

## **Women are more responsible in environmental, social and governance issues, yet when?**

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### **Abstract:**

This paper extends the literature analyzing the impact of board gender diversity on firms' environmental, social, and governance (ESG) performance. The main purpose is to highlight the circumstances under which women on board become more responsible in conducting corporate ESG activities. Using an international sample from 23 countries for the years 2004-2019, we provide consistent and robust evidence that female representation on board positively influences ESG performance and the three subcategories of ESG: environmental, social, and governance, and negatively impacts ESG controversies. Our results are robust to alternative variable definitions, specifications, and methodologies, addressing endogeneity concerns. Furthermore, we demonstrate that information asymmetry moderates the gender diversity – ESG link, such that the positive association between gender diversity and ESG is stronger for firms with lower information asymmetry. Finally, we provide novel evidence that information asymmetry moderates the board gender diversity-ESG association only for high-risk firms or firms with low financial constraints. Hence, female representation on boards tend to enhance corporate ESG performance more in companies with lower information asymmetry, higher risk and lower financial constraints.

**Keywords:** board gender diversity, environmental, social and governance performance, information asymmetry, monitoring, corporate risk-taking, financial constraint.

## 1. Introduction

As a vital governance mechanism, the board of directors (BOD) has experienced many regulatory reforms in the last 20 years. There has been a surge in public pressure to increase the representation of women on BOD, with many suggestions for governance reform stressing the significance of gender diversity on the boards (Adams and Ferreira, 2009). Within this framework, one of the recent developments is to involve more female board members to utilize their contribution to BOD's dynamics with the heterogeneity in female directors' skills, approaches, and ideas. In line with the voluntary or legislative plans, countries encourage female representation in BOD. Some countries have quotas for female representation on BOD (Norway, Spain, Israel, Iceland, France, and Belgium). In contrast, in some countries, it is mentioned as a recommendation in a good corporate governance code (Australia, Austria, Denmark, Germany, Ireland, Luxembourg, Malawi, Malaysia, the Netherlands, Nigeria, Poland, South Africa, Sweden, the UK, the USA) (Terjesen, Aguilera, & Lorenz, 2015). Following the implementation of these initiatives, 35% of all board members are women in Europe in 2021, which has increased from 33% in 2019<sup>1</sup>. In the USA, 26.1% of board members were women increasing to 28.2% in 2020<sup>2</sup>. These percentages are lower globally, as 20.6% of board members are women in 2020, up from 20.0% in 2019. Adams and Ferreira (2009) suggest that whether legislative or voluntary, these initiatives suggest that women's representation on BODs may significantly impact the performance and governance of firms.

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<sup>1</sup> European Women on Boards Report (2021) co-funded by the Rights, Equality and Citizenship Programme of the European Union, <https://europeanwomenonboards.eu/wp-content/uploads/2022/01/2021-Gender-Diversity-Index.pdf>

<sup>2</sup> Women on Corporate Boards (2021) report supported by Catalyst <https://www.catalyst.org/research/women-on-corporate-boards/>

On the other hand, companies' environmental, social and governance (ESG) performance has attracted growing interest in the business and academic worlds. Following the challenges of global warming, climate change, and poor working conditions, companies started to consider ESG issues in their businesses (Ioannou & Serafeim, 2012). Moreover, regulatory bodies started implementing new responsibilities with national regulations for companies to enhance their accountability and transparency in their ESG performance. At the international level, Global Reporting Initiative (GRI) and International Integrated Reporting Council (IIRC) help companies categorize and communicate their actions on ESG issues by disclosing a CSR report. At the European level, with Directive 2014/95/EU (Non-Financial Reporting Directive), the European Union lists the rules on the disclosure of non-financial and diversity information by large companies. BOD, who carry out significant tasks in a firm, such as monitoring and controlling the management, providing resources for the company, and enhancing the company's sustainable actions and responsibility to stakeholders, also has significant roles in corporate ESG performance.

This study focuses on the gender aspect of board diversity, examining its impact on corporate ESG performance. Even though the positive link between board feminization and ESG performance has been shown in previous studies, we predict that this positive impact may differ for firms with different firm characteristics. Our main motivation for this study is to comprehend these firm-specific characteristics under which board gender diversity affects corporate ESG performance. Accordingly, our research question is under what circumstances do women on board become more responsible regarding ESG issues. To gain insight on this question, we examine the moderating role of outside monitoring (information asymmetry). We further investigate this moderation for all the sub-dimensions of ESG to comprehend the exact attributes of ESG performance that are affected by board gender diversity. Finally, we investigate which firm-

specific characteristics amplify or reduce the moderating impact of information asymmetry on the board gender diversity – ESG link.

Employing an international sample of 19,665 firm-year observations from 23 countries, our results demonstrate that (1) board gender diversity enhances corporate ESG performance, its three subcategories (Environmental, social, and governance performance), and the ten sub-dimensions (emissions, resource use, environmental innovation, workforce, human rights, community, product responsibility, management, shareholders, and CSR strategies). (2) Board gender diversity reduces ESG controversies. (3) We provide novel evidence that the link between board gender diversity and ESG seems stronger for firms with lower information asymmetry. Female board members seem to behave more ethically when outside monitoring is higher. (4) Information asymmetry moderates the board gender diversity and ESG link only in high-risk firms or firms with low financial constraints.

This study extends previous studies, which demonstrate a positive link between board gender diversity and ESG performance (Harjoto et al., 2015; Velte, 2016; Wasiuzzaman & Wan Mohammad, 2020) by providing a detailed analysis of this relationship and considering the moderating effect of information asymmetry and whether this moderating effect differs for companies with different firm-specific characteristics. Notwithstanding this, our contribution to literature is threefold. Prior literature on this topic covers either a single country (Nguyen et al., 2015; Francoeur et al., 2019; McGuinness et al., 2017; Wasiuzzaman & Wan Mohammad, 2019) or a single index (Bruna et al., 2021; Manita et al., 2018; Dang et al., 2021) analysis. Our first contribution to the literature is to provide evidence for the board gender diversity - ESG performance relationship employing an international sample from 23 countries and ten different

sectors. Moreover, we examine this link not only through the combined ESG rating but also through all its main categories (environmental, social, and governance), all the sub-dimensions of each, and finally through the ESG controversy score for a diverse set of countries and sectors from all around the globe. ESG performance is proxied with a multidimensional score, with the aggregation of different aspects into a composite score, implying much of the richness and meaning in the data could be lost. To overcome this shortcoming, we analyze the impact of the individual subcategories of the ESG score, providing evidence on which exact subcategory is affected by board feminization.

Second and more importantly, our contribution to the literature is to highlight the circumstances, under which board feminization enhances corporate ESG performance. Within this scope, we initially examine the moderating effect of information asymmetry (i.e., outside monitoring). We provide novel evidence that the positive gender diversity-ESG association is stronger for firms with greater outside monitoring, i.e., less information asymmetry. Finally, for the first time in the literature, we demonstrate which specific firm characteristics influence the moderating effect of information asymmetry on the board gender diversity – ESG link. We provide novel evidence that external monitoring positively moderates the board gender diversity-ESG association only for high-risk firms or firms with low financial constraints but not for low-risk firms or firms with high financial constraints. These findings may imply that female board members in high-risk firms seek to strengthen their ESG performance, especially when external monitoring is high, with the ultimate purpose of reducing their risk-taking profile. Furthermore, female board members in firms with high financial constraints are not likely to enhance their ESG performance due to limited resources. These findings suggest that female board members only in firms with low financial constraints are likely to strengthen their ESG performance, especially

when external monitoring is high. Hence, we provide novel evidence that firm risk and financial constraints play crucial roles in the positive moderating effect of external monitoring in the board gender diversity – ESG relation.

A growing body of literature investigates the link between gender diversity of BOD and possible firm outcomes yet mostly focuses on the firm's financial performance (Post & Byron, 2015), with only a limited number of studies examining the link between board gender diversity and non-financial performance and especially ESG performance (Rao & Tilt, 2016). Notwithstanding this, these studies yield mixed results, demonstrating either a positive (Francoeur et al., 2019; Wasiuzzaman & Wan Mohammad, 2020), a negative (Husted & de Sousa-Filho, 2019), or a null association (Hussain et al., 2018; Manita et al., 2018). The ambivalent link between board gender diversity and ESG performance could be partially attributable to ESG being multifaceted, making it a difficult concept to study (Francoeur et al., 2019). Furthermore, mixed results can also be attributable to the specificities of the countries analyzed (institutional/legal frameworks, governance systems, etc.), the heterogeneity in the years analyzed, or the adopted methodologies (Adams et al., 2015) that do not consider endogeneity issues. The association between corporate governance and performance could be dynamic, suggesting a "dynamic endogeneity" (Wintoki et al., 2012). Accordingly, we employ the generalized method of moments (GMM) besides ordinary least squares (OLS) with fixed effects to overcome this problem. Finally, we also employ hierarchical regression to capture the country and industry-level variations better. Our main findings continue to hold when we consider these possible endogeneity issues and employ different methodologies.

