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The Impact of Female Board of Directors on Firm Performance and Dividend Payout Policies: Evidence from Vietnam

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Abstract

This research aims to explore the impact of female board of directors on firm performance which are ROA, ROE and Tobin's Q as well as dividend payout policy of listed corporates in Vietnam. Fixed Effects and Random Effects methods are applied to test our suppositions on the dataset of 647 listed companies in Vietnam from 2010 to 2015. The result of this paper displays positive influence of the ratio of female directors and over-retirement age female directors and the negative effect of the ratio of independent female directors on firm performance but fail to confirm the statistically significant impact of these groups on dividend payout policy. The finding from this work could be scientific basic for Vietnamese enterprises to build and form the most proper board for themselves and contributes to the existing literature through the empirical evidence with more insight into the effect of corporate governance, particularly female directors on firm outcomes from a typical developing country, Vietnam.

Keywords: board of directors, female directors, firm performance, dividend payouts, Vietnam.
JEL Classification: D2, L25

1. Introduction

How can enterprises achieve high profit as well as favorable business operation? That has always been the big concern for all business executives. A ship wants to be in the right direction, it needs to have a good helmsman. That is the reason why corporate governance has always been an essential part in the survival and advancement of an enterprise. According to Ho (2015), the effectiveness of corporate governance affects not only the development of the company itself but also the wealth and thriving of the national economy in general. In order to make the progress of this administration mechanism, board of directors (BODs) is the crucial factor or a corporate governance driver with directly impacts on it by their decision-making process and leading to push enterprise to achieve its goals (Pugliese *et al*., 2009).

In particular, the consideration of woman rate on the BODs emerged as a phenomenon. The ratio of female members in the BODs in a company is hitherto still limited in most countries, even in US and Western countries, but it has been increasing as a good signal for women benefit in particular and for companies in general. Many documents have shown the positive influence of women on the corporate performance, but some proved the opposite views, while others informed the insignificant results. The effect of those factors may change over time, the turmoil can be displayed in different

circumstances, different situations or different times (Carter *et al.,* 2010). This topic has been and will remain controversial in academia and practical cases in different approaches.

In the integration and development of the country, Vietnamese women keep continuing to overcome prejudices and challenges, making positive contribution to social activities, especially in economy field. The new study by the International Labour Organization (ILO) (2015) showed that Vietnam was ranked 76 out of 108 countries in the rate of women's participation in management at 23%. Vietnam is one of the countries making the progress in this term but the proportion is still limited. In the increasing trend of the board gender diversification or female-quota policy all over the world, studies related to this issue seem noteworthy than ever. This policy also generated many different consequences and various controversies in many countries. The number of studies of the relation between this rate and the operating results of the company has become increasing rapidly, but focused predominantly on developed countries or well-established markets, not many of them focused on developing countries or nascent markets such as Vietnam and other similar economies. Moreover, the combination of the gender element of the BODs with their other characteristics such as ownership, independent and age seems not to be fully and properly considered.

The Effect of Women in the Boardroom

Gender issue belonging to distinguished demographic characteristic is sensitive but easier to identify. Lückerath-Rovers (2013) affirmed the positive association of female members in the boardroom toward financial performance in particular and firm performance in general in many advanced countries such as Netherlands, Spain, Norway or France by their better connection with the inside and outside stakeholders of their company, it led to strengthen company's image and reputation. Resource dependency theory of Salancik and Pfeffer (1978) is another story. It enhances the positive role of the BODs as a resource of business networks and competitive environment to reduce transaction cost, handle risks and uncertainty of companies. It focuses on exercising control, power and mutual negotiation to ensure that resource flow is stable and minimize environmental uncertainties. As claimed by resource dependency theory, if women can reach the top by their abilities, they absolutely can lead their company to success by their talent, ingenuity and flexibility themselves (Salancik and Pfeffer, 1978; Krishnan and Park, 2005). The strong positive influence on ROA and ROE of female directors is also found in the study of Liu, Wei and Xie (2014). This study showed the consistency with many previous studies by concluding that the more women on the board of directors, the more effective the firm performance is. According to these authors, female directors have the ability to connect and inspire well the company's female partners, even the female employees of the company to interact and work better. There are many other studies that followed this favorable school, typically as Smith *et al.*(2006), focused on female directors who have a good educational background, or Sarkar and Selarka (2015) with the particular support for independent female directors.

