

# Does Environmental Disclosure and Instagram Engagement affect Firm Performance? The Moderating Role of Board's Gender Diversity

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**Abstract.** This study examines the impact of corporate environmental disclosure and Instagram engagement on firm performance, with the moderating role of board's gender diversity. Data from 100 firms listed on the KOMPAS100 index and the Indonesia Stock Exchange (BEI) for the period of 2019-2020 was collected. After removing firms with excessive missing data, the final sample comprised of 57 firms, resulting in a total sample of 114 for the years 2019 and 2020. Environmental disclosure data were obtained from corporate annual reports and stand-alone sustainability reports, analyzed using the GRI Standards. Engagement data with firms' official Instagram accounts were manually obtained from Socialblade. Hypothesis testing was conducted using Structural Equation Modelling (SEM) with Partial Least Squares (PLS). Findings indicate that environmental disclosure and Instagram engagement do not significantly impact firm performance. However, board's gender diversity moderates the relationship between Instagram engagement and firm performance, strengthening it. However, no significant moderating effect of board's gender diversity was found on the relationship between environmental disclosure and firm performance.

## 1 Introduction

In relation to the practice of sustainability reports in Indonesia, the government regulates the implementation of sustainable finance for financial service institutions, issuers, and public companies under the regulation number 51/POJK.03/2017 [1]. The letter issued by OJK (Financial Service Authority) number SEOJK 4/2022 [2] noticed that the preparation of the sustainability report for the first time was postponed to the reporting period of January 1 to December 31, 2021 and submission of it to OJK for the first time was postponed to be no later than May 31, 2022 due to the covid-19 pandemic. Most of sustainability disclosures have been prepared based on specific SDGs guideline, which applies the GRI (Global Reporting Initiative) Standards as its measurement tool that considerably provides a clear approach for assessing a corporate SDGs performance [3]. GRI is an independent international organization that develops global standards on how to disclose economic, social, and environmental impacts of firms and other organizations [4]. Environmental awareness can be a way for firms to create good reputation and image to the stakeholders. The better the reputation, the more likely the firm discloses social and environmental information intended to strengthen its image as a responsible organization [5]. Positive reputation gives benefits to the firm in for example gaining trust and building closer relationships with the

stakeholders [6]. This study uses stakeholder theory to examine relationship of the firm to its stakeholders through environmental disclosure.

Better relationship with the stakeholders can possibly improve the firm reputation which eventually enhances financial performance [7]. In the past two decades, engagement with stakeholders has been the critical step in determining the content of environmental and sustainability information in the sustainability report which is considerably substantial and relevant [8]. Social media has been the media for engaging with the stakeholders. Due to current technological developments, industries have been pushed to adopt social media to communicate with the stakeholders. Social media is able to transform the way of communication to be more collaborative and participative [9]. It intensifies, personalizes, and equalizes the relationship between businesses and their stakeholders [9]. This study uses stakeholder theory to examine relationship of the firm to its stakeholders through social media (Instagram) engagement. When it comes to the number of individuals that can be reached through social media, it is considered to be the most powerful and cost-efficient communication channels in the recent times [10]. Nowadays, the rise of information exchanges in the form of imagery is a notable development in social media communication. Instagram has gained a reputation as one of the best visual-oriented social media platform [11]. According to Forbes,

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Instagram is ranked in the second in term of total downloads in 2020 amounted 57.5 million downloads [12].

In businesses, women are considerably more aware of the value of social media usage in increasing stakeholder engagement [13]. A survey conducted by Pew Research Center showed that 78% of women and 66% of men have used social media actively in 2021. This indicates that women use social media than men do [14]. Prior research concluded that the use of social media for corporate disclosure rises as the number of female board members rises. In other words, gender in the board of directors may have impact on corporate social media disclosure [15]. The board of directors has crucial role in deciding the environmental-related information disclosed in the sustainability report. Therefore, the information disclosed in the sustainability report reflects the board's decision-making process, discretion, and judgment. The board's judgment depends on the members' professional (i.e., educational background, educational level, tenure) and personal (i.e., age, ethnicity, nationality) characteristics. In addition, the information disclosed in the sustainability report is also affected by gender diversity of the board of directors [16]. [17] suggests that gender diversity in a firm can improve corporate governance, creativity, and innovation through different perspectives and considerations in the process of making decisions. These lead to competitive advantage. The more diverse the gender on the board of directors, the greater the potential for understanding and resolving issues that allow managers to effectively deal with the business environment and eventually impact positively on the sustainability report rating [18]. It is argued that female directors may be more emotionally sensitive toward economic, social, and environmental sustainability [19]. This study uses the theory of gender stereotypes to lay out a theoretical framework for explaining the moderating effect of board's gender diversity that may strengthen the relationship of environmental disclosure and Instagram engagement on firm performance.