Our study also has theoretical contributions. We demonstrate that boards with gender diversity monitor corporate ESG performance more effectively, satisfying companies' moral commitment, serving multiple stakeholders' interests, and performing better in ESG activities. Our results support the stakeholder theory since board gender diversity enhances a firm's ethical behavior and improves companies' capacity to satisfy a wider group of stakeholders' needs. Moreover, female board members are expected to enhance the monitoring function of BODs, resulting in lower agency conflicts and information asymmetry, which is likely to positively moderate the board gender diversity and ESG link, supporting the agency theory. For companies with lower information asymmetry, female board members, who are likely to be more risk-averse, may feel more pressure to perform better and to involve in more ESG activities to reduce ambiguity and prove themselves to the market, resulting in a moderation effect of information asymmetry.

The rest of the paper is organized as follows: Section two presents the theoretical background and the literature review. The data and variables are explained in section three. The fourth section covers our empirical findings, robustness tests, and discussion. Section 5 concludes the paper.

## **2. Theoretical background and literature review**

No single theory predicts the association between board diversity and ESG performance. However, several theories, including agency, resource-dependence, and stakeholder theories, provide insight into this association, implying the possibility that board diversity affects ESG performance. The first important task of BOD is to monitor the management, where BOD has a controlling function (Hillman & Dalziel, 2003), which can be explained with the agency theory (Fama & Jensen, 1983, Jensen & Meckling, 1976). Agency theory suggests that through its monitoring role, especially

monitoring the management's behavior towards shareholders, BOD mitigates potential principal-agent conflicts with the separation of ownership and control. In line with this, recent studies suggest that board gender diversity strengthens this monitoring function, as female directors are more likely to have better monitoring ability. Female directors are more inclined to think independently, not influenced by the so-called "old-boys club syndrome" (Adams & Ferreira, 2009).

On the other hand, Adams and Ferreira (2009) suggest that by increasing board meeting attendance and the responsibilities of CEOs, female director representations aid in enhancing managerial accountability and accordingly offer better monitoring. Female directors are also more involved with committees requiring intense monitoring, including nominating, audit, and corporate governance committees, than male directors (Adams & Ferreira, 2009). Accordingly, board gender diversity is expected to assign more effort to monitoring. Consequently, female directors tend to act as additional independent board members who enhance BOD's monitoring role (Adams & Ferreira, 2009).

Another key task of BOD is providing resources (Hillman & Dalziel, 2003), which can be explained using the resource-dependence theory (Pfeffer & Salancik, 1978). Resource dependence theory suggests that companies' critical resources and the association between companies and the external world can be enhanced by an upsurge in the size and diversity of BOD (Pfeffer & Salancik, 1978). As the BOD of companies gets larger and more diverse, including gender diversity, companies gain more advantages in acquiring and preserving essential resources encompassing the human capital of the board members, counsel, and advice means of communication and legitimacy (Nguyen et al., 2015). Employing this theory, Hillman et al. (2000) suggest that board



diversity encompassing gender diversity offers differing resources, from which the firm is expected to benefit.

In addition to the BOD's two key functions, BOD also enhances the company's sustainable actions and responsibility to stakeholders (Hill & Jones, 1992). Accordingly, the association between board gender diversity and ESG performance can also be explained with stakeholder theory (Freeman, 1984), which argues that firms should be responsible to all stakeholders, both their primary stakeholders (employees and customers) and their secondary stakeholders (suppliers, social communities, local authorities, etc.). Freeman (1984) suggests that a company's success depends on how the stakeholders' anticipations are considered, including respecting social beliefs; hence managers are obliged to meet the needs of all stakeholders for firm value maximization. As shareholders' representatives, BOD plays a significant role in supervising managers' plans to balance the interests of all stakeholders. Accordingly, the responsibilities of BOD have been expanded from traditional shareholder orientation to incorporate stakeholder orientation.

Stakeholder theory also posits that management uses corporate disclosure to deliver information to various stakeholders. By disclosing their ESG information, companies try to obtain legitimacy from stakeholders (Deegan, 2010); hence it is a tool to answer stakeholders' varying demands (Islam & Deegan, 2008). Accordingly, as effectively managing stakeholders' needs is vital for firm success (Harjoto et al., 2015), BOD plays a key role in balancing the interests of various stakeholders. With an upsurge in board gender diversity, BOD's ability to comprehend different stakeholders' interests and needs is expected to increase, which is expected to be reflected in ESG performance (Harjoto et al., 2015).

## **2.1. Board gender diversity and ESG performance**

Board composition is a key feature of the board's capacity to execute its duties and corporate decisions (Francoeur et al., 2019). One of the essential characteristics of board composition is its level of diversity, which is defined as "variety in the composition of the BOD" that can be observable or non-observable (Kang et al., 2007) or as heterogeneity among board members, with varying characteristics, expertise, and attributes.

Notwithstanding the significance imposed on board diversity, diversity is perceived as a "double-edged sword," with arguments both in favor and against it. The arguments in favor suggest that board heterogeneity lets the group have in-depth discussions resulting in a wider perspective, creating different solutions (Watson et al., 1998), enhances the board's capability to acknowledge different groups' necessities and requirements, and bring together different skills and know-how (Harjoto et al., 2015). Conversely, diversity may also negatively affect the decision-making process in groups. By constructing sub-groups with opposing views, minority groups are likely to possess lower group loyalty and commitment (Rao & Tilt, 2016), creating conflicts, leading to problems in reaching an agreement on strategies and effectively executing board monitoring functions due to potential conflicts of interest (Nguyen et al., 2015; Goodstein et al., 1994). Hence, board gender diversity may not always lead to more effective boards (Carter et al., 2003). Despite its potential negative outcomes, diversity outperforms homogeneity with its superior problem-solving quality (Harjoto et al., 2015).

Within the board diversity attributes (characteristics, expertise, and features, including board independence, board tenure, age, occupational background, educational qualifications, race/ethnicity, functional background, and gender), gender diversity is one of the most important

concerns for companies. Accordingly, the pressure to increase female directors is a continuing global challenge (Rao & Tilt, 2016; Adams & Ferreira, 2009).

The literature analyzing gender-based differences suggests that women and men possess different perceptions about their leadership roles (Wood & Eagly, 2009). Primarily, men possess agentic attributes, such as being self-confident, aggressive, ambitious, and independent. In contrast, women are characterized as empathic, affectionate, kind, and supportive, possessing communal characteristics (Eagly et al., 2003), suggesting that women are more interested in others' welfare and deal with stakeholders' interests better than male board members, who are likely to focus on economic concerns and shareholders (Adams et al., 2015).

Second, female directors' backgrounds and experiences tend to differ from male directors (Hillman et al., 2002), with female directors possessing more community influence (Hillman et al., 2002), resulting in boards with female board members being sensible towards ESG issues. Third, with board members being the face of firms (Manita et al., 2018), the presence of female board members sends a positive signal to all stakeholders that the company is ready to comply with society's expectations.

Fourth, female directors are likely to be risk-averse (Adams & Funk, 2012), avoiding ambiguity (Wasiuzzaman & Wan Mohammad, 2020) and being more averse to reputation loss (Srinidhi, Gul, & Tsui, 2011). Thus, female directors tend to make decisions to reduce asymmetric information (Gul, Hutchinson, & Lai, 2013). Female directors are likely to be more concerned with strategic matters and consider differing perspectives, norms, attitudes, and beliefs (Pelled et al., 1999), being more responsive to community and social needs (Adams & Funk, 2012). Hence it is highly unlikely for female top managers to trade off social interests against quantifiable

financial results, where companies with a higher number of female top managers tend to reach enhanced social and financial performance (McGuinness et al., 2017).

In line with these arguments, Krüger (2009) suggests that firms with board gender diversity have higher social responsibility, with female board members paying more attention to the well-being of a company's stakeholders and being more generous to communities, stimulating strategic commitment, nourishing CSR awareness (Bruna et al., 2021) and boosting CSR engagement (Adams & Funk, 2012). Accordingly, female directors are expected to enhance corporate ESG performance (Manita et al., 2018) and encourage CSR projects (Dang et al., 2021).