Consistent with both agency theory and resource dependency theory on the role of corporate governance, Nguyen, Locke and Reddy (2015) commented that the role of women in extra monitoring and alternative management would be more effective in firms having weak governance system and in institutional environments supporting for the advancement of women. By using the dataset from 1,939 firms (1996-2003) of Investor Responsibility Research Center, Adam and Ferreira (2009) in their research about women in the boardroom found out some positive presentations of gender diversity on some aspects such as board inputs, firm outcomes, committee assignments and equity-based compensation. They also claimed that the diversity in term of gender has the unfavorable impact on firm performance because that is likely lead to over-monitoring in the corporate governance. Moreover, firm and shareholder value can be diminished overtime by strict mandating gender quotas. As such, that relation seems to be more complex.

Firm Performance Measurements

In this paper, ROA, ROE and Tobin's Q were chosen as firm performance measurements. ROA can be seen as the ratio that reveals firm' ability to manage its investments in assets to be profitable or to profit from its investments during a specified period of time (Bathula, 2008). Return on equity is another one of the accounting measures for the profitability of a business by assessing how well a firm can use investments to produce earnings growth (Vo and Nguyen, 2014). Tobin's Q is another story about the market-based measure of firm performance. It acts as a reliable performance indicator by considering whether it is greater than one. This ratio is a wide concern with the firm's stakeholders, especially shareholders (Wahba, 2015). For this paper, I suppose that higher ratio of women on board will lead to better firm performance in term of ROA, ROE and Tobin's Q.

Dividend Payout Policy

Another important factor has been paid attention by inside and outside parties of a company is the dividend payout policy. This is the policy that has a direct impact on the earnings and interests of shareholders, but it also affects the value of the company on the stock market through its share price. It can simultaneously solve the agency contradictions by reducing the free cash flow that could be appropriated by opportunistic managers. In addition to the above suggestion, Dewi and Handayani (2017) gave unfavorable result between good corporate governance and the increase in dividend payouts. Accordingly, they argued that good governance mechanism is a great proof and commitment for the growth and value increase of a company in the future, including the agency conflict solving without the high dividend payout rate. Lückerath-Rovers (2013) in his study also showed the different influences between male and female directors on dividend payout policy- the reaction of managers to shareholders. In this research, higher ratio of women on board is supposed that lead to positive dividend payout policy in the listed firms in Vietnam.

Ratio of Share-Ownership Female Directors

By defining the concept of agency costs, Jensen and Meckling (1976) promoted that the management (known as agent) and ownership should be interlocked to deliver better efficiency for performance of the company, otherwise the benefit opposition between agent as manager and owners or shareholders could be occur. Fama and Jensen (1983) supposed that these two subjects should not be one. The reasons are partly due to the subjective impacts, partly because owners are not always those who have good ability and experience in administration and decision-making. At the same time, the fame and influence of outside directors will enhance and promote the reputation and performance of the company. Simultaneously, the ownership creates closely ties between the benefits and responsibilities that can solve agency problem for enterprises. By focus on women element of the board of directors, I set share-ownership female directors (women directors who own shares of the company) as an alternative independent variable in consideration. Then, the next supposition is established that the more share-holding women directors, the more concentration on corporate governance the BODs show, the better firm performance and positive dividend payout policy.

Independent Female Directors

Independent directors are those who are viewed as shareholders' representors in controlling and monitoring the company with a high degree of objectivity, leading to significant operational efficiencies and marked reduction in agency problem by their impartial decisions. Shukeri *et al.* (2012) have done their research on 300 listed firms in Malaysia proving that the board independence brings negative effect to firm performance because of their foreign origin with different business customs and culture background. Fich and Shivdasani (2006) demonstrated the weakening of the market-to-book ratios and the reducing of the corporate governance effect in the case of enterprises that having more

than two outside directors in comparison to enterprises having less than that by their weak connection with those companies. Elloumi and Gueyie (2001) argued that the financial pressure or even the probability of bankruptcy of a company in the economic crisis or the deterioration of business environment can be reduced and controlled over time by the higher rate of independent directors in the BODs. In this paper, the positive influence of the independent female directors on firm performance and dividend payout policy is assumed to be true in the context of Vietnam.

