The effect of board gender diversity on firm risk

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ABSTRACT: This research aims to analyze the effect of board gender diversity on firm risk with the annualized standard deviation of monthly stock return as a proxy. The independent variables used were board gender diversity, board size, profitability, and firm size. This research used a quantitative approach with multiple linear regression analysis model and a sample of non-financial firms listed on the Indonesia Stock Exchange (BEI) over the 2013-2017 period. The number of samples used in this study was 1480 observations. The results show that board gender diversity, profitability, and firm size have a positive effect on firm risk, while board size has no significant influence on firm risk in non-financial sector firms over the 2013-2017 period.

Keywords: board gender diversity, board size, profitability, firm size, firm risk.

1. INTRODUCTION

The economic crisis in Asia in 1997 was indicated due to poor corporate governance practices (McKinsey and Co, 2002 in Kusumastuti et al. 2008). Members of the board of directors who are in charge of running daily firms acting as agents of firm owners determine how the quality of corporate governance will ultimately affect firm performance. There is empirical evidence that shows that diversity on the board of directors has a significant influence on the firm's strategic decisions (Goerzen and Beamish, 2005 in Elmagrhi et al. 2018). There are various kinds of diversity that can be observed in the board of directors, which can affect corporate governance. However, gender diversity in the board of directors has become an issue that attracts great attention from various parties (Kilic & Kuzey 2016). Srinidhi et al. (2011) in Jizi & Nehme (2017) show that the presence of female directors increases the quality of monitoring, as evidenced by the higher quality of accounting earnings.

Effective corporate governance can be reflected by the variability of firm performance which is often used as a leading indicator of a firm's ability to manage risk (Lenard et al. 2014). Therefore, this study aims to determine the relationship between gender diversity in the board of directors and firm risk, which is measured using a standard deviation of stock returns. This study uses the object of all non-financial sector firms listed on the Indonesia Stock Exchange over the 2013-2017 period, because the financial sector has a format for financial reports and regulations that are different from other sectors.

There are several results of previous studies that examined the effect of board gender diversity on firm risk. The results of the research are presented in Table 1.

Jizi & Nehme (2017) study shows that women on board negatively affect the volatility of the stock return. Regarding uncertainty avoidance, female executives are perceived to be more careful in making important decisions (Huang & Kisgen, 2013 in Khaw et al. 2016). Based on group dynamics, two or more female directors tend to be able to work together and have more power to voice their perspectives (Jizi & Nehme 2017). The board of directors with more women will be more dynamic, supportive, and collaborative, and women will be freer to discuss their thoughts and socialize together (Konrad et al. 2008 in Azmi & Barret 2014).

H1a. Board gender diversity as measured by performance of women negatively affects firm risk.

H1b. Board gender diversity as measured by percentage of women negatively affects firm risk.

Table 1. Previous Results of the Research on The Effect of Board Gender Diversity

Author	Jizi and Nehma (2017)	Sila *et al.* (2015)	Lenard *et al.* (2014)
Woman on Board	Sig (-)	Insig (+)	Sig (-)
Control Variable			
Board Size	Insig (+)	Sig (-)	Sig (-)
Board Independence	Insig (-)	Insig (-)	
Board Meetings	Insig (-)		
ROA	Sig (-)	Sig (-)	Sig (-)
Market-to-Book Value	Sig (-)	Sig (+)	
Leverage	Insig (+)	Sig (+)	Sig (+)
Firm Size	Sig (-)	Sig (-)	Sig (-)
Average Traded Volume	Sig (+)		
R & D Expenditure		Sig (-)	
Capital Expenditure		Insig (+)	Sig (+)
Sales Growth		Sig (+)	Sig (+)
Firm Age		Sig (-)	
Diversification		Insig (+)	
Cash Surplus		Sig (-)	

Source: Jizi and Nehma (2017), Sila *et al.* (2015), and Lenard *et al.* (2014).

For board size control variable, the effect is estimated to be negative on firm risk because the decisions they take are not extreme and reflect further discussion before reaching an agreement (Cheng 2008 in Jizi & Nehme 2017). For profitability control variable, the effect is estimated to be negative on firm risk because based on the prospect theory; it is found that there is a positive relationship between risky actions taken by organizations and low levels of profitability (Chattopadhyay et al. 2001 in Tsai & Luan 2016). For firm size control variable, the effect is estimated to be negative on firm risk because smaller firms are more risk-seeking than large firms (Faccio et al. 2011 in Khaw et al. 2016).