The remainder of this article is organized as follows: The next section is about hypothesis development and the research design. The sample and descriptive statistics are discussed in the third section. The fourth section is to reports the empirical results. The last section is to present conclusion, recommendations, and explanation of the study limitations.

### 1.1 Objectives

This paper aims to examine the effect of corporate environmental disclosure and Instagram engagement on the firm performance conducted on 100 firms listed on the KOMPAS100 index and the Indonesia Stock Exchange (BEI). This study applies the GRI Standards on particularly the environmental aspects to examine environmental disclosure in the corporate annual report and stand-alone sustainability report. The study of [3] investigates whether the GRI Standard is a useful measure in evaluating the environmental initiatives. Meanwhile, comparing the total followers and total posts of the corporate official Instagram account is to

examine Instagram engagement. This paper contributes to the previous research gap, by adding board's gender diversity as the moderating variable to strengthen the influence of corporate environmental disclosure and Instagram engagement on the firm performance. Previous research focused only on the effect of environmental disclosure on firm performance and only few had studied the effect of Instagram engagement on firm performance. They have mixed results regarding to the effect of environmental disclosure on firm performance. The research result of [20-23], and [24] concluded that there is a significant positive relationship between environmental disclosure on firm performance, while [25] and [26] concluded that there is no such relationship between environmental disclosure and firm performance. The research done by [9] conclude that Instagram engagement has positive correlation with financial performance. Thus, this study is different in term of it examines whether gender diversity (positively) moderates the association between corporate environmental disclosure and Instagram engagement on the firm performance of 100 firms having good liquidity and large market capitalization.

## 2 Literature Review

Instagram is a social media application that allows users to capture or post photographs and videos and then share them with their followers [27]. Nowadays, it is adopted by corporations to share important information with the stakeholders and to interact with public [9]. Number of posts and followers are used to measure engagement activity with the followers since they can provide insight on participation level in the account [28]. The number of followers reflects size of the network and is used to determine popularity of an Instagram account [29]. It also indicates the number of social media users subscribed to the Instagram account and the number of followers who receive notifications on their homepage [30]. According to [29], it shows members from the community that can be utilized as communication channel for the account owner.

Diversity is considered to stimulate not only creativity but also different perspective [31]. Gender diversity is usually measured with the proportion of male and female in a firm or institution [32]. According to [18], the higher proportion of female in the board of directors can possibly improve business effectiveness since it can ensure comprehensive perspectives and issues are certainly considered in the decision making process for arriving at a better decision. Previous research by [33-36] concluded that gender diversity on the board of directors has positive relationship to firm performance. Women are considered to have equal capabilities and performance to men which may impact on company performance positively [37]. It is also argued that female directors are more emotionally

sensitive towards economic, social, and environmental sustainability issues than male directors [19].

## **2.1 Research Theory and Hypothesis Development**

Many theories explain the relationship between environmental disclosure and firm. Prior studies by [25, 21, 26] adopted legitimacy theory, while [20, 38, 23, 24] applied stakeholder theory, and [22] used economic theory, social and political theory. Only few research studying the effect of Instagram engagement on firm performance apply stakeholder theory [9]. While [34] and [37] used agency theory, [33] adopted threat rigidity theory and job matching theory, [35] adopted contingency theory, and [36] utilized stakeholder theory to explain the relationship between board's gender diversity and firm performance. Stakeholder theory is generally used more often. The effect of environmental disclosure and Instagram engagement on firm performance can be explained using stakeholder theory. The theory considers relationships that exist between the organization and its various stakeholders rather than the society as a whole [39]. Stakeholder theory posits that an organization success is determined by the interests and informational demands of its key stakeholders (e.g. employees, customers, government, investors and suppliers) and environmental disclosures can increase transparency and enhance the relationship between managers and stakeholders [20]. According to [9], Instagram can strengthen the relationship between the firm and its stakeholders by making the communication styles to be more interactive and participative. This study uses stakeholder theory to examine relationship of the firm to its stakeholders through social media (Instagram) and environmental disclosure by referring to the research of [20, 38, 23, 24, 9].

