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## Article

# Sustainability reporting, gender diversity, firm value and corporate performance in ASEAN region

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## ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

# Sustainability reporting, gender diversity, firm value and corporate performance in ASEAN region

Rojana Khunkaew<sup>1</sup>, Jittima Wichianrak<sup>1</sup> and Muttanachai Suttipun<sup>1\*</sup>

**Abstract:** This paper aimed to examine the influences of sustainability reporting and gender diversity on corporate outcomes of listed companies in ASEAN region. The listed companies in ASEAN region consisting of Thailand, Malaysia, Indonesia, and the Philippines during 2010 to 2019 were used as population and sample of this study. Seven key performance indexes of the Global Reporting Initiative (GRI) Standards, Carbon Disclosure Project (CDP), Carbon Knights, and Refinitiv were used to measure the extent and level of sustainability reporting, while the proportion of female board committee was used to measure gender diversity, and firm value measured by Tobin's Q and firm performance measured by return on asset (ROA) were used as the proxies of corporate outcomes. The sequential logit regression models were developed to test the hypotheses used in this study. This study found positive impact of energy used, water management, work safety, and gender diversity on corporate performance, while corporate performance was influenced by carbon emission and waste management negatively. Moreover, gender diversity moderated the negative relationship between energy used, water management, work safety, and corporate performance. On the other hand, there was water management, and work safety influencing firm value positively, while waste management had negative impact on firm value. However, gender diversity did not moderate any relationship between sustainability reporting and firm value. The study findings benefit to top management who may encourage in sustainability reporting especially water management and work safety to enhance the corporate performance and value.

**Subjects:** Asian Studies; Sustainable Development; Business, Management and Accounting

**Keywords:** sustainability reporting; gender diversity; firm value; corporate performance; ASEAN region

**JEL classification:** M40; M41; M48

### 1. Introduction and background

The new goal of maximizing wealth in today's economic concept is likely to sustain businesses because corporations have to focus not only on their economic perspective, but also environmental and social perspectives. Moreover, in the new wealth maximizing companies, top-



managements satisfy not only shareholders' demand on financial returns, but also the other stakeholders' demands and expectations such as investors, customers, employees, creditors, suppliers, competitors, society and community, environmental lobbies, and governors. Sustainable stock exchanges are central to encourage the corporations providing sustainability actions, activities, and disclosure of accurate information followed by the markets' requirements (Aboud & Diab, 2018). Compared with the traditional reporting which mostly aimed to provide only financial information, sustainability reporting can better satisfy stakeholders' pursuit of information diversification. Moreover, the new disclosure does not focus on only shareholders, but it has to attract the other stakeholder groups either. Based on an evaluation of sustainability reporting by listed companies in each stock exchanges around the world, there are seven quantitative indicators considered by the Global Reporting Initiative (GRI) Standards, Carbon Disclosure Project (CDP), Carbon Knights, and Refinitiv which are labor turnover, energy use, carbon emissions, labor spending, work safety, waste management, and water management (Global Reporting Initiative, 2019). In ASEAN region, although most countries have still been emerging economic countries, their stock exchanges were in high range of the world's stock exchange based on sustainability reporting in 2019 (CorporateKnights, 2019). For example, the Stock Exchange of Thailand was in ninth rank out of 49 stock exchanges followed by Bursa Malaysia (22<sup>nd</sup> ranking), Singapore Exchange (24<sup>th</sup> ranking), Philippine Stock Exchange (30<sup>th</sup> ranking), and Indonesia Stock Exchange (36<sup>th</sup> ranking) (CorporateKnights, 2019).

Sustainability reporting does provide benefit not only to stock exchanges, but also can be benefited on the corporate outcomes such as higher performance, better value, and greater reputation (Aouadi & Marsat, 2018) because top-managements try to spend the corporate utilities or resources to satisfy stakeholders' demands. In addition, the reporting also helps to reduce the conflict of interest and agency cost between top-managements and shareholders. However, considering by efficiency market process and equilibrium between all stakeholders, stakeholder-agency theory is used to explained how the corporation balances the relationship between top-managements and shareholders as well as the relationship between top-managements and the other stakeholders in inefficiency market by using gender diversity in this study (Hill & Jones, 1992). For example, top-managements in stakeholder-agency theory need to balance between their stakeholders' demands and corporate utility loss because, to satisfy the demands of stakeholders, the corporations have to reduce and lost the corporate resources that may create the conflict of interests between top-managements and shareholders.

However, the level and pattern of sustainability reporting fluctuate and inconclusive in today's world because (1) the change in economy, which the corporations have become more technology and IT businesses, makes the corporations provide less sustainability reporting, and (2) the increase in scrutiny and accountability of sustainability information has caused the corporations to pull back on sustainability transparency such as litigation and prosecution of risk and uncertainty, and regulation and law of sustainability transparency. Moreover, the prior related literatures on the benefit of sustainability and related reporting provided conflicts and mixed results. On one hand, most studies found a positive relationship between the reporting and corporate performance (Ekwueme et al., 2013; Suttipun & Saefu, 2017; Timothy, 2011). This is because top-managements strongly believe that their stakeholders will still have loyalties, if corporate actions and activities including sustainability reporting can satisfy their stakeholders' demands and expectations (Suttipun & Saefu, 2017). In addition, the reporting can balance the relationship between top-managements and stakeholders, and can reduce the conflict of interest between top-managements and shareholders as well. On the other hand, Connelly and Limpaphayom (2004) found that the top-managements were more likely to view and feel sustainability reporting as cost acting to decrease their utilities and resources. But some literatures found no relationship between both variables (Hossain & Hammami, 2009).

Furthermore, governance mechanisms would play a crucial role in the relationship between sustainability reporting and corporate outcomes. Therefore, this study investigates the role of

female board committee as one of governance mechanisms in the relationship between sustainability reporting and corporate outcomes. In addition, to realize an adequate quality of sustainability management, which could lead to positive corporate outcomes, corporate governance mechanisms are of key importance (Velte, 2016). However, the number of prior related studies on female board committee moderating the relationship between sustainability reporting and corporate outcomes is very rare (Albitar et al., 2020; Husted & Suasa-Filho, 2018). But it is believed that female board committee can enhance the processes of decision-making including strategies of sustainability reporting by providing different approaches in board committee's discussions. Therefore, more female board committee may help result in a positive impact on corporate outcomes such as corporate performance and firm value (Aouadi & Marsat, 2018; Husted & Suasa-Filho, 2018).

From the research problems above, this study aimed to examine the influences of sustainability reporting and gender diversity on corporate outcomes of the listed companies in ASEAN region consisting of Thailand, Malaysia, Indonesia, and the Philippines during 2010 to 2019. There was the main research question which were there any possible influences of sustainability reporting and gender diversity on corporate outcomes of the listed companies in ASEAN region. As the results, multiple regressions are tested that sustainability reporting in issues of water management and work safety has positive impact on corporate performance and value, while waste management has negative influence on firm performance and value. On the other hand, although gender diversity has a positive impact on firm performance, it does not have any impact on firm value.

