 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~~. ~~In other word, idiosyncratic risk is specific to a particular company and stock~~. Idiosyncratic risk is also ~~known~~ ~~famous~~ as unsystematic risk or firm-specific risk. For example, when the company generates high income, the company can justify ~~the~~ 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 unsystematic risk by diversifying the portfolios (Bartram *et al.*, 2011). Idiosyncratic risk can be ~~measured~~ ~~calculated~~ using standard deviation of the residuals from the market model regression (Pathan, 2009; Sila *et al.*, 2016).

3. Hypothesis development

3. The board of directors in company is in charge of appointing decisions to achieve company's goals, while ~~some decisions contain inherent risk bearing~~ (Zhu and Weyant, 2003; Mathew *et al.*, 2016). Wood and Zaichwosky (2004) stated that the board's decision 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 primary purpose of risk management, but it is more on how to pick the appropriate risk along with its level~~ (Mathew *et al.*, 2016).

3.1 Board size and firm risks

~~In terms~~ ~~Among of the~~ corporate governance components that ~~have~~ influence ~~to the~~ firm risk, it ~~is likely~~ ~~seems~~ that internal governance mechanism related to the board ~~will be~~ ~~is~~ more relevant. ~~Moreover, the company that applies good corporate governance will have a better performance since the decisions made by board of commissioners give a crucial contribution to the governance. Referring to Chakraborty et al. (2018), the larger the number of board members, the fewer risks the firm has due to better monitoring. The larger the board, the wider the perspectives are contributed (Haider & Fang, 2016). According to Haider and Fang (2016), the larger the board size, the less risk the firm is taking due to better monitoring.~~ In addition, company that applies good corporate governance is expected to have better performance. Besides, 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 associates positively to firm risks, because small board size will be more cooperative, efficient, and decisive. However, Sun and Liu (2014) argued that board size is positively related to firm risk because small board size is more cooperative, efficient and decisive.~~ While, Lee *et al.* (2016) found that board size is insignificantly affecting the firm risks. Therefore, the hypotheses are:

H1a: Board size has ~~impact~~ ~~an~~ ~~impact~~ towards total risk.

H1b: Board size has ~~an~~ impact towards asset return risk.

H1c: Board size has ~~an~~ impact towards idiosyncratic risk.

3.2 Independent directors and firm risk

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Independent ~~directors members in the board~~ are ~~playing~~ ~~believed to be~~ better ~~role as the monitors overseers of for managers the executives~~ because the ~~board does~~ ~~independent directors do~~ 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 ~~is~~ ~~was~~ mentioned that ~~at least no less than~~ 30% of the board ~~should behas been~~ 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 in lowering~~ the agency cost. The presence of more outsider board of commissioner may ~~ebstruet block the indulgencethe action~~ of the ~~firm management~~ in riskier projects as they ~~are concerned with the volatility of the care of unsteady~~ returns. According to Alam & Shah (2013) ~~and Chakraborty et al. (2018)~~, the association of ~~board independence independent directors~~ and firm risks is negative. ~~The more outsider board of commissioner may hold up the indulgence of the firm in riskier projects as they are concerned with the volatility of the returns. Furthermore, Zhang et al. (2018) argued that board independence positively influence the asset return risk due to the ability of the independent directors in inducing the executors to initiate risky projects. While Sun and Liu (2014) and Alam and Shah (2013); Sun and Liu (2014); Lee et al. (2016) found verified that board independence board independence is insignificantly affecting firm risks. It is because independent directors are unaccustomed to intra-firm information; thus, the outside directors may not affect firm risks management (Zhang et al., 2008). As a result, board independence has an important role to lower the agency cost. Therefore, authors the hypotheses sized that are:~~

H2a: Board independence has ~~an~~ ~~impact towards~~ ~~s~~ total risk.

H2b: Board independence has ~~an~~ ~~impact towards~~ ~~s~~ asset return risk.

H2c: Board independence has ~~an~~ ~~impact towards~~ ~~s~~ idiosyncratic risk.

3.3 Board gender diversity and firm risk

Gender composition ~~ean be is~~ explained as the proportion of man and woman on the board (Mathew et al., 2018). Increase in women present in the organization is due to the scandal ~~that~~ occurred related to corporate governance, such ~~as 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 ~~women's skills promotes better encourage a clearer~~ understanding of the marketplace. Secondly, diversity ~~increases enhances both novelty and~~ creativity, ~~and innovation, as since~~ attitudes and beliefs ~~tend to are likely vary to be varied~~ with demographic variables. ~~The last is, gender diversity produces likely offers~~ more effective problem solving, ~~as different views are considered when making a decision since decision-making process goes through more than one opinions~~ (Lenard et al., 2014). Prior studies conducted by Lenard et al. (2014) and Mathew et al. (2018) found that ~~there is~~ a negative relationship ~~between occurs between~~ gender diversity and firm risk. ~~Since Female female~~ characteristics ~~are known tend~~ to be more careful in taking decision, ~~therefore the company is taking lower risk or known they tend to take a lower risk or known~~ as risk averse. ~~Thus, The~~ low risk taking can be implicated as less competitive in the industry. On the other ~~sidehand~~, Sila et al. (2016) ~~found stated~~ that there is no ~~significant distinctive~~ relationship ~~is discovered~~ between female board members and firm risks, ~~the study was done in the US between 1996 and 2010. Therefore, hypothesized that; Thus, here are the hypotheses:~~

H3a: Board gender has ~~an~~ ~~impact towards~~ ~~s~~ total risk.

H3b: Board gender has ~~an~~ ~~impact towards~~ ~~s~~ asset return risk.

H3c: Board gender has ~~an~~ ~~impact towards~~ ~~s~~ idiosyncratic risk.

3.4 Board ownership and firm risk

Board ownership ~~ean be defined as measured as~~ the number of shares owned by board of commissioners on the company divided by total outstanding shares (Mathew et al., 2018). Board ownership ~~plays has~~ a ~~significant role in firm's risk taking vital function in a firm's risk-taking~~. Managerial equity ownership reduces the agency problem and helps to ~~align synchronize~~ 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 ~~a~~ 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 ~~regard situation~~ may ~~hold back prevent~~ the managers to ~~indulge involve~~ in risky projects. On the other hand, board members may take risky project in order to give stakeholders ~~a~~ high return. Board members ~~eter~~

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are highly concerned with their careers and avoid-prevent risk-taking; even, sometimes, even these risks are avoided. The avoided risk that could have highly potentially increased the value of the firm. Pathan (2009). According to Alam and Shah (2013), and Haider and Fang (2016) confirmed that, board ownership has positive influence toward influences firm risk positively. Moreover, Pathan (2009) also found that board ownership has positive influence toward firm risk. In addition, Haider and Fang (2016) found a positive relationship of board ownership toward firm risk. Hence, this study expects:

H4a: Board ownership has an impact towards total risk.

H4b: Board ownership has an impact towards asset return risk.

H4c: Board ownership has an 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).