On the other hand, female board members are likely to attend more board meetings and participate more in monitoring committees (Adams & Ferreira, 2009); witness reduced internal audit weaknesses (Chen et al., 2016) than their male colleagues. Furthermore, effective monitoring is expected to decrease conflicts due to the separation between ownership and control (Manita et al., 2018), suggesting that BOD with female members has a better monitoring function, is better in observing, and therefore is more effective. Besides monitoring, supported by the stakeholder theory, building a good relationship between stakeholders is the other corporate governance aspect of women on board (Donaldson & Davis, 1991). Moreover, women are more sensitive to ethical issues (Cumming et al., 2015). As boards are held responsible for ESG matters in general, with ESG being a key item on the agendas of BOD (Rao & Tilt, 2016), with their unique characteristics, board gender diversity is expected to enhance corporate ESG performance, leading to our first hypothesis:

*Hypothesis 1. Board gender diversity enhances corporate ESG performance.*

Besides analyzing companies' overall ESG performance, several studies examine the impact of board gender diversity on the subcategories and sub-dimensions of ESG performance. For example, Arayakarnkul et al. (2022) focus only on the social aspect of ESG performance, showing that board gender diversity is positively associated with companies' commitment to their community, workforce, human rights, and product responsibility. On the other hand, Lu and Herremans (2019) demonstrate that gender diversity is positively linked to corporate environmental performance. Analyzing environmental performance in more detail, Kuzey et al. (2022) provide evidence that female board members significantly and positively impact eco-innovation, emissions, and resource usage. Finally, Nuber and Velte (2021) show a positive association between board gender diversity and carbon performance. The common point of these studies is that they analyze only one subcategory of ESG performance (i.e., environmental performance) or the sub-dimensions within that subcategory (i.e., carbon emissions). Our study contributes to the literature since we investigate all subcategories (i.e., environmental, social, and governance subcategories) and all the sub-dimensions within these subcategories (i.e., emissions, environmental innovation, resource use, workforce, community, product responsibility, human rights, shareholders, management, and CSR strategy), providing evidence on which exact subdimension gender diversity impacts within the three subcategories (i.e., environmental, social, and governance).

## **2.2. Impact of information asymmetry**

Within the agency theory framework (Jensen & Meckling, 1976), information asymmetry refers to market environments with some actors possessing more information than others. When some investors hold on to private information about the company, they are better informed than other investors who only possess public information, resulting in information asymmetry. In this context,

it is presumed that management can utilize information asymmetry to act in a way that contrasts with the shareholders' interests. Information asymmetry should be reduced to mitigate this agency issue, likely with key governance qualities, including accountability and transparency (Rao & Tilt, 2016). Higher disclosure, both financial and non-financial, is expected to reduce information asymmetry. Since BOD is anticipated to play a significant role in ESG performance and its disclosure, the level of information asymmetry is expected to influence the association between BOD and ESG performance.

Financial analysts, which are employed as one of the proxies of information asymmetry in the literature, are perceived as an essential external corporate governance mechanism, serving as intermediaries of information between companies and outside parties (Flores et al., 2019). Within the agency theory context, external monitors are employed to control insiders' decisions based on the assumption that there are conflicts of interest between agents and principals (Wright et al., 2002). Acting like external monitors, analysts are expected to collect, analyze, and distribute information about the company to interested parties, reducing information asymmetry.

On the other hand, female board members are more risk-averse and dislike ambiguity more than males in their corporate decisions (Wasiuzzaman & Wan Mohammad, 2020). Moreover, the feminization of BOD is also likely to decrease informational biases (Francoeur et al., 2019) and improve corporate decision-making processes by constructing an environment with a higher level of CSR engagement (Adams & Ferreira, 2009; Harjoto et al., 2015). Accordingly, female board members tend to make decisions and take actions to enhance diligence and decrease asymmetric information (Gul et al., 2013). Although many recent studies document a positive effect of women's representation on corporate policies, the number of women board members is less (only

20.6% of all board members are women globally in 2020). Indeed, female board members have recently started to occupy these positions compared to their male colleagues. Companies with a higher number of analysts following (i.e., higher level of outside monitoring) are likely to be more transparent; hence, information asymmetry is likely to be low. In these kinds of firms, female board members may feel more pressure to perform better and to involve in more ESG activities to reduce ambiguity and prove themselves to the market. Thus, we expect to have a moderating effect of outside monitoring, which we may call information asymmetry, on the link between gender diversity and corporate ESG performance. Accordingly, we build our second hypothesis as follows:

*Hypothesis 2. The positive impact of board gender diversity on corporate ESG performance is more pronounced for firms with less information asymmetry (more external monitoring).*

In addition to our expectation that information asymmetry will moderate the board gender diversity-ESG performance link, we also anticipate this moderation effect to differ for companies with different firm characteristics. Female board members are more risk-averse (Adams & Funk, 2012). Moreover, ESG performance reduces overall firm risk (Godfrey et al., 2009; El Ghouli et al., 2011; Jo & Na, 2012; Kim et al., 2014). Companies, which have higher external monitoring (i.e., lower information asymmetry), are more inclined to perform better in ESG issues to reduce their risk as it is expected to be observed more in the market. Considering these different strands of literature, we conjecture that female board members in high-risk firms are likely to enhance their ESG performance to reduce their firm risk, especially when external monitoring is high (i.e., information asymmetry is low). On the other hand, financial constraint is another firm characteristic that may influence the moderation effect of information asymmetry. Investors or

creditors who are likely to follow the financially constrained firms closely may expect them to utilize their limited resources only for their basic operating functions instead of ESG activities, which may be considered redundant. Accordingly, firms may choose not to be engaged in ESG activities if they do not have adequate resources (i.e. if firm has higher financial constraints) (Chan et al., 2017). Hence, we anticipate external monitoring to significantly moderate the gender-ESG link only in companies with low financial constraints. Consequently, we posit that the moderating effect of information asymmetry on the board gender diversity – ESG link is more pronounced in high-risk companies or companies with low financial constraints.

*Hypothesis 3. Firm-specific characteristics (firm risk and financial constraints) have a significant impact on how information asymmetry moderates the gender diversity – ESG relationship.*

*Hypothesis 3.a. The moderating effect of information asymmetry on the board gender diversity – ESG link is more pronounced in high-risk companies.*

*Hypothesis 3.b. The moderating effect of information asymmetry on the board gender diversity – ESG link is more pronounced in companies with lower financial constraints.*

### **3. Data and variables**

The sample consists of 19,665 firm-year observations with 2,930 publicly traded individual firms from 23 countries for 2004-2019. The sample breakdown according to the countries and industries is given in Table 1. Although 37 percent of the firm-year observations come from US firms, the remaining cross-country part seems distributed evenly. 15 percent of the observations are from manufacturing, 12 percent from computers, electronics, and software, and 11 percent from oil, gas, and coal extraction and products sectors.

(INSERT TABLE 1)



We gather the firm-level data from Refinitiv EIKON and Datastream and macro-level variables from the World Bank database. Refinitiv (formerly Thomson Reuters) EIKON partitions ESG information into three categories: environmental, social, and governance. These three categories also have sub-dimensions which are emission, resource use, and environmental innovation for the environmental category; workforce, community, product responsibility, and human rights for the social category; management, shareholders, and CSR strategy for the governance category.

Our main dependent variables are the combined ESG score and environmental, social, and governance scores. Following the literature, to measure corporate environmental responsibility, we take the average of the three sub-dimensions of the environmental category, including emissions, resource use, and environmental innovation. Similarly, we evaluate the social and governance performance by taking the average of appropriate sub-dimensions for each category.<sup>3</sup> We also use the ESG controversies score in our analysis to examine how gender diversity on board impacts negative events regarding ESG. We further use the sub-dimensions as dependent variables in our extended analysis to fully comprehend the gender diversity effect on corporate ESG performance.

The main independent variable of interest is board gender diversity, estimated by the number of female board members to the board size ratio. The other crucial variable in our study is information asymmetry, which is used as a moderating variable. Following the previous studies claiming that analysts' coverage increases the informativeness of the stock prices, we estimate information asymmetry by analyst coverage (Ayers & Freeman, 2003; Griffin & Lemmon, 2002;

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<sup>3</sup> We use the combined ESG score provided by EIKON as the ESG performance of a firm.

Brennan, Jegadeesh, & Swaminathan, 1993, etc.). Analyst coverage is defined as the natural logarithm of the number of analysts following the company.

To decently study the relationship between ESG and gender diversity, following the prior literature, we control for a list of some firm and macro-level variables in our empirical analysis. First, we include board size in our research which is proxied by the natural logarithm of the total number of board members. Husted and Sousa-Filho (2019) document a positive link between board size and ESG disclosure for Latin American firms. Similarly, we expect to have a higher overall ESG (and higher environmental, social, and governance scores) for firms with larger boards since, on such boards, there would be broader perspectives in corporate decision-making. Second, we control for firm size. Larger firms are under more pressure to get involved in ESG practices as they have greater visibility and more resources for ESG activities. Thus, consistent with the previous studies, we expect larger companies to have higher ESG scores (Drempetic, Klein & Zwergel, 2020). Next, we control profitability, proxied with return on equity (net income/shareholders equity). Drempetic et al. (2020) use three different profitability measures in their study and find conflicting results: a negative effect on return on invested capital and an insignificant effect on earnings per share and operating profit margin. On the other hand, Borghesi et al. (2014) document a positive link between operating profitability and ESG scores. Following Borghesi et al. (2014), we claim that scarce resources lead companies to less ESG commitment and thus expect more profitable firms to have more resources for their ESG activities, predicting profitability to affect ESG performance positively.