ASEAN region is used to investigate sustainability reporting and the impact of sustainability reporting on corporate outcomes with several reasons. First, even though stock exchanges in ASEAN region are high ranking by evaluating the GRI, the CDP, Carbon Knights, and Refinitiv, the literatures of sustainability reporting were quite scarce compared with the other regions such as North America, Europe, and Oceania (Aouadi & Marsat, 2018; Aboud and Diab, 2018). Tran et al. (2021) found that the ASEAN listed corporations have the average sustainability disclosing lower than in European listed firms, although some countries have made sustainability disclosure mandatory or it on a "comply or explain" basis consisting of Malaysia, Indonesia, the Philippines, (Alsayegh et al., 2020), and Thailand (Suttipun & Stanton, 2012). Secondly, most prior related studies have focused on only each ASEAN member country instead of ASEAN region such as Malaysia (Johari & Komathy, 2019; Kasbun et al., 2017), Thailand (Poowadin et al., 2018; Suttipun, 2015), Indonesia (Burhan & Rahmanti, 2012; Gunarsih & Ismawati, 2019), and the Philippines (Raneses, 2020). Finally, the results of relationship between sustainability reporting and corporate outcomes were still mixed and unconcluded in ASEAN region. For example, most previous related literatures found positive relationship between sustainability reporting and corporate outcomes (Johari & Komathy, 2019; Aouadi & Marsat, 2018; Gunarsih & Ismawati, 2019; Poowadin et al., 2018; Roxes et al., 2017), while some studies found no relationship between sustainability reporting and corporate outcomes (Kasbun et al., 2017; Raneses, 2020; Suttipun, Suttipun & Saelee, 2015; Burhan & Rahmanti, 2012).

There are several contributions expected of this study findings. Firstly, the results will shed light on the extent, level, and pattern of sustainability reporting by listed companies in ASEAN region, and on the relationship between sustainability reporting, gender diversity, and corporate outcomes. Secondly, the study also endeavored to validate the relevance and applicability of sustainability reporting to corporate sustainable development. Thirdly, the study's results will demonstrate whether stakeholder-agency theory can explain the extent, level, and pattern of sustainability reporting by ASEAN listed companies as well as a positive influences of sustainability reporting and gender diversity on corporate outcomes. Moreover, based on stakeholder-agency theory, it is conceptually defined as a tool to reduce information asymmetry and the extent of agency problems between top-managements and a wide range of stakeholders. Next, the study will close or decrease the research gap by analysis the link between sustainability reporting and corporate outcomes interacted by board female committee (gender diversity). Finally, the study's

results will provide some benefits for regulators, shareholders, top-managements, and the other stakeholders, and help the listed companies in ASEAN region to accelerate the improvement of sustainability reporting.

The reminder of this study is divided into six sections. The next section offers theoretical literature review on the research area and explains the relevance of stakeholder-agency theory in explaining the extent, level, and pattern of sustainability reporting as well as the relationship between sustainability reporting, gender diversity, and corporate outcomes. The following section presents empirical literature review and hypothesis development. The research design is outlined in the next section which is separated into three topics as population and sample, data collection and variable measurement, and data analysis. The fifth section indicates the empirical results and discussions. The study concludes with summary and conclusion including contributions and implications, and limitations.

## 2. Theoretical literature review

Several theoretical approaches have been used to explain empirical advantages in terms of corporate outcomes providing sustainability reporting by listed companies including related information reporting such as political economic theory (Huang & Kung, 2010), media agenda setting theory (Brown & Deegan, 1998), dependency theory (Amran & Devi, 2008), agency theory (Li et al., 2008; Van Brecht et al., 2018), signaling theory (Almeyda & Darmansya, 2019), stakeholder theory (Joshi & Gao, 2009; Llana et al., 2007), legitimacy theory (Brown & Deegan, 1998; Islam & Deegan, 2010; Suttipun, 2018), and stakeholder-agency theory (Albitar et al., 2020; Hill & Jones, 1992). Even though there were several theories used in sustainability reporting's studies, stakeholder-agency theory was used to explain the influence of sustainability reporting and gender diversity on corporate outcomes of listed companies from ASEAN region in this study. This is because stakeholder-agency theory can be used to explain the relationship between top-managements (agents) and shareholders (principles) as well as the relationship between top-managements (agents) and the other stakeholders in inefficiency market countries (Hill & Jones, 1992).

Stakeholder-agency theory has been developed by Hill and Jones (1992) based on assumptions that market processes are sustainably different from the underlying financial version of agency theory. Stakeholder-agency theory is explained that each stakeholder is a part of implicit and explicit contracts that can contribute to a corporation. However, top-managements are only a group of stakeholders who can enter into a contractual relationship with all other stakeholder groups. In addition, the top-managements are also only a group of stakeholders who can directly manage and control over the decision-making apparatus of the corporation. Therefore, the top-managements can be seen as agents of the other stakeholder groups. In stakeholder-agency theory, the relationships between top-managements and the other stakeholders are divided within two main relationships consisting of the relationship between top-managements (agents) and shareholders (principles), and the relationship between top-managements (agents) and the other stakeholders. In the relationship between top-managements (agents) and shareholders (principles), information asymmetry, agency cost and conflict of interest between both are always problems in this relationship. Both agents and principles have to reduce these problems. On the other hand, the relationship between top-managements (agents) and the other stakeholders has to face with utility loss problems. The problems are happened when top-managements try to satisfy their stakeholders' demands because the demands will reduce corporate utilities which are used to operate in the corporation. Stakeholder-agency theory confirms that the other stakeholders place their claims into the corporation that, if satisfied reduce the amount of resources that top-managements can channel towards the pursuit of growth through diversification. Thus, top-managements need to balance their stakeholders' demands and corporate utility loss. However, agency cost, conflict of interest, and utility loss are inherent in the relationship between top-managements and all over shareholders. The main purpose of both relationships is to pay attention to divergent interests. Moreover, both relationships are policed by governance structure.



Stakeholder-agency theory is different with agency theory and stakeholder theory. The difference between stakeholder-agency theory and agency theory is that agency theory can be used in efficient markets that (1) are surrounded by efficient firms and (2) existence of power equilibrium between top-managements (agents) and shareholders (principles) must be admitted, while stakeholder-agency theory can be used in inefficient markets and different powers of equilibrium. On the other hand, the difference between stakeholder-agency theory and stakeholder theory is that the corporation need to provide its actions and activities followed by corporate stakeholder demands in the notions of stakeholder theory, while top-managements (agents) in stakeholder-agency theory need to balance between their stakeholders' demands and corporate utility loss because to satisfy the demands of stakeholders, the corporation has to reduce and lost the corporate resources. In addition, the other stakeholder's satisfactions may be able to create the conflict of interests between top-managements and shareholders.

In this situation, sustainability reporting is supposed to contribute to a reduction of information asymmetry, agency cost, and utility loss from the relationships between top-managements and shareholders, and between top-managements and the other stakeholders. Aside from information asymmetry, conflicts of interest between top-managements and all stakeholders are to be reduced. Top-managements can see an increased necessity here, given an undervaluation of the stock exchange. As the result, sustainability reporting would be positively correlated to the use for stakeholders' expectations and demands, and the ability to influence on corporate outcomes positively such as firm value and firm performance (Velte, 2016).

All objectives of this study can be answered by stakeholder-agency theory. For example, to investigate the extent, level, and pattern of sustainability reporting, the theory can be used to explain how top-managements try to satisfy their stakeholders' demands by providing sustainability reporting as corporate actions and activities. On the other objective to test for the influence of sustainability reporting and gender diversity on corporate outcomes, the theory also can be explained how the corporation balances the relationship between top-managements (agents) and shareholders (principles) as well as the relationship between top-managements (agents) and the other stakeholders by using female board committee as gender diversity.

### 3. Empirical literature review and hypothesis development

#### 3.1. Sustainability reporting

Sustainability reporting disclosed about company's activities on the economic, environmental and social impacts, and it is a tool for communicating its social and environmental performance. Furthermore, it has been used interchangeably with corporate social responsibility (CSR) reporting, triple bottom line (TBL) reporting, integrated reporting (IR), or environmental, social and governance (ESG) reporting. The sustainability reporting is based on the principles of sustainable development. Started in 1980s, the term of sustainable development being mentioned in business contexts and well-known after the Earth Summit in Rio de Janeiro in 1992 (Tregidga & Milne, 2006). Sustainable development considers the way to organise and manage human activities to meet those needs without causing damage to the environment, social or economic base (Bebbington et al., 2008), balances between economic, environmental and social for human well-being in the future generations (Daizy Sen & Das, 2013). As the corporates are the main player, their activities have critical effects on society and the environment, and also the corporate actions are important for long-term sustainable development.