A gender stereotype is a standardized assumption about the characteristics that men and women have or ought to have, or the roles that each should fulfil [40]. Gender stereotypes are shaped by different roles of men and women caused by the unequal distribution and represent the idea of socialized expectations on appropriate behaviours, emotions, occupations and roles of men and women [41]. Women very often have to deal with community prejudice and discrimination in the workplace because of gender dimension and such condition hinders career development of women [42, 43]. [44] concluded that gender diversity on the board of directors is closely related to gender stereotypes and affects the contribution of female directors to the board strategic involvement and decision-making. Research concludes that board's gender diversity affects decision making by the board in relation to environmental disclosure and utilization of Instagram [15, 18, 45, 16, 19, 13]. As a result, the theory of gender stereotypes lay out a theoretical framework for explaining the moderating effect of board's gender diversity that may

strengthen the relationship of environmental disclosure and Instagram engagement on firm performance.

### **2.1.1 Instagram Engagement Affects Firm Performance**

The use of social media facilitates communication between a business and its stakeholders. The social media platform is considered as effective and cost-efficient communication channel [10]. Nowadays corporations use Instagram to share important information with their stakeholders and thus this strengthens their relationship with the stakeholders and individuals [9]. This idea is in accordance with stakeholder theory, in which disclosure is practiced by corporations to maintain relationships with the stakeholders [21]. [46] mentioned that stakeholder theory explains how corporations treat all stakeholder groups fairly in order to get their support in achieving success. Thus, maintaining relationship with them will increase the firm performance through increased investment or profits [21]. Several research on SMEs examine the effect of social media adoption on firm performance [47]. Also, the usage of social media as marketing capabilities on firm performance [48]. [47] concluded that social media adoption has a positive effect on firm performance of SMEs in the UAE. The study of [48] concluded that social media usage as marketing capabilities has a positive effect on the performance of SMEs in the hotel industry in the UK. Previous research conducted by [9] arrived at the conclusion that Instagram engagement measured by number of followers and posts has a positive correlation with the financial performance of the Indonesia banking industry. The difference of this study compared to previous ones is on the measurement of engagement with the firm official Instagram account that is determined by dividing number of followers to total posts. Given this, the hypothesis in this study is formulated as follows:

H1 : There is a relationship between Instagram engagement and firm performance

### **2.1.2 Environmental Disclosure Affects Firm Performance**

Environmental disclosure implemented by firms is to improve firm image and reputation [49]. According to [50], environmental disclosure is a firm communication tool to disseminate environmental activities to stakeholders as posited in stakeholder theory [39]. An extensive environmental disclosure may eventually improve reputation as a responsible firm in the perception of the stakeholders and stakeholder relationship. According to [7], having a good relationship with the stakeholders can improve the firm reputation which in turn can attract investments and affect the firm performance positively. The relationship between environmental disclosure and company performance has been examined in some previous studies such as [20, 25, 49, 22, 23, 26, 24] which results in a significant positive relationship between

environmental disclosure and firm performance. Given this, the second hypothesis proposed in this study is as follows:

H2: There is a relationship between environmental disclosure and firm performance

### **2.1.3 Instagram Engagement Moderated by Board's Gender Diversity Affects Firm Performance**

A survey conducted by Pew Research Center in the US showed that 78% of women and 66% of men have used social media actively in 2021. This indicates that women use social media more than men do [14]. Gender stereotypes theory explains that there are socialised expectations on appropriate behaviours, emotions, occupations and roles for men and women [41]. Previous research conducted by [13] concluded that in business, modern women adopt technology through digital tools, the internet, and social media platforms for them to gain competitive advantage by improving stakeholder engagement. As far as we can indicate, there has been very limited research investigating the relationship between Instagram engagement and board's gender diversity. The available one is the research examining the relation between board's gender diversity and disclosure using social media [15, 45]. The research done by [45] resulted in a positive and significant relationship between the gender composition of the board and the level of financial disclosure in social media. This finding is in line with [15] that concluded higher number of female on the boards of directors may result in more corporate disclosure utilizing social media platforms. Given this, the third hypothesis proposed in this study is as follows:

H3: Gender diversity moderates positively on the relationship between Instagram engagement and firm performance