2 RESEARCH METHODS

This study is a causal study because it aims to examine the effect of independent variables of presence of women and percentage of women and control variables of board size, profitability, and firm size control on the dependent variable of firm risk. This study used multiple linear regression data processing methods. The population in this study were all non-financial sector firms listed on the Indonesia Stock Exchange with a sample time period of 2013-2017.

The dependent variable in this study is firm risk which is measured by the annual standard deviation of monthly stock returns. The independent variable is board gender diversity with two measuring instruments, namely (1) presence of women (DWoman), which is a dummy variable, a variable that has a value of 0 when there is no female director and has a value of 1 when there is a female director in the board of directors; and (2) percentage of women (PWoman) which is the percentage of female directors in the board of directors of the firm. The control variable is board size as measured by the number of members of the board of directors, profitability as measured by Return On Assets (ROA), and firm size as measured by the natural logarithm of the firm's market value of equity. The following is the regression model used in this study.

$$VOL_{it} = \alpha + \beta_1 DWOMEN_{it} + \beta_2 BS_{it} + \beta_3 Profitability_{it} + \beta_6 FS_{it} + \varepsilon_{it} \qquad (1)$$

$$VOL_{it} = \alpha + \beta_1 PWOMEN_{it} + \beta_2 BS_{it} + \beta_3 Profitability_{it} + \beta_6 FS_{it} + \varepsilon_{it} \qquad (2)$$

3 RESULTS AND DISCUSSIONS

Research objects were non-financial sector firms listed on the Indonesia Stock Exchange over the 2013-2017 period and meet population characteristics, namely: (1) issuing audited financial reports for 5 (five) consecutive years and (2) having complete data for the variables studied. Of the 371 firms listed on the Indonesia Stock Exchange, 296 firms meet the population characteristics. After the selection of existing report data, it was found that the study sample is 1480 observations. The following is a table of descriptive statistics for this research variable.

Table 2. Descriptive Statistics

	N	Min.	Max.	Mean
Volatility	1.480	0.0100	5.7757	0.4446
DWomen	1.480	0.0000	1.0000	0.4392
PWomen	1.480	0.0000	1.0000	0.1340
BS	1.480	2.0000	18.0000	4.9095
ROA	1.480	-1.2791	1.1184	0.0366
FS	1.480	23.0259	33.9106	28.1204

Source: Data processing using eView 8

Table 2 presents the results of data processing using descriptive statistic which informs the mean, minimum, and maximum. For the dependent variable of firm risk as measured by VOLATILITY, the maximum value obtained by GMTD firm (Gowa Makassar Tourism Dev., Tbk.) in 2013 and the minimum value obtained by MTSM firm (Metro Realty, Tbk.) also in 2013. For independent variable of board gender diversity as measured by PWOMAN,

the maximum value obtained by IIKP firm (Inti Agri Resources, Tbk.) and minimum value obtained by several firms, including BISI (BISI Inter-national, Tbk.), AALI (Astra Agro Lestari, Tbk.), and BWPT (Eagle High Plantation, Tbk.) in 2013-2017. For control variable of board size (BS), the maximum value obtained by TCID firm (Mandom Indonesia, Tbk.) in 2015-2016, while the minimum value obtained by several firms, including IIKP in 2013-2017, SMRU (SMR Utama, Tbk.) in 2013-2017, and PICO (Pelangi Indah Canindo, Tbk.) in 2013-2015. For control variable of profitability (ROA), the maximum value obtained by MBSS firm (Mitrabahtera Segara Sejati, Tbk.) in 2015 and KARW firm (ICTSI Jasa Prima, Tbk.) also in 2015. For control variable of firm size (FS), the maximum value obtained by ASII firm (Astra International, Tbk.) in 2017 and the minimum value obtained by AIMS firm (Akbar Indo Makmur Stimec, Tbk.) also in 2017.