Corporation undertakes the sustainability reporting to reduce information gap to their stakeholders, increased transparency, maintain their competitiveness (Suttipun, 2021), build image and reputation (Bebbington et al., 2008), survival in the long term (Luken & Stares, 2005). Moreover, disclosing about corporate social responsibility information is one of the corporate management tools for communicating, their impacts to stakeholders (Coetzee & van Staden, 2011; Mousa, 2010)

and create intangible resource. Therefore, the corporation will use the sustainability reporting as strategic tool to manage their stakeholders.

The sustainability reporting mostly applies or aligns with Global Reporting Initiative (GRI) guidelines which provide guidance on contents and implementation. GRI guidelines are one of the most popular in relation to report corporate economic, social, and environmental performance (Laskar, 2018) and now is in the GRI standard version. However, the way to measure sustainability reporting performance for comparing across the business, it should be some ranking system.

The sustainability reports have been ranking and give the rating by many institutions such as the Dow Jones Sustainability Index (DJSI), FTSE4Good Developed Index, MSCI World ESG Leaders Index, and Corporate Knights Global 100 Most Sustainable Corporations in the World. However, the Corporate Knights organization not only ranks the corporations but it also ranks the world's major stock exchanges in relation to sustainability disclosure performance (CorporateKnights, 2019) with their own evaluation system. In 2019, Corporate Knights ranked the world's stock exchanges based on ESG disclosures of issuers. The ranking showed that top 10 are the stock exchanges in Finland, Spain, Portugal, France, South Africa, Italy, Netherlands, Colombia, Thailand, Sweden and Denmark, respectively, also most of them are in European countries. The Stock Exchange of Thailand is one in the top10. Other ASEAN countries are also ranking in as Malaysia is in 22<sup>nd</sup>, Singapore is in 24<sup>th</sup>, Philippines is in 30<sup>th</sup>, Indonesia is in 36<sup>th</sup>, Vietnam is in 45<sup>th</sup>. One of the Corporate Knight measuring scored is the disclosure rate of how many companies report the seven indicators. The seven indicators are employee turnover, energy, GHG emissions, injury rate, payroll, water, and waste (CorporateKnights, 2019). Those seven items also align with Environmental and Social indicators in GRI standard guidelines.

On one hand, there are many studies that examine sustainability reporting especially in the global area. For example, the United Kingdom has high level of social and environmental reporting with mandatory requirements (Romero et al., 2019), including mandate of integrated reporting in South Africa (Romero et al., 2019). Furthermore, in Spain, Denmark, Sweden, Finland, Portugal and France have to report on environmental issues as adopted the accounting legislation under the European recommendation (Criado-Jiménez et al., 2008). As a result, during 2001–2013, in Sweden, Finland, Spain, and Italy have the percentage of publishing sustainability report as 50.9%, 35.9%, 33.3%, and 24.1% respectively (Miralles-Quiros et al., 2017) which quite aligns with the result of the Corporate Knights rating report in 2019.

On the other hand, the studies still small amount in ASEAN and showed the low number of disclosure and low quality. ASEAN corporations have the average sustainability disclosing lower than in European corporations, even though some countries, have made sustainability disclosure mandatory or it on a “comply or explain” basis, such as Malaysia, Singapore, the Philippines, (Alsayegh et al., 2020), and Thailand (Suttipun & Stanton, 2012). Furthermore, the ASEAN firms provide information in the database such as Thomson Reuters Data stream also just in Malaysia, Singapore, the Philippines, Indonesia, and Thailand (Alsayegh et al., 2020). Therefore, the studies will be in limited area. With the deep consideration in the sustainability reporting without information in the database, there have been the studies in the separated country such as in Thailand, Suttipun (2021) studied the ESG disclosure in annual report from 2015–2019, found the increasing trend during the period, and positive significant between board composition (including female board committee and ESG disclosure. Petcharat and Zaman (2019) examined sustainability reporting in integrated reporting of Thai listed 50 largest companies and found the reports emphasized in the use of natural resources (including material, energy, water and air) and skills improvement topics. In Malaysia, there have been many previous studies examined the relationship between ESG and firm performance that showed mixed results (Alsayegh et al., 2020; Amran et al., 2012; Zainon et al., 2020). As the limited research and mixed results about the sustainability reporting in ASEAN, this topic will be examined.



### 3.2. Sustainable reporting and corporate outcomes

The survey reports of KPMG in 2008 and 2013 reveal a significant increase in the number of corporate that disclosure the sustainability report, the reporting rates are very high in developed countries, like USA, UK, France, and Germany. While, in Asia, only a few countries are publishing corporate responsibility (CR) report (Japan, South Korea, China, India, Indonesia, Malaysia and Singapore), and in other Asian countries apart from Japan and South Korea, there are still at the initial stage (KPMG, 2008, 2013). Recently in 2017, KPMG survey CR and sustainability reporting based on 4900 companies in 49 countries and regions, the findings reveal that reporting on SDGs has significantly increased worldwide (KPMG, 2017). Even though, there are some cross-country analyses to look into the sustainability reporting practices but have failed to provide an overview of sustainability practices in the Asian context (Gill et al., 2008; Singh et al., 2017) that probably because of the study period limitations and quantitative analysis model.

Another dimension that should be investigated is the influence of sustainability reporting on corporate performance, (Ameer & Othman, 2012; Bachoo et al., 2013; Burhan & Rahmanti, 2012). The prior evidence of the association between the sustainable reporting and corporate performance is still inconclusive, there is insufficient evidence to conclude any differences in the financial performance of reported and unreported sustainability (Kasbun et al., 2017). The study based on 100 sustainable global companies, Ameer and Othman (2012) demonstrated that there is a simultaneous relationship between the sustainability practices and corporate financial performance. Another evidence of Global Fortune (N100) firms, Hussain (2015) examined the influence of corporate sustainability performance (CSP) on firm performance by employing the indicators of GRI reporting framework, the findings indicated that CSP has a significant positive influence on firm performance. While, the evidence of USA company, researcher found both positive and negative relationships (Eccles et al., 2012; Lu & Taylor, 2018).

In ASEAN region, although there were several prior related studies on the relationship between sustainability reporting and corporate outcomes such as Malaysia (Johari & Komathy, 2019; Kasbun et al., 2017), Thailand (Poowadin et al., 2018; Suttipun & Saelee, 2015), Indonesia (Burhan & Rahmanti, 2012; Gunarsih & Ismawati, 2019), and the Philippines (Raneses, 2020; Roxes et al., 2017), the results of relationship between sustainability reporting and corporate outcomes were still mixed and unconcluded in ASEAN region. For example, most previous related literatures found positive relationship between sustainability reporting and corporate outcomes (Johari & Komathy, 2019; Aouadi & Marsat, 2018; Gunarsih & Ismawati, 2019; Poowadin et al., 2018; Roxes et al., 2017), while some studies found no relationship between sustainability reporting and corporate outcomes (Burhan & Rahmanti, 2012; Kasbun et al., 2017; Raneses, 2020; Suttipun & Saelee, 2015). This may be because year and obligation of sustainability reporting are different in each country, although they are in the same region. For example, Indonesia has regularly started as the first country to provide sustainability reporting in 2006, followed by Thailand and Malaysia in 2012, and the Philippines in 2016 (Tran et al., 2021).