In order to achieve the aim To attain the objectives of the study, panel data regression models, that combines time series and cross section data, are examined by utilizing Gretl Statistical Software. The statistical process is done through a collection of collecting secondary data, testing of hypothesis, and identifying a causal relationship. The sample firms involve agriculture, mining, and property industry in the Indonesia Stock Exchange from 2013 until 2017, as shown in Table 1. This study uses 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 which is gained from the information published by the company, such as from annual reports, Bloomberg, and other reliable sources.

Table I Summary of the sample observed

Sampling Criteria	No. of Companies Observations
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

Eventually, as seen in Table I, total samples observed that meets the criteria in this research is 310 firm-year observations in the period 2013 until 2017.

4.2 Measures

The dependent variable is firm risks that divided into three variables, consisted of namely total risk, asset return risk, and idiosyncratic risk. Corporate governance, as the independent variable, is measured using assessed by the internal governance mechanism, that is described into four indicators, which are the board size, board independence, board gender, and board ownership. Control variables, is variable controlled to assess the relationship between independent variables and that may affect the dependent variables are considered in the models (Lind et al., 2015). Control variables that may affect the dependent variables are considered in the model. The proper use of control variables are crucial because control variables are able to can produce effective-useful replications. On the other hand, contrary, 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
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Board Size (BS)	It represents the total member of board of commissioners 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 (B own)	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 (A RR)	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 (IdioR)	The residual from the market model regression	Yahoo Finance
Leverage (Lev)	Total debt over total assets	Bloomberg
Firm Size (FSize)	Market capitalization	Bloomberg
Growth	Capital expenditures over total sales	Bloomberg
Lagged Performance (Perf)	The lagged return on assets for the firm	Bloomberg

4.3 Research model

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

$$TotR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BOW_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(Fsize)_{it} + \alpha_7 Growth_{it} + \alpha_8 Perf_{it-1} + \epsilon_{it} \quad (5)$$

$$ARR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BOW_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(Fsize)_{it} + \alpha_7 Growth_{it} + \alpha_8 Perf_{it-1} + \epsilon_{it} + \alpha_9 BS_{it} + \alpha_{10} BI_{it} + \alpha_{11} BG_{it} + \alpha_{12} BOW_{it} + \alpha_{13} Lev_{it} + \alpha_{14} \ln(size)_{it} + \alpha_{15} Growth_{it} + \alpha_{16} Perf_{it-1} + \epsilon_{it} \quad (6)$$

$$IdioR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BOW_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(Fsize)_{it} + \alpha_7 Growth_{it} + \alpha_8 Perf_{it-1} + \epsilon_{it} + \alpha_9 BS_{it} + \alpha_{10} BI_{it} + \alpha_{11} BG_{it} + \alpha_{12} BOW_{it} + \alpha_{13} Lev_{it} + \alpha_{14} \ln(size)_{it} + \alpha_{15} Growth_{it} + \alpha_{16} Perf_{it-1} + \epsilon_{it} \quad (7)$$

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 ~~provides~~desplays the descriptive statistics of each variable, explaining further on the minimum, maximum, mean, and standard deviation value ~~of each variable~~.

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
B own	0.026	0	0	0.067	0.099
Risk Measures					
TotR	1.498	0.491	0.008	10.54	2.39
A RR	3.932	3.456	0.046	34.97	3.108
IdioR	0.118	0.109	0.046	0.556	0.06
Control variables					
Lev	0.251	0.239	0	0.855	0.178

FSize	28.794	29.076	23.747	31.717	1.623
Growth	19.986	7.179	0.029	990.6	66.29
Perf	4.3625	3.587	-57.361	34.44	8.133

Table III shows that the maximum number of board members in the sample is a maximum of 10 people, a minimum of 2 people, and a median of 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, BOWN, IdioR and LevEV) indicates that the data is in the same set. It can be seen is evident that the number of board ownership in this sample is relatively small; the its maximum value is only 0.67 per cent. It is also seen 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 (ARR) is the risk that has the highest value.

5.2 Panel data estimation method regression

Determining the estimation model is important in assessing panel data. determining the estimation model is important. Using the Gretl software, after plotting with devising the OLS pooled or ordinary least square (OLS) model method, the best preminent panel regression data model could be estimated assessed using by three tests investigations. The F-Test is conducting to choose the best model between pooled and fixed panel. The test result from Breusch-Pagan define the best model between pooled and random. Test, and The Hausman Test verifies whether fixed or random model is the appropriate one Test. As there are With three regressions, the tests are run three times. Below are the detailed complete results for each test are as follows:

Table IV Summary of Ordinary Least Square Models

Dependent Variables	Dependent: TotR		Dependent: ARR		Dependent: IdioR		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
BOWN	-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
FSize	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
Perf	-0.018	0.319	0.014	0.551	-0.001	0.227	1.278
Adj. R ²	0.067		0.173		0.051		
p-value (F)	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: ARR	Dependent: IdioR
	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:			
Breusch-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

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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 need 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 looking at full collinearity variance-inflation factor (VIF) values. When conducting the classical assumption test, it is ~~indicated-notified~~ that the model has heteroscedasticity issue. Therefore, ~~the author~~ [this study](#) uses OLS with heteroscedasticity-corrected. ~~From Table V, the results show~~ [the result from panel model test is random effect model for total risk and asset return risk, and fixed effect model for idiosyncratic risk, respectively that random effect, random effect, and fixed effect. However, fixed effect cannot be used, as there is 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: Total Risk)

	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

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

Table VII Comparison of Models (Dependent: Asset Return RiskR)

	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 Final Panel Model (Dependent: IdR) for Idiosyncratic Risk

	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 is a, b and c. a represents total risk, b represents asset return risk, and c represents idiosyncratic risk. First hypothesis stated that board size has impact towards total risk, asset return risk, and idiosyncratic risk. The analysis resulted that board size has insignificant ~~relationship-influence~~ towards total risk, asset return risk, and idiosyncratic risk. **Hence, hypothesis 1a, b and c are not accepted.** ~~This result is findings are consistent in line~~ with Lee *et al.* (2016) that found board size has insignificant influence towards total risk and idiosyncratic risk. This result is contradictory with Mathew *et al.* (2018) and Pathan (2009) ~~that who initiated that found~~ board size is negatively related to asset return risk.

