
Women on boards and corporate governance: evidence from listed companies in Thailand

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Abstract: Despite high female participation in the Thai labour market, female representation on Thai boards of directors is low. This study investigates the effect of female representation on boards of directors on the level of corporate governance in Thailand. The ordered logit regression is applied to a dataset of companies listed on the Stock Exchange of Thailand (SET). The main results show that an improvement in corporate governance is associated with a higher ratio of women appointed as board directors. Furthermore, female leadership in the form of chairpersons on executive and audit committees, two important subcommittees, strongly and positively affects corporate governance levels. Finally, the presence of women on a board has a similar effect on corporate governance as that of the presence of independent directors does. The findings offer an insightful introduction to policy makers for promoting female leadership roles on boards to enhance corporate governance.

Keywords: corporate governance; women; female leadership; gender diversity; gender equality; boards of directors; listed companies; Stock Exchange of Thailand; SET; Thailand.

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1 Introduction

Female representation on boards of directors has been growing significantly in both European countries (McKinsey & Company, 2013) and the USA (Catalyst Group, 2011) although the ratios are still low: 16.6% in the European Union and 16.9% in the USA. Furthermore, because of the institutional and cultural context of male-dominated societies, women are still under-represented on boards in Asian countries (Qian, 2016),

with ratios of 11.6% in Indonesia, 8.6% in Malaysia, and 5% in India (Dieleman et al., 2014).

Several studies have explored the effect of gender diversity on corporate performance; however only a small number have addressed its effect on corporate governance (Adam and Ferreira, 2009). Furthermore, most existing studies only provided empirical evidence on developed countries such as Australia (Capezio and Mavisakalyan, 2016; Kang et al., 2007). No studies of developing countries could be found, most likely because of the limited data accessibility and availability in these countries.

This study investigates the effect of female board representation on the level of corporate governance. Thailand is chosen for the study as it has one of the highest female labour force participation rates in the world (Phananiramai, 1995). The rate is approximately 65%, in contrast to 25%–50% in other Southeast Asian countries such as Malaysia and the Philippines (ILO, 2008). However, the basic summary statistics from the data of companies listed on the Stock Exchange of Thailand (SET) in 2015 (Table 2) show that the ratio of Thai women's representation on boards is only approximately 17%.

Even though the number is still above the average of 7.5% in Asian countries (Qian, 2016), the low board representation is still quite surprising considering the much improved status of Thai women because of their high level of education. This is evidenced by high female participation in the labour market and leading roles in many public and private organisations. However, it seems that Thai women have not been able to progress to higher positions on boards of directors; instead, they have remained at management level.

Based on a survey by Grant Thornton International (2017), the ratio of women working at a senior level in Thailand ranked third in the Asia Pacific region with 31%, right after Indonesia (46%) and the Philippines (40%). The International Labour Organization (ILO, 2015) concluded that even though there have been improvements in education as well as women's roles in the labour market, they are still 'under-represented in decision-making'. Ramly et al. (2017) state that this might be because of gender discrimination as women are considered poorer leaders than men, leading to few women being present on boards of directors in most Southeast Asian countries.

However, the issue of increasing female representation on boards of directors has been ignored despite several recent legislative actions on corporate board diversity and the increasing attention paid to this with an aim to enhance corporate governance in many countries. Some examples are the minimum representation of 40% for women on boards in Norway and 30% in listed companies in Malaysia, a neighbouring country, as mentioned in the Malaysian Corporate Governance Blueprint (2011). This does not bode well for Thailand as, currently, gender diversity in boards is considered the best policy for improving a firm's corporate governance (Carter et al., 2003), with many countries around the world looking to implement policies to that effect.

So far, there have only been two studies – Singhathep and Pholpirul (2015) and Sae-ngow (2016) – that investigated the issue of gender diversity in boards of directors in Thailand. However, both studies focus on the effect on firm performance. Singhathep and Pholpirul's (2015) study showed a negative effect of female chief executive officers (CEOs) on both short-term and long-term corporate performance, while Sae-ngow (2016) showed no link between the proportion of female executives on boards and the return on equity. Neither of these studies examined the effect of gender diversity on corporate governance, which is the main contribution of this study.