In more detail, Raneses (2020) performed the structural equation modelling (SEM) to investigate the influence of Entrepreneurial Orientation (EO) and Environmental Sustainability Orientation (ESO) on corporate performance of small business in the Philippines. Based on three elements of ESO, environmental sustainability knowledge, environmentally sustainable practices, and commitment toward environmental sustainability. The findings revealed that EO (proactive, risk-taking, and innovativeness) plays an important role in the development of environmental sustainability. In addition, the study indicated that EO and ESO are positive contribution to the performance of small business, however, that may be different result for the large firm. Johari and Komathy (2019) studied the sustainability reporting and firm performance of 100 top Malaysian companies with good disclosure in 2016, by using four indicators of firm performance, return on assets, return on equity, earnings per share, and dividend per share. The findings indicated that there is a positive relationship between sustainability reporting and firm performance when measuring as return on assets and earnings per share. Supported, Zainon et al. (2020) and Lins et al. (2017) studied social

disclosure and performance by measuring social reporting component as workforce, product integrity, engagement in community, diversity, employment, environment and human rights, the results indicated that social disclosure have a positive influence on firm performance.

Poowadin et al. (2018) investigated the association between corporate sustainability disclosure and financial performance of Thai firm listed, by employing six criteria of GRI to measure CS disclosure, economic, environmental, labor, society, human right, and product responsibility. The findings indicated that CR disclosure in term of environmental, labor and product sustainability are positive influence on firm performance, consequently, improving the quality of sustainability performance lead to better financial performance of firm. Suttipun and Sittidate (2016) investigated the influence of sustainability disclosure on firm performance based on Thai listed companies, the results revealed that social disclosure have a positive influence on financial performance, while there is no significant influence of environmental disclosure. Consistent with the evidence of Indonesian companies, Burhan and Rahmanti (2012) examined the impact of CS reporting on company performance of 32 companies listed on Indonesian stock exchange, the study demonstrated that social performance disclosure positively and significantly influenced the financial performance (ROA), however, there is an evidence of Indonesia that has no significant influence on CSR disclosure on ROA (Angelia & Suryaningsih, 2015).

On another hand, Malarvizhi and Matta (2016) examined the relationship between environmental reporting and firm performance of corporation listed in Bombay Stock Exchange (BSE), India, by measuring performance as return on capital employed, return on assets, net profit margin and earnings per share (EPS). The findings revealed that there is no significant relationship. Consistent with the evidence of Indonesian companies, Kusuma and Koesrindartoto (2014) reported that there is insignificant impact of sustainability practice on the financial performance measured by return on assets, return on equity, return on Invested Capital, EBITDA and net operating profit, which probably because the sustainability score is weak to measure the sustainability practice. Another evidence of French companies, researchers indicated that financial performance (measured by ROA and ROE) is not significant affected by CSR disclosure, especially, in the short term (Najah & Jarboui, 2013).

According to the literature above, this study aims to clarify the relationship between sustainability reporting and corporate performance by expanding the sustainability reporting to seven indicators of the (2019). Therefore, the study forms the following hypotheses:

**H1a:** There is a positive relationship between energy use management and corporate performance.

**H1b:** There is a positive relationship between water management and corporate performance.

**H1c:** There is a positive relationship between carbon emissions and corporate performance.

**H1d:** There is a positive relationship between waste management and corporate performance.

**H1e:** There is a positive relationship between labor turnover and corporate performance.

**H1f:** There is a positive relationship between work safety and corporate performance.

**H1g:** There is a positive relationship between labor spending and corporate performance.

Apart from corporate performance, the literature revealed that ESG disclosure can play the role both to increase and decrease firm value, which depends on the strength of ESG (Sadiq et al., 2020). The evidence of Malaysian firm listed, Mohammad and Wasiuzzaman (2021) studied ESG

disclosure, competitive advantage and firm performance by clustering time and industry in the regression analysis. The result demonstrated that environmental disclosure and ESG disclosure score have a positive association with Tobin's Q, which can interpret that firm with more responsible would have better and sustainable performance. In the context of Thai companies, Suttipun and Yordudom (2022) studied the influence of ESG disclosure on firm value by investigating data of 60 listed companies in THSI group from the SET. The findings revealed that the average words of environmental, social and governance disclosure during 2015 to 2019 were 309.91, 1196.12, and 1197.84, respectively. Moreover, the regression results demonstrated that environmental and social have a positive influence on market value of firm, conversely, governance has a negative influence. In another hand, Huaypad (2019) studied the quality of social responsibility disclosure and market firm value of 385 firms listed in the Stock Exchange of Thailand in year 2015, by classifying the quality of social responsibility disclosure into four categories, environment, employees, social and community activities, and product/service. The study found that the quality of product/service responsibility disclosure has a positive influence on firm value, in contrast, social and community activities has a negative influence. Suttipun and Sittidate (2016) investigated the influence of sustainability disclosure on firm value based on Thai listed companies, the results revealed that social disclosure have a positive influence on firm's market value.

The study of Asian corporation listed, Laskar and Maji (2018) examined the influence of sustainability reporting on market to book ratio of four countries in Asia, which are Japan, South Korea, Indonesia and India. The study employed the framework of Global Reporting Initiatives (GRI3.1) to measure corporate sustainability. The findings revealed that Japanese has the highest quality of disclosure, followed by India, South Korea and Indonesia, respectively. In a part of regression results, the study found that there is a positive impact of corporate sustainability. In another hand, Husnaini and Basuki (2020) studied the Corporate Governance Scorecard (ACGS), Sustainability Reporting (SR) and Firm Value based on 359 company observations in Asian (Indonesia, Malaysia, Singapore, Philippines, and Thailand), the results revealed that ACGS and SR have a significant negative influence on firm value, however, there is a weakness content analysis in the study because many companies lack of ACGS disclosure, and sustainability reporting in Asia is voluntary. This study aims to perform depth analysis the impact of sustainability reporting on corporate value by investigating seven indicators of sustainability reporting form Corporate Knight (CorporateKnights, 2019). Therefore, the study forms the following hypotheses:

- H2a:** There is a positive relationship between energy use and corporate value.
- H2b:** There is a positive relationship between water management and corporate value.
- H2c:** There is a positive relationship between carbon emissions and corporate value.
- H2d:** There is a positive relationship between waste management and corporate value.
- H2e:** There is a positive relationship between labor turnover and corporate value.
- H2f:** There is a positive relationship between work safety and corporate value.
- H2g:** There is a positive relationship between labor spending and corporate value.

### ***3.3. The influence of gender diversity on corporate outcomes and its interactive factor on the relationship between sustainability reporting and corporate outcomes***

The literature revealed that board gender diversity has an influence on the business. Ben-Amar et al. (2017) indicated that the increase in voluntary climate change disclosures was consistent with the percentage of female on board of director. Supported, the literature of both developed and developing countries demonstrated that high percentage of female on board of director cause

companies greater reporting efficiency, especially in disclosing sustainability information either in form of sustainability report, CSR report or ESG report. That probably because in the boardroom female director puts more emphasis on the social agenda in order to improve the social image of the company (Al-Shaer & Zaman, 2016; Anazonwu et al., 2018; Arayssi et al., 2016; Fernandez Feijoo et al., 2014; Jizi, 2017).