~~The s~~Second hypothesis states ~~d~~ that board independence has impact towards total risk, asset return risk, and idiosyncratic risk. Table IX shows that board size has negative ~~relationship-influence~~ towards total risk, thus **H2a is accepted.** This result is consistent with ~~some previous prior studies~~ conducted by Mathew *et al.* (2018); Pathan (2009); Haider and Fang (2016) ~~that which confirmed that~~ board independence is negatively ~~related to affected the~~ total risk. Table IX also shows that board independence ~~has positive impact towards rises the~~ asset return risk. This result ~~is in line with Zhang et al. (2018) who also noticed that the outsider directors, who are unaccustomed to intra-firm information, could not limit the executives' risk-taking actions. Furthermore, the existence of independent board members is inconsistent with previous study conducted by Mathew et al. (2018) and Pathan (2009) that found board independence is negatively related to asset return risk. Moreover, the existence of independent board members is~~ insignificant towards idiosyncratic risk. This result is consistent with Alam and Shah (2013); Sun and Liu (2014); and Lee *et al.* (2016) that found board independence ~~does not affect has no significant impact towards~~ idiosyncratic risk ~~significantly.~~

~~The t~~Third hypothesis states ~~d~~ that board gender has ~~an~~ impact towards total risk, asset return risk, and idiosyncratic risk. The analysis results ~~sed in a fact that~~ that board size has ~~an~~ insignificant ~~relationship-impact~~ towards total risk, asset return risk, and idiosyncratic risk. **Hence, hypothesis 3a, b and c are rejected.** This result is consistent with Sun and Liu (2014); Sila *et al.* (2016) that found board independence has no significant influence towards total risk. However, this ~~result-finding is inconsistent not in line with the previous studies stating that board gender can mitigate the asset return risk conducted by (Mathew et al., (2018) and Pathan, (2009) that board gender is negatively related to asset return risk. Another Other~~ previous studies ~~discovered that board gender shows negative impact to idiosyncratic risk (Mathew et al., (2018); Pathan, (2009); and Lenard et al. (2014), and it contradicts to the result in this study, conducted by Mathew et al. (2018); Pathan (2009); and Lenard et al. (2014) found that board gender is negatively related to idiosyncratic risk, and it was contrast to the result in this study.~~

~~The f~~Fourth hypothesis ~~finds stated~~ that board ownership has ~~a~~ 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 is also contrast with Mathew *et al.* (2018) and Pathan (2009) ~~that which~~ found board ownership has ~~a~~ positive influence towards ~~s~~ asset return risk.

Table IX [Research from the The final](#) regression [models](#) of corporate governance and firm risks

	TotR				ARR				IdioR			
	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
BOwn	-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***
FSize	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
Perf	-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(F)	0.000114				0.000264				0.02158			
Adj. R²	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 risk. Board independence has a significant negative correlation influence towards total risk, positive correlation effect towards asset return risk, and insignificant impact towards idiosyncratic risk. While Meanwhile, board ownership has negative significant correlation toward can force the mitigation of total risk and idiosyncratic risk, while but it cannot control insignificant toward the asset return risk. Next, Board size has an insignificant correlation control towards total risk, asset return risk, and idiosyncratic risk the three types of firm risks. 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. These findings results support promote the study study of Sambasivan *et al.* (2009) that explained that risk-taking attitude of board members related to personal quality. Board gender has insignificant correlation control towards total risk, asset return risk, and idiosyncratic risk. These results might happened because Indonesia's regulator has not set the minimum number of gender diversity in the board, the company to apply gender diversity on board and board ownership. In overall, the average 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%. In the case of Of data observed, the small number of female on board may indicate a symbolic meaning only to get attention from the stakeholders (Wang & Clift, 2009). Moreover, there is no minimum number figure of women on board directors in 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 risk. However, board independence increases asset return risk. Independent board members' decisions depend on the quality and completeness of information. As the independent board obtain poor information, accurate decision regarding risk-taking may not be achieved. Hence, uncertainty becomes higher. Risk-seeker investors demand uncertainty, therefore, companies prefer to obtain funding from shareholders rather debtholders. While, 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, but smaller board does not indicates the board has less effective monitoring.

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

In conclusion, Firms firms should be aware on the result showed that corporate governance and firm risk has a negative causal effect relationship. Corporate governance is the system how the company governs, which is shown in the annual report, to communicate with all shareholders that the company has fulfilled stakeholders' interests. Towards society, companies 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 that have significant influence towards the firm risk. The recommendation for the companies is to pay attention more on the effectiveness of board size board size and board the composition female directors in the board gender.

This study paper is subjected to certain limitations. The values of adjusted R² for each research model examined in this study are relatively low. It indicates that there are some several factors, other than independent variables observed in this study, This study which can also affect the firm risks. This study focused on the use of internal mechanism to explain corporate governance as the independent variable, more especially limited to is only limited to analyse the influence of board size, board independence, board gender, and board ownership. Along with the increasingly dynamic business development, towards total risk, asset return risk, and idiosyncratic risk. Further researches may use more other indicators to explain corporate governance indicators and more measurements of firm risk related to corporate risk management, and other measurements of firm risks. Aside from that, this study is limited by using the agriculture, mining, and property industries data listed in Indonesia Stock Exchange which have available data in 2013-2017. Future

studies can try to observe-investigate the impact of corporate governance on firm risk in different industries and update the observed periods in order to provide new evidences.

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Sincerely,
Dr. Bathurst
Associate Editor, Corporate Governance
R.Bathurst@massey.ac.nz

Saorce Elsy Hatane <elsyehat@petra.ac.id>

Thu, Jun 13, 2019 at 1:02 PM

To: R.Bathurst@massey.ac.nz

Cc: elsyehat@gmail.com

Dear Associate Editor,

Please apologize for the late reply because I was working on the revision. Today I am trying to continue my revision process but the link in my account is not active anymore. Would you please help me to figure this out.

Many thanks for your cooperation.

Best regards
Saorce Elsy Hatane
Business Accounting Lecturer
Petra Christian University

[Quoted text hidden]

Saorce Elsy Hatane <elsyehat@petra.ac.id>

Thu, Jun 13, 2019 at 1:48 PM

To: R.Bathurst@massey.ac.nz

Dear Dr. Bathurst

I am very sorry for my late response to the emerald webpage. I thought that I still have time today (June 13, 2019), as 13 of June is the due date. While this morning, I tried to continue my revised submission in the page of the revised manuscript in draft, but the link is not active anymore. Would you please give a suggestion so I can submit my revised manuscript?

Thank you very much

Best regards,
Saarce Elsy Hatane
Business Accounting Lecturer
Petra Christian University

[Quoted text hidden]

Corporate Governance

Decision Letter (CG-02-2019-0071)

From: R.Bathurst@massey.ac.nz

To: elsyehat@petra.ac.id, elsyehat@gmail.com

CC:

Subject: Corporate Governance - Decision on Manuscript ID CG-02-2019-0071

Body: 13-May-2019

Dear Mrs. Hatane:

Manuscript ID CG-02-2019-0071 entitled "DOES INTERNAL CORPORATE GOVERNANCE MECHANISM CONTROL FIRM RISK? EVIDENCE FROM INDONESIA THREE HIGH RISK SECTORS" which you submitted to Corporate Governance, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

We will accept your paper for publication subject to you incorporating the comments made by the reviewer(s). I'd strongly suggest you improve the English in your paper. Without improving the language and proper editing, your paper is in danger of being rejected.

In addition the publisher, Emerald Group Publishing Ltd, are undertaking considerable improvements in article accessibility and thus have adopted a structured approach for the content of abstracts.

We would also ask you to format the references in Harvard style, as per the author guidelines which can be downloaded from <http://www.emeraldinsight.com/info/journals/cg/notes.jsp> Please could we ask you to pay particular attention to the punctuation and order of the references - especially note that for book references: the publisher is placed before the town/city; article references: please ensure that the words 'Vol.', 'No.' and 'pp.' appear in the appropriate places.