Indeed, the main objective of this study is to investigate the effect of gender diversity in boards of directors on the level of corporate governance in Thailand. We use the corporate governance rating system of the Thai Institute of Directors Association (IOD), Thailand, which is endorsed by the National Corporate Governance Committee as a tool to incorporate good corporate governance practices for Thai listed companies. By applying an ordered logit regression to a dataset of companies listed on SET, the study examines whether the presence of women on boards, the proportion of their presence, their position on sub-committees, and other significant factors related to company performance and characteristics, affects corporate governance in Thailand.

This study therefore not only provides the first empirical evidence investigating this issue in Thailand but could also serve as a case study presenting the issue of gender diversity in corporate governance in one of the world's developing countries. The findings in this study could be generalised to apply to other developing countries that have similar characteristics (i.e., that face the same problems regarding gender discrimination). Furthermore, one of the important aspects of this work lies in analysing whether appointing women to leadership positions in important sub-committees (e.g., chairing audit and executive committees) could improve corporate governance.

Finally, our main findings will contribute to the body of evidence presenting the gender equality situation in Thailand, which reflects the level of acceptance as well as the perception of female leadership roles in Thai society. This study will remind policy makers in Thailand to reconsider the situation of gender equality in the country. While it considers policies relating to gender diversity in the context of corporate governance (e.g., implementing a gender quota on boards as a tool to promote good corporate governance for publicly listed companies in the country), it is also our hope that this study will lead to the development of other policies aimed at the improvement of gender equality in the country more generally.

The remainder of the paper is structured as follows. The second section presents a review of the related literature. The data and methodology used in the analysis are included in the third and fourth sections. The fifth section discusses the results, and the final section provides conclusions.

2 Literature review

Gender diversity in corporate boardrooms has developed into a significant agenda for improving corporate governance around the world (Ramly et al., 2017). Terjesen et al. (2015) provided a comprehensive review of the effect of gender diversity in corporate boards on corporate governance, including both theory and empirical studies, and concluded that gender diversity contributes to better corporate governance. The recent survey by Velte (2017) reviewed around 200 empirical studies related to this issue and concluded that having women on boards would enhance the quality of corporate governance.

Several theories support the idea that the presence of women on boards improves corporate governance by linking various aspects. A theoretical framework based on agency theory is most commonly used to understand the link between board characteristics and corporate governance. Agency theory is basically concerned with the conflict of interest between agents (directors) and principals (owners). Jensen and Meckling (1976) indicate that the relationship between the principal and agent is

established through the process of delegation of the decision-making authority by the principal to the agent. Female representation on boards could prevent any individual or group from dominating the decision-making process of the board and provide effective management monitoring through several mechanisms.

Adams and Ferreira (2009) conducted a pioneering empirical study, which emphasised the effect of board gender diversity on corporate governance by focusing on governance characteristics. Their main results showed that female directors have fewer attendance problems and are more active in monitoring than male directors. In addition, female members on board sub-committees, particularly audit and governance committees, make a positive difference in corporate governance. Finally, female directors on boards have a similar effect on the firm to independent directors. These results have been confirmed by several later studies.

Carter et al. (2003) found that female directors have higher independence levels compared with male directors. Langevoort (2011) argued that women have more 'other-orientation' than 'self-orientation', which could benefit firms. Thiruvadi and Huang (2011), Upadhyay and Zeng (2014), and Terjesen et al. (2015) also indicated that the presence of women on boards could improve corporate governance through better monitoring, more transparency, and a better public image. Van Uytbergen and Schoubben (2015) indicated that the presence of women on boards definitely affects corporate decision-making as well as corporate governance. Byoun et al. (2016) concluded that gender diversity in boards is a significant factor contributing to good corporate governance. Furthermore, Capezio and Mavisakalyan (2015) found that an increase in the ratio of women on boards could decrease the probability of fraud in listed companies in Australia.

A second, and related, theory used is the resource dependence theory, which explains how external resources affect firm performance (Pfeffer, 1978). Board diversity is one of the main managing tools to help firms access resources that are important to their success as well as to improve their problem-solving capacity (Johnson et al., 1996). For example, boards gain new ideas from outsider representation on boards (Bathula, 2008) and their connection with useful external resources (Hillman et al., 2000).