Anazonwu et al. (2018) provided the evidence of manufacturing firms in Nigeria that the number of female directors is a part of supporting and improving the sustainability reporting measured by ESG report. However, researchers recommended that Standards developed in western countries are often inappropriate for developing countries like African, therefore, adopting the Nigeria Stock Exchange's (NSE) Sustainability Disclosure Guidelines will encourage the sustainability disclosure for the company. The evidence of Germany and Austria companies, researcher investigated the link between gender diversity and ESG performance, the findings revealed that the average presence of women on board has a positive effect on ESG performance. In depth, it was found that the company had an average of eight female board members, or about 20 percent (Velte, 2016). Consistently, the results of stock-exchange-listed banks over a ten period, researchers found that different proportion of female directors affect sustainability reporting in different directions. Firm with 22–50% of female on board will have a positive impact on the ESG disclosure, which lead to a significant increase in the disclosure of environmental, social, and governance information. While, over 50% of female on board has an insignificant negative impact on ESG disclosure, however, that can be interpreted as increasing the percentage of female directors could cause the corporate disclosures declining as well (Buallay et al., 2020).

The evidences of three Asia Pacific emerging economies, including Malaysia, Pakistan, and Thailand, indicated that gender diversity has a positive influence on corporate Social responsibility (Yasser et al., 2017). Supported, Suttipun (2021) studied the influence of board composition on ESG disclosure of Thai corporation listed, the findings revealed that high percentage of female on board has a positive significant influence on ESG disclosure in term of social information. The reason is that female committee plays an important role on the participation and consideration of what information should be disclosed in order to create the businesses sustainable. As well as the evidence of Malaysian firm listed, researcher found that the increasing proportion of female participate on board will improve ESG disclosure score (Wasiuzzaman & Wan Mohammad, 2020).

According to the literature above we can conclude that participation of women on board contributes to the disclosure of corporate sustainability information. A part from that, the evidence of Arayssi et al. (2016) indicated that ESG disclosure lead to increase firm performance at the high percentage of female on board. Therefore, this study aims to clarify and expand the research by investigating the association between board gender diversity and corporate outcomes, and the effect of board gender diversity on the relationship between sustainability reporting and corporate outcomes in ASEAN.

**H3a:** There is a significant influence of gender diversity on corporate performance.

**H3b:** There is a significant influence of gender diversity on firm value.

Several prior related studies suggest that female diversity had a positive impact on sustainability reporting (Gulzar et al., 2019; Orazalin, 2019) as well as firm performance and value (Agyemang-Mintah & Schadewitz, 2019). This is because the female diversity can improve decision making and can help align the corporations with their external environment and resources (Agyemang-Mintah & Schadewitz, 2019). Moreover, more female diversity helps to increase the different opinions and the quality of discussion related to decision making process that is believed to add the quality and quantity of information reporting and this would potentially have a positive influence on corporate outcomes (Husted & Suasa-Filho, 2018). For example, Ben-Amar et al. (2017) found that an increase in voluntary

reporting was affected by the percentage of female diversity. This is because, in the board-room, female diversity puts more emphasis on the social agenda in order to improve the environmental and social images of corporations (Al-Shaer & Zaman, 2016; Anazonwu et al., 2018; Jizi, 2017). Therefore, the female diversity can enhance corporate outcomes as well as sustainability reporting. However, to the best of knowledge, this is the first study to consider the moderating factor of female diversity on the relationship between sustainability reporting and corporate outcomes among listed companies in Thailand as:

**H4a:** There is a significant influence of gender diversity on the relationship between sustainability reporting and corporate performance.

**H4b:** There is a significant influence of gender diversity on the relationship between sustainability reporting and firm value.

#### 4. Research design

##### 4.1. Population and samples

To test the influence of sustainability reporting and gender diversity on corporate outcomes, listed companies in the ASEAN region were used as population in this study because Thailand, Malaysia, Indonesia, Singapore, the Philippines, Vietnam, Brunei, Cambodia, Lao, and Myanmar have become ASEAN Economic Community (AEC) since 2016 to create a single market and production base for free flow of goods, services, investment, capital, and skill labor within ASEAN member countries. However, the initial samples consisted of Top90 and Top100 firms as 390 firms from four ASEAN countries which are Thailand, Malaysia, Indonesia, and the Philippines. The reason of Top90 and Top100 used in this study is that Thailand, Malaysia, and the Philippines provide Top100 firms in their capital markets, while Indonesia provides Top90 listed companies in its capital market. Moreover, this study also excluded the listed companies that (1) were registered in financial or banking industry and any fund sector, and (2) were withdrawn from listing by their capital market including firms under rehabilitation. After applying the condition above, 776 firm-year observations were adopted as the samples in this study. The final samples were unbalanced panel data.

##### 4.2. Data collection and variable measurement

Data collection was cover 2010 to 2019 from Refinitiv. To collect the data, there were four groups of variables used in this study. In terms of sustainability reporting, seven key performance indexes (KPIs) of the Global Reporting Initiative (GRI) Standards, Carbon Disclosure Project (CDP), Carbon Knights, and Refinitiv were used to measure the extent and level of sustainability reporting of listed companies from Thailand, Malaysia, Indonesia, and the Philippines. The KPIs consisted of energy use, water management, carbon emissions, waste management, labor turnover, work safety and labor spending. In terms of corporate outcomes, there were two variable groups used in this study that are firm value measured by Tobin's Q, and firm performance measured by return on asset (ROA) ratio. In terms of gender diversity, the proportion of female board committee was used to measure as the proxy. Finally, corporate characteristics were also used as control variables in this study which consists of firm size, firm risk (leverage), firm age, and firm year. The summary of variable measurement is indicated in Table 1.

##### 4.3. Data analysis

To investigate the extent, level, and pattern of sustainability reporting of listed companies from the ASEAN region during 2010 to 2019 as the first objective, descriptive analysis by mean and standard deviation was used. On the other study objective, the sequential logit regression models were developed to test for any possible influences of sustainability reporting and gender diversity on corporate outcomes including testing for the hypotheses. The models were used to capture within two main sequential decisions in terms of (1) corporate performance in Model A. The models were as follows:

**Table 1. Variable measurement**

Variable Used	Notation	Measurement
<b>Sustainability Reporting</b>		
Energy used management	ENERGY	Total direct and indirect energy consumption in the million gigajoules
Water management	WATER	Total water withdrawal in the million cubic meters
Carbon emissions	CARBON	Total carbon dioxide (CO2) and CO2 equivalents emission in the million tons.
Waste management	WASTE	The amount of waste recycled total in the million tons.
Labor turnover	TURN	The percentage of employee turnover
Work safety	SAFETY	Total Injury Rate Total
Labor spending	LABOR	Training Costs Total in the million US dollar
<b>Corporate Outcomes</b>		
Firm value	VALUE	Tobin's Q
Firm performance	PROFIT	Return on asset (ROA) ratio
<b>Gender Diversity</b>		
Gender diversity	GENDER	The proportion of female board committee
<b>Corporate Characteristics</b>		
Firm size	SIZE	The natural logarithm of total asset
Firm risk	RISK	Total debt divided by total equity
Firm age	AGE	Firm age as year
Firm year	YEAR	Year fixed effect

$$\text{PROFIT} = \beta_0 + \beta_1\text{ENERGY} + \beta_2\text{WATER} + \beta_3\text{CARBON} + \beta_4\text{WASTE} + \beta_5\text{TURN} + \beta_6\text{SAFETY} + \beta_7\text{LABOR} + \varepsilon \quad (\text{Model A1})$$

$$\text{PROFIT} = \beta_0 + \beta_8\text{GENDER} + \varepsilon \quad (\text{Model A2})$$

$$\text{PROFIT} = \beta_0 + \beta_9\text{SIZE} + \beta_{10}\text{RISK} + \beta_{11}\text{AGE} + \beta_{12}\text{YEAR} + \varepsilon \quad (\text{Model A3})$$

