The Effect of Gender Diversity and the Business Expertise of Female Directors on Firm Performance: Evidence from the Indonesia Stock Exchange

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ABSTRACT

The aim of this research is to determine the effect of gender diversity and the business expertise of female directors on the performance of 264 non-financial firms listed in the Indonesia Stock Exchange between 2013 and 2017 (1,223 observations). The research model employs panel data analysis with random and fixed effect model approaches. We address the endogeneity issues (reverse causality and omission of variables) in our research models via lagged independent and control variables. Controlling for firm size, leverage, liquidity, cash flow, and growth opportunities, the results show that 1) in general, gender diversity does not significantly affect firm performance except where there is a female CEO, this being a factor which significantly affects return on assets (ROA), and 2) the business expertise of female directors does not significantly affect firm performance as measured by ROA and return on equity (ROE). We run robustness checks using a market-based proxy (Tobin's Q) to measure firm performance and these tests confirm the results. We argue that the presence of women on the board of directors reflects family relationship with shareholders, rather than their having been chosen based on expertise and experience.

I. INTRODUCTION

An annual research report entitled 'Woman in Business' conducted by Grant Thornton International Ltd (2018) shows that the percentage of global businesses with at least one woman in senior management increased significantly in 2017, from 66% to 75%. This report was based on a global survey which interviewed approximately 4,995 members of company top management in 35 countries between July and December 2017 and was compared with the previous year's survey conducted in 5,500 companies in 36 countries. The survey showed that in 2017 Indonesia had the highest percentage of female leaders in the Asia Pacific region and was ranked second worldwide. The report showed that 46% of senior management roles in Indonesia were held by women, this being a significant increase on the figure for the previous year of 36%. In global rankings, Indonesia was second to Russia, which occupied the top position at 47%, while Estonia (40%), Poland (40%) and the Philippines (40%) were just below Indonesia in the rankings. In contrast, the countries with the lowest proportion of female involvement at the top level of company management were Japan (7%), Argentina (15%), India (17%), Germany (18%) and Brazil (19%).

According to Julizaerma and Sori (2012), limited number of women holding positions at top management level reflects a number of issues, one of which is cultural and social attitudes and behaviours regarding the types of work considered suitable for women and men. This leads to women tending to be stereotyped as suitable for particular industries. Women's ability to manage a company or organization is often questioned because of perceptions arising from the belief that they are more emotional and also very thorough. There tend to be several considerations which ultimately lead to the low levels of female involvement in decision making. Another reason given is the perceived limited ability/expertise of women in the field of business which results in a lack of opportunities for promotion (Julizaerma and Sori, 2012). A number of previous studies have found a relationship between gender diversity and company performance. Studies conducted by Low et al. (2015), Perryman et al. (2016), Amin and Sunarjanto (2016), Tu (2017), Conyon and He (2017), Ahmadi et al. (2018) and Wiley and Monllor-Tormos (2018) show a positive relationship between gender diversity on the board of directors and company performance. Carter et al. (2010) suggest that gender diversity in a company can bring new perceptions to the decision-making process and can positively influence the effectiveness of corporate governance, creativity and innovation to competitive advantage. Terjesen and Singh (2008) put forward the view that gender diversity in company management provides several advantages for companies, including new ideas and improved company communication skills, and that these have a positive impact on company performance.

Low et al. (2015) state that, in general, gender diversity on the board of directors has a positive impact on company performance, but that this impact will be less in a country that is more receptive to women in the work environment and in important positions. Greater gender diversity in company top management creates lower risk and provides better performance (Perryman et al., 2016). Tu (2017) states that gender diversity on the board of directors is a good thing for company performance as indicated by increased ROA, ROE and Tobin's Q. Wiley and Monllor-Tormos (2018) say that gender diversity on the board of directors provides better management performance and innovative thinking and result in better company performance.

In the context of Indonesia, several studies on the impact of gender diversity on firm performance have been conducted. Amin and Sunarjanto (2016) found that there is a positive relationship between gender diversity on the board of directors and firm performance. In contrast, Darmadi (2011, 2013a) and Iswadi (2016) found that there is a negative relationship between gender diversity on the board of directors and firm performance, while Kusumastuti et al. (2007), Mardiyati (2016) and Astuti (2017) found there was no relationship between gender diversity on the board of directors and firm performance.