Burke (1993, 1994) listed the distinct benefits of inducting women into boardrooms. First, female board members tend to have a higher education level than male members, thus, bringing more women into the boardroom may acquire new and crucial assets. In addition, female members tend to have diverse educational backgrounds and this could contribute to the variety of work experience and diversity of perspective in the boardroom. Thus, female representation on boards could bring new abilities, skills, and perspectives (Jamali et al., 2007); different human capital (Carter et al., 2003); more diverse social networks (Ibarra, 1993); and more understanding of consumers and markets (Arfken et al., 2004) thereby improving information and resulting in better corporate governance.

The third theory is the stakeholder agency theory. Hill and Jones (1992, p.151) describe it as "a modification of agency theory to accommodate theories of power including resource dependence theories of organizations." Velte (2017) used the stakeholder agency theory to state that placing women on the board of directors (WOBD) is a key corporate governance measure to reduce information asymmetries and conflicts of interest between boards and stakeholders. In fact, it could be a feasible and effective management strategy to decrease stakeholder agency costs and fulfil corporate social

responsibility (CSR), thereby improving both the financial and CSR performance of firms.

The ILO (2015) states that having women on boards could enhance corporate governance as women tend to give priority to non-financial performance indicators as well as CSR. In addition, Williams (2003) found that a higher number of WOBD led to greater charitable activity. Finally, Velte (2017, p.306) concluded that “WOBD allow a more open government process that ensures the incorporation of the key stakeholder interests (Hillman et al., 2002) in the principal-agent context.”

Besides the theories relating to the presence of WOBD discussed previously, we discuss the critical mass theory. This theory not only mentions the presence of WOBD, but also specifies the number of women needed to influence corporate governance. Dahlerup (2006, pp.275–276) pointed out that 30% could be a relevant starting point and emphasised that this number ensures that ‘a large minority can make a difference, even if still a minority’. Campbell and Mínguez-Vera (2008) confirmed that gender composition can be a significant internal control mechanism within a board of directors; while Kans and Stengard (2012) mentioned that a ratio of WOBD of at least 30% could affect corporate governance.

Zaichkowsky (2014) documents the positive relationship between the number of WOBD and corporate governance scores (CGS) of the top publicly traded companies across different industrial sectors in the Toronto Stock Exchange (TSX), Canada. Her results not only support the theory of ‘critical mass’ – indicating that having at least three or more WOBD will have a positive impact on corporate governance – but also confirms that even having only one woman on the board still leads to higher CGS compared with companies with none. This supports Konrad et al.’s (2008) argument that “even one woman can make a positive contribution” (p.160). My study is similar to Zaichkowsky’s (2014) in that it aims to test whether the number of WOBD has an effect on the level of corporate governance. However, because of limited data availability in Thailand, this study could not go further to analyse the effect of appointing women on boards on CSR as well as CEO compensation.

In light of these theoretical arguments and empirical evidence, we propose to test the following hypotheses:

- H1 The presence of WOBD improves the overall level of corporate governance.
- H2 A higher proportion of WOBD has a positive and significant association with the overall level of corporate governance.
- H3 Female directors on boards have the same effect on corporate governance as independent directors do.

3 Data

The sample set consists of all firms publicly listed on the SET, which have been rated on their level of corporate governance by the IOD in the year 2015 (IOD, 2016). The total number of observations comprises 346 firms, classified into seven main sectors:

- 1 agriculture and food industry
- 2 consumer products
- 3 industrials
- 4 property and construction
- 5 resources
- 6 services
- 7 technology.

The firms in the financial sector are excluded from the sample because they have a different management structure from firms in other sectors.

Firm information is collected from the Annual Registration Statement (Form 56-1) and the companies' 2015 annual report available on SET Market Analysis and Reporting Tool (SETSMART, <http://www.setsmart.com>), the official online database of the SET. In this study, we have excluded companies for which trading was suspended by the SET during 2015, for example, because of an amalgamation process

In Thailand, the board of directors is the supervisory board of a company. The SET (2018a) defines it as follows: "The listed company's board of directors is representing the shareholders. They are responsible for making decisions on the company's important policies and strategies." The general composition of boards of directors in the publicly listed companies in the SET comprise nine positions as follows:

- 1 chairperson of the board of directors
- 2 chairperson of the executive committee
- 3 vice-chairperson of the board of directors
- 4 director
- 5 independent director
- 6 chairperson of the audit committee
- 7 audit committee member
- 8 managing director
- 9 president.