Over-Retirement Age Female Directors

Another component also relates to the BODs that I want to mention is the director's age. More specifically, I focus on the elders those are at retirement age already but are still members in the BODs. Waelchli and Zeller (2013) with the study of the chairmen of unlisted Swiss firms negated the management capacity of this age group, from the onset of the 50s. The reason is the cognitive ability and motivation of this group begin to decline at this age level. In another study about CEO mandatory retirement policies of Cline and Yore (2016), it is also consistent with the above point of view that the CEO age has a negative impact on firm value and performance in companies without mandatory retirement policies by the same reason. The number of female directors who are over the age of retirement in Vietnam is quite high. Negative relationships were found in many literatures before. Therefore, in this paper, I want to verify the hypothesis that higher number of over-retirement age female directors will lead to worse firm performance and dividend policy.

2. Research Objectives

To sum up, this study is designed to inspect whether the ratio of women in BODs has positive influence on firm performance and dividend payouts, then conduct similarly with two more features of this object such as ownership, independence and negative effect of the over-age female directors by providing new evidence from Vietnam. I use the performance measures in turn for listed firms from various sectors on two largest stock markets of Vietnam in the period from 2010 to 2015.

The remains of this paper will be proceeded as follows. In the next section, the data and methodology will be described in detail. In section 3, the main regression results will be analyzed, interpreted and discussed exhaustively through the regression model. Conclusions, further discussions and the suggestion for possible future research will be outlined at the end of the paper.

3. Data and Methodology

The financial data set was collected from 647 non-financial firms that were listed in both Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX), Vietnam for the period from 2010 to 2015. This is equivalent to about 3882 observations after eliminating missing data. Our sample excludes financial companies, insurance firms, banks and funds due to many difficulties in collecting and analyzing data by significant differences in the accounting system, capital structure and mode of operation. Besides, the data is also gathered and cross-checked from online portal for finance and securities as Vietstock website, Cophieu 68 website to assure the correctness of the collected data.

Table 1 and 2 show descriptive statistics for firm and board characteristics of listed firms.

Table 1 Descriptive statistics for firm characteristics

Variable (Firm level)	Obs	Mean	Std. Dev.	Min	Max
Firm age	3,765	15.838	10.320	1	61
Assets (billion VND)	3,765	1,623.825	5,206.210	7.000	145,494.7
Firm size (billion VND)	3,765	6.156	1.473	1.945	11.887
ROA	3,765	0.059	0.080	-0.645	0.783
ROE	3,765	0.109	0.255	-7.836	0.982
TOBINQ	3,611	0.446	0.487	0	7.308
Dividend payouts (%)	3,713	0.812	7.750	0	409.045

From two biggest stock exchange markets HOSE and HNX in Vietnam, I filtered 647 firms that are all non-financial companies with 3,765 firm level observations from 2010 to 2015 after subtracting missing data. There are 7 characteristics at company level, including firm-age, Firm size, and financial ratios group. The age of the enterprise was calculated by year since the company was fully formed and came into operation. By 2015, the longest-running period of the businesses was 61 years. Firm size was calculated by taking the natural logarithm of the firm total assets. The average value of total assets of these companies is around 1,623.8 billion VND. The biggest firm size is nearly 12 billion VND. The financial ratios that represent the company performance in the study include ROA, ROE, Tobin's Q, and Dividend payouts.

In particular, ROA is Return on Assets, calculated as the ratio between Net Income and total assets of firms, with mean is 5.9% and maximum value is 78.3%. Similarly, ROE is measured by the ratio between Net Income and Equity. The minimum values of both ROA and ROE are negative because of the negative Net Income from some observations. The market-based measurement-Tobin's Q is another story. It was computed by dividing the market value of a company by its assets. Enterprises with high Q values often attract investors and take competitive advantage. Dividend payout policy is the ratio between dividends and Net Income. This policy depends largely on the decision of the business leader on the short-term and long-term strategy for the development of the company. These indexes were collected from the financial statements of listed companies on two Vietnamese stock exchange markets.