Further, we include leverage as a control variable. Some previous studies argue that stakeholders' impact on companies will be higher for highly levered firms regarding ESG involvement (Drempetic et al., 2020; Yu & Choi, 2016). On the other hand, consistent with the

managerial overinvestment hypothesis from a corporate social responsibility aspect, many studies document a negative impact of leverage on corporate ESG activities (Borghesi et al., 2014; Barnea & Rubin, 2010). Supporting the managerial overinvestment hypothesis, we expect lower ESG scores for highly levered firms since they are more vulnerable to financial constraints and have scarce sources for their operations. Our last firm-level control variable is corporate investments. Although investments in new equipment and environmentally friendly technologies are expected to improve a firm's environmental performance (Clarkson et al., 2008), managerial overinvestment in CSR for their private benefits may cause investment to have a negative impact on ESG scores (Yarram & Adapa, 2021). Finally, our last two control variables are country-level: gross domestic product (GDP) and growth of GDP. Following the literature, we expect to have higher ESG performance for companies operating in countries with higher GDP and GDP growth countries (Li et al. 2010).

#### **4. Empirical results**

##### *4.1. Summary statistics*

According to the descriptive statistics displayed in Table 2, the ESG rating has a median of 38.37 and a standard deviation of 21.20. The environmental score is the lowest among the three categories, with a median of 28.27, and the governance score is the highest, with a median of 44.83. The average board size is 10, with an average of 13.84 percent female members. We should note that the third quartile for the board gender diversity is only 22.22 percent of the board size, validating the lower number of female members in the board of directors. The average number of analysts following a firm is approximately 13. Although the maximum number of analysts following a firm is 55, the third quartile for this variable only consists of 19 analysts.

The pairwise correlation coefficients of the key variables are presented in Table A1 in the Appendix. The possibility of multicollinearity is unlikely as the correlation coefficients are not high.

(INSERT TABLE 2)

#### 4.2. ESG & Board Diversity

To explore the relationship between board gender diversity and ESG performance, we use panel data estimation with fixed effects which can be expressed as,

$$ESG_{ict} = \alpha_0 + \beta Gender\ diversity_{it} + \gamma' X_{it} + \theta' Y_{ct} + \vartheta_j + \rho_c + \tau_t + \varepsilon_{it} \quad (1)$$

where  $X_{it}$  stands for firm controls,  $Y_{ct}$  for macro-level controls,  $\vartheta_j$  for industry fixed effects,  $\rho_c$  country fixed effects,  $\tau_t$  year fixed effects and finally  $\varepsilon_{it}$  stands for the error terms. First, we estimate Model (1) for ESG performance and then for the three categories of ESG: environmental, social, and governance. We further run model (1) for ESG controversies to examine the effect of gender diversity on the negative events regarding ESG. We display the findings in Table 3. Supporting our expectation, the coefficient on board gender diversity is positively significant with a p-value less than 0.01 for four dependent variables: ESG, environmental, social, and governance performances (columns 1 – 4). As female directors tend to be risk-averse, placing greater importance on trust-building relations, they prioritize taking actions that would decrease asymmetric information to gain stakeholders' trust, investing in ESG activities (Wasiuzzaman & Wan Mohammad, 2020). Our findings provide evidence that board gender diversity enhances ESG performance, implying that diverse boards influence managers' decision process, consequently balancing multiple stakeholders' interests. However, for the dependent variable of ESG controversies, the coefficient on gender diversity is negatively significant at a five percent level

(column 5). This finding indicates that in firms with higher gender representation on their boards, negative events reflected in the global media regarding the ESG would be lower.

In line with our expectations, we document a positive relationship between board size and ESG, indicating that larger boards provide broader perspectives in corporate decision-making regarding ESG activities. Furthermore, larger and more profitable firms have greater overall ESG, environmental, social, and governance performances as they have more resources to involve in ESG activities. These firms are more visible and under more pressure. Supporting the managerial overinvestment hypothesis, our results document lower ESG scores for highly levered firms as they have scarce sources for their operations. Similarly, consistent with our expectations, firms with high investment levels have lower ESG scores. Our country-level control variable, GDP, has a positive influence on ESG. On the other hand, GDP growth negatively affects ESG.

(INSERT TABLE 3)

#### *4.3. Robustness*

Among 19,665 firm-year observations, 7,353 observations are from US firms, 1,638 are from Canada, and 1,546 are from Hong Kong, which reveals the necessity to control whether the observations from these three countries dominate the sample and drive the results. Thus, we re-estimate our main model under alternative samples, which are obtained by excluding the US, Canada, and Hong Kong. The positive impact of board gender diversity on ESG performance continues to hold under alternative sample constructions (Table 4 Columns 1-2-3).

Next, we check the validity of our results under alternative gender diversity measures. Following the literature, we use three alternatives: Blau index for gender, a dummy for the existence of at least one female on board, and a dummy for more than one female board member

(McGuinness et al., 2017; Nguyen et al., 2015; Bear et al., 2010). First, the Blau index is used as it considers the overall diversity (Nadeem et al., 2017; Bear et al., 2010; Blau, 1977).<sup>4</sup> Next, we use two dummy variables to proxy for gender diversity. *D\_boardgender* is equal to one if at least one female member is on board. *D\_morethanone* is equal to one if there is more than one female on board to take into consideration the impact of token representation, which causes performance pressure on the solo female member, and may result in a limited opportunity to share her ideas and experiences (Cook & Glass, 2018; Kanter, 1977). The positive association between gender diversity and ESG performance continues to hold under alternative gender diversity measures. (Table 4, Columns 4-5-6).

Furthermore, we control for alternative fixed effects in our model. The main model uses industry, year, and country fixed effects. For robustness, we re-estimate the model with firm and year-fixed effects. Also, the multilevel nature of our data enables us to apply hierarchical regression, which better captures the country and industry-level variations. These two alternative model specifications demonstrate that the positive influence of gender diversity on ESG performance continues to hold.

We further consider possible endogeneity problems, which may be caused by omitted variable bias, mismeasurement of variables and causality (Wooldridge, 2010). To deal with the first source of endogeneity, namely the omission of variables, by using various fixed effects in the main model, such as year, industry, and country fixed effects. In the robustness checks we also control for firm and year fixed effects and verify that omitted variables do not drive our results. To deal with the other source of endogeneity, namely, the mismeasurement of variables, we run

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<sup>4</sup> Blau index is calculated by  $1 - \sum_i p_i^2$  where  $p_i$  is the proportion of the board in each gender category and  $i=1,2$  (female and male)

our main regression with various alternative measures of board gender diversity. Our main findings are valid under different measures of board gender diversity. We also apply a GMM analysis to further control for endogeneity, measurement errors, reverse causality, and unobserved heterogeneity in our sample (Bond et al., 2001). Moreover, the association between corporate governance and performance could be dynamic, implying that past performance and corporate governance characteristics affect current performance and corporate governance characteristics, suggesting a “dynamic endogeneity” (Wintoki et al., 2012). To overcome this problem, we apply a two-step system GMM analysis which uses lagged explanatory variables as instruments (Blundell & Bond, 1998; Arellano & Bond, 1991). The coefficient on gender diversity is positively significant (Table 4, Column 9). We check the validity of the model and the instruments by using the AR(2) and Hansen tests. The Hansen test statistic is equal to 7.17 with a p-value of 0.31, implying that the null hypothesis of the overall validity of the instruments cannot be rejected. Moreover, AR(2) is equal to 0.82 with a p-value of 0.41, indicating that the null hypothesis of the serially uncorrelated error terms cannot be rejected. Both test results support the validity of the instruments and the model.