These nine positions have different roles. For example, the main role of the audit committee is to review the credibility of the financial statements of the company. The details of the responsibility of each position can be found in the listing rules of the SET (SET, 2018b).

Kanter (1977) noted that not only should gender diversity be measured by the presence of female representation on boards of directors, but the ratio of WOBD should also be considered in the analysis. Thus, gender diversity will be evaluated as a measure of the following two variables:

- 1 *Dummy variable*: This variable will capture whether a firm has a female presence on its board. If it does, the dummy variable will be equal to one, but will be zero otherwise. The presence of WOBD could fall into one of the following categories:
- a at least one woman on the board
 - b the board comprises at least 30% women
 - c the overall chairperson of the board is a woman
 - d the managing director is a woman
 - e the president is a woman.

Furthermore, in addition to women being represented on the board of directors, the presence of women appointed to sub-committees has been counted as well. The dummy variable will be equal to one if the chairperson of the executive or audit committee of a firm is a woman but will be zero otherwise.

- 2 *Ratio variable*: This variable will represent the share of WOBD for each firm. This variable could be measured in terms of the ratio of WOBD as well as the ratio of women in each position on sub-committees of the board, including:
- a the ratio of women as directors on the board
 - b the ratio of women who are independent directors on the board
 - c the ratio of women who are audit committee members.

Note that ‘chairperson of the board’ refers to the overall chairperson of the board of directors, while ‘chairperson of the audit committee’ only refers to the chairperson of the audit committee.

The other control variables used in this estimation capture firm characteristics: paid up capital, net profit margin, company age, returns on assets, debt-to-equity ratio, and number of workers. Furthermore, to capture board characteristics, board size and the ratio of independent directors on boards are included.

The main dependent variable is the level of corporate governance, representing the rating of corporate governance of all publicly listed firms in the SET. The rating system has classified firms into three main categories: ‘good’, ‘very good’, and ‘excellent’. The data are from the 2015 Corporate Governance Report of Thai Listed Companies of the IOD (IOD, 2016). As such, corporate governance is rated on a three-point Likert scale: good (= 1), very good (= 2), and excellent (= 3). Note that even though this dependent variable is a classification variable (with values 1, 2, or 3), it is a rank order scale; therefore, the ordinal response model – which here implies an ordered logit regression – is the most appropriate method for the estimation.

In order to evaluate the level of corporate governance, the IOD (2016) developed assessment criteria based on the Organization for Economic Cooperation and Development’s (OECD, 2004) *Principles of Corporate Governance*; the assessment is therefore considered to meet internationally-accepted standards of measure. The definition of corporate governance follows the OECD’s definition (p.11): “Corporate governance involves a set of relationships between a company’s management, its board, its shareholders, and other stakeholders. Corporate governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined.”

The criteria used in the *Principles of Good Corporate Governance* for listed companies by the SET include five main categories:

- 1 rights of shareholders
- 2 equitable treatment of shareholders
- 3 roles of stakeholders
- 4 disclosure and transparency
- 5 board responsibilities.

Thus, a good rating for corporate governance implies that the company meets the principles of good corporate governance in all five categories.

For example, if the company meets the principles of good corporate governance in criterion 1 (rights of shareholders), this means that there is adequate ‘protection of shareholders’ rights and facilitation for shareholders to exercise their rights effectively’ [IOD, 2016, p.6]; if criterion 2 (equitable treatment of shareholders) is met, this means that there is ‘equitable treatment of all shareholders, especially the minority and foreign shareholders’, and the ‘non-controlling shareholders should receive protection from the adverse actions, directly or indirectly, of the controlling shareholders’ [IOD, (2016), p.12].