### **2.1.4 Environmental Disclosure Moderated by Board's Gender Diversity Affects Firm Performance**

A study conducted by [44] used gender stereotype theory to examine whether female directors contribute to strategic involvement and board decision-making. They concluded that involvement of female director to board decision-making is moderate and female potential involvement in making decisions in the board may be limited if they are perceived as unequal board members. The board of directors play an important role in determining which information will be disclosed by the firm [16]. The information disclosed in sustainability report thus reflects the board's judgment, discretion, and decision-making process. The board of directors' judgments are influenced by ethnicity, age, educational background, and educational level of the board members. Therefore, the more diverse the gender on the board of directors, the greater the potential for understanding and resolving issues that allow managers to effectively deal with the business environment, which eventually impact on a positive sustainability report

acknowledgement [18]. Previous research even suggested that gender diversity is one of the factors influencing formation of a good sustainability report [51, 52, 53]. [44] stated that inherent differences between men and women are that men are more self-reliant while women are more sympathetic and sensitive. Consequently, female directors may be more emotionally sensitive toward economic, social, and environmental sustainability [19]. This logic is in line with to gender stereotype theory stating that female and male have different social expectations on behaviours, emotions and roles [41]. Extensive environmental disclosure by the firm can attract stakeholders, since most of them are interested in sustainable business practices [49]. Environmental disclosure has also been linked to socially responsible behaviours of a firm to improve its sustainable performance [23]. Stakeholders are individuals or groups who affect or are affected by the accomplishment of a firm's objectives [46]. Therefore, enhanced stakeholder relationship can attract investments and eventually enhance financial performance [7]. Given this, the fourth hypothesis proposed in this study is as follows:

H4: Gender diversity moderates positively on the relationship between environmental disclosure and firm performance

## **3 Methodology**

### **3.1 Sample and Data**

This study uses secondary data of 100 firms listed on the KOMPAS100 index and the Indonesia Stock Exchange (BEI) in 2020. Of these 100 firms, those with excessive missing data on Socialblade that is used for Instagram engagement analysis were taken out from the sample. This resulted in the final sample of 57 firms. The analysis covers data in the period of 2019 and 2020, thus the total sample is 114. KOMPAS100 is an index that is jointly developed by the Indonesia Stock Exchange (BEI) and Kompas Gramedia Group, an Indonesian media corporation. This index measures the stock price performance of 100 stocks having relatively large market capitalization, high liquidity, and good fundamentals [54]. Data on environmental disclosure, board's gender diversity, and firm performance were manually obtained from the firms' annual report or sustainability report, while those on firm's Instagram engagement was manually obtained from Socialblade. The secondary data is analyze using Structural Equation Modelling (SEM) with the Partial Least Squares (PLS), PLS is useful when a large number of indicators must be considered and only a small sample size is available.

### **3.2 Variables**

Firm performance is the dependent variable and measured with return on assets (ROA) and return on equity (ROE) [21]. ROA and ROE are accounting-based indicators that can be used to measure a firm performance [26]. They indicate the firm past performance in how effectively assets are used to

generate value [55]. They also reflect internal decision-making abilities rather than external perceptions of performance because they are subject to managers' discretion on the allocation of funds to different projects. [26]. ROA is measured as the ratio of income to the total assets at the end of a fiscal year [25]. While ROE is measured as the ratio of income to the total equity at the end of a fiscal year [21]. Two independent variables are Instagram engagement and environmental disclosure. Referring to previous research conducted by [9] Instagram engagement is proxied by total followers count and posts. This study applies ratio of the number of followers to total posts as the proxy to Instagram engagement of the 57 firms listed on the KOMPAS100 index, for the period of 2019 and 2020, thus the total sample is 114. In Instagram, number of posts and followers are measured for engagement activity with the followers, since it provides insight on participation level of the account [28]. Environmental disclosure is represented by the percentage of total environmental disclosure aspect in the firm's annual report and stand-alone sustainability report to the total GRI Standard index on Environmental Aspect [3]. The GRI is a widely used measurement for assessing non-financial disclosure [56]. According to [57], firms generally share their environmental information or environmental disclosures through annual reports, corporate websites, and stand-alone sustainability report. Potential moderating impact of gender diversity on board of director is investigated using the percentage of female directors in the board of directors [37].