Table 2 Descriptive statistics for board characteristics

Variable (Board level)	Obs	Mean	Std. Dev.	Min	Max
Board size	3,501	5.454	1.090	3	11
Female directors ratio	3,501	0.136	0.158	0	0.75
Share-ownership female directors ratio	3,501	0.095	0.138	0	0.75
Independent female directors ratio	3,459	0.137	0.203	0	1
Over-retirement age female directors	3,481	0.080	0.283	0	2
Independent directors	3,501	3.286	1.334	0	10

This study includes the data of the board characteristics such as board size and female membership in BODs. The BODs of Vietnamese listed companies have 6 members on average and the highest number is 11. The highest percentage of women in the board is 75%, however, 0% is the most common rate. This percentage is the dividend between the number of female directors and the number of total BODs members. The ratio of female directors who own company shares to the total number of directors in BODs accounts for a low average ratio of 9.5%. The ratio of independent female directors was calculated by dividing the total number of independent female directors by the total number of independent directors in BODs. The last independent variable considered is the number of female directors who are over 55 years old. In addition, the average number of independent directors in companies is 3, acting as a control variable in the research model.

Correlation

In order to proceed to the next step of regression analysis, the Pairwise correlation test and the variance inflation factors (VIF) were implemented to clarify the correlation among independent variables and check for multicollinearity (Table 3). All of correlation coefficients between every single pair of independent variables are not higher than 0.8 and the VIFs are all also under 4.0 (much smaller than 10). Hence, multicollinearity will not be a problem or not considered to be serious in this study. (Kumari, 2012).

Table 3 Correlation matrix

	1	2	3	4	5	6	7	8	9	VIF
Female directors ratio	1.000									3.59
Share-ownership female directors ratio	0.6479	1.000								1.81
Independent female directors ratio	0.7785	0.4734	1.000							2.59
Over-retirement age female directors	0.3240	0.2519	0.2513	1.000						1.16
Board size	0.0408	-0.0420	0.0315	0.1067	1.000					1.67
Firm age	0.0191	-0.0314	0.0197	0.0601	0.0906	1.000				1.05
Firm size	-0.0094	-0.0436	0.0002	0.0068	0.2867	0.0839	1.000			1.10
Independent directors	0.0151	-0.0708	0.0453	0.0612	0.6012	-0.0021	0.2249	1.000		1.62
Average age of BODs	-0.0564	-0.0302	-0.0476	0.1348	0.0364	0.1787	-0.0070	0.0138	1.000	1.07

Heteroscedasticity & Autocorrelation

Heteroscedasticity and autocorrelation is the cause of biased standard errors of the estimates. Accordingly, normal hypotheses and confidence interval based on t-distribution and F-distribution will no longer be reliable (Bun and Carree, 2006). In this study, I performed Breusch-Pagan / Cook-Weisberg test for heteroscedasticity and Breusch-Godfrey test for testing autocorrelation. In the table 4, the result indicates the existence of Heteroscedasticity (P_value < 0.05) and autocorrelation (P-values equal to 0 for the equation of ROA, ROE and Tobin's Q with chi-squares are 85.093, 54.556 and 63.674 respectively at lag 12 in the residuals). Hence, in order to solve these problem, the variance-covariance matrix (robust) was used for dealing with suspected heteroscedasticity or within panel autocorrelation in the idiosyncratic error term.

Regression model selecting

Choosing the proper model for research is critical and essential to avoid the bias from the regression results, ensure the consistency and achieve reliable results for the study. Fixed effects model (FEM) and random effects model (REM) methods were initially supposed to be suitable for taking into consideration because they are known and widely used for panel data. While FEM assumes that the particular characteristics of the unnoticed factors correlate with independent variables, REM supposes the opposite that distinctive characteristics of unseen effects are random (Bell and Jones, 2015). In order to ascertain which model is the best for this study, I carried out the Hausman test. The result of table 4 shows the P-value (Prob>chi2) of Hausman test for the first three equations of ROA, ROE and Tobin's Q equal to 0. It means the FEM is better to run the regression of ROA, ROE and Tobin's Q than REM. However, the P-value of the equation of Dividend payout policy is 0.78 (>0.05). It can be interpreted that there is no statistically significant difference between FEM and REM, then REM is

better selection to run regression by its efficient (Ho, 2015). In conclusion, FEM is selected to run the regression of ROA, ROE and Tobin's Q and REM is chosen for dividend payout policy.