Table 1 defines the variables used in this estimation. The basic summary of statistics in Table 2 show that the board size is, on average, 15 members, composed of around 12.5 men and 2.5 women. The mean of the dummy variable previously discussed is presented in Table 3, which is the percentage of firms that have a female presence on their boards. Approximately 81% of companies have at least 1 woman on the board, but only 15% have at least 30% female representation. Moreover, only 7% have women appointed as chairpersons on boards; while 6% and 3% have women as managing director and president, respectively. These figures clearly show the underrepresentation of women on boards as well as in leadership positions of firms.

Table 1 The definition of variables

<i>Variables</i>	<i>Definition</i>
Firm	Number of firms ($n = 346$)
Corporate governance	Level of corporate governance (good = 1, very good = 2, excellent = 3)
Paid up capital	Paid up capital
Age	Age of firms (from year of establishment)
Workers	Number of workers in firm
Net profit margin	Net profit margin
Return on assets	Return on assets
Debt to equity ratio	Debt to equity ratio
Board size	Number of board members
Men	Number of male board members
Women	Number of female board members
Ratio of independent director	The proportion of independent director on boards
Gender diversity (dummy)	= 1 if at least 1 woman included in board
Ratio of women on board	The proportion of women on boards

Table 2 The basic summary of statistics

<i>Variables</i>	<i>Unit</i>	<i>N</i>	<i>Mean</i>	<i>sd</i>	<i>Min</i>	<i>Max</i>
Corporate governance	level	346	1.65	0.70	1	3
Paid-up capital	1,000 million Thai baht (THB)	346	2.49	8.75	0.06	133
Age	Year	346	30.4	14.9	2	133
Net profit margin	%	346	2.84	56.6	-993	68.7
Return on assets	%	346	7.62	9.46	-50.3	40.8
Debt to equity ratio	%	346	1.07	1.14	0	11.1
Number of workers	Persons	346	2,521	5,963	11	56,301
Number of male committee	Persons	346	12.50	3.35	3	24
Number of female committee	Persons	346	2.50	2.09	0	11
Board size	Persons	346	15.01	2.87	8	28
<i>The ratio variable</i>						
Ratio of women on boards	%	346	0.17	0.14	0	0.66
Ratio of women as director on boards	%	346	0.22	0.23	0	1.00
Ratio of women as independent director on boards	%	346	0.04	0.05	0	0.25
Ratio of women as audit committee on boards	%	346	0.03	0.04	0	0.22

Source: Author's calculation

Table 3 The percentage of firms that have a female presence on their boards

<i>Variables</i>	<i>Number of firms</i>	<i>Percentage</i>
Firm has at least 1 woman on boards	346	81.2
Firm has at least 30% women on boards	346	15.9
Firm has woman as chairman on boards	346	7.54
Firm has woman as chairman on executives	346	7.80
Firm has woman as chairman on audit committee	346	14.2
Firm has woman as MD	346	6.36
Firm has woman as president	346	3.76

Source: Author's calculation

4 Methodology

As corporate governance, the main dependent variable is measured on a three-point Likert scale, a simple ordinary least square (OLS) analysis cannot be used in this estimation. OLS treats Likert-scale variables as cardinal, thus we will apply the ordinal response model, which is an ordered logit regression. The model can be presented first as follows:

$$y_i^* = x_i' \beta + u_i$$

where y_i^* is an unobserved continuous variable, x_i is a vector of covariates (gender diversity, paid up capital, net profit margin, company age, company size, return on assets, debt to equity ratio, number of workers, industry sectors, boards size, and the ratio of independent directors), and u_i is an error term.

To obtain y_i^* , this study assumes y_i to be an observed ordinal dependent variable, where $i = 1, \dots, n$; and n is the number of observations.

Then, $y_i \in \{1, \dots, J\}$, where J are different outcomes, and y_i is determined by y_i^* .

$$y_i = j, \text{ if } \kappa_{j-1} \leq y_i^* < \kappa_j$$

where $j = 1, \dots, J$.

Here, $\kappa_1, \dots, \kappa_{j+1}$ are threshold values; where $\kappa_1 = -\infty$ and $\kappa_{j+1} = \infty$.

Then, in the ordered model, the threshold values (κ_j) are assumed as constant and will be estimated with the parameters (β).