In addition, firm size, leverage, firm growth, liquidity and firm age are included as control variables that possibly have impact on financial performance of the firm. Market capitalization and total operating revenue are used as the proxy to firm size [58]. Meanwhile, Debt to Equity Ratio (DER) is utilized as the proxy to leverage [59]. The proxies to firm growth are respectively annual change in percentage of net revenues [60]. Liquidity is proxied by firm's current ratio [37]. The firm age is measured by the number of years the firm has been operating since the inception [35]. Measurements of the variables are provided in Table 1.

**Table 1.** Measurements of the variables

Variable	
<b>FP</b>	Firm performance is measured by Return on Asset (ROA) and Return on Equity (ROE). ROA is calculated by dividing the firm's net profit in a particular year by the total assets in the same year [21]. ROE is determined by dividing the net profit of the firm in a specific year by the total equity in the same year [61].
<b>ED</b>	ED is measured by firm's score of the environment disclosure in the annual report and sustainability report which is evaluated based on environmental aspect of the GRI Standards [62].
<b>IE</b>	Instagram engagement is measured by dividing Instagram total followers with the total posts in a particular year.
<b>GD</b>	Gender diversity is measured by percentage of female directors in the firm board of directors [37].

<b>Fsize</b>	Firm size is measured by market capitalization and total operating revenue of the firm. Market capitalization is calculated by dividing firm's total outstanding shares in a given year by the price of shares in the same year [63].
<b>Lev</b>	Leverage is measured by Debt to Equity Ratio (DER) which is calculated by dividing firm's total debt in a given year by the total equities in that year [64].
<b>Fgrowth</b>	Firm growth is percent change of the firm's net revenues in the current year compared to it in the previous year [60].
<b>Liq</b>	Liquidity is measured by Current Ratio which is calculated by dividing firm's current assets by current liabilities in particular year [37].
<b>Fage</b>	Firm age is the number of years of firm operation since the inception [65].

### 3.3 Model

The following model is used to test the hypotheses:

$$FP_{it} = \beta_0 + \beta_1 ED_{it} + \beta_2 ED_{it} + \beta_3 ED_{it} \times GD_{it} + \beta_4 IE_{it} \times GD_{it} + \beta_5 X_{it} + \varepsilon$$

Where  $FP_{it}$  is performance of firm  $i$  in year  $t$ ;  $ED_{it}$  is environmental disclosure score of firm  $i$  available in the firm's annual report and sustainability report based on the environmental aspect of the GRI Standards in year  $t$ ;  $IE_{it}$  is Instagram engagement of firm  $i$  measured by dividing total followers to total posts in year  $t$ ;  $GD_{it}$  is percentage female directors to the total board of directors in firm  $i$  in year  $t$ ;  $X_{it}$  is firm size, leverage, firm growth, liquidity, and firm age as the control variables for firm  $i$  in year  $t$ ;  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4,$  and  $\beta_5$  are the parameters to be estimated, and  $\varepsilon$  is the error term.

## 4 Results and Discussion

### 4.1 Result

Table 2 presents descriptive statistics of the variables. The average of ROA and ROE that reflects FP of the sample firms is 4.01% and 4.70%. This shows that the firms are well performed. The average percentage of ED of the sample firms is 29.18%, which means that the environmental disclosure in either annual report or stand-alone sustainability report is still relatively low compared to the items of environmental disclosure in the GRI standard guidelines. The average of IE of the firms in sample is 96.410 indicating there are on average 96 followers who interact with each post. The average of GD in the firm board of director is 14.99% which means the percentage of female directors is relatively high compared to the median of female directors to the total board of directors in the firm which is only 8.71%. The market capitalization and total operating revenue that reflect FSize of the sample firms is respectively IDR 71,036,592.53 billion and IDR 10,018,812.89 on average. It is assumed that the firms' average market capitalization and total operating revenue are large. Meanwhile, with the average Lev is 141.49% which

indicates the firms' liabilities are higher than the net equities. The average growth indicates that the firms' net income increases 8.89% annually. With the average Liq of 174.99%, the firms' liquidity is considerably healthy and thus can pay their current liabilities using their liquid assets. The firm age is on average 49 years.