Unfortunately, previous studies focused on the presence and proportion of female directors without regard to the quality of those female directors. In considering this aspect of gender equality, the quality of women directors can be inferred from their age, educational background and experience in the industry (Kim and Lim, 2010). Educational background can be considered as an indicator of the quality of a director because it will affect the decisions taken relating to company interests (Amin and Sunarjanto, 2016). Studies that explain the impact of the educational background of female directors on company performance are rarely found, but include studies conducted by Kim and Lim (2010) and Bennouri et al. (2018). This scarcity of studies may be due to the limited information that can be found related to the characteristics of female directors. However, there are studies that explain the impact of educational background of directors on firm performance (see Amin and Sunarjanto, 2016; Ararat et al., 2015; Darmadi, 2013b; Kusumastuti et al., 2007).

Business expertise is judged by the ability and knowledge of the board of directors as a result of the experience of internal decision making in large companies. They are the main strategic advisers and are in the vanguard in communicating with external parties (Peterson and Philpot, 2007). Business expertise and knowledge of economics and law can be useful assets for companies (Kim and Lim, 2010). This expertise increases the efficiency of directors in making decisions (Chemmanur et al., 2009). By having expertise in the fields of business and economics, the board of directors is better able to manage and make business decisions (Amin and Sunarjanto, 2016).

Gottesman and Morey (2010) stated that there was no significant relationship between the business expertise of the board of directors and company performance, while Darmadi (2013b) and Amin and Sunarjanto (2016) found that business expertise in the board of directors was negatively related to firm performance. Research by Kim and Lim (2010) also showed that business expertise possessed by female directors had a negative impact on firm performance. Furthermore, Bennouri et al. (2018) reinforce previous research findings by establishing that the business expertise of female directors has a negative relationship with firm performance. This is possibly because, for the board of directors, educational background in a scientific discipline which matches the industrial sector of the company is more important for the making of effective strategic decisions than business expertise: if the proportion of directors with business expertise increases, there will be a smaller proportion who have an educational background that is appropriate to the industrial sector of the company, and this in turn will impact on firm performance (Amin and Sunarjanto, 2016).

Studies of the impact of gender diversity and business expertise on firm performance deliver contradictory results, and we are motivated to conduct this research because the role of women today is increasingly valued in the business world. Women are considered to have abilities that are equivalent to men and even to have a positive impact on company performance. Our study contributes to the

literature in the following ways: 1) previous studies into the impact of gender diversity on firm performance in Indonesia measure diversity by the presence of female directors (Kusumastuti et al., 2007; Darmadi, 2011; Darmadi, 2013a) and the proportion of female directors (Darmadi, 2011; Darmadi, 2013a; Amin and Sunarjanto, 2016; Mardiyati, 2016; Iswadi, 2016; Astuti, 2017). In our study, we further employ the presence of a female CEO as a proxy for gender diversity and thus employ three proxies for gender diversity; 2) to the best of our knowledge, no studies of the impact of the business expertise of female directors on firm performance in Indonesia have been attempted. All previous studies in Indonesia focus on the impact of business expertise in the board of directors as a whole on firm performance (see Amin and Sunarjanto, 2016; Darmadi, 2013b; Kusumastuti et al., 2007), while our study looks at the business expertise of female directors; 3) our study employs larger observations compared to previous studies into the impact of gender diversity and business expertise on firm performance in Indonesia.

The sample used in this study is drawn from non-financial companies. Non-financial companies and financial companies have different capital structures, so by not including financial companies in this study, it is expected that the sample companies used have similar characteristics. Several previous studies have found that there is endogeneity in the relationship of gender diversity with company performance, such as studies conducted by Conyon and He (2017) and Gottesman and Morey (2010). Our study uses lagged independent and control variables to overcome endogeneity (reverse causality and omission of variables).

The rest of the paper is structured as follows. Section II reviews the literature and develops the hypotheses. Section III explains the research methods. Section IV reports the results and discussion, and Section V concludes the overall study.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A. Literature Review

Agency theory is often used by researchers in the financial and economic literature to understand the relationship between the characteristics of directors and firm value. This theory suggests several reasons why good corporate governance increases the value and performance of companies, because, in essence, good corporate governance involves better supervision and transparency and public information disclosure between investors (principals) and managers (agents) (Krafft et al., 2014).