By applying maximum likelihood to estimate $j - 1 + k$ parameters where distribution function $F(u)$ is specified, the forms of likelihood contributions are as follows:

$$p_{ij} = p(y_i = j | x_i) = F(\kappa_j - x_i' \beta) - F(\kappa_{j-1} - x_i' \beta).$$

Let $y_{ij} = 1$ if $y_i = j$, otherwise $y_{ij} = 0$.

The log likelihood function for a sample could be expressed as follows:

$$L(\beta, \kappa_2, \dots, \kappa_j; y, x) = \sum_{i=1}^n y_{ij} \ln p(y_i = j | x_i).$$

Thus, the ordered logit model is derived by substituting the cumulative standard logistic distribution into the equation (F), where $F(Z) = \frac{e^z}{(1 + e^z)}$. The ordered logit has j alternatives, and thus a set of coefficients equal to $(j - 1)$ intercepts. To interpret the ordered logit regression results, the sign of coefficients will indicate whether the unobserved continuous variable (y_i^*) increases (or decreases) with the independent variables. However, the magnitude of the coefficient cannot be directly interpreted from the ordered logit regression but could be measured through the average marginal effect models. The marginal effects of an increase (or decrease) in an independent variable on the probability of selecting alternative j is as follows:

$$\frac{\partial p_{ij}}{\partial x_{ir}} = \{ F(\kappa_{j-1} - x_i' \beta) - F(\kappa_j - x_i' \beta) \} \beta_r.$$

where x_{ir} is the r^{th} element of the vector of covariates and β_r is the corresponding parameter. The marginal effect could be indicated as a percentage. In other words, it expresses the percentage increase (or decrease) in the probability of selecting alternative j with each unit increase of the independent variables.

5 Results and discussion

The ordered logit estimate is presented in Table 4 (gender diversity in the form of the dummy variable) and Table 5 (gender diversity in the form of the ratio variable). However, the coefficients from both tables cannot be interpreted as regular OLS coefficients. These logit coefficients only indicate the sign of the relationship between gender diversity variables and the level of corporate governance. In addition, this study is limited in that the level of corporate governance, the major dependent variable, only has three data points (good, very good, and excellent) resulting in very little variation in the data. Thus, given the availability of a finer dependent variable, the results might be different from those in this study.

Table 4 shows that when women have been appointed as chairpersons on executive and audit committees (columns 4 and 5), the effect on corporate governance is positive and significant. These results are consistent with studies that highlight the advantages to corporate governance of having women represented on significant subcommittees. Adams and Ferreira (2009) and Srinidhi et al. (2011) suggest that when women are involved in the audit committee, they improve the level of corporate governance. The main reason is that the task of the audit committee is to monitor the quality and progress of financial reports (Klein, 2002), which can directly affect corporate governance. Rador (2016) even stated that the audit committee is a fundamental element of a firm's corporate governance.

Sultana and Rahman (2016, p.4) concluded that because of the 'risk-averse nature and higher diligence' of female audit committee members compared with male members, female representation will decrease risk and improve the quality of auditing, leading to good corporate governance. Srinidhi et al. (2011) confirmed that when women are appointed as audit committee members, the level of monitoring and ethical decision-making increase because they provide different opinions and tend to be risk-averse and diligent, leading to improvement in accounting quality. Furthermore, the results also support Vahamaa's (2017) study, appointing women to executive positions (i.e., as CEOs and chief financial officers – CFOs) leads to enhanced corporate checks and balances and a better quality of corporate governance. These results are consistent with Thiruvadi and Huang's (2011) study, indicating that the presence of women on audit committees affects management decisions and audit quality.

However, these results do not support our first hypothesis as the presence of WOBD per se does not result in an improvement in the level of corporate governance, contradicting Zaichkowsky's (2014) findings, which indicated that having only one woman on the board can have an effect on corporate governance. Interestingly, Zaichkowsky (2014, p.108) mentioned that 'when there are conflicting findings, Lawrence (1997) states that the issue is one of theory; one of data; or one of analyses'. Furthermore, methodological variance, the lack of standard measurement, as well as the 'differences in cultural values' of each country, or the industry studied, could explain the different results and difficulties in making cross-country comparisons [Zaichkowsky, (2014), p.109]. For example, our study focuses on companies listed on the SET, while Zaichkowsky (2014) focuses companies publicly traded on the TSX. The CGS used in these two studies consists of different factors/criteria, and different techniques are applied to find the relationship. Thus, it is not surprising that these two studies yield different results.