(INSERT TABLE 4)

#### *4.4. ESG, board gender diversity & information asymmetry*

In addition to examining the impact of board gender diversity on ESG performance, our main interest in this paper is to explore how information asymmetry influences this link. To examine this moderating effect, we include the interaction term between information asymmetry (proxied with the number of analysts) and gender diversity. We apply the following model with continuous variable  $\ln(analysts)$ . The results are provided in Table 5.

$$\begin{aligned}
ESG_{ict} = & \alpha_0 + \beta_1 Gender\ diversity_{it} + \beta_2 Gender\ diversity_{it} \times \ln\ Analysts_{it} \\
& + \beta_3 \ln\ Analysts_{it} + \gamma' X_{it} + \theta' Y_{ct} + \vartheta_j + \rho_c + \tau_t + \varepsilon_{it}
\end{aligned}
\tag{2}$$

In all estimations, both gender diversity and the number of analysts following positively and significantly affect ESG performance, suggesting that companies benefit from board feminization and external monitoring in terms of obtaining superior ESG performance. Moreover, in Column 1, the interaction term between gender diversity and information asymmetry appears positively significant (with a p-value less than 0.01), indicating that the positive impact of board gender diversity on ESG performance is greater for firms with a higher number of analysts following (i.e., lower information asymmetry). To gain a deeper understanding, we use the subcategories of ESG as the dependent variables in the next three columns. Similarly, the interaction term is positive and significant for all these dependent variables, showing that the positive influence of women on boards on environmental, social, and governance performances is greater for firms with a higher number of analysts following the firm.<sup>5</sup>

(INSERT TABLE 5)

#### 4.5. Additional analysis: Influence of firm characteristics on the moderating effect of information asymmetry

The previous section provides novel empirical evidence that information asymmetry moderates the board gender diversity - ESG performance relationship. Notwithstanding this, it is also important to consider whether certain firm-specific characteristics could amplify or reduce the

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<sup>5</sup> For robustness, we define tercile dummies according to the number of analysts following the firm and interacting with gender diversity. We split the sample into three groups according to the number of analysts following companies and define three dummy variables. *Analysts tercile 1* dummy variable is equal to 1 if the firm is in the lower group according to the number of analysts and zero otherwise. *Analysts tercile 2* dummy variable is equal to 1 if a firm belongs to the middle group and zero otherwise. *Analysts tercile 3* dummy variable is equal to 1 if the number of analysts following a firm is in the highest-level group. According to the results given in Table A2, the interaction terms are positive and significant for the third tercile only, implying that higher gender diversity on boards increases ESG (and its subcategories: environmental, social, and governance) performance more for firms with higher outside monitoring.



anticipated moderating effect of information asymmetry on the association between board gender diversity and ESG performance. Firm risk is closely related to ESG activities, board gender diversity, and information asymmetry (Cui et al., 2018). On the other hand, companies' cash flow liquidity affects their ESG activities, implying that it is highly unlikely for financially constrained companies to engage in ESG activities (Chan et al., 2017). Hence, we focus on these two firm-specific characteristics, i.e., firm risk and financial constraints, which could affect ESG engagement.

Empirical studies show that companies' engagement in ESG activities reduces overall firm risk (Godfrey et al., 2009; El Ghouli et al., 2011; Jo & Na, 2012; Kim et al., 2014) for the following reasons: Primarily, more ESG activities mitigate a company's information asymmetry (Cui et al., 2018), hence lessening the risk. Second, stronger ESG engagement creates a positive social image by improving corporate reputation (Michelon, 2011) and reducing the impact of negative news, reducing firm risk. Third, ESG investments contribute to long-term corporate performance (Mahoney & Thorne, 2005), thus reducing the motivation to carry the disadvantages of negative news about companies. Finally, more responsible firms regarding ESG activities have wider investor bases, which reduces firm risk (El Ghouli et al., 2011). Accordingly, stronger ESG performance is anticipated to protect companies during unfavorable market conditions, reducing firm risk (Benlemlih & Girerd-Potin, 2017). Based on this rationale, we conjecture that the female board members of high-risk companies are likely to employ ESG activities to reveal more non-financial information to the public to reduce firm risk and prove this to the investors to reduce adverse selection issues. Accordingly, we posit that female board members who are likely to be more risk-averse may put more effort into strengthening their ESG performance with the ultimate

objective of decreasing their overall firm risk, especially when external monitoring is high (i.e., information asymmetry is low).

On the other hand, financial constraints are frictions that stop companies from financing all desired investment opportunities, which may result from an inability to borrow or issue equity (Bae et al., 2021). Accordingly, financially constrained firms are not likely to engage in ESG activities due to inadequate resources, suggesting that the crucial role played by ESG is reduced for companies with high financial constraints (Chan et al., 2017). Hence, we conjecture that external monitoring positively moderates the female board member - ESG association only in companies with low financially constrained firms but not in companies with high financial constraints.

Specifically, we focus on earnings and sales volatility to reveal total firm risk and on the Kaplan-Zingales index<sup>6</sup> (KZ-index) to reflect financial constraints (Kaplan and Zingales, 1997). Following previous studies, we estimate firm risk-taking by earnings and sales volatility (Koirala et al., 2018, Upadhyay et al., 2017, Boubakri et al., 2013, John et al., 2008). We define earnings volatility as the standard deviation of the firm's earnings to total assets ratio over a five-year window with at least three years of non-missing observations. Similarly, sales volatility is defined as the standard deviation of the natural logarithm of the firm's sales over a five-year window with at least three years of non-missing observations.

We conduct a sub-sample analysis by constructing six sub-samples based on the median value of earnings volatility, sales volatility, and KZ-index. For example, a company is categorized

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<sup>6</sup> KZ Index =  $-1.001909 \times \text{Cash Flows} / K + 0.2826389 \times Q + 3.139193 \times \text{Debt} / \text{Total Capital} + '-39.3678 \times \text{Dividends} / K + -1.314759 \times \text{Cash} / K$ , where K: property, plant and equipment<sub>t-1</sub>; Q =  $(\text{Market Capitalization}_t + \text{Total Shareholder's Equity}_t - \text{Book Value of Common Equity}_t - \text{Deferred Tax Assets}_t) / \text{Total Shareholder's Equity}_t$

as high risk if its earnings volatility is higher than the whole sample's median value of earnings volatility. Then, we re-estimate Model 2 for these six sub-samples separately. We display the findings in Table 6. Columns 1 and 3 (2 and 4) provide the findings for the high-risk (low-risk) companies. Finally, column 5 (6) presents the findings for companies with higher (lower) financial constraints.

(INSERT TABLE 6)

In all six sub-samples (columns 1 – 6), board gender diversity positively affects ESG performance, suggesting that no matter how risky the firm is or whether the firm is financially constrained, the presence of female board members enhances corporate ESG performance. Similarly, in all six sub-samples, the surge up in the number of analysts, i.e., reduction in information asymmetry, is likely to improve ESG performance. However, the moderating effect of information asymmetry seems to change for the different sub-samples: For high-risk firms, i.e., firms with higher earnings and sales volatility (columns 1 & 3), information asymmetry has a significant moderating effect on the association between board gender diversity and ESG performance. However, the moderating effect of information asymmetry is insignificant for low-risk firms (Columns 2 & 4). Our findings demonstrate that the moderating effect of information asymmetry on the association between board gender diversity and ESG performance differs for firms with different levels of risk. When a higher number of analysts follow firms, external monitoring is expected to surge up, reducing information asymmetry. In high-risk firms, female board members, who are likely to be more risk-averse and who try to avoid ambiguity (Wasiuzzaman & Wan Mohammad, 2020), try to prove themselves and perform better in ESG issues to reduce their firms' risk-taking.

Conversely, the moderating impact of information asymmetry on the linkage between board gender diversity and ESG performance is insignificant for low-risk firms. In low-risk firms, female board members do not feel pressure to reduce their risk-taking behavior even when the number of analysts following the firm is increasing since these firms are already low-risk. Hence, information asymmetry, i.e., the number of analysts following the firm, does not moderate the association between board gender diversity and ESG performance for low-risk firms, implying that female board members have no incentive to reduce their companies' risk-taking stemming from stronger ESG performance.

As another firm characteristic, we consider financial constraints, for which we employ the KZ index as a proxy. Information asymmetry significantly moderates the association between board gender diversity and ESG only for firms with low financial constraints (column 6) as opposed to the insignificant moderating effect of information asymmetry in high financial constrained firms (column 5). This novel evidence suggests that companies with high financial constraints cannot spare an extra budget for ESG activities since these activities are not their priority. Hence, a surge in the number of analysts following the firm does not moderate the association between board gender diversity and ESG performance. Even though investors' monitoring increases in line with the number of analysts following, which ultimately reduces information asymmetry, the presence of female members on their boards is not likely to result in an improvement in their ESG performance in highly financially constrained firms. This finding is explained by the fact that when firms are financially constrained, i.e., when firms do not have enough budget to be spent on additional ESG activities, female board members are not likely to enhance their ESG performance, even when their monitoring increases. Accordingly, information asymmetry (number of analysts following) moderates the board gender diversity-ESG association only for firms with low financial

constraints, implying that board gender diversity offers differing resources to the company, and the company benefits from this. However, companies will benefit only if they have enough resources to fund it. Moreover, as investors and creditors monitor firms with financial constraints closely, external monitoring increases. Consequently, it is highly unlikely for female board members in these companies to enhance their ESG performance, as these companies do not possess the necessary funds to carry out ESG activities.

#### *4.6. Additional analysis with ESG sub-dimensions*

To gain more insights, we perform additional analysis with ESG sub-dimensions: emissions, resource use, environmental innovation, workforce, community, human rights, product responsibility, shareholders, management, and CSR strategy. First, we estimate the baseline model (1) with each of these dependent variables. The findings are displayed in Table 7. We see that the coefficient on gender diversity is positive and significant, with a p-value less than 0.01 for all ESG sub-dimensions (Table 7), implying that board gender diversity enhances ESG practices in all subdimensions.