To revise your manuscript, log into <https://mc.manuscriptcentral.com/cg> and enter your Author Centre, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or coloured text.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Centre.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Because we are trying to facilitate timely publication of manuscripts submitted to Corporate Governance, your revised manuscript should be uploaded as soon as possible. If it is not possible for you to submit your revision in a reasonable amount of time, we may have to consider your paper as a new submission.

Please note that Emerald requires you to clear permission to re-use any material not created by you. If there are permissions outstanding, please upload these when you submit your revision. Emerald is unable to publish your paper with permissions outstanding.

Once again, thank you for submitting your manuscript to Corporate Governance and I look forward to receiving your revision.

With best wishes,
Dr. Gabriel Eweje

Editor, Corporate Governance

Reviewer(s)' Comments to Author:
Reviewer: 1

Recommendation: Minor Revision

Comments:
(There are no comments.)

Additional Questions:

1. Originality: Does the paper contain new and significant information adequate to justify publication?: Paper theme and title is relevant and contemporary

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Literature review is nicely done. Suggest to enhance literature study a little more.

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: Research tools used are adequate


4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: Findings are correctly done.

5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: this paper has good policy implications both for regulatory and businesses.

6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the fields and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: Language needs some editing

Date Sent: 13-May-2019

File 1: * [How-to-submit-a-revision.doc](#)

 Close Window



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

Journal:	<i>Corporate Governance</i>
Manuscript ID	CG-02-2019-0071.R1
Manuscript Type:	Original Article
Keywords:	Firm Risks, Idiosyncratic risk, Asset return risk, Total Risk, Corporate Governance

Response to comments Manuscript ID CG-02-2019-0071

Comments:

(There are no comments.)

Additional Questions:

1. Originality: Does the paper contain new and significant information adequate to justify publication?: Paper theme and title is relevant and contemporary
2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Literature review is nicely done. Suggest to enhance literature study a little more.

Author response: There are some previous studies added in:

Part 3 Hypotheses Development.

The board of directors in company is in charge of appointing decisions to achieve company's goals, while some decisions contain inherent risk bearing (Zhu and Weyant, 2003; Mathew *et al.*, 2016). Wood and Zaichwosky (2004) stated that the board's decision 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 primary purpose of risk management, but it is more on how to pick the appropriate risk along with its level (Mathew *et al.*, 2016).

Part 3.1:

Chakraborty *et al.* (2018), the larger the number of board members, the fewer risks the firm has due to better monitoring.

Part 3.2:

Chakraborty *et al.* (2018), the association of board independence and firm risk is negative.

Zhang *et al.* (2018) argued that board independence positively influence the asset return risk due to the ability of the independent directors in inducing the executors to initiate risky projects.

Part 3.3:

women colour the process by bringing a different perspective to the board (Mathisen *et al.*, 2013)

Part 5.4: Second Paragraph:

The result is consistent with the previous study conducted by Zhang *et al.* (2018) who also found that independent directors, who are unfamiliar with intra-firm information, could not limit the executives' risk-taking actions.

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3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: Research tools used are adequate
4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: Findings are correctly done.
5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: this paper has good policy implications both for regulatory and businesses.
6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the fields and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: Language needs some editing.

Author response: the revision has been done in order to make the language clearer and readability. Author did the language and grammar checking to the proof reader. The changes can be seen in the track changes

For example:

Sentence structure: revised in every paragraph. For example in the first paragraph part 1 introduction:

Looking at high-risk industries in Indonesia, mining, agriculture, and property industries are included in the category. *They are very susceptible towards changes in the global macroeconomic* (Indonesia Investments, 2018). Factors such as economics, politics, regulation changes, technology, market situation, and nature can interfere with the business. The mining industry has been an essential sub-sector of industry since 1970, and has gained constant 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 on the locals.* In Indonesia, the property industry has low share price due to a slow recovery from the Asian Financial Crisis in 2009 that causes the property demand less than the supply. Moreover, the purchasing power of buying a house in Indonesia is week (DBS Bank, 2016).

Acronym

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ACCA, Association of Chartered Certified Accountants. → added in the references
Asset Return Risk : ARR
Firm Size: FSize
Board Ownership: BOwn

Corporate Governance

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

Abstract

Purpose - This ~~paper study aims aims~~ to examine ~~impact-the control~~ 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 a sample of 62 companies ~~from-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 gives positive influence towards total 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 ~~total~~ asset return risk, but influences idiosyncratic and total risk negatively.

Practical implications – Firms should incorporate corporate governance, especially the ~~effective-impactful~~ roles of board independence and board ownership since they serve as tools in reducing firm risk. Moreover, investors may have a better understanding of corporate governance and factors that are influencing firm risks. Therefore, this study can assist them in order to make the ~~good-right~~ 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 ~~kind-types~~ of risks facing the company. Total risk measures both the internal and external risk, 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 risks, 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~~ They are very ~~sensitive-susceptible~~ towards changes in the global macroeconomic (Indonesia Investments, 2018). Factors such as economics, politics, regulation changes, technology, market situation, and nature can interfere ~~with~~ the business. ~~The Mining-mining~~ industry has been an ~~important essential~~ sub-sector of industry since 1970, and has gained ~~continuous-constant~~ 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). ~~Naturally, the larger plantations produce goods like rubber and palm oil that are mainly for export while the smaller ones have their focus on satisfying the food demand of the locals.~~ Generally, larger plantations produce goods like rubber and palm oil that are mainly for export, while smaller ones focus on satisfying the food demand on the locals. ~~On the other hand, property industry in Indonesia has low share price due to slowly recovery from~~ In Indonesia, the property industry has low share price due to a slow recovery ~~from the~~ Asian Financial Crisis in 2009 ~~that causes the property demand less than the supply. Moreover, the purchasing power of buying a house in Indonesia is week. This causes the demand for property is less than the supply. In addition, the purchasing power in buying house in Indonesia is weak.~~ (DBS Bank, 2016).

Risk-taking is fundamental in running business. Following the financial crisis in 2008, firms ~~are turning attention~~ have ~~turned attention~~ towards risk management. ~~It is in line with~~ Then, it was highlighted that the board is responsible in ~~managing the risk~~ (ACCA, (2012) which highlighted that the board is responsible for managing the risk. Further, the ~~Board-board~~ has two ~~important-critical~~ roles, such 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. ~~Meanwhile~~ Whereas, ~~the~~ internal control mechanism is a part of corporate

governance to ensure the risks managed ~~properly~~adequately. After the crisis, a large number of investors lost confidence in investing in the companies. ~~To cope with such situation, The~~the companies have attempted to increase the confidence of investors by developing the corporate governance appliance, which ~~comes along with include~~risk governance.