Our findings show that the presence of women will not in and of itself improve the level of corporate governance; they will need to at least be appointed as the head of an important sub-committee as well. These results are supported by the findings of Green and Homroy (2015), which indicate that appointing women on boards will have a greater influence on corporate governance and performance where they are also appointed as a member of a significant committee in the boardroom (usually the audit committee).

Table 4 The ordered logit estimates (gender diversity in the form of dummy variable)

<i>Dependent variable = corporate governance</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Number of workers	0.42*** (0.09)	1.51*** (0.14)	1.51*** (0.14)	1.52*** (0.15)	1.53*** (0.15)	1.50*** (0.14)	1.52*** (0.14)
Ratio of independent director on boards	3.27* (1.74)	29.32* (51.22)	25.51* (44.47)	25.41* (44.23)	36.00** (63.72)	29.10* (50.77)	25.70* (44.83)
Firm has at least one woman on boards	-0.03 (0.28)						
Firm has at least 30% women on boards		0.76 (0.24)					
Firm has woman as chairman on boards			1.09 (0.43)				
Firm has woman as chairman on executives committee				0.38** (0.18)			
Firm has woman as chairman on audit committee					0.36*** (0.13)		
Firm has woman as MD						0.59 (0.28)	
Firm has woman as president							1.94 (1.03)
Observations	346	346	346	346	346	346	346

Notes: Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The regression includes all control variables including: paid up capital, net profit margin, company age, returns on assets, debt to equity ratio, number of workers, board size and the ratio of independent directors on boards.

Table 5 shows that gender diversity in boards of directors, when measured as the ratio of women on the board (presented in column 1), does not have a statistically significant effect on the level of corporate governance. However, when classifying into sub-committee groups, the higher ratio of women as directors on the board (presented in column 2) leads to a higher level of corporate governance as it shows positive statistically significant effects. Thus, the ratio of women as directors on boards has a similar effect on corporate governance as the ratio of independent directors, consistent with the findings of Adams and Ferreira (2009). They also assert that female directors tend to be more independent as well as effective as monitors compared with male directors, especially in management tasks.

Note that the number of workers and the ratio of independent directors having positive and statistically significant effects on corporate governance are common results of both Tables 4 and 5. These results clearly confirm that an increase in the ratio of independent directors and number of workers in firms contributes to better corporate governance. These results do not support our second hypothesis but support the third hypothesis as the ratios of independent directors on the board and of female directors on the board similarly show a positive and statistically significant correlation.

Our results are in line with agency theory, which implies that the existence of gender diversity and independent directors on a board could assist in reducing the principal-agent problem and improve corporate governance. Furthermore, the resource dependency theory also explains that both independent directors and female board representation could provide new perspectives (Pearce and Zahra, 1992) and access to essential resources (Johnson et al., 1996), which lead to better corporate performance.

Table 5 The ordered logit estimates (gender diversity in the form of ratio variable)

<i>Dependent variable</i> <i>= corporate governance</i>	(1)	(2)	(3)	(4)
Number of workers	0.41*** (0.09)	1.51*** (0.14)	1.51*** (0.14)	1.52*** (0.14)
Ratio of independent director on boards	3.39* (1.75)	28.17* (49.52)	22.10* (39.31)	24.14* (42.08)
Net profit margin	-0.002 (0.001)	0.99 (0.001)	0.99 (0.001)	0.99 (0.001)
Debt to equity ratio	-0.12 (0.11)	0.89 (0.09)	0.89 (0.09)	0.89 (0.09)
Return on assets	0.004 (0.01)	1.00 (0.01)	1.00 (0.01)	1.00 (0.01)
Ratio of women on boards	-1.05 (0.81)			
Ratio of women as director on boards		0.27** (0.14)		
Ratio of women as independent director on boards			2.65 (5.74)	
Ratio of women as audit committee on boards				3.72 (8.69)
Observations	346	346	346	346

Notes: Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The regression includes all control variables including: paid up capital, net profit margin, company age, returns on assets, debt to equity ratio, number of workers, board size and the ratio of independent directors on boards.