**Table 2.** Descriptive statistics

Variabl e	Observatio ns	Mini mu m	Maxi mum	Mean	Standar d Deviatio n
ROA	114	- 0.4509	0.3600	0.0401	0.0932
ROE	114	- 4.1125	1.4000	0.0407	0.4874
ED	114	0.0000	0.9231	0.2918	0.2295
IE	114	6.1071	593.7104	96.4102	109.3648
GD	114	0.0000	0.6667	0.1499	0.1925
MarkCap (Billion)	114	693,750.00	834,571,750.00	71,036,592.53	143,358,016.31
OpRev (Billion)	114	50,055.00	75,165,000.00	10,018,812.89	15,337,822.86
Lev	114	- 6.5532	666.5266	14.1487	87.5193
Fgrowth	114	- 0.3462	1.6761	0.0889	0.2473
Liq	114	0.1249	5.9586	1.7499	1.2232
Fage	114	5.0000	125.0000	48.9211	24.6398

Discriminant validity refers to the value of the cross-loading factor intended to know whether a variable has an adequate discriminant. A variable is considered as having adequate discriminant if its loading factor is greater than that of other variables [66]. Based on the estimated cross loading, it can be concluded that all variables have good discriminant validity with loading factor of the indicators in the indicator block greater than those in other blocks.

Table 3 represents the results of the hypothesis testing using Structural Equation Modelling (SEM) with the Partial Least Squares (PLS). With 95% level of confidence, thus the p-value below 0.05 is accepted. The p-value of the IE variable in the hypothesis 1 test is 0.513, which means that engagement with the firm's official Instagram account has no impact on the firm performance. This result in H1 is rejected. The hypothesis 2 test indicates the p-value of the ED variable is 0.698. This means that environmental disclosure by the firms has no impact on the performance. This means that H2 is rejected.

**Table 3.** Structural Equation Modelling Partial Least Squares (SEM-PLS) result

Firm Performance	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P-Values
X2 IE -> FP	-0.084	-0.066	0.128	0.655	0.513
X1 ED -> FP	-0.025	-0.020	0.065	0.388	0.698
IE * GD -> FP	0.250	0.246	0.118	2,126	0.034
ED * GD -> FP	-0.037	-0.034	0.059	0.637	0.524
X3 Fsize -> FP	0.202	0.203	0.077	2,640	0.008
X4 Lev -> FP	0.051	0.015	0.100	0.509	0.611
X5 Fgrowth -> FP	0.057	0.058	0.150	0.378	0.706
X6 Liq -> FP	0.246	0.234	0.090	2,746	0.006
X7 Fage -> FP	0.142	0.130	0.126	1,129	0.259

The moderating impact of GD on the relationship between Instagram engagement and firm performance is represented by the interaction value resulting in the p-value 0.034 with coefficient 0.250. This means that gender diversity moderates positively the relationship between Instagram engagement and firm performance. Therefore, H3 is accepted. Finally, the p-value of the moderating variable GD is 0.524. This indicates that H4 is rejected meaning that high gender diversity on the board of directors (GD) does not moderate the relationship between environmental disclosure and firm performance. Among the control variables, only firm size and liquidity are positively related to firm performance (p-value below 0.05). On the other hand, leverage, firm growth, and firm age are evidently not associated with firm performance (p-value above 0.05).

## 4.2 Discussion

The H1 is not supported by the analysis that results in there is no relationship between Instagram engagement and firm performance. This finding is not in accordance with the stakeholder theory that addresses existence of the relationship between the organization and its stakeholders [39]. This misalignment is possibly caused by the research sample that consists of various industries. Some industries may never embrace social media platforms due to their nature [67]. Meanwhile, previous research resulting in existence of the relationship between social media and firm performance

was conducted in certain industries such as tourism, hospitality, and banking industry [9, 48]. Instagram engagement is found to have a positive effect on firm performance in banking industry, since banks use Instagram actively to share the information [9]. Similarly, social media also has a positive effect on firm performance in tourism and hospitality industries as they use social media platforms to build and maintain relationship with the customers for marketing and sales purposes [48]. The second finding indicates that environmental disclosure has no significant relationship with firm performance. Thus, the H2 stating there is a relationship between environmental disclosure and firm performance is rejected. This finding is not in accordance to the stakeholder theory in which a firm can use environmental disclosure as the communication tool to disseminate its environmental activities to the stakeholders [50]. The extensiveness level of environmental disclosure in a country can be influenced by the country's social and political status and the fact that more environmental-related regulations and supports are implemented by wealthier countries to address environmental challenges [56]. On the opposite, environmental disclosures in developing countries such as Indonesia is still voluntary including those during the period of the research. Even though the issuance of provision number 51/POJK.03/2017 [1] has mandated firms to do environmental disclosures in a stand-alone sustainability report, the implementation of the provision was delayed until 2021 due to the covid-19 pandemic and referring to the letter of OJK number SEOJK 4/2022 the submission of the sustainability report must be submitted no later than May 31, 2022 [2]. Empirically, this finding is consistent with several previous studies which also used companies from developing countries as the data sample and conclude that environmental disclosure has insignificant impact on firm performance [25, 26].