We re-estimate model (2) for ESG sub-dimensions as the dependent variables. We present the findings in Table 8. We observe that the interaction term between *gender diversity* and *ln(analysts)* is positive and significant for resource use and environmental innovation in the environmental category, human rights and community in the social category, and management and CSR strategy in the governance category (Table 8). The findings indicate that the positive influence of gender diversity on the sub-dimensions (resource use, environmental innovation,

human rights, community, management, and CSR strategy) is greater for firms with lower information asymmetry.<sup>7</sup>

Overall, we explore that gender diversity increases resource use, environmental innovation, emission, community, management, and CSR strategy practices more for firms with greater outside monitoring (lower information asymmetry).

(INSERT TABLE 7 & 8)

## 5. Conclusion

Our paper investigates the impact of board gender diversity on corporate ESG performance and ESG sub-dimensions. In addition, we explore the moderating role of information asymmetry to extend the previous literature on the association between board feminization and ESG performance. Finally, we investigate which firm-specific characteristics amplify or reduce the moderating impact of information asymmetry on the board gender diversity – ESG link. Accordingly, our main motivation and contribution in this study is to examine the firm-specific circumstances under which women on board enhance corporate ESG performance.

Using an international sample of 19,665 firm-year observations from 23 countries over the 2004-2019 period, we find that female board members positively influence corporate ESG performance and its three subcategories: environmental, social, and governance, supporting stakeholder theory. Moreover, gender diversity in BOD also positively impacts all sub-dimensions of ESG: emissions, resource use, environmental innovation, workforce, human rights, community, product responsibility, management, shareholders, and CSR strategies. On the other hand, board

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<sup>7</sup> For robustness checks, we use information asymmetry terciles and have these dummy variables interact with gender diversity. The findings are displayed in Table A3 in the Appendix. The interaction term is positive and significant for the third tercile for all ten subdimensions, except for environmental innovation and shareholders.

gender diversity reduces ESG controversies, suggesting that with board feminization, firms are likely to face fewer negative events regarding ESG. Our findings remain robust to alternative sample constructions, alternative variable measurements, and alternative model specifications. Particularly employing a fixed effect methodology, hierarchical regression, and GMM in separate estimations, our finding regarding the positive impact of board feminization on corporate ESG performance continues to hold.

Furthermore, we present novel evidence that the link between board gender diversity and ESG performance seems stronger for firms with lower information asymmetry, aligning with the agency theory perspective. Female board members are likely to behave more ethically when outside monitoring is higher. On the other hand, studies show that corporate ESG engagement is expected to reduce companies' overall risk, including credit risk. Accordingly, female board members in high-risk companies are likely to make more effort to undertake ESG activities to reduce firm risk, especially when external monitoring is high. From a resource-dependence theory perspective, female board members offer different resources to companies from which they benefit. As superior ESG performance is expected to reduce credit risk, cost of debt, and equity, the female board members, who are likely to be more risk-averse, may try to lower their risk by employing different resources. Hence our findings show that the moderating impact of information asymmetry on the board gender diversity – ESG link is more pronounced for high-risk firms or firms with low financial constraints but not for low-risk firms or firms with high financial constraints, providing support for resource-dependence theory.

This study contributes to the existing literature in several ways: (1) Primarily, we demonstrate that board feminization enhances not only companies' combined ESG performance

but also all three categories (environmental, social, and governance) and all the sub-dimensions of each (emissions, resource use, environmental innovation, workforce, human rights, community, product responsibility, management, shareholders, and CSR strategies). Hence, we provide evidence that with board gender diversity, each aspect embedded within the ESG performance would be enhanced. (2) Second, we contribute to the literature by providing evidence about the circumstances under which board feminization enhances corporate ESG performance. We show evidence that information asymmetry (proxied with the number of analysts following the firm reflecting external monitoring) moderates the linkage between board feminization and corporate ESG performance: The association between board gender diversity and ESG performance seems stronger for firms with lower information asymmetry. This finding reveals that female board members are likely to behave more ethically when outside monitoring is higher. This finding could be attributable to the fact that female board members have recently started to occupy positions in boards compared to their male colleagues. Hence, they appeal to perform better and involve more ESG activities to reduce ambiguity and prove themselves to the market. (3) Finally, our study contributes to the literature by providing novel evidence that two other firm-specific characteristics, i.e., firm risk and financial constraints, affect the moderation impact of information asymmetry on the board gender diversity-ESG link. We provide novel evidence that information asymmetry moderates the board feminization-ESG association only in high-risk firms or firms with low financial constraints. These findings imply that female directors are likely to improve their ESG performance to reduce their firm risk, especially when external monitoring is high. Notwithstanding this, female directors strengthen their ESG performance only if their companies' financial constraints are low, i.e., only if they have enough budget to support the extra spending on ESG activities.



Our study has important theoretical contributions. Our findings reveal that female representation on the board enhances a firm's ethical behavior, satisfying companies' moral commitment, serving multiple stakeholders' interests, and supporting the stakeholder theory. Our findings also align with agency theory. Higher financial and non-financial disclosure is expected to reduce information asymmetry, mitigating agency issues. Within the agency theory context, external monitors (i.e., financial analysts) are employed to control insiders' decisions based on the assumption that there are conflicts of interest between agents and principals. External monitors collect, analyze and distribute information about the company to interested parties, reducing information asymmetry. Female board members, who are likely to be more risk-averse, tend to make decisions and take actions to enhance diligence and decrease asymmetric information processes by constructing an environment with a higher level of ESG engagement (Gul et al., 2013).

Furthermore, our findings also have significant practical and managerial implications. Primarily, we provide useful information about how board gender diversity affects corporate ESG performance, suggesting that board feminization should be increased if there is any intention to strengthen corporate ESG performance. Especially if more analysts are monitoring companies, managers should highlight the importance of board feminization as its impact on ESG performance would be even stronger. Moreover, owners of high-risk companies could also prioritize board feminization since female board members who are likely to be risk-averse tend to reduce firm risk by improving their ESG performance.

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Table 1. Sample breakdowns

<u>Panel A: Country breakdown</u>			
Country	firm-year obs.	Firm	% of sample
Australia	400	48	2.03%
Belgium	212	27	1.08%
Brazil	407	55	2.07%
Canada	1638	173	8.33%
Chile	177	24	0.90%
China	897	321	4.56%
Colombia	49	10	0.25%
Germany	768	101	3.91%
Spain	378	42	1.92%
France	862	92	4.38%
The UK	1205	128	6.13%
Greece	97	14	0.49%
Hong-Kong	1546	184	7.86%
Ireland	72	9	0.37%
Italy	354	50	1.80%
Japan	367	41	1.87%
South Korea	792	99	4.03%
Mexico	232	32	1.18%
The Netherland	333	35	1.69%
Russia	870	93	4.42%
Sweden	443	68	2.25%
Singapore	213	17	1.08%
The USA	7353	1267	37.39%
Total	19,665	2,930	100%
<u>Panel B: Industry Breakdown</u>			
Industry	firm-year obs.	Firm	% of sample
Consumer Nondurables	1482	230	7.54%
Consumer Durables	789	115	4.01%
Manufacturing	2981	400	15.16%
Oil, Gas, and Coal Extraction and Products	2088	222	10.62%
Computers, Software, and Electronic Equip.	2300	514	11.70%
Telephone and Television Transmission	746	81	3.79%
Wholesale, Retail, and Some Services	1529	251	7.78%
Healthcare, Medical Equipment, and Drugs	1745	347	8.87%
Utilities	1869	213	9.50%
Other Non-financial Industries	4136	557	21.03%
Total	19665	2930	100.00%

This table reports the sample breakdown across countries (regions) and industries.

Table 2. Descriptive statistics

Variable	N	mean	min	p25	median	p75	max	Std.dev
ESG	19665	41.19	0.38	23.65	38.37	57.35	94.96	21.20
Environmental	18656	32.82	0.00	5.75	28.47	55.01	98.46	27.89
Social	19665	41.67	0.06	22.77	38.18	59.26	98.42	23.77
Governance	19665	45.31	0.11	29.27	44.83	60.67	99.24	20.97
ESG controversies	19665	90.41	0.63	100	100	100	100	23.18
B. gender diversity	19429	13.84	0	0	12.50	22.22	100	12.38
Board size	19598	10.21	1	8	10	12	33	3.43

ln(Board size)	19598	2.27	0.00	2.08	2.30	2.48	3.50	0.34
Firm Size	19633	16.21	3.93	14.47	15.97	17.63	21.58	2.48
Profitability	19377	0.15	-5.28	0.07	0.17	0.29	4.74	0.70
Leverage	19630	0.27	0	0.13	0.26	0.38	4.34	0.22
Investment	19131	0.07	0	0.02	0.04	0.08	0.86	0.08
# of Analysts	19578	13.38	0	6.00	12.00	19.00	55.00	9.22
ln(Analysts)	18540	2.40	0	1.95	2.56	3.00	4.01	0.79

Table for the descriptive statistics. ESG is the ESG score of the Refinitiv EIKON. Environmental performance is the average of three sub-dimensions: emission, resource use, and environmental innovation. Social performance is the average of the four sub-dimensions: workforce, product responsibility, human rights, and community. Governance is the average of three sub-dimensions: management, shareholders, and CSR strategies scores. ESG controversies “measures a firm’s exposure to environmental, social and governance controversies and negative events reflected in global media.”<sup>8</sup> Board gender diversity is the percentage of female board members on the board. Board size is the number of board members. Size is the natural logarithm of the total assets. Profitability is estimated by the return on equity (net income/shareholders equity). Leverage is the ratio of total debt to total assets. Investment is estimated by the capital expenditures scaled by the previous year’s total assets. The natural logarithm of the number of analysts following the firm is the proxy for information asymmetry.