The agency relationship is said to be a contract between agents and shareholders (Jensen and Meckling, 1976). In carrying out this contractual partnership, the shareholders (the principals) assign the task of utilizing and managing the available funds to obtain maximum benefits at an efficient cost to company management (the agents). Thus, there are two interests in a company, namely the interests of investors in maximizing profits of the company of their choice and the interests of management in managing the company to acquire large rewards for themselves.

These different interests can lead to conflict of interest between management and investors, whereby managers often use their control in managing the company to increase their own personal returns using shareholders' long-term investments. This can lead investors to be pessimistic about the returns they will receive on their investments (Krafft et al., 2014). In the relationship between agents and principals there is also the possibility of agency conflict (Jensen and Meckling, 1976) resulting from asymmetric information, in which a manager of a company knows more about

the company than the shareholders. This asymmetric information can cause conflicts within the company as an aspect of the agency problem.

One way to overcome agency problems is the application of a corporate governance system. In line with gender diversity, agency theory also suggests that women on company boards make existing supervisory mechanisms stronger for managers and executives, because the existence of female directors increases the independence of the board and the tendency to ask questions more frequently (Carter et al., 2010). Good corporate governance is needed in agency issues between investors and management to equalize the interests of company owners with company managers (Wulandari, 2006). A strong corporate governance system can minimize ethical conflicts between management (agents) and shareholders (principals).

Hambrick and Mason (1984) developed a theory based on assumptions of what would happen to a company obtained by studying the top management team (TMT). This theory says that explanation and understanding of why a company operates in a particular way can be achieved by studying the TMT characteristics of the company. Several previous studies of the characteristics of TMT in terms of company performance have used this theory. Because the board of directors is also part of the TMT, diversity in board members is believed to encourage the emergence of diverse decision alternatives in the optimal decision-making process. Diversity related to race and gender is often seen as important for maximizing organizational resources (Siciliano, 1996). In other words, gender diversity can improve company performance because it allows the decisions made to be informed from a variety of perspectives.

B.   Hypothesis Development

Diversity in company management can have a positive impact on company performance as well as on stock performance (Liao et al., 2015) because if the perceptions, views and background of the board of directors are homogeneous then decision-making strategies will be single-minded, predictable and inflexible (Wicaksana, 2010). With women on the board of directors, it is considered that they may make more informed decisions and have a lower propensity to take risk. Amin and Sunarjanto (2016) say this is because women tend to make decisions more slowly and based on known considerations, in accordance with the basic female attitudes of caution, of being risk-averse, and of being more conscientious than men. Ahmadi et al. (2018) state that greater gender diversity on the board of directors can improve company performance because it can improve relations with company stakeholders and improve company image.

In line with this opinion, the findings revealed by Carter et al. (2010) show that companies with two or more female directors have better company performance than companies with fewer than two female directors. Bennouri et al. (2018), Tu (2017), Amin and Sunarjanto (2016) and Ararat et al. (2015) also examine the relationship of gender diversity in the board of directors with company performance and have found a positive relationship between gender diversity in the board of directors and company performance.

H1: Gender diversity on the board of directors has a positive effect on firm performance.

Although it is not a requirement for someone who wants to enter the business world to have business expertise, it is considered likely to be an advantage if the top

management of a company has such experience. Members of the board of directors with this expertise are considered to have better abilities in managing businesses and making business decisions than those who do not (Amin and Sunarjanto, 2016). A degree or educational background in finance possessed by a member of the board of directors (as representing business expertise) will provide many benefits for the financial management the company (Jeanjean and Stolowy, 2009).

Many studies have examined the relationship between the educational background of the board of directors and company performance, including Amin and Sunarjanto (2016), Ararat et al. (2015), Kusumastuti et al. (2007), Darmadi (2013b) and Smith et al. (2006), and results show that relevant educational background has a positive effect on company performance. However, only a few studies have looked at the relationship between the educational background of female directors and firm performance (Kim and Lim, 2010; Bennouri et al., 2018). These studies found that business expertise possessed by female directors has a negative impact on company performance.

H2: Business expertise of female directors has a positive effect on firm performance.

III. RESEARCH METHODS

A. Sample Selection

The population of this study comprises all non-financial companies listed on the Indonesia Stock Exchange (IDX) for the period 2013–2017. This study uses unbalanced panel data sampled purposively based on the following the main criteria. A full list of criteria is presented in Table 1.
a) Non-financial companies listed on the Indonesia Stock Exchange (IDX) that issued financial reports for at least one year in the 2013–2017 period.
b) Non-financial companies listed on the Indonesia Stock Exchange (IDX) that provide the data needed in this research.