$$\text{PROFIT} = \beta_0 + \beta_1\text{ENERGY} + \beta_2\text{WATER} + \beta_3\text{CARBON} + \beta_4\text{WASTE} + \beta_5\text{TURN} + \beta_6\text{SAFETY} + \beta_7\text{LABOR} + \beta_8\text{GENDER} + \beta_9\text{SIZE} + \beta_{10}\text{RISK} + \beta_{11}\text{AGE} + \beta_{12}\text{YEAR} + \varepsilon \quad (\text{Model A4})$$

$$\begin{aligned} \text{PROFIT} = & \beta_0 + \beta_1\text{ENERGY} + \beta_2\text{WATER} + \beta_3\text{CARBON} + \beta_4\text{WASTE} + \beta_5\text{TURN} \\ & + \beta_6\text{SAFETY} + \beta_7\text{LABOR} + \beta_8\text{GENDER} + \beta_9\text{ENERGY} * \text{GENDER} + \beta_{10}\text{WATER} * \text{GENDER} \\ & + \beta_{11}\text{CARBON} * \text{GENDER} + \beta_{12}\text{WASTE} * \text{GENDER} + \beta_{13}\text{TURN} * \text{GENDER} + \beta_{14}\text{SAFETY} * \text{GENDER} \\ & + \beta_{15}\text{LABOR} * \text{GENDER} + \beta_{16}\text{SIZE} + \beta_{17}\text{RISK} + \beta_{18}\text{AGE} + \beta_{19}\text{YEAR} + \varepsilon \end{aligned} \quad (\text{Model A5})$$

The Model B indicates the equations of relationship between sustainability reporting, gender and firm value. The models were as follows:

$$\text{VALUE} = \beta_0 + \beta_1\text{ENERGY} + \beta_2\text{WATER} + \beta_3\text{CARBON} + \beta_4\text{WASTE} + \beta_5\text{TURN} + \beta_6\text{SAFETY} + \beta_7\text{LABOR} + \varepsilon \quad (\text{Model B1})$$



$$\text{VALUE} = \beta_0 + \beta_8 \text{GENDER} + \varepsilon \quad (\text{Model B2})$$

$$\text{VALUE} = \beta_0 + \beta_9 \text{SIZE} + \beta_{10} \text{RISK} + \beta_{11} \text{AGE} + \beta_{12} \text{YEAR} + \varepsilon \quad (\text{Model B3})$$

$$\begin{aligned} \text{VALUE} = & \beta_0 + \beta_1 \text{ENERGY} + \beta_2 \text{WATER} + \beta_3 \text{CARBON} + \beta_4 \text{WASTE} + \beta_5 \text{TURN} + \beta_6 \\ & \text{SAFETY} + \beta_7 \text{LABOR} + \beta_8 \text{GENDER} + \beta_9 \text{SIZE} + \beta_{10} \text{RISK} + \beta_{11} \text{AGE} + \beta_{12} \text{YEAR} + \varepsilon \end{aligned} \quad (\text{Model B4})$$

$$\begin{aligned} \text{VALUE} = & \beta_0 + \beta_1 \text{ENERGY} + \beta_2 \text{WATER} + \beta_3 \text{CARBON} + \beta_4 \text{WASTE} + \beta_5 \text{TURN} \\ & + \beta_6 \text{SAFETY} + \beta_7 \text{LABOR} + \beta_8 \text{GENDER} + \beta_9 \text{ENERGY} * \text{GENDER} \\ & + \beta_{10} \text{WATER} * \text{GENDER} + \beta_{11} \text{CARBON} * \text{GENDER} + \beta_{12} \text{WASTE} * \text{GENDER} \\ & + \beta_{13} \text{TURN} * \text{GENDER} + \beta_{14} \text{SAFETY} * \text{GENDER} + \beta_{15} \text{LABOR} * \text{GENDER} \\ & + \beta_{16} \text{SIZE} + \beta_{17} \text{RISK} + \beta_{18} \text{AGE} + \beta_{19} \text{YEAR} + \varepsilon \end{aligned} \quad (\text{Model B5})$$

## 5. Empirical results and discussion

### 5.1. Descriptive analysis of model variables

To test for the influences of sustainability reporting and gender diversity on corporate outcomes of listed companies in ASEAN region, firstly, descriptive analysis was used to describe mean and SD of variables used in this study. Table 2 indicates that the means of sustainability reporting's components were 19.819 (SD = 49.407) of ENERGY, 185.906 (SD = 237.332) of WATER, 3.089 (SD = 8.619) of CARBON, 4.580 (SD = 4.048) of WASTE, 7.497 (SD = 9.448) of TURN, 1.354 (SD = 5.381) of SAFETY, and 3.797 (SD = 10.024) of LABOR. In terms of gender diversity, this study provides that mean was 12.911 average proportion of female board committee on total board committee with 11.984 SD. On the other variable groups, the mean of PROFIT was 10.087 (SD = 10.929), while the mean of VALUE was 2.270 (SD = 2.576).

### 5.2. Correlation matrix

Multicollinearity problem between variables used in this study is tested by Pearson's correlation, Tolerance, and Variance Inflation Factor (VIF) in Table 3 as correlation matrix. As the results, it can be decided that multicollinearity problem does not appear to be a concern in explaining the regression analysis results from Tolerance and VIF results, which are tested separately. To examine correlations between two dependent variables, eight independent variables, and three control variables, the results find that PROFIT is positively correlated by VALUE, WATER at 0.01 level, while it is negatively correlated by LABOR, SIZE, RISK, and AGE at 0.01 level. On the other corporate outcome as firm value, there is positive correlation between VALUE, WATER, and TURN at 0.01 level, while CARBON, LABOR, SIZE, and RISK has negative correlated with VALUE at 0.01 level. In addition, GENDER has positively correlated with SAFETY at 0.05 level, it has negatively correlated with ENERGY at 0.01 level.

### 5.3. Multivariate results

#### 5.3.1. The influences of sustainability reporting and gender diversity on firm performance

Table 4 indicates the multiple regression results for the A models. The R squared scores were during 0.214 to 0.348. To test the first hypothesis group during H1a to H1g, this study found positive impact of ENERGY, WATER and SAFETY on PROFIT at 0.10 and 0.01 levels, while PROFIT was influenced by CARBON and WASTE negatively at 0.01 level. However, the study did not find any influence of TURN, and LABOR on PROFIT at 0.10 level. The result of impacts of energy used management, water management, carbon emission, and work safety on corporate performance can be explained by stakeholder-agency theory. This is because sustainability reporting is supposed to contribute to a reduction of information asymmetry, agency cost, and utility loss from the relationships between top managements and shareholders, and between top managements and the other stakeholders. Aside from information asymmetry, conflicts of interest between top managements and all stakeholders are to be reduced. The result of this study is consistent with

**Table 2. Descriptive analysis**

Variables	Observation	Mean	Std. Dev.	Min	Max
PROFIT	776	10.087	10.929	0.1	73.112
VALUE	776	2.270	2.576	0.534	22.232
ENERGY	776	19.819	49.407	0.0	357.420
WATER	776	185.906	237.332	0.0	43747.000
CARBON	776	3.089	8.619	0.0	57.081
WASTE	776	4.580	4.048	0.0	46.767
TURN	776	7.497	9.448	0.0	84.000
SAFETY	776	1.354	5.381	0.0	88.980
LABOR	776	3.797	10.024	0.0	121.951
GENDER	776	12.911	11.984	0.0	62.500
SIZE	776	12.299	3.240	6.935	21.071
RISK	776	2.151	2.968	0.0	22.030
AGE	776	17.712	5.258	3.0	29.000

the results of pervious related studies (Aboud & Diab, 2018; Albitar et al., 2020). Thus, this study supports H1a, H1b, H1c, and H1f, while H1d, H1e, and H1g are rejected.