Table 3. Board gender diversity and ESG

	(1)	(2)	(3)	(4)	(5)
Variables	ESG	Environmental	Social	Governance	ESG controversy
Board gender diversity	0.2933*** (0.0119)	0.2209*** (0.0150)	0.2186*** (0.0131)	0.3274*** (0.0142)	-0.0348** (0.0144)
Board size	4.6571*** (0.4968)	0.0640*** (0.0067)	0.0557*** (0.0058)	0.0138** (0.0054)	-2.3363*** (0.5826)
Firm Size	6.9895*** (0.0967)	0.0929*** (0.0013)	0.0704*** (0.0011)	0.0548*** (0.0011)	-5.5185*** (0.1527)
Profitability	0.5417*** (0.1553)	0.0078*** (0.0024)	0.0038** (0.0017)	0.0076*** (0.0018)	0.3815 (0.2552)
Leverage	-1.6141*** (0.5230)	-0.0336*** (0.0071)	-0.0125** (0.0060)	0.0083 (0.0062)	2.6859*** (0.7726)
Investment	-6.5174*** (1.5707)	-0.0698*** (0.0190)	-0.0639*** (0.0179)	0.0079 (0.0189)	6.9340*** (1.8079)
GDP	6.0638*** (1.0444)	0.0661*** (0.0126)	0.0016 (0.0120)	0.0680*** (0.0126)	0.9115 (1.4121)
GDP growth	-0.2504*** (0.0888)	-0.0052*** (0.0011)	-0.0018* (0.0010)	-0.0036*** (0.0011)	0.1925* (0.1148)
Constant	-260.5755*** (30.3465)	-3.2486*** (0.3668)	-0.9139*** (0.3484)	-2.4732*** (0.3653)	157.5527*** (41.1056)
Year FE	yes	Yes	yes	yes	yes
Industry FE	yes	Yes	yes	yes	yes
Country FE	yes	Yes	yes	yes	yes
Observations	18,678	17,749	18,678	18,678	18,678
R-squared	0.5180	0.5480	0.4888	0.3183	0.2190

This table presents the empirical results for Model (1) that analyzes the effect of board gender diversity on ESG performance and the subcategories of ESG. ESG controversies measure the negative events reflected in global media. The model includes controls at the firm and country-level variables and country, year, and industry fixed effects. Robust standard errors are reported in the parentheses (clustered at firm-level) \*, \*\*, \*\*\* represent statistical significance at the 1%, 5%, 10%, resp.

<sup>8</sup> Refinitiv EIKON

Table 4. Robustness: Alternate sample construction, model specification, gender diversity measures, and endogeneity

VARIABLES	<u>Alternate sample by excluding</u>			<u>Alternate board gender diversity measures</u>			<u>Alternate Model Specification</u>		<u>Endogeneity</u>
	US	US&CA	US&CA&HK	Blau Index	D_boardgender	D_more than one	hierarchical	Firm & Year FE	GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ESG	ESG	ESG	ESG	ESG	ESG	ESG	ESG	ESG
B. gender diversity	0.2111*** (0.0155)	0.2215*** (0.0165)	0.2221*** (0.0183)	0.2385*** (0.0089)	0.0524*** (0.0026)	0.0283*** (0.0050)	0.3487*** (0.0104)	0.1001*** (0.0115)	0.9972*** (0.2988)
Board size	4.6873*** (0.5691)	3.5224*** (0.6146)	4.9906*** (0.6737)	0.0398*** (0.0049)	0.0358*** (0.0051)	0.0172** (0.0074)	4.2825*** (0.4364)	1.4166*** (0.4483)	1.0656 (6.5592)
Firm Size	7.1552*** (0.1303)	7.3354*** (0.1402)	7.2135*** (0.1504)	0.0697*** (0.0010)	0.0711*** (0.0010)	0.0770*** (0.0012)	6.8513*** (0.0905)	2.7741*** (0.2182)	3.4292 (5.0541)
Profitability	0.9871*** (0.3017)	1.3948*** (0.3303)	1.0801*** (0.3490)	0.0054*** (0.0016)	0.0059*** (0.0016)	0.0042** (0.0019)	0.3530** (0.1602)	0.2019* (0.1065)	1.3902 (1.3716)
Leverage	0.5021 (0.7340)	1.7690** (0.8280)	1.2490 (0.9076)	-0.0177*** (0.0052)	-0.0183*** (0.0054)	-0.0158** (0.0078)	-2.3522*** (0.5437)	0.1746 (0.5683)	1.3440 (8.8289)
Investment	-0.2640 (2.1979)	3.3383 (2.6436)	0.9844 (2.8556)	-0.0613*** (0.0157)	-0.0640*** (0.0163)	-0.0428 (0.0264)	-5.6731*** (1.6020)	-1.6222 (1.3135)	-6.2108 (19.0622)
GDP	7.5346*** (1.1530)	6.9511*** (1.1664)	2.7969** (1.2927)	0.0577*** (0.0104)	0.0377*** (0.0103)	0.0080 (0.0160)	13.6549*** (0.7671)	5.9956*** (0.7131)	16.2019*** (4.3013)
GDP growth	-0.0169 (0.0984)	-0.0385 (0.1005)	0.0289 (0.1045)	-0.0024*** (0.0009)	-0.0018** (0.0009)	-0.0058*** (0.0013)	-0.3633*** (0.0612)	-0.1430*** (0.0529)	-0.6543*** (0.2187)
Constant	-301.76*** (32.3744)	-287.422*** (32.7323)	-170.84*** (36.7008)	-2.51*** (0.3023)	-1.93*** (0.3003)	-1.05** (0.4680)	-463.60*** (22.5122)	-180.84*** (20.6113)	
Observations	11,710	10,142	8,648	18,678	18,678	10,282	18,690	18,220	15,787
R-squared	0.5284	0.5264	0.5223	0.5197	0.5105	0.5405	0.4852	0.8780	AR(2)=-0.82 p=0.41 Hansen=7.17 p=0.31

This table displays some robustness checks for the main analysis, which analyzes the relationship between board gender diversity and ESG performance. Columns (1)–(3) present the results for alternative sample selection. Column (1) excludes the US firms, Column (2) excludes the US and Canada firms, and Column (3) excludes the US, Canada, and Hong Kong. Columns (4)–(6) present the results for alternative measures for board gender diversity. Column (4) uses Blau index. Column (5) uses the dummy variable, which is equal to 1 if there is at least one female board member. Column (6) uses the dummy variable, which is equal to one if there is more than one female board member. Columns (7)–(8) show the results for alternative model specifications. Column (7) shows the results for hierarchical regression. Column (8) shows the model specification with alternative fixed effects, namely firm and year fixed effects. Column (9) presents the findings of the two-step system GMM model. The two test statistics, AR (2) and the Hansen test, used for the validity of instruments and the model provide evidence that the model and the instruments are valid. Columns (1)–(6) include country, industry (according to 2-digit SIC), and year-fixed effects. Robust standard errors are used and reported between parentheses. \*, \*\*, \*\*\* represent statistical significance at the 1%, 5%, 10%, resp.