Table 1
Study Sample

Sample criteria	Total
Non-financial companies listed on the Indonesia Stock Exchange that issued financial reports for at least one year in the 2013–2017 period	359
Non-financial companies that issued financial statements in other currencies than the rupiah	(69)
Companies that did not publish in full the data and related information needed in this research	(27)
Total samples used	264
Total observations (264 Companies listed on the Indonesia Stock Exchange for at least one year for the period 2013–2017)	1,223

Based on the predetermined criteria, 264 non-financial companies met the criteria for determining the sample, with a total of 1,223 observations.

This study uses data from non-financial companies listed on the Indonesia Stock Exchange (IDX) for the period 2013–2017 in the form of secondary data obtained from financial reports and annual reports for each selected company through the official website of the Indonesia Stock Exchange (IDX, at www.idx.co.id) and the websites of each company.

B. Research Variables

In this study, three types of variable are used: dependent, independent and control. Firm performance is the dependent variable, calculated via accounting-based and market-based measures and measured in terms of ROA, ROE and Tobin's Q. These can be formulated as follows:

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}} \tag{1}$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Stockholder equity}} \tag{2}$$

$$\text{Tobin's Q} = \frac{(\text{MVS+D})}{\text{TA}} \tag{3}$$

where MVS = market value of all outstanding shares; D = debt and TA= total assets.

The independent variables used in this research are gender diversity and the business expertise of female directors. Gender diversity can be proxied by three measurements:

$$\text{GD1} = \text{Dummy 1 if there is at least 1 female director, 0 if none} \tag{4}$$

$$\text{GD2} = \text{Dummy 1 if the CEO is female, 0 if male} \tag{5}$$

$$\text{GD3} = \frac{\sum \text{female directors}}{\sum \text{board of directors}} \times 100\% \tag{6}$$

The business expertise of female directors is represented by the educational background of female directors. Business expertise can be proxied as follows:
DBW = Dummy 1 if there are any female directors who have business education,

$$\text{0 if none} \tag{7}$$

Several control variables are used: firm size, as measured by the natural log of total assets; leverage, as measured by total debt divided by total assets; liquidity, as measured by the ratio of current assets divided by current liabilities; cash flow, as measured by net income plus depreciation divided by total assets; and growth opportunities, as measured by total assets minus total assets of the previous year divided by total assets of the previous year.

IV. RESULTS

A. Descriptive Statistics

Descriptive statistical analysis is used to analyse data by describing processed data to make it more easily understood. The descriptive analysis presented in this study consists of mean, median, maximum value, minimum value and standard deviation.

Table 2
Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
ROA	0.0227	0.0319	2.1920	-10.7443	0.4310	1,223
ROE	0.0745	0.0700	7.9904	-11.0404	0.6474	1,223
TBQ	1.3478	0.7379	22.8657	-0.6107	2.3027	1,223
GD_1 (dummy)	0.4358	0.0000	1.0000	0.0000	0.4961	1,223
GD_2 (dummy)	0.0630	0.0000	1.0000	0.0000	0.2430	1,223
GD_3	0.1372	0.0000	1.0000	0.0000	0.1870	1,223
DBW (dummy)	0.3737	0.0000	1.0000	0.0000	0.4840	1,223
LnSIZE	14.4908	14.5165	19.3833	8.5331	1.7494	1,223
LEV	0.5466	0.4772	11.8463	0.0076	0.7116	1,223
LQ	2.3220	1.4771	32.6617	0.0044	2.9158	1,223
CF	0.3464	0.2186	16.3919	-1.4395	1.0184	1,223
GO	0.1684	0.1012	9.6132	-0.9331	0.4849	1,223

ROA: return on assets; ROE: return on equity; TBQ: Tobin's Q; GD_1: the existence of female directors – dummy 1 if there are female directors, 0 if not; GD_2: female CEO – dummy 1 if female CEO, 0 if male; GD_3: proportion of female directors; DBW – dummy 1 if there are female directors who have business expertise, 0 if none; LnSIZE: natural log of total assets (firm size); LEV: debt to assets ratio (leverage); LQ: current assets to current liabilities ratio (liquidity); CF: net income plus depreciation divided by total assets (cash flow); GO: total assets minus total assets of previous year divided by total assets of the previous year (growth opportunities)

B. Chow Test

The hypotheses proposed by the Chow test are as follows:

H0: common effect model (CEM)
H1: fixed effect model (FEM)

The criterion used for the test is that if the p-value ≤ 0.05 then H0 is rejected, meaning that the panel data regression model that is most appropriate is the fixed effect model (FEM). If p-value > 0.05, then H0 is accepted and the panel data regression model that is most appropriate is the common effect model (CEM). We then used the Hausman test to determine whether the most appropriate model was the FEM or the random effect model (REM).