Data processing in this study used eViews 8 program. Before the data is processed using a regression model that has been prepared, the classic assumption test was done first. Of the 4 (four) types of classical assumption tests that must be done, the autocorrelation test is not needed in this study, because the data used is the data panel. The normality test using Jarque-Bera shows that the data is not normally distributed. However, because the number of research samples was quite large, namely 296 firms and 1480 observations, the data can be considered normally distributed based on the Central Limit Theorem proposed, that says "as the sample size increases the distribution of the mean is approximately normally distributed regardless of the shape of the distribution of the individual values in the population. However, to meet the parametric normal distribution assumptions based on the Central Limit Theorem, a minimum of 30 data sets are required." While the results of the multicollinearity test show that the data did not contain symptoms of multicollinearity.

The heteroscedasticity test can be done using the cross section weight in the General Least Square weight section. For this reason, it is necessary to first determine the appropriate model to be used whether the common effect model, fixed effect, or random effect. To determine the appropriate model between fixed effect and common effect, a Chow test is performed. Based on the results of the Chow test, the fixed effect is a better model than the common effect. The Hausman test is then conducted to choose whether the most appropriate model to use is a fixed effect or random effect model. Based on the model test, it is known that H_0 cannot be rejected in both fixed effect and random effect models. This study uses a fixed effect model.

The regression results using the fixed effect model for model 1 and model 2 are presented in Table 3.

Table 3. The Results of Regression

Variables	B	t	Sig.
DWomen	0.08171	0.024733	0.0010***
BS	-0.00234	0.003142	0.4555
ROA	0.10712	0.041554	0.0101**
FS	0.04391	0.012900	0.0007***
R Squared		0.516120	
Adjusted R Squared		0.393510	
F Statistics		4.209441	
Prob. F Stat.		0.000***	

Note ** : significance at 5%
    *** : significance at 1%

From Table 3 which shows the results of the regression test, it can be seen that presence of women (DWOMEN) variable has a positive significant effect on firm risk, meaning that H_{1a} is rejected. This means that the presence of female directors increases firm risk. According to Adams & Funk (2011), women who occupy the board of directors position through the competition process are more oriented towards power and achievement. They are also open to change and prefer risk compared to women who do not occupy the board of directors position. Thus, female directors are significantly more willing to take risks than male directors. For control variable of board size, the results obtained show no significant effect on firm risk. Profitability variable has a significant positive effect on firm risk. Based on risk-based explanation by Akbas et al. (2017), higher profit levels and trends are likely to be associated with several risk factors inherent in the firm. Firm size variable has a significant positive effect on firm risk. Alipour et al. (2015) states that large firms are vulnerable to agency problems and have complex bureaucratic problems, resulting in high performance variability and increasing firm risk.

Table 4. The Results of Regression

Variables	B	t	Sig.
DWomen	0.063132	1.996412	0.0461**
BS	0.002094	0.605688	0.5448
ROA	0.101503	2.230547	0.0205**
FS	0.046530	3.666126	0.0003***
R Squared		0.509364	
Adjusted R Squared		0.385042	
F Statistics		4.097134	
Prob. F Stat.		0.000***	

Note ** : significance at 5%
    *** : significance at 1%

The regression test results for model 2 presented in Table 4 show that percentage of women (PWOMEN) has a significant positive effect on firm risk, meaning that H_{1b} is rejected. Based on the theory of social identity proposed by Tajfel (1982) in

Seo *et al.* (2017), when a group of individuals forms a group, the female directors will show similar social behavior. This behavior aims to protect and strengthen their identity as a differentiator from other groups. Of the several types of social identity, gender is the most dominant (Tolbert et al. 1999 in Seo *et al*. 2017). Thereby, the behavior of female directors who prefer risk based on Adams & Funk (2011) will be stronger on the board of directors with a group of female directors than if there is only one female director.

4. CONCLUSION

It can be concluded that: a) Board gender diversity, board size, profitability, and firm size have a significant effect on firm risk; b) partially, board gender diversity measured by the presence of women and percentage of women has a significant positive effect on firm risk; board size does not affect firm risk; and profitability and firm size have a positive significant effect on firm risk.

For further research, it is expected to expand the object of research such as examining non-financial firms in ASEAN countries, examining more specifically the effect of the presence of female directors when occupying important positions such as CEOs and CFOs against firm risk, using research samples with a time period longer than five years, and examining the possibility of interaction among independent variables in the study.

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