In terms of firm risk measurement, most of 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 a~~ combination of systematic and idiosyncratic risks. This risk identifies ~~all of thethe whole~~ risk ~~factors~~aspects from both external risk in systematic risk and ~~internal-inherent~~ risk in ~~the~~ idiosyncratic-risk. ~~Meanwhile, Asset-asset~~ return risk is ~~an alternative to another way to measure assess the~~ firm risk. ~~Asset return risk includes that cover~~ market capital ratio in the measurement. ~~The Market-market~~ capital ratio is ~~defined~~ viewed as ~~the market value of equity's market value~~ to ~~market value of total assets' market value~~ (Flannery & Rangan, 2008). The ratio helps ~~to~~ determine the percentage of ~~company's assets owned by~~ shareholders' ~~assets in the company~~ and ~~measure assess~~ the ability of the company to ~~survive-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. These two risks are hard to be controlled by the ~~companycompany~~. ~~Therefore,~~ the company needs ~~to~~ minimize the risk from within. Idiosyncratic risk is ~~the risk that a~~ controllable risk and ~~specific exclusive~~ to the firm. ~~Idiosyncratic riskIt~~ includes the corporate culture, operating strategy, financial policy, and investment strategy. This risk is the risk that company can control.

Furthermore, ~~Corporate-corporate~~ governance ~~can be explained from~~has a strong bond with the ~~internal mechanism as criteria by the board of directors~~ (Li et al., 2012). The internal mechanism is ~~shown from the characteristics of corporate governance, such as board of directors. Internal mechanism is~~ known to be limited, yet ~~the~~ important dimension of corporate governance (Dedu & Chitan, 2013). The ~~corporate boardsboard~~ ~~have~~as the role ~~to oversee the company and control in supervising and in controlling~~ the risk ~~faceted to by~~ the company properly ~~on behalf of the for the sake of both the~~ investor and stakeholders. ~~Some possible ways to Improving-improve~~ the function of ~~the corporate boards are, such as~~ by gaining the independence level, enhancing the oversight roles, ~~and~~ applying ~~practices that are more effectivepractices that are more effective~~. Among ~~the~~ internal corporate governance attributes, the board composition, ~~i.e., such as~~ board size, ~~board-independence,~~ and ~~board-gender,~~ ~~as well as the -and~~ board leadership structure ~~like the, such as board-ownershipboard ownership~~, are the most affecting factors. This internal mechanism ~~can be used in order to minimizeis useful to mitigate~~ the idiosyncratic risk. Therefore, ~~total risk and~~ asset return risk ~~and total risk~~ can be ~~reduced-controlled~~ as well.

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 impact toward measures of firm risk. Board size ~~and board and board-gender~~ ~~has insignificant influence toward firm riskare giving insignificant influence to the firm risks~~. Board independence has significantly negative influence towards total risk, positive influence toward asset return risk, and insignificant influence toward idiosyncratic risk. Board ownership has significant negative influence toward total risk and idiosyncratic risk, ~~while-but~~ insignificant towards asset return risk.

This study ~~is-notably becomes the first to investigate~~~~the first study that examines the~~ impact of board size, board independence, board gender, and board ownership, which ~~is-are~~ the internal mechanism of corporate governance, towards firm risks ~~in Indonesia. The Firm-firm risks is-are~~ measured using three measurements, ~~those-namely are~~ total risk, asset return risk, and idiosyncratic risk ~~in Indonesia~~. The corporate governance used ~~is-related~~here is closer ~~connection~~ to internal ~~rather~~ than ~~to~~ 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 theories ~~are~~ used in this ~~study-research to are~~ explaining the ~~role-part~~ of internal corporate governance mechanisms in controlling firm risks.

Agency Theory. Jensen and Meckling first initiated ~~agency-this theory~~concept in 1976. ~~The theoryIt~~ 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 (Nyberg et al., 2010). As a reward, agents earn remuneration, bonus, and

~~compensation~~compensation;- ~~w~~Whereas; principals are the owner of the company and supply the funds for the company. However, the ~~separation-distinction of-between~~ ownership and control will ~~guide-possibly foster~~ an agency issue ~~where there is a possibility-forof~~ conflict of 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~~the responsible party in ~~to~~ running the company, have a susceptibility to ~~maximize-optimise~~ their own interests ~~at every~~ opportunistically-opportunity by misapplying the firm's resources. ~~Commonly~~, 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 ~~do the day-to-day~~day-to-day operations, ~~es the company~~ will have a better information about the company rather than shareholders since shareholders are not controlling ~~the~~ daily activity of the company. Therefore, asymmetric information costs the shareholder because they ~~cannot are not able to~~ make ~~precise-significant~~ decisions from the performance of the manager. Hence, the firm is being harmed (Siagian *et al.*, 2013). ~~In order to~~ reduce the agency problem, ~~shareholders, throughout corporate governance mechanism,~~ monitor ~~ing of~~ the directors ~~is supposed to be conducted by shareholders to align the interest of both parties. They want to ascertain the directors, as the agents, are conducting the best interests of the principals and to disclosing crucial information~~ ~~—The aim of corporate governance is to ensure that the directors will conduct the best interest of the shareholders and obliged the director to disclose crucial information~~ (Siagian *et al.*, 2013).

Stewardship Theory. Companies have many stakeholders, and the ~~primary~~major ones are shareholders, employees, creditors, customers, and government, ~~respectively~~. The ~~pure-genuine~~ agency relationship describes the relationship between ~~company-shareholders~~ and managers ~~ins~~ an incomplete contract, ~~covering-including~~ every aspect of business decision due ~~to the~~ significant-substantial uncertainty and information ~~asymmetries-imbalance~~ (Subramanian, 2018). Stewardship theory, ~~which was~~ 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 interests of shareholder rather than the agent's self-interests. Managers, as the agents, are highly dedicated and are more likely to serve the organisation completely (Davis *et al.*, 2007). In ~~other~~ another 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 mechanisms components designed to ~~mitigate-alleviate~~ the agency conflicts between boards and shareholders (Mathew *et al.*, 2018). Schäuble (2018) argues that board ownership, a ~~s~~-part of internal corporate governance mechanism, ~~is-able to~~can mitigate agency costs. Corporate boards ~~are responsible for monitoring~~hold responsibility for ensuring the information ~~in financial reports are qualified-the quality of information contained in the financial statements~~, ~~thus-Consequently~~, they control the behaviour of senior managers ~~in order to guarantee that their actions are associated to ensure their actions are according to~~with the ~~interests of~~ stakeholders' interests. Corporate governance acts as a ~~significant~~substantial part in ~~determining~~defining the ~~success~~accomplishment of a business and ~~the~~ 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 c~~Corporate governance manages a better control and direction; therefore, managers ~~make a decision-making for the goal of~~decide for the sake of the stakeholders and shareholders (~~Siagian et al., (2013)~~). By applying this governance mechanism, agency problem can be mitigated.

Moreover, the purpose of agency cost is to ~~synchronise~~ the interests between board and shareholder. Therefore, having good corporate governance is ~~important~~essential. This study ~~focus~~emphasis on examining ~~one-offour~~ indicators of corporate governance internal mechanisms, ~~which is an~~amely board size (BS), board independence (BI) and board gender (BG), and board ownership (BO).

2.2 Firm Risk

At the time the investor invest 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 ~~g~~ilts. In general, firm risk 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, ~~which are~~namely, systematic and unsystematic risk. Systematic risk is also ~~known~~ famous as market risk or inherent risk, ~~whereas~~—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~~. ~~On the other hand~~, systematic risk cannot be diversified away (Mathew *et al.*, 2018). Total risk reflects the market's perception about the risks inherent in the firm's assets and liabilities. ~~Both~~ ~~Moreover, not only~~ regulators ~~but also and~~ firm executives ~~frequently monitor~~ observe this risk ~~frequently~~ (Pathan, 2009).