Table 3
Chow Test Results

Y		*Chi-Square*	Prob.
	Model 1	500.6541	0.0000
ROA	Model 2	496.4331	0.0000
	Model 3	500.4491	0.0000
	Model 1	552.3649	0.0000
ROE	Model 2	553.6095	0.0000
	Model 3	554.2742	0.0000
	Model 1	1,990.4415	0.0000
TBQ	Model 2	1,991.4729	0.0000
	Model 3	1,979.0727	0.0000

From the data shown in Table 3 it can be seen that the results of the Chow test indicate varying chi-square value but the same probability value of 0.0000. A probability value of $0.00 < 0.05$ means that H0 is rejected and H1 is accepted, indicating that the CEM is not the best model for panel data regression. A Hausman test is then needed to determine the FEM or the REM is the best model.

C. Hausman Test

The hypotheses proposed by the Hausman test are as follows:

H0: random effect model (REM)
H1: fixed effect model (FEM)

      The criteria for this test are chi-square value and p-value with a significance level of 0.05. If the p-value is ≤ 0.05 then H0 is rejected, meaning that the most appropriate panel data regression model is the FEM. Meanwhile, if p-value > 0.05, then H0 is accepted and REM is the most appropriate panel data regression model.

Table 4
Hausman Test Results

Y		Chi-square	Prob.
	Model 1	13.2521	0.0662
ROA	Model 2	12.7243	0.0791
	Model 3	13.2403	0.0665
	Model 1	11.4530	0.1200
ROE	Model 2	10.4968	0.1621
	Model 3	15.0560	0.0353
	Model 1	24.6546	0.0009
TBQ	Model 2	25.9388	0.0005
	Model 3	31.9957	0.0000

      From Table 4 it can be seen that the Hausman test shows that chi-square values and probability values vary. Four models have probability values of $0.00 \leq 0.05$, meaning the FEM is the best model for panel data regression while the remaining five have probability values of $0.00 > 0.05$, meaning that the REM is the best model.

D. Multicollinearity Test

The multicollinearity test aims to establish whether the regression model finds a correlation between independent variables. A regression model can be said to be good if there is no perfect correlation between independent variables. If there is a high correlation between independent variables, of 0.9 or close to 1, multicollinearity is indicated. In this study, we employ Pearson correlation as the multicollinearity test.

Table 5
Pearson Correlation Matrix

	GD_1	GD_2	GD_3	DBW	LnSIZE	LEV	LQ	CF	GO
GD_1	1.0000	-	-	-	-	-	-	-	-
GD_2	0.2949	1.0000	-	-	-	-	-	-	-
GD_3	0.8356	0.4436	1.0000	-	-	-	-	-	-
DBW	0.8788	0.2520	0.7886	1.0000	-	-	-	-	-
LnSIZE	-0.0103	-0.1389	-0.1644	-0.0355	1.00000	-	-	-	-
LEV	-0.0061	-0.0226	-0.0020	-0.0097	-0.2063	1.0000	-	-	-
LQ	0.0307	0.0946	0.0897	0.0398	-0.1207	-0.2271	1.0000	-	-
CF	-0.0263	0.0314	0.0229	-0.0124	-0.3231	0.7027	-0.0593	1.0000	-
GO	0.0379	0.0039	0.0066	-0.0061	0.0800	-0.0791	-0.0152	-0.0395	1.0000

E. Discussion

The purpose of this research is to examine the impact of gender diversity and the business expertise of female directors on firm performance. This study uses three proxies for gender diversity in the board of directors as indicated by the codes GD1 (presence of female directors), GD2 (presence of female CEO), and GD3 (proportion of female directors). The business expertise of female directors is represented by the educational background of female directors and is measured with dummy 1 if there is female director who has business expertise, 0 if none. Firm performance is measured with return on assets (ROA) and return on equity (ROE). These are accounting-based measures.