Table 4 Methodology tests

		Equation **ROA**	Equation **ROE**	Equation **TOBINQ**	Equation **DIPAYOUT**
Breusch-Pagan / Cook-Weisberg test	Chi-square	237.15	68.22	1375.57	82.26
	Prob > Chi-squared	0.0000	0.0000	0.0000	0.0000
Breusch-Godfrey test	Chi-square	85.093	54.556	63.674	3.837
	Prob > Chi-squared	0.0000	0.0000	0.0000	0.9862
Hausman test	Chi-square	130.29	111.91	75.50	5.55
	Prob>Chi-squared	0.0000	0.0000	0.0000	0.7838

Multivariate regression models

I implemented this empirical evidence by using three variable sections including independent variables: the ratio of female directors (Feratio), the ratio of share-ownership female directors (Feownratio), the ratio of independent female directors (Fe_inde_ratio), and the number of over-retirement age female directors (Overage_fe); dependent variables: ROA, ROE, Tobin's Q and dividend payout policy; and control variables: board size (Bsize), firm age (Firm_Age), firm size (Firmsize), the number of independent directors (All_inde) and the average age of BODs (Average_age_dir). Multivariate regression models are set below:

$$Perform_i = \alpha + \beta * Feratio_i + \gamma * Feownratio_i + \lambda * Fe\_inde\_ratio_i + \varphi * Overage\_fe_i + \mu * Bsize_i + \pi * Firm\_Age_i + \Omega * Firmsize_i + \omega * All\_inde_i + \partial * Average\_age\_dir_i + \varepsilon_i$$

Therein, $perform_i$ is a bunch of four performance measures which are ROA, ROE, Tobin's Q and dividend payout policy respectively. For each of them, four alternative models are evaluated.

4. Results and Discussion

Fixed effects model was run for ROA, ROE and Tobin's Q regression, while random effects model was chosen for Dividend payouts regression. The results are displayed at table 5. According to below regression result table, there are positive relationships between the ratio of women in the BODs and ROA ($\beta = .05$, $p < .01$) as well as Tobin's Q ($\beta = .56$, $p < .01$). In particular, Tobin's Q is strongly influenced by an average increase of 5.6% over the 10% increase in the ratio of female directors while this number is only 0.5% towards ROA. Therefore, the hypotheses predicting that the proportion of women in BODs has a positive effect on ROA and Tobin's Q are supported. This result is consistent with previous studies from other countries as Krishnan and Park (2005); Sarkar and Selarka (2015) and Liu *et al.* (2014). However, this study contradicts the results of Adam and Ferreira (2009) showing that having women on a board of directors decreases firm and shareholder value. These conflicting results may be explained by the fact that in a country with certain barriers towards women such as Vietnam, female directors are being and have to experienced, skillful, or knowledgeable enough to stand in such positions. However, there is no significant relationship between this independent variable and ROE or Dividend payout policy. Therefore, the hypotheses of positive ROE and dividend payouts based on the effect of higher ratio of women on board are rejected.

The ratio of female directors owning shares has no significant influence on firm performance in any of the measurement methods. All the coefficients are not statistically significant. All hypotheses that demonstrate the positive relationship of the ratio of female directors who own shares to firm

performance and the dividend payout policy are rejected. This is different from previous studies by Vo and Nguyen (2014) or Le and Thi (2016) about the significant positive impact of the BODs ownership on ROA, ROE and Z-score. They emphasized that the more shares directors hold, the higher interest they offer for shareholders along with agency-problem reducing. In this study, my data set involves share-ownership director dummy variable only and has no concern with the exact percentage of share-ownership. This might deflate the significant difference between directors who own more shares and fewer shares.

Contrary to my prediction, the proportion of independent female directors on board has a negative relationship with ROA (β = -.04, p < .01) and Tobin's Q (β = -.33, p < .01). Meanwhile, the relationships with ROE and dividend payouts are not statistically significant. From these results, the hypotheses about the positive impact of independent female directors' ratio on firm performance and dividend payouts are rejected. In contrast to the positive effect of the independent directors on both sexes, similar to the disclosure of Adam and Ferreira (2009), independent female directors in Vietnam do not produce the desired effect, even in a negative way. It can be explained by the non-executive status of independent directors, who may not be aware of the company's situation in an active way. In other words, this may be because many independent female directors are appointed rigidly and blindly in the application of gender-quotas, or they are merely representatives for state-owned or bank-related organizations to increase the control and transparency in these companies in a rigid manner.