Asset return risk is ~~used~~ ~~employed~~ as ~~the another~~ alternative to find firm risks (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 of 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 ~~to determine~~ ~~settle~~ the percentage of company's assets owned by shareholders and measure the ~~ability~~ ~~capability~~ of the company to ~~survive over a long period~~ ~~maintain 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~~. ~~In other word~~, ~~idiosyncratic risk is specific to a particular company and stock~~. Idiosyncratic risk is also ~~known~~ ~~famous~~ as unsystematic risk or firm-specific risk. For example, when the company generates high income, the company can justify ~~the~~ 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 unsystematic risk by diversifying the portfolios (Bartram *et al.*, 2011). Idiosyncratic risk can be ~~measured~~ ~~calculated~~ using standard deviation of the residuals from the market model regression (Pathan, 2009; Sila *et al.*, 2016).

3. Hypothesis development

~~3-~~ ~~The board of directors in a company is in charge of appointing decisions to achieve company's goals, while some decisions contain inherent risk bearing (Zhu and Weyant, 2003; Mathew et al., 2016). Wood and Zaichowsky (2004) stated that the board's decision 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 primary purpose of risk management, but it is more on how to pick the appropriate risk along with its level (Mathew et al., 2016).~~

3.1 Board size and firm risks

~~In terms~~ ~~Among of the~~ corporate governance components that ~~have~~ influence ~~to the~~ firm risk, it ~~is likely~~ ~~seems~~ that internal governance mechanism related to the board ~~will be~~ ~~is~~ more relevant. ~~Moreover, the company that applies good corporate governance will have a better performance since the decisions made by board of commissioners give a crucial contribution to the governance. Referring to Chakraborty et al. (2018), the larger the number of board members, the fewer risks the firm has due to better monitoring. The larger the board, the wider the perspectives are contributed (Haider & Fang, 2016) According to Haider and Fang (2016), the larger the board size, the less risk the firm is taking due to better monitoring.~~ In addition, company that applies good corporate governance is expected to have better performance. Besides, 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 associates positively to firm risks because small board size will be more cooperative, efficient, and decisive. However, Sun and Liu (2014) argued that board size is positively related to firm risk because small board size is more cooperative, efficient and decisive.~~ While, Lee *et al.* (2016) found that board size is insignificantly affecting ~~the~~ firm risks. Therefore, the hypotheses are:

H1a: Board size has ~~impact~~ ~~an impact~~ towards ~~s~~ total risk.

H1b: Board size has ~~an~~ impact towards ~~s~~ asset return risk.

H1c: Board size has ~~an~~ impact towards ~~s~~ idiosyncratic risk.

3.2 Independent directors and firm risk

Independent ~~directors members in the board~~ are ~~playing~~ ~~believed to be~~ better ~~role as the monitors overseers of for managers the executives~~ because the ~~board does independent directors do~~ 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 ~~is was~~ mentioned that ~~at least no less than~~ 30% of the board ~~should be has been~~ 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 in lowering~~ the agency cost. The presence of more outsider board of commissioner may ~~obstruct block the indulgence the action~~ of the ~~firm management~~ in riskier projects as they ~~are concerned with the volatility of the care of unsteady~~ returns. According to Alam & Shah (2013) ~~and Chakraborty et al. (2018)~~, the association of ~~board independence independent directors~~ and firm risks is negative. ~~The more outsider board of commissioner may hold up the indulgence of the firm in riskier projects as they are concerned with the volatility of the returns. Furthermore, Zhang et al. (2018) argued that board independence positively influences the asset return risk due to the ability of the independent directors in inducing the executors to initiate risky projects. While Sun and Liu (2014) and Alam and Shah (2013); Sun and Liu (2014); Lee et al. (2016) found verified that board independence board independence is insignificantly affecting firm risks. It is because independent directors are unaccustomed to intra-firm information; thus, the outside directors may not affect firm risks management (Zhang et al., 2018). As a result, board independence has an important role to lower the agency cost.~~ Therefore, ~~authors the~~ hypothesized that are:

H2a: Board independence has an impact towards s total risk.

H2b: Board independence has an impact towards s asset return risk.

H2c: Board independence has an impact towards s idiosyncratic risk.

3.3 Board gender diversity and firm risk

Gender composition ~~can be is~~ explained as the proportion of man and woman on the board (Mathew et al., 2018). Increase in women present in the organization is due to the scandal ~~that~~ occurred related to corporate governance, such ~~as: as~~ Enron, Lehman Brother, and WorldCom (Sener & Karaye, 2014). There have been debates about gender composition in organ~~is~~zations to improve good corporate governance (Plessis et al., 2012). First, they reasoned that diversity in terms of ~~women's skills promotes better encourage a clearer~~ understanding of the marketplace. Secondly, diversity ~~increases enhances both novelty and creativity, and innovation, as since~~ attitudes and beliefs ~~tend to are likely vary to be varied~~ with demographic variables. ~~The last is, gender diversity produces likely offers~~ more effective problem solving, ~~as different views are considered when making a decisionsince decision-making process goes through more than one opinions~~ (Lenard et al., 2014). Prior studies conducted by Lenard et al. (2014) and Mathew et al. (2018) found that ~~there is~~ a negative relationship ~~between occurs between~~ gender diversity and firm risk. ~~Since Female female characteristics are known tend~~ to be more careful in taking decision, ~~therefore the company is taking lower risk or known they tend to take a lower risk or known~~ as risk averse. ~~Thus, The~~ low risk taking can be implicated as less competitive in the industry. On the other ~~sidehand~~, Sila et al. (2016) ~~found stated~~ that there is no ~~significant distinctive~~ relationship ~~is discovered~~ between female board members and firm risks, ~~the study was done in the US between 1996 and 2010. Therefore, hypothesized that: Thus, here are the hypotheses:~~

H3a: Board gender has an impact towards s total risk.

H3b: Board gender has an impact towards s asset return risk.

H3c: Board gender has an impact towards s idiosyncratic risk.

3.4 Board ownership and firm risk

Board ownership ~~can be defined as measured as~~ the number of shares owned by board of commissioners on the company divided by total outstanding shares (Mathew et al., 2018). Board ownership ~~plays has~~ a ~~significant role in firm's risk taking vital function in a firm's risk-taking~~. Managerial equity ownership reduces the agency problem and helps to ~~align synchronize~~ 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 a 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 ~~regard situation~~ may ~~hold back prevent~~ the managers to ~~indulge involve~~ in risky projects. On the other hand, board members may take risky project in order to give stakeholders a high return. Board members ~~eater~~

for are highly concerned with their careers and avoid prevent risk-taking; even, sometimes, even those risks are avoided the avoided risk that could have highly potentially increased the value of the firm. Pathan (2009). According to Alam and Shah (2013), and Haider and Fang (2016) confirmed that, board ownership has positive influence toward influences firm risk positively. Moreover, Pathan (2009) also found that board ownership has positive influence toward firm risk. In addition, Haider and Fang (2016) found a positive relationship of board ownership toward firm risk. Hence, this study expects:

H4a: Board ownership has an impact towards total risk.