From Table 6 it can be seen that Model 1 has GD1 coefficient value of 0.0028 with a probability value of 0.9617; Model 2 has GD2 coefficient of -0.1198 with a probability value of 0.0491; Model 3 has GD3 coefficient of -0.0691 with a probability value of 0.5799. Models 4, 5 and 6 have coefficient values of GD1 of 0.0821 with a probability value of 0.3775; coefficient value of GD2 of 0.0531 with a probability value of 0.5833; and coefficient value of GD3 of -0.4966 with a probability value of 0.1560, respectively.

These results show that gender diversity in the board of directors does not significantly affect accounting-based measures (ROA and ROE) except when gender diversity is measured by the presence of a female CEO, which significantly affects ROA at a level of significance of 5%. So, the first hypothesis (H1), which states that gender diversity on the board of directors has a positive effect on company performance, is rejected. These results support the studies conducted by Carter et. al. (2010), Kusumastuti et al. (2007), Mardiyati (2016), Astuti (2017) and Horak and Cui (2017) which found no relationship between gender diversity on the board of directors and company performance. We suggest that this is because women have not been strongly represented in corporate governance in Indonesia, where most public companies are controlled by families (Darmadi, 2011). Thus, the presence of women on the board of directors is very possibly because of their family relationship with shareholders, rather than being based on their expertise and experience. The result is that many female directors have minimal or no business competence. In addition, the number of female directors is still very small compared to the number of male directors and it is therefore difficult to measure whether a woman's position on a board of directors is only due to family factors or is in fact because of her competence to improve the firm's financial performance.

Table 6
Regression Results

Y	ROA			ROE		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	REM	REM	REM	REM	REM	FEM
Intercept	-0.0961	-0.0640	-0.0799	-0.2985	-0.3107	2.2043
	0.4834	0.6415	0.5683	0.1733	0.1603	0.0180
GD1	0.0028	-	-	0.0821	-	-
	0.9617	-	-	0.3775	-	-
GD2	-	-0.1198**	-	-	0.0531	-
	-	0.0491	-	-	0.5833	-
GD3	-	-	-0.0691	-	-	-0.4966
	-	-	0.5799	-	-	0.1560
DBW	-0.0335	-0.0168	-0.0103	-0.0541	0.0140	0.0918
	0.5827	0.5755	0.8281	0.5731	0.7693	0.3573
	0.0142	0.0121	0.0132	0.0237	0.0249*	-0.1419**

LnSIZE	*0.1178*	*0.1818*	*0.1533*	*0.1029*	*0.0885*	*0.0289*
LEV	-0.1928***	-0.1954***	-0.1932***	-0.0071	-0.0047	-0.0570
	0.0000	*0.0000*	*0.0000*	*0.8579*	*0.9060*	*0.5759*
LQ	-0.0033	-0.0028	-0.0031	0.0013	0.0012	-0.0050
	0.5080	*0.5626*	*0.5244*	*0.8624*	*0.8794*	*0.4545*
CF	0.0908***	0.0926***	0.0910***	0.0112	0.0096	-0.0196
	0.0000	*0.0000*	*0.0000*	*0.6847*	*0.7268*	*0.6766*
GO	0.0124	0.0131	0.0130	0.0400	0.0429	0.0592
	0.6104	*0.5887*	*0.5916*	*0.2776*	*0.2426*	*0.3723*
R^2	0.0478	0.0508	0.0480	0.0044	0.0040	0.3702
Adjusted R^2	0.0423	0.0453	0.0425	-0.0014	-0.0018	0.1915
Observations	1,223	1,223	1,223	1,223	1,223	1,223

*, ** and *** indicate significance at the level of 10%, 5% and 1%. The numbers in italics are the p-values. REM is the random effect model and FEM is the fixed effect model. All explanatory variables are lagged (one lag) to avoid endogeneity (reverse causality) in the research models.