To test whether gender diversity has impact on corporate performance, and gender diversity moderates the relationship between sustainability reporting and corporate performance, this study found a positive impact of GENDER on PROFIT at 0.01 level. Moreover, GENDER moderated the negative relationship between ENERGY, WATER, SAFETY, and PROFIT at 0.05 and 0.10 levels. The main understanding of positive impact of gender diversity on corporate performance is that gender diversity can help to increase the different opinions and the quality of discussion related to decision making process that would potentially have a positive influence on corporate performance (Adam and Ferreira, 2009; Husted & Suasa-Filho, 2018). Therefore, the corporations are encouraged to have more numbers of female committee than male committee on their board committee from the maximum of proportion of female board committee on total board committee as 62.50 percent in this study with 12.29 percent of average proportion of female board committee. Even though the proportion of female board, which found in this study, is about 12 percent, so ASEAN board committee is highly skewed male board. However, the results of this study suggest that the small proportion of female board can make difference of corporate performance. The result of this study is consistent with the results of pervious related studies (Agyenmang-Mintah & Schadewitz, 2019; Albitar et al., 2020; Husted & Suasa-Filho, 2018). Therefore, the result of this study is in support of H3a.

However, this study found that gender diversity moderated the negative relationship between energy used management, water management, work safety, and corporate performance. This may be because female boards are more concerned about the environmental and social, they may consider reducing energy and water consumption by using the renewable which results in lower costs and increased corporate performance. Apart from that, female boards are also focused on investing in workplace safety, although it may cause safety expenditure but that can make an injury rates down and allows employees to work more efficiently. Consistent with the previous study, researchers provided evidence that female improves environmental and social performance, and also found a positive influence of board gender diversity on renewable energy, moreover, the interaction between board gender diversity and renewable energy lead to increased financial performance of firm (Atif et al., 2021; Elmagrhi et al., 2019; Kyaw et al., 2017). However, there is no significant influence of gender diversity on the other indicators and corporate performance, thus, the study did not support H4a.

Table 3. Correlation matrix												
Variables	PROFIT	VALUE	ENERGY	WATER	CARBON	WASTE	TURN	SAFETY	LABOR	GENDER	SIZE	RISK
PROFIT	1											
VALUE	0.8486**	1										
ENERGY	0.0236	-0.0917	1									
WATER	0.1863**	0.0838*	0.1315**	1								
CARBON	-0.0299	-0.0775*	0.5907**	-0.0155	1							
WASTE	-0.0638	-0.0476	0.0195	-0.0079	0.0691	1						
TURN	0.0645	0.1599**	-0.1112**	-0.0139	-0.0836*	-0.0696	1					
SAFETY	0.0553	-0.0204	0.0105	-0.0106	-0.0210	-0.0224	-0.0254	1				
LABOR	-0.1298**	-0.1136 **	0.1448**	-0.0079	0.2341**	-0.0253	0.0064	-0.0741*	1			
GENDER	-0.0508	0.0386	-0.1125**	-0.0702	-0.0347	-0.0256	-0.0390	0.0858*	0.0119	1		
SIZE	-0.1372**	-0.1387**	0.0873*	-0.0156	0.0203	-0.1345**	-0.0484	-0.0111	0.2838**	-0.3348**	1	
RISK	-0.3192**	-0.1668**	-0.1946**	-0.0218	-0.1734**	-0.0765*	0.1145**	-0.1129**	0.2667**	0.1709**	0.2846**	1
AGE	-0.1259**	-0.0330	-0.0151	0.0124	0.0632	0.0658	0.0859*	0.0074	0.0686	0.0632	0.2094**	0.1448**

Note: \*\* is significant at 0.01 level, and \* is significant at 0.05 level.

Furthermore, Table 4 also shows the relationship between corporate characteristics used as the control variables, and corporate performance. The results indicate that there is negative relationship between firm size (SIZE), leverage (RISK), firm age (AGE), and corporate performance (PROFIT) at 0.01 level in all model shown on Table 4.

#### 5.3.2. *The influences of sustainability reporting and gender diversity on firm value*

Table 5 indicates the multiple regression results for the B models. The R squared scores were during 0.119 to 0.156. To test the second hypothesis group during H2a to H2g, this study found positive impact of WATER, WASTE, and SAFETY on VALUE at 0.10 and 0.05 levels, while VALUE was not influenced by ENERGY, CARBON, TURN, and LABOR at 0.10 level. The result of impact of water withdrawal or consumption may explain as the water used in facilitated to produce corporate production align with the study of Simionescu et al. (2020) that the water consumption has a positive impact on ROA. Furthermore, the impact of waste recycles on firm value, this may because the waste recycling in some cases can be the raw materials leading to cost saving, the reduce of hazardous disposal can decrease the dumping costs and retain the good reputation (Leonidou et al., 2017). There is a significant influence of injury rate on firm value, this may because the investment in operation safety is sensitive to firm value (Cohn & Wardlaw, 2016), the corporate may cut spending on safety in the level that not trigger violations, the injury rate was higher when firms meet forecast (Caskey & Ozel, 2017) as the agency cost and utility lost concept that the manager may have to manage the needs of both stakeholder groups. Thus, this study accepts H2b and H2f, while H2a, H2c, H2d, H2e, and H2g are rejected.

To test whether gender diversity has impact on firm value, and gender diversity moderates the relationship between sustainability reporting and firm value, this study found no impact of GENDER on VALUE at 0.10 level. In addition, GENDER did not moderate any relationship between each component of sustainability reporting (ENERGY, WATER, CARBON, WASTE, TURN, SAFETY, and LABOR) and firm value at 0.10 level. The results of this study are similar with Miralles-Quiros et al. (2017) who also found no significant relationship between female board and firm value. In terms of no impact of gender diversity on firm value, this may be because the proportion of female board committee on total board committee in ASEAN region as 12.911 percent cannot change the firm value, even though the proportion may drive the better corporate performance. To compare the average proportion of female board committee between this study and Velte (2016), there are different proportions of female board committee between ASEAN region as 12.911 percent and European region as 19.800 percent. In addition, Velte (2016) found that during 20 to 50 percent of proportion of female board committee, they can lead to an increase of firm value. Therefore, with small proportion of female on board, female board committee may not drive the change of firm value. On the other reason, Velte (2016) found that gender diversity representation positively related to corporate outcomes, and the relationship is more positive in countries with stronger shareholder protections, but the regulation of shareholder protection in ASEAN region are still underdeveloped compared with the other regions such as European, North America, and Oceania regions. Moreover, H3b and H4b are not supported.