H4b: Board ownership has an impact towards asset return risk.

H4c: Board ownership has an 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).

In order to achieve the aim To attain the objectives of the is study, panel data regression models, that combines time series and cross section data, are examined by utilizing Gretl Statistical Software. The statistical process is done through a collection of collecting secondary data, testing of hypothesis, and identifying identification of correlation causal relationship. The sample firms involve agriculture, mining, and property industry in the Indonesia Stock Exchange from 2013 until 2017, as shown in Table 1. This study uses 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 which is gained from the information published by the company, such as from annual reports, Bloomberg, and other reliable sources.

Table I Summary of the sample observed

Sampling Criteria	No. of Companies Observations
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

Eventually, as seen in Table I, total samples observed that meets the criteria in this research is are 310 firm-year observations in the period 2013 until 2017.

4.2 Measures

The dependent variable is firm risks that divided into with three variables, consisted of namely total risk, asset return risk, and idiosyncratic risk. Corporate governance, as the independent variable, is measured using assessed by the internal governance mechanism, that is described into four indicators, which are the board size, board independence, board gender, and board ownership. Control variables is variable controlled to assess the relationship between independent variables and that may affect the dependent variables are considered in the models (Lind *et al.*, 2015). Control variables that may affect the dependent variables are considered in the model. The proper use of control variables are is crucial because control variables are able to can produce effective useful replications. On the other hand contrary, 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
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Board Size (BS)	It represents the total member of board of commissioners 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 _{wn})	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 (ARR)	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 (IdioR)	The residual from the market model regression	Yahoo Finance
Leverage (Lev)	Total debt over total assets	Bloomberg
Firm Size (FSize)	Market capitalization	Bloomberg
Growth	Capital expenditures over total sales	Bloomberg
Lagged Performance (Perf)	The lagged return on assets for the firm	Bloomberg

4.3 Research model

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

$$TotR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{wn}_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(Fsize)_{it} + \alpha_7 Growth_{it} + \alpha_8 Perf_{it-1} + \varepsilon_{it} \quad (5)$$

$$ARR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{wn}_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(Fsize)_{it} + \alpha_7 Growth_{it} + \alpha_8 Perf_{it-1} + \varepsilon_{it} \quad (6)$$

$$IdioR_{it} = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 BI_{it} + \alpha_3 BG_{it} + \alpha_4 BO_{wn}_{it} + \alpha_5 Lev_{it} + \alpha_6 \ln(Fsize)_{it} + \alpha_7 Growth_{it} + \alpha_8 Perf_{it-1} + \varepsilon_{it} \quad (7)$$

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 provides displays the descriptive statistics of each variable, explaining further on 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 _{wn}	0.026	0	0	0.067	0.099
Risk Measures					
TotR	1.498	0.491	0.008	10.54	2.39
ARR	3.932	3.456	0.046	34.97	3.108
IdioR	0.118	0.109	0.046	0.556	0.06
Control variables					
Lev	0.251	0.239	0	0.855	0.178

FSize	28.794	29.076	23.747	31.717	1.623
Growth	19.986	7.179	0.029	990.6	66.29
Perf	4.3625	3.587	-57.361	34.44	8.133

Table III shows that the ~~maximum~~ number of board members in the sample is a maximum of 10 people, a minimum of 2 people, and a median of 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, BOwn, IdioDR and LevEV) indicates that the data is in the same set. It ~~can be seen is evident~~ that the number of board ownership in this sample is relatively small; ~~the its~~ maximum value is only 0.67 per cent. It is ~~also seen 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 (ARR) is the risk that has the highest value.

5.2 Panel data ~~estimation method regression~~

~~Determining the estimation model is important~~ ~~in~~ assessing panel data, ~~determining the estimation model is important.~~ ~~Using the Gretl software, after~~ ~~plotting with~~ ~~devising the~~ ~~OLS~~ ~~Spooled~~ ~~or~~ ~~ordinary~~ ~~least~~ ~~square~~ ~~(OLS)~~ ~~model~~ ~~method,~~ the ~~best~~ ~~preeminent~~ ~~panel~~ ~~regression~~ ~~data~~ ~~model~~ ~~could~~ ~~be~~ ~~is~~ ~~estimated~~ ~~assessed~~ ~~using~~ ~~by~~ ~~three~~ ~~tests~~ ~~investigations.~~ ~~The~~ ~~F-~~ ~~Test~~ ~~is~~ ~~conducting~~ ~~to~~ ~~choose~~ ~~the~~ ~~best~~ ~~model~~ ~~between~~ ~~pooled~~ ~~and~~ ~~fixed~~ ~~panel.~~; ~~The~~ ~~test~~ ~~result~~ ~~from~~ ~~Breusch-Pagan~~ ~~define~~ ~~the~~ ~~best~~ ~~model~~ ~~between~~ ~~pooled~~ ~~and~~ ~~random.~~ ~~Test,~~ ~~and~~ ~~The~~ ~~Hausman-Test~~ ~~verifies~~ ~~whether~~ ~~fixed~~ ~~or~~ ~~random~~ ~~model~~ ~~is~~ ~~the~~ ~~appropriate~~ ~~one.~~ ~~Test.~~ ~~As~~ ~~there~~ ~~are~~ ~~With~~ three regressions, the tests are run three times. ~~Below~~ ~~are~~ ~~the~~ ~~detailed~~ ~~complete~~ results for each test are as follows:

Table IV Summary of Ordinary Least Square Models

Dependent Variables	Dependent: TotR		Dependent: ARR		Dependent: IdioR		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
BOwn	-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
FSize	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
Perf	-0.018	0.319	0.014	0.551	-0.001	0.227	1.278
Adj. R ²	0.067		0.173		0.051		
p-value (F)	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: ARR	Dependent: IdioR
	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 need 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 looking at full collinearity variance-inflation factor (VIF) values. When conducting the classical assumption test, it is ~~indicated-notified~~ that the model has heteroscedasticity issue. Therefore, ~~the author~~^{this study} uses OLS with heteroscedasticity-corrected. ~~From Table Vv,~~ ~~the results show~~^{ss the result from panel model test is random effect model for total risk and asset return risk, and fixed effect model for idiosyncratic risk. respectively that random effect, random effect, and fixed effect.} However, fixed effect cannot be used, as there is 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: Total Risk)

	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	

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

Table VII Comparison of Models (Dependent: Asset Return RiskR)

	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 Final Panel Model (Dependent: IdR) for Idiosyncratic Risk

	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 is a, b and c. a represents total risk, b represents asset return risk, and c represents idiosyncratic risk. First hypothesis stated that board size has impact towards total risk, asset return risk, and idiosyncratic risk. The analysis resulted that board size has insignificant ~~relationship-influence~~ towards total risk, asset return risk, and idiosyncratic risk. **Hence, hypothesis 1a, b and c are not accepted.** ~~This result is findings are consistent-in line~~ with Lee *et al.* (2016) that found board size has insignificant influence towards total risk and idiosyncratic risk. This result is contradictory with Mathew *et al.* (2018) and Pathan (2009) ~~that who initiated that found~~ board size is negatively related to asset return risk.