The second hypothesis tested in this study is that the business expertise of female directors has a positive effect on firm performance. From Table 6 it can be seen that Model 1 has coefficient value for the business expertise of female directors of -0.0335 and probability value of 0.5827; Model 2 has a coefficient of -0.0168 with probability of 0.5755, and Model 3 has coefficient value for the business expertise of female directors of -0.0103 with probability of 0.8281. Model 4 shows a coefficient value of business expertise of female directors of -0.0541 with a probability value of 0.5731 and Model 5 has coefficient value of 0.0140 and probability of 0.7693. Model 6 has coefficient value of business expertise of female directors of 0.0918 and probability value of 0.3573. These results show that the business expertise of female directors does not affect company performance (ROA and ROE), indicating that the presence or absence of business expertise in female directors does not affect company performance. The second hypothesis (H2) which states that the business expertise of female directors has a positive effect on company performance (ROA) is therefore rejected. These results support the study conducted by Adnan et al. (2016) which found that education is not the chief influence in improving company performance, which may in fact result from other characteristics of the board of directors themselves, such as the personal discipline and work experience. Another argument, revealed by Kusumastuti et al. (2007), suggests that there is a possibility that companies need directors who have educational background in accordance with the sector or line of business of the company rather than having general business background.

E. Robustness Checks

The regressions were used to check the robustness of the main results, and the outputs are presented in Table 7. We use market-based measure of firm performance (Tobin's Q). Gender diversity in the board of directors is indicated by the codes GD1 (presence of female directors), GD2 (presence of female CEO), and GD3 (proportion of female directors). The business expertise of female directors is measured with dummy 1 if there is female director who has business expertise, 0 if none.

Model 1 has coefficient for GD1 of 0.0354 with a probability value of 0.8144 and Model 2 has coefficient value for GD2 of -0.3593 with probability of 0.0955. Model 3 has coefficient for GD3 of -0.8039 with a probability of 0.5047. These results show that the presence and proportion of women on the board of directors (GD1 and GD3) do not significantly affect Tobin's Q. However, the presence of a female CEO (GD2) affects Tobin's Q at a level of significance of 10%. This indicates

that the presence or absence of women on the board of directors does not affect company performance. Model 1 shows the coefficient value of business expertise of female directors of -0.1612 and probability value of 0.4493, while Model 2 shows the coefficient value of business expertise of female directors is -0.1059 with probability of 0.5423. Model 3 has coefficient value of business expertise of female directors of 0.0823 with a probability value of 0.7697. These results show that the business expertise of female directors does not affect Tobin's Q, indicating that the presence or absence of business expertise among female directors does not affect firm performance. The robustness-test results presented in Table 7 confirm the main results in Table 6.

Table 7
Robustness Tests

Y	TOBIN'S Q		
	Model 1	Model 2	Model 3
	FEM	FEM	FEM
Intercept	3.4738	3.5949	3.7090
	0.1688	*0.1477*	*0.1259*
GD1	0.0354	-	-
	0.8144	-	-
GD2	-	-0.3593*	-
	-	*0.0955*	-
GD3	-	-	-0.8039
	-	-	*0.5047*
DBW	-0.1612	-0.1059	0.0823
	0.4493	*0.5423*	*0.7697*
LnSIZE	-0.1702	-0.1771	-0.1836
	0.3080	*0.2808*	*0.2531*
LEV	0.4194	0.4119	0.4080
	0.2891	*0.2963*	*0.3078*
LQ	0.0490*	0.0480*	0.0479*
	0.0546	*0.0564*	*0.0510*
CF	0.1193	0.1287	0.1256
	0.6178	*0.5949*	*0.6066*
GO	0.0030	0.0054	0.0085
	0.9774	*0.9552*	*0.9264*
R^2	0.8312	0.8314	0.8315
Adjusted R^2	0.7833	0.7835	0.7837
Observations	1,223	1,223	1,223

* indicates significance at the level of 10%. The numbers in italics are the p-value. FEM is the fixed effect model. All explanatory variables are lagged (one lag) to avoid endogeneity (reverse causality) in the research models.

V. CONCLUSION

This research aims to determine the effect of gender diversity of the board of directors and the business expertise of female directors on firm performance of non-financial firms listed in Indonesia Stock Exchange between 2013 and 2017. The results are mixed. In general, gender diversity of the board of directors does not affect firm performance when proxied by the presence of women and the percentage of women on the board of directors. However, gender diversity significantly affect ROA when gender diversity is proxied by female CEOs. The business expertise of female directors does not affect firm performance. The robustness checks confirm the results. This study is expected to be able to provide recommendations to non-financial companies in Indonesia, specifically in enabling them to make the right decisions in

placing women on the board of directors based on the experience and expertise of these women rather than on family relations with shareholders. Several suggestions can be made for further research: 1) employ other measures of gender diversity, namely the presence and proportion of women on boards of commissioners and female CFOs, and 2) use other techniques, such as GMM and 2SLS, to address endogeneity issues.

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