The number of over-retirement age female directors has a positive and significant impact on ROA (β = .03, p < .01), ROE (β = .04, p < .01), Tobin's Q (β = .23, p < .01), and dividend payouts (β = -.17, p < .1). This can be explained that the more over-retirement age female directors in BODs, the higher ROA, ROE and Tobin's Q ratios. Therefore, the hypotheses about the assumption of the negative relationship with firm performance and dividend payouts are rejected. Waelchli and Zeller (2013) are two of the researchers who also support this conclusion. There might be the opposite finding because many overaged female directors in Vietnam come from the family-owned company before being equitized and listed on the Stock Exchange market. These high-experienced female directors by themselves are keen and powerful. Obviously, after going through the most difficult periods and different stages of the country, they have stood firm and run the business smoothly until today.

In term of dividend payout policy, it is commonly known as a strategic factor for the future rather than merely reflecting the results of the past as financial indicators. Unlike the studies of Chen *et al.* (2017), the results do not display any impact or insignificant impact between womanly independent variables and dividend payouts. There were some companies despite their high profits, they paid an extremely low, even zero dividend. Payments for dividend depend on long-term business plan or strategy and are decided by the entire corporation rather than by any individual in the board based on their gender or any other characteristics of the BODs.

Table 5 Fixed effects and Random effects regression of female director characteristic influence on firm performance and dividend payouts

	ROA	**ROE**	**TOBINQ**	**DIPAYOUT**
Female director ratio	0.0501***	0.00204	0.562***	0.0538
	(0.00957)	(0.0546)	(0.0586)	(0.409)
Share-ownership female director ratio	0.00958	0.0473	-0.00295	0.612
	(0.0111)	(0.0337)	(0.0370)	(0.514)
Independent female director ratio	-0.0442***	-0.0388	-0.338***	-0.294
	(0.00645)	(0.0204)	(0.0233)	(0.428)
Over-retirement age female directors	0.0307***	0.0422***	0.230***	-0.175*
	(0.00312)	(0.00788)	(0.0391)	(0.100)
Board size	0.000453	0.00447	0.000527	0.0432
	(0.00165)	(0.00421)	(0.00559)	(0.115)

	ROA	ROE	TOBINQ	DIPAYOUT
Firm age	0.000481**	0.000696*	0.00322***	-0.00114
	(0.000156)	(0.000309)	(0.000791)	(0.00508)
Firm size	-0.00347***	0.00413*	-0.0323***	0.0386
	(0.000844)	(0.00170)	(0.00391)	(0.0753)
Independent directors	0.00472***	-0.000543	0.0723***	-0.126**
	(0.000741)	(0.00148)	(0.00278)	(0.0533)
Average age of BODs	0.00154***	0.00212***	0.00341**	0.0106
	(0.000134)	(0.000202)	(0.00120)	(0.0143)
Constant	0.0491	-0.140***	0.848***	-0.649
	(0.0261)	(0.0237)	(0.130)	(1.721)
R^2	0.047	0.016	0.086	
Observations	3335	3335	3187	3333

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Additional Test

In order to further confirm the robustness of the main regression results, I carried out two more additional alternative methods. They are Pooled OLS model and the outlier robustness - by trimming off the 1% top and bottom of the firm size distribution and rerun the regressions. By this technique, the two data points which are extremely high or low values will be removed. Hence, it helps ignoring the effect of these outliers in the model to obtain the more efficient estimates of the regression parameters and draw inferences about them. Table 6 and table 7 display the results by running Pooled ordinary least squares and outlier robustness.

Table 6 Pooled OLS regression of female director characteristic influence on firm performance and dividend payouts

	ROA	ROE	TOBINQ	DIPAYOUT
Female director ratio	0.0501***	0.00204	0.562***	0.0466
	(0.0166)	(0.0518)	(0.111)	(0.433)
Share-ownership female director ratio	0.00958	0.0473	-0.00295	0.601
	(0.0134)	(0.0397)	(0.0802)	(0.509)
Independent female director ratio	-0.0442***	-0.0388	-0.338***	-0.290
	(0.0100)	(0.0252)	(0.0664)	(0.344)
Over-retirement age female directors	0.0307***	0.0422***	0.230***	-0.176
	(0.00538)	(0.00941)	(0.0539)	(0.142)
Board size	0.000453	0.00447	0.000527	0.0454
	(0.00183)	(0.00381)	(0.0106)	(0.110)
Firm age	0.000481***	0.000696*	0.00322***	-0.00156
	(0.000138)	(0.000410)	(0.000959)	(0.00419)
Firm size	-0.00347***	0.00413*	-0.0323***	0.0366
	(0.00101)	(0.00248)	(0.00765)	(0.0624)
Independent directors	0.00472***	-0.000543	0.0723***	-0.128**
	(0.00141)	(0.00275)	(0.00787)	(0.0630)
Average age of BODs	0.00154***	0.00212***	0.00341*	0.0104
	(0.000281)	(0.000582)	(0.00175)	(0.0153)
y2010	0.0295***	0.0777***	0.0916***	-0.185
	(0.00449)	(0.00826)	(0.0317)	(0.184)
y2011	0.0107**	0.0328***	-0.187***	0.0167
	(0.00480)	(0.00867)	(0.0282)	(0.224)
y2012	-0.00830*	-0.0188*	-0.166***	0.00923
	(0.00492)	(0.00995)	(0.0287)	(0.250)
y2013	-0.0114**	-0.0266**	-0.0994***	-0.117