In order to improve gender diversity or appoint more women on their boards, each firm might need to consider specific factors related to their individual circumstances and make adjustments to accord with aspects of gender diversity. This could be by initiating corporate policies implementing gender equality plans in the internal corporate

mechanisms such as the appointment process, promotions, rewards, and compensation. The ILO (2015) even provided preliminary suggestions for actions that firms can take to promote the increased representation of WOBD, such as getting a commitment on the gender equality agenda from the top leadership as well as analysing obstacles within firms, overcoming them, and taking affirmative action to promote gender diversity.

The estimated results from Table 5 indicate that the ratio of women as directors on boards, the number of workers, and the ratio of independent directors all have a positive effect on corporate governance. To extend these findings, the study proceeds to find the magnitude of this positive direction. The marginal effect is used to determine the change in probability when the independent variable increases by one unit. Table 6 shows the marginal effect after ordered logit regression. The results show that with a one-unit increase in the ratio of female directors on boards, the likelihood of reaching a good corporate governance level is 28% higher; that of reaching a very good governance level is 14% lower; and that of reaching an excellent governance level is 13% lower.

Table 6 The marginal effect of the ordered logit estimates

<i>Corporate governance level (CG)</i>	<i>Marginal effect for 'good' CG</i>	<i>Marginal effect for 'very good' CG</i>	<i>Marginal effect for 'excellent' CG</i>
Ratio of women as directors on the boards	0.28***	-0.14***	-0.13***
Number of Workers	-0.09***	0.04***	0.04***
Ratio of independent director on the boards	-0.71**	0.35**	0.33**

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6 Conclusions

This study investigates gender diversity in boards of directors and its effect on corporate governance in Thailand by applying an ordered logit regression on a dataset of 346 listed companies on the SET in 2015. It is the first empirical study to address the effectiveness of gender diversity in the boardrooms on corporate governance in Thailand. The results are interesting and show that gender diversity in boards has a positive impact on corporate governance, especially when women chair the executive and audit sub-committees. In addition, an improvement in corporate governance level is associated with a higher ratio of women appointed as directors on boards, which is consistent with the prominent study of Adams and Ferreira (2009).

Our main findings lead to practical implications for firms in Thailand that need to diversify their boards of directors in order to improve corporate governance. For example, many developed countries such as Germany, Japan, and the UK already impose requirements relating to gender equality in their respective corporate governance codes (Al-Rahahleh, 2017). The regulators in Thailand could use this research as evidence to support their regulations regarding gender diversity in boards, while the authorities in the SET could use this basic information to assess the current proportion of gender positions in boards and seek to find a way to encourage a greater role for females on boards to improve the corporate governance of publicly listed firms in Thailand. There is a greater presence of Thai women at the management level compared with the board level, which

is opposite to the situation in other countries that have imposed gender quotas. Thus, Thailand could stand to learn from the experience of other countries when considering the main policy relating to gender diversity (for example, imposing a gender quota on boards, which several countries – especially in Europe – have been focusing on).

The implementation of gender quota regulations for corporate boards by Norway, which was the first country to introduce such gender-equality laws (Seierstad et al., 2017), has led to an increase in the proportion of women on boards for them (Seierstad and Opsahl, 2011). In addition, lessons can be learned from Australia's policy. After the Australian Securities Exchange Corporate Governance Council supported the agenda on gender diversity on boards by requesting firms to reveal the proportion of women as executives and members on their annual report (Sultana and Rahman, 2016), the number of female directors increased from 8.3% in 2009 to 23.4% in 2016 (Australian Institute of Company Directors, 2017).

The ILO (2015) also suggests alternative ways to increase the number of women on boards by allowing companies to voluntarily set targets; this approach has shown success in the UK as the proportion of women on boards has increased since 2010. Finally, in addition to the direct effect on improving gender balance in the boardrooms, promoting gender diversity on boards could also indirectly promote and improve the gender equality situation in the country.

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