The H3 formulated as gender diversity moderates positively the relationship between Instagram engagement and firm performance is supported by the third finding and thus H3 is accepted. This becomes the contribution of this study as there has been limited research addressing board's gender diversity as the moderating variable that strengthens the relationship between Instagram engagement and the firm performance. According to gender stereotypes theory, there are socialized expectations on appropriate behaviours, emotions, occupations and roles for both male and female [41]. Previous study conducted by [15] and [45] concluded that there is a relation between board's gender diversity and social media disclosure, while that of [37] concluded that women are considered to have equal capabilities and performance to men which may impact on firm performance positively. [45] conclude that there is positive relationship between the gender composition of the board and the level of social media financial disclosure. Furthermore, a research also conclude that higher number of female on the board of directors may result in more corporate disclosure utilizing social media platforms [15]. This is possible since modern women in business embrace technology through the internet and social media platforms which

enable them to gain a competitive advantage by improving stakeholder engagement [13]. The H4 mentioning that gender diversity moderates positively the relationship between environmental disclosure and firm performance is rejected. Although female directors may be more emotionally sensitive toward economic, social, and environmental sustainability [19], gender stereotypes and female potential contribution to board decision-making may be limited if they are perceived as unequal board members [44]. Furthermore, the percentage of female directors is still low in the Indonesian companies, 14.99% on average (refer to Table 2). The presence of gender stereotypes in term of gender diversity on the board of directors and lack of the number of female directors may limit ability of female directors to contribute in making decisions in the board.

## 5 Conclusion

Female directors may be more emotionally sensitive toward environmental sustainability [19]. More female on the board of directors may result in more corporate disclosures utilizing social media platforms [15]. Nowadays corporations use Instagram to share important information with their stakeholders and thus this strengthens their relationship with the stakeholders and individuals [9]. However, according to [44], gender diversity on the board of directors is closely related to gender stereotypes and contribution of female to the board decision-making may potentially be limited if they are perceived as unequal board members. This study uses stakeholder theory to examine relationship of the firm to its stakeholders through social media (Instagram) and environmental disclosure, and the theory of gender stereotypes to lay out a theoretical framework for explaining the moderating effect of board's gender diversity that may strengthen the relationship of environmental disclosure and Instagram engagement on firm performance. Thus, the objective of our study is to examine whether board's gender diversity (positively) moderates the association of environmental disclosure and Instagram engagement on the firm performance. This study concludes that board's gender diversity measured by the percentage of female directors against the total directors in the board does moderate positively the relationship between Instagram engagement and firm performance. Previous research conducted by [13] concluded that modern women adopt social media platforms for them to get advantages by improving stakeholder engagement. The finding implies that higher percentage of female in the board of directors leads to a better Instagram engagement and better firm performance. This finding is in accordance with the gender stereotypes theory, there are socialized expectations on appropriate behaviours, emotions, occupations and roles for both male and female [41]. Therefore, firms must reduce gender stereotypes in the board of directors and give more opportunities for women to take role in the board of directors and to contribute in making decisions. Firms can create policy on gender-fair language that according to [68] has significant contributions to the reduction of gender

stereotyping. Gender-fair language policy contains guidelines for verbal and written language in which masculine generic pronouns must be used infrequently, the usage of generic “he” must be reduced, and personal nouns and job titles in masculine form must not be included [68].

This study has several limitations that can be addressed in future research. First, the Instagram engagement data is limited to only the period of 2019-2020 due to the data availability on Socialblade and other Instagram analytical tools, thus the sample size is relatively small. Second, not all of the firms listed on the KOMPAS100 index and the Indonesia Stock Exchange (BEI) in the period of 2019-2020 may not yet adopt social media platforms, thus only 57 firms out of 100 were used as research samples. Thus, this paper suggests future research may find additional sources for Instagram engagement data. In addition, moderating role of other board diversity characteristics such as ethnicity, age, educational background, and educational level can be added in future research.

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