~~The s~~Second hypothesis states~~d~~ that board independence has impact towards total risk, asset return risk, and idiosyncratic risk. Table IX shows that board size has negative ~~relationship-influence~~ towards total risk, thus **H2a is accepted.** This result is consistent with ~~some previous prior~~ studies~~sy~~ conducted by Mathew *et al.* (2018); Pathan (2009); Haider and Fang (2016) ~~that which confirmed that~~ board independence is negatively ~~related to affected the~~ total risk. Table IX also shows that board independence ~~has positive impact towards rises the~~ asset return risk. This result ~~is in line with Zhang et al. (2018) who also noticed that the outsider directors, who are unaccustomed to intra-firm information, could not limit the executives' risk-taking actions. Furthermore, the existence of independent board members is inconsistent with previous study conducted by Mathew et al. (2018) and Pathan (2009) that found board independence is negatively related to asset return risk. Moreover, the existence of independent board members is insignificant towards idiosyncratic risk. This result is consistent with Alam and Shah (2013); Sun and Liu (2014); and Lee et al. (2016) that found board independence does not affect has no significant impact towards idiosyncratic risk significantly.~~

~~The t~~Third hypothesis states~~d~~ that board gender has ~~an~~ impact towards total risk, asset return risk, and idiosyncratic risk. The analysis results~~ed in a fact that~~ that board size has ~~an~~ insignificant ~~relationship-impact~~ towards total risk, asset return risk, and idiosyncratic risk. **Hence, hypothesis 3a, b and c are rejected.** This result is consistent with Sun and Liu (2014); Sila *et al.* (2016) that found board independence has no significant influence towards total risk. However, this ~~result finding is inconsistent not in line with the previous studiesy stating that board gender can mitigate the asset return risk conducted by (Mathew et al., -(2018); and Pathan, -(2009) that board gender is negatively related to asset return risk. Another-Other previous studies discovered that board gender shows negative impact to idiosyncratic risk (Mathew et al., -(2018); Pathan, -(2009); and Lenard et al., (2014), and it contradicts to the result in this study. conducted by Mathew et al. (2018); Pathan (2009); and Lenard et al. (2014) found that board gender is negatively related to idiosyncratic risk, and it was contrast to the result in this study.~~

~~The f~~Fourth hypothesis ~~finds stated~~ that board ownership has ~~a~~ 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 is also contrast with Mathew *et al.* (2018) and Pathan (2009) ~~that which~~ found board ownership has ~~a~~ positive influence towards asset return risk.

Table IX Research from the The final regression models of corporate governance and firm risks

	TotR				ARR				IdioR			
	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
BOwn	-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***
FSize	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
Perf	-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(F)	0.000444				0.000264				0.02158			
Adj. R ²	0.111				0.261				0.058			

6. Conclusion, suggestion and limitation

It is found that corporate governance has mixed results towards firm risk. Board independence has a significant negative ~~significant correlation influence~~ towards total risk, positive ~~correlation effect~~ towards asset return risk, and insignificant ~~impact~~ towards idiosyncratic risk. ~~While Meanwhile~~, board ownership ~~has negative significant correlation toward~~ can force the mitigation of total risk and idiosyncratic risk, ~~while but it cannot control insignificant toward~~ the asset return risk. ~~Next, b~~ Board size has an insignificant ~~correlation control~~ towards total risk, ~~asset return risk, and idiosyncratic risk. the three types of firm risks~~. 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. ~~These findings is results support promote~~ the ~~study study~~ of Sambasivan *et al.* (2009) that ~~explained that~~ risk-taking attitude of board members related to personal quality. Board gender has insignificant ~~correlation control~~ towards total risk, asset return risk, and idiosyncratic risk. These results might happened because Indonesia's regulator has not set ~~the minimum number of gender diversity in the board. the company to apply gender diversity on board and board ownership~~. In overall, the ~~average~~ 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%. ~~In the case of Of~~ data observed, the small number of female on board may indicate a symbolic meaning only to get attention from the stakeholders (Wang & Clift, 2009). Moreover, there is no minimum ~~number figure~~ of women ~~on board directors~~ in 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 risk. However, board independence increases asset return risk. Independent board members' decisions depend on the quality and completeness of information. As the independent board obtain poor information, accurate decision regarding risk-taking may not be achieved. Hence, uncertainty becomes higher. Risk-seeker investors demand ~~uncertainty~~, therefore, companies prefer to obtain funding from shareholders rather debtholders. While, 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, but smaller board does not indicates the board has less effective monitoring.

The results for board ownership are inconsistent with agency theory and past studies; ~~instead, t- The he~~ negative impacts of board ownership towards total risk and idiosyncratic risk ~~is are consistent in line~~ with the stewardship theory. Board ownership in organizatons encourages boards to control their opportunistic attitudes. The insignificant impact of board ownership toward asset return risks may ~~occur~~ due to ~~the~~ small number of shares owned by the ~~board directors~~ in the companies. The mean of board ownership in this study is only 2.6%. ~~Moreover Besides~~, there is no regulation ~~that stated about the~~ minimum number of shares ~~should be~~ owned by the board. Risk-seeking investors tend to the high risk-taking, ~~whereas or~~ risk averse investors consider ~~to~~ the low risk-taking.

~~In conclusion, Firms firms~~ should be aware on the result showed that corporate governance and firm risk has a negative ~~causal effect relationship~~. Corporate governance is the system how the company governs, which ~~is~~ shown in the annual report, to communicate with all shareholders that ~~the~~ company has fulfilled stakeholders' interests. Towards society, companies 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 that ~~haves~~ significant influence towards the firm risk. The recommendation for the companies is to pay attention more on the effectiveness of ~~board size board size~~ and ~~board the composition female directors in the board gender~~.

This ~~studypaper~~ is subjected to certain limitations. ~~The values of adjusted R² for each research model examined in this study are relatively low. It indicates that there are some several factors, other than independent variables observed in this study, This study which can also affect the firm risks. This study focused on the use of internal mechanism to explain corporate governance as the independent variable, more especially limited to is only limited to analyse the influence of board size, board independence, board gender, and board ownership. Along with the increasingly dynamic business development, towards total risk, asset return risk, and idiosyncratic risk. f~~ Further researches may use ~~more other indicators to explain corporate governance indicators and more measurements of firm risk related to corporate risk management, and other measurements of firm risks~~. Aside from that, this study is limited by using the agriculture, mining, and property industries data listed in Indonesia Stock Exchange which have available data in 2013-2017. Future

studies can try to observe-investigate the impact of corporate governance on firm risk in different industries and update the observed periods in order to provide new evidences.

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Corporate Governance

Decision Letter (CG-02-2019-0071.R1)

From: R.Bathurst@massey.ac.nz

To: elsyehat@petra.ac.id, elsyehat@gmail.com

CC:

Subject: Corporate Governance - Decision on Manuscript ID CG-02-2019-0071.R1

Body: 26-Jun-2019

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