## 6. Summary and conclusion

To answer the research question that were there any possible influences of sustainability reporting and gender diversity on corporate outcomes of the listed companies in ASEAN region, this study found positive impact of energy used, water management, work safety, and gender diversity on corporate performance, while corporate performance was influenced by carbon emission and waste management negatively. Moreover, gender diversity moderated the negative relationship between energy used, water management, work safety, and corporate performance. On the other hand, there was water management, waste management, and work safety influencing firm value positively, while waste management had negative impact on firm value. However, gender diversity did not moderate any relationship between sustainability reporting and firm value. Using control variables as corporate characteristics, the study found a negative relationship between size of

Variables	Model A1		Model A2		Model A3		Model A4		Model A5	
	Coef. (sig)	t	Coef. (sig)	t	Coef. (sig)	t	Coef. (sig)	t	Coef. (sig)	t
Constant	73.80***	(6.88)	64.57***	(6.18)	70.02***	(6.54)	61.70***	(5.91)	58.90***	(5.67)
ENERGY	-	-	0.00435	(0.65)	-	-	0.00567	(0.85)	0.0208*	(2.47)
WATER	-	-	0.000439***	(5.47)	-	-	0.000429***	(5.36)	0.000484***	(5.53)
CARBON	-	-	-0.219***	(-3.52)	-	-	-0.218***	(-3.52)	-0.312***	(-4.07)
WASTE	-	-	-0.468***	(-5.43)	-	-	-0.449***	(-5.22)	-0.377***	(-3.90)
TURN	-	-	-0.0350	(-1.32)	-	-	-0.0333	(-1.26)	-0.0330	(-1.27)
SAFETY	-	-	0.127***	(3.52)	-	-	0.123***	(3.42)	0.197***	(4.70)
LABOR	-	-	0.0519	(1.72)	-	-	0.0510	(1.70)	0.0982	(1.89)
GENDER	-	-	-	-	0.0961***	(3.34)	0.0768**	(2.81)	0.113***	(3.75)
ENERGY* GENDER	-	-	-	-	-	-	-	-	-0.00128*	(-1.99)
WATER* GENDER	-	-	-	-	-	-	-	-	-0.000348*	(-2.19)
CARBON* GENDER	-	-	-	-	-	-	-	-	0.00534	(1.64)
WASTE* GENDER	-	-	-	-	-	-	-	-	-0.00750	(-1.66)
TURN* GENDER	-	-	-	-	-	-	-	-	0.0000129	(0.94)
SAFETY* GENDER	-	-	-	-	-	-	-	-	-0.0197**	(-3.25)

(Continued)

Table 4. (Continued)										
Variables	Model A1		Model A2		Model A3		Model A4		Model A5	
	Coef. (sig)	t	Coef. (sig)	t	Coef. (sig)	t	Coef. (sig)	t	Coef. (sig)	t
LABOR* GENDER	-	-	-	-	-	-	-	-	-2.41e-09	(-1.15)
SIZE	-4.365***	(-4.46)	-3.724***	(-3.91)	-3.971***	(-4.06)	-3.415***	(-3.58)	-3.218***	(-3.40)
RISK	-0.613***	(-3.33)	-0.632***	(-3.63)	-0.703***	(-3.81)	-0.703***	(-4.02)	-0.736***	(-4.26)
AGE	-0.486***	(-3.71)	-0.384**	(-3.03)	-0.610***	(-4.51)	-0.490***	(-3.72)	-0.487***	(-3.74)
YEAR	Included		Included		Included		Included		Included	
R <sup>2</sup>	0.214		0.312		0.228		0.321		0.348	
Prob > F	0.0000		0.0000		0.0000		0.0000		0.0000	
Observations	776		776		776		776		776	

Note: \*\*\* \*\*, \* Coefficient is significant at the 0.001, 0.01, 0.05 level respectively



**Table 5. Multiple regression of sustainability reporting, female board, and firm value**

Variables	Model B1			Model B2			Model B3			Model B4			Model B5		
	Coef. (sig)	t		Coef. (sig)	T		Coef. (sig)	t		Coef. (sig)	t		Coef. (sig)	t	
Constant	13.82***	(7.27)		12.99***	(6.68)		13.83***	(7.23)		13.06***	(6.68)		12.80***	(6.48)	
ENERGY	-	-		0.000262	(0.21)		-	-		0.000228	(0.18)		0.00102	(0.63)	
WATER	-	-		0.0000498***	(3.33)		-	-		0.0000501***	(3.34)		0.0000530**	(3.18)	
CARBON	-	-		-0.0164	(-1.41)		-	-		-0.0164	(-1.41)		-0.0229	(-1.57)	
WASTE	-	-		-0.0353*	(-2.20)		-	-		-0.0358*	(-2.22)		-0.0314	(-1.71)	
TURN	-	-		0.000493	(0.10)		-	-		0.000451	(0.09)		0.000307	(0.06)	
SAFETY	-	-		0.0119	(1.77)		-	-		0.0120	(1.78)		0.0198*	(2.49)	
LABOR	-	-		0.00214	(0.38)		-	-		0.00217	(0.39)		0.00185	(0.19)	
GENDER	-	-		-	-		-0.000240	(-0.05)		-0.00198	(-0.39)		-0.000219	(-0.04)	
ENERGY* GENDER	-	-		-	-		-	-		-	-		-0.0000669	(-0.55)	
WATER* GENDER	-	-		-	-		-	-		-	-		-0.0000179	(-0.59)	
CARBON* GENDER	-	-		-	-		-	-		-	-		0.000431	(0.70)	
WASTE* GENDER	-	-		-	-		-	-		-	-		-0.000449	(-0.52)	
TURN* GENDER	-	-		-	-		-	-		-	-		0.00000148	(0.57)	
SAFETY* GENDER	-	-		-	-		-	-		-	-		-0.00212	(-1.85)	

(Continued)

**Table 5. (Continued)**

Variables	Model B1			Model B2			Model B3			Model B4			Model B5		
	Coef. (sig)	t		Coef. (sig)	T		Coef. (sig)	t		Coef. (sig)	t		Coef. (sig)	t	
LABOR* GENDER	-	-		-	-		-	-		-	-		2.65e-12	(0.01)	
SIZE	-0.938***	(-5.42)		-0.878***	(-4.95)		-0.939***	(-5.38)		-0.886***	(-4.96)		-0.867***	(-4.81)	
RISK	-0.0926**	(-2.84)		-0.0922**	(-2.85)		-0.0923**	(-2.80)		-0.0904**	(-2.76)		-0.0917**	(-2.79)	
AGE	0.00677	(0.29)		0.0126	(0.54)		0.00708	(0.29)		0.0154	(0.62)		0.0161	(0.65)	
YEAR	Included			Included			Included			Included			Included		
R <sup>2</sup>	0.119			0.149			0.119			0.149			0.156		
Prob > F	0.0000			0.0000			0.0000			0.0000			0.0000		
Observations	776			776			776			776			776		

Note: \*\*\*, \*\*, \* Coefficient is significant at the 0.001, 0.01, 0.05 level respectively

company, risk, firm age, and corporate performance, while there was a negative relationship between size of company, risk, and firm value.

This study's findings provide several contributions and implications. In terms of theoretical contributions, the results are demonstrated that stakeholder-agency theory can be used to explain the reason of sustainable development information disclosed by listed companies in ASEAN region, although the disclosure is still voluntary reporting in this region. Based on the theory, it is conceptually defined as a tool to reduce information asymmetry and the extent of agency problems between top-managements and a wide range of stakeholders. The study will close or decrease the research gap by analysis the link between sustainability reporting and corporate performance, and between sustainability reporting and firm value interacted by gender diversity. The results contribute database of sustainability reporting in ASEAN Region where has abilities of competitive advantage, production capacity and economic development as well as the other regions in the world. In terms of practical implications, top managements may be able to encourage in sustainability reporting especially water management and work safety to enhance their corporate performance and value. The findings also emphasize the needs to have sustainability regulations to promote sustainable development in ASEAN region as well as the other regions.

However, limitations are mentioned in this study. Although corporate performance and value were used in this study, there are the other several corporate outcomes that may be influenced by sustainability reporting and gender diversity, such as reputation, market reaction, and economic value added. The proxies of corporate performance and value in this study can be mentioned as limitation because there are several proxies, which are measured as corporate performance and value used in previous studies, such as return on equity, economic value added, and abnormal return. Finally, the study focuses on listed companies on the capital markets of five countries in ASEAN region where there are ten countries, which are member of ASEAN. Therefore, to close the limitations of this study, the suggestions for future study are to investigate sustainability reporting of listed companies in the other ASEAN member countries using market reaction or economic value added as the other corporate outcomes.

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