	ROA	ROE	TOBINQ	DIPAYOUT
	(0.00463)	(0.0120)	(0.0307)	(0.196)
y2014	-0.00546	-0.00649	-0.0193	-0.0234
	(0.00433)	(0.0113)	(0.0311)	(0.279)
Constant	0.0471	-0.148**	0.912***	-0.531
	(0.0289)	(0.0645)	(0.213)	(1.382)
R^2	0.069	0.047	0.123	0.003
Observations	3335	3335	3187	3333

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

Table 7 Outlier robustness

	ROA	ROE	TOBINQ	DIPAYOUT
Female director ratio	0.0517***	0.00127	0.509***	0.0623
	(0.00950)	(0.0545)	(0.0721)	(0.421)
Share-ownership female director ratio	0.0124	0.0460	0.0178	0.631
	(0.00998)	(0.0341)	(0.0109)	(0.532)
Independent female director ratio	-0.0451***	-0.0377	-0.315***	-0.290
	(0.00677)	(0.0206)	(0.0400)	(0.436)
Over-retirement age female directors	0.0283***	0.0409***	0.182***	-0.190*
	(0.00362)	(0.00835)	(0.0255)	(0.104)
Board size	0.00109	0.00471	0.00762	0.0463
	(0.00171)	(0.00406)	(0.00787)	(0.117)
Firm age	0.000534**	0.000783*	0.00344***	-0.00153
	(0.000168)	(0.000337)	(0.000730)	(0.00540)
Firm size	-0.00453***	0.00228	-0.0473***	0.0484
	(0.000780)	(0.00216)	(0.00530)	(0.0844)
Independent directors	0.00465***	-0.000696	0.0717***	-0.127**
	(0.000811)	(0.00147)	(0.00301)	(0.0533)
Average age of BODs	0.00156***	0.00211***	0.00322**	0.0110
	(0.000146)	(0.000188)	(0.00119)	(0.0147)
Constant	0.0722**	-0.0917*	1.220***	-0.937
	(0.0235)	(0.0395)	(0.126)	(1.976)
R^2	0.049	0.015	0.088	
Observations	3273	3273	3127	3271

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

The regression results after performing two alternative analyzes show a strong consistency with the main results. Although there is some of little differences in the coefficients of correlations and significances, they are in the unimportant and insignificant level. This confirms that the research results are reliable.

5. Conclusion

The efficiency of business operations in general and the efficiency of BODs in particular are the results from a wide range of factors, sometimes from unexpected factors. This study is a typical case by focusing on female directors in Viet Nam. The result of this study shows that having women in board of directors, especially the group of over-age female directors is good to firm performance represented by ROA, ROE and Tobin's Q. Moreover, in contrast to the positive effect on firm performance of the independent directors in both sexes, independent female directors in Vietnam do not produce the desired effect, even in a negative way. This research was finalized on the desire to contribute to the diversity of corporate governance issues, particularly the board of directors regards to female factors in

both literature and experiment as well as can be seen as a scientific basis to assist Vietnamese enterprises in building and forming the most proper board of directors for themselves.

However, this study remains some limitations that endogeneity issue has not been taken into account. Besides, the degree or intensity of the director's share ownership has not been fully exploited and analyzed. Hence, the endogeneity issue should be addressed and dealt with by future studies in order to propose more incisive conclusions with higher reliability. In addition, the share ownership level of board members should be investigated to clarify whether it has any impact on the performance of the business.

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