Table 5. Board gender diversity and ESG: The moderating effect of information asymmetry

VARIABLES	(1) ESG	(2) Environmental	(3) Social	(4) Governance
Board gender diversity	0.2330*** (0.0289)	0.1471*** (0.0357)	0.1596*** (0.0315)	0.2484*** (0.0352)
ln(analysts)	3.1948*** (0.2461)	0.0252*** (0.0032)	0.0323*** (0.0028)	0.0226*** (0.0029)
B. gender diversity*ln(analysts)	0.0335*** (0.0114)	0.0403*** (0.0143)	0.0317** (0.0127)	0.0402*** (0.0138)
Board size	3.9613*** (0.5139)	0.0598*** (0.0070)	0.0483*** (0.0060)	0.0065 (0.0055)
Firm Size	6.1181*** (0.1083)	0.0869*** (0.0015)	0.0618*** (0.0013)	0.0484*** (0.0013)
Profitability	0.6191*** (0.1523)	0.0096*** (0.0023)	0.0042** (0.0018)	0.0079*** (0.0018)
Leverage	-1.1087** (0.5525)	-0.0322*** (0.0076)	-0.0068 (0.0065)	0.0147** (0.0068)
Investment	-10.911*** (1.6585)	-0.107*** (0.0203)	-0.105*** (0.0188)	-0.0184 (0.0204)
GDP	4.5930*** (1.1098)	0.0556*** (0.0135)	-0.0141 (0.0128)	0.0484*** (0.0133)
GDP growth	-0.3098*** (0.0968)	-0.0061*** (0.0012)	-0.0023** (0.0011)	-0.0039*** (0.0011)
Constant	-209.652*** (32.3020)	-2.895*** (0.3917)	-0.375 (0.3724)	-1.841*** (0.3866)
Year FE	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes
Country FE	yes	yes	yes	yes
Observations	17,674	16,797	17,674	17,674
R-squared	0.5265	0.5523	0.4939	0.3282

This table displays the results for Model (2), which studies the moderating effect of information asymmetry on the link between board gender diversity and ESG (and the subcategories of ESG: environmental, social, and governance). The natural logarithm of the number of analysts following a firm is used as a proxy for information asymmetry. Robust standard errors are used and reported between parentheses. \*, \*\*, \*\*\* represent statistical significance at the 1%, 5%, 10%, resp.

Table 6. Board gender diversity and ESG performance: The moderating effect of information asymmetry for subsamples with different firm characteristics

	Firm Risk Taking				Financial Constraint	
	Earnings Volatility		Sales Volatility		KZ Index	
	High	low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)
	ESG	ESG	ESG	ESG	ESG	ESG
Board gender diversity	0.0987** (0.0424)	0.3298*** (0.0412)	0.1056** (0.0488)	0.3106*** (0.0398)	0.3039*** (0.0416)	0.2203*** (0.0455)
ln(analysts)	2.1898*** (0.3491)	3.8550*** (0.3584)	2.3440*** (0.3579)	4.9246*** (0.3683)	3.9949*** (0.3566)	2.9202*** (0.3891)
B. gender diversity*ln(analysts)	0.1129*** (0.0182)	-0.0148 (0.0154)	0.0638*** (0.0199)	-0.0078 (0.0152)	0.0132 (0.0164)	0.0309* (0.0172)
Board size	5.6753*** (0.8940)	2.7038*** (0.6591)	3.1175*** (0.8049)	3.5906*** (0.7063)	3.7106*** (0.8049)	3.1109*** (0.7260)
Firm Size	4.8172*** (0.1749)	7.0906*** (0.1521)	4.9812*** (0.1695)	6.4782*** (0.1530)	6.4522*** (0.1672)	6.3981*** (0.1629)
Profitability	0.4970*** (0.1678)	0.8057*** (0.2987)	0.4070* (0.2183)	0.5355** (0.2151)	1.1654*** (0.2763)	1.0722*** (0.2678)
Leverage	0.4459 (0.6885)	-2.5890*** (0.9452)	-1.2917 (0.8781)	-0.8887 (0.7425)	-3.1603*** (1.0724)	0.3604 (0.7946)
Investment	-15.0610*** (2.1176)	-2.9414 (3.2224)	-15.1840*** (1.9377)	10.0127** (3.9843)	-17.7175*** (2.1398)	16.5853*** (4.3344)
GDP	2.7890 (1.8957)	6.8884*** (1.4054)	6.2208*** (1.6927)	2.5273 (1.6536)	5.7047*** (1.5119)	3.7954** (1.7443)
GDP growth	-0.3341** (0.1490)	-0.2431* (0.1262)	-0.2115 (0.1323)	-0.2535* (0.1416)	-0.2464* (0.1332)	-0.2934** (0.1432)
Constant	-138.22** (55.7261)	-291.09*** (40.7131)	-237.31*** (49.2997)	157.42*** (48.0501)	-249.37*** (43.9954)	-188.55*** (50.3962)
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes
Observations	6,124	10,906	7,153	9,762	8,291	8,023
R-squared	0.5452	0.5175	0.4478	0.5394	0.5459	0.5348

This table displays the results for Model (2), which studies the moderating effect of information asymmetry on the link between board gender diversity and ESG for different sub-samples. The subsamples are created based on the median value of earnings volatility (columns 1 & 2), sales volatility (columns 3 & 4), and financial constraints (columns 5 & 6). The natural logarithm of the number of analysts following a firm is used as a proxy for information asymmetry. Robust standard errors are used and reported between parentheses. \*, \*\*, \*\*\* represent statistical significance at the 1%, 5%, 10%, resp.

Table 7. Board gender diversity and ESG sub-dimensions

VARIABLES	(1) emissions	(2) resource use	(3) envi ino.	(4) workforce	(5) human rights	(6) community	(7) product resp.	(8) management	(9) shareholders	(10) CSR strat.
Board gender diversity	0.2710*** (0.0178)	0.2776*** (0.0184)	0.0922*** (0.0192)	0.2607*** (0.0168)	0.2135*** (0.0184)	0.2220*** (0.0175)	0.1781*** (0.0207)	0.5970*** (0.0216)	0.1476*** (0.0218)	0.2378*** (0.0187)
Board size	6.4061*** (0.7917)	8.1592*** (0.8011)	4.3821*** (0.7619)	7.0879*** (0.7728)	6.2480*** (0.7316)	4.7496*** (0.7390)	4.2075*** (0.8582)	-2.8966*** (0.8547)	-0.5648 (0.8231)	7.5907*** (0.8519)
Firm Size	10.9997*** (0.1538)	10.9010*** (0.1535)	5.7366*** (0.1614)	7.4744*** (0.1436)	7.7327*** (0.1562)	7.2179*** (0.1363)	5.7279*** (0.1688)	4.0921*** (0.1674)	1.6242*** (0.1786)	10.7124*** (0.1609)
Profitability	0.8684*** (0.2497)	0.9855*** (0.2548)	0.0807 (0.2657)	0.2339 (0.2537)	0.8780*** (0.2581)	0.2270 (0.2300)	0.2004 (0.2868)	1.1205*** (0.2636)	0.4317 (0.3037)	0.7339*** (0.2733)
Leverage	-4.1534*** (0.8685)	-4.0022*** (0.8727)	-1.1332 (0.8028)	-5.1664*** (0.8924)	0.1808 (0.8364)	0.4805 (0.7889)	-0.4762 (0.9683)	1.5702* (0.9518)	3.3288*** (1.0693)	-2.4085*** (0.8521)
Investment	-4.1293* (2.4460)	-9.5259*** (2.5048)	-4.7213** (2.0278)	-1.1503 (2.4513)	-3.7399* (2.2188)	-2.3160 (2.4527)	-18.3738*** (2.7520)	-2.5966 (2.9682)	9.5942*** (2.9536)	-4.6246* (2.6337)
GDP	11.2640*** (1.6015)	9.3147*** (1.6722)	-0.0978 (1.6465)	7.3235*** (1.6204)	-1.7501 (1.6295)	-3.9348** (1.5808)	-0.9804 (1.9687)	13.9367*** (1.8664)	-1.8448 (1.9799)	8.3099*** (1.8242)
GDP growth	-0.6820*** (0.1428)	-0.7067*** (0.1417)	-0.1565 (0.1400)	-0.5305*** (0.1350)	0.2563* (0.1482)	-0.2190 (0.1420)	-0.2423 (0.1643)	-0.0989 (0.1500)	-0.2062 (0.1633)	-0.7688*** (0.1522)
Constant	-481.889*** (46.5552)	-428.009*** (48.6050)	-79.920* (47.8701)	-298.791*** (47.0849)	-67.545 (47.4506)	35.239 (45.9730)	-34.483 (57.3006)	-420.810*** (54.2220)	76.213 (57.5155)	-397.366*** (53.0241)
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	18,678	18,678	17,749	18,678	18,678	18,678	18,678	18,678	18,678	18,678
R-squared	0.5233	0.5057	0.3450	0.4191	0.4413	0.4100	0.2594	0.1542	0.0499	0.4615

This table presents the empirical results for Model (1) that analyzes the effect of board gender diversity on ESG sub-dimensions: emissions, resource use, environmental innovation for the environmental category; workforce, community, human rights, and product responsibility for the social category; and shareholders, management, and CSR strategy for governance category. Robust standard errors are reported in the parenthesis (clustered at firm-level) \*, \*\*, \*\*\* represent statistical significance at the 1%, 5%, 10%, resp.

Table 8. Board gender diversity and ESG sub-dimensions: The moderating effect of information asymmetry

VARIABLES	(1) emissions	(2) resource use	(3) envi. ino	(4) workforce	(5) human rights	(6) community	(7) prod. resp.	(8) management	(9) shareholders	(10) CSR strat.
Board gender diversity	0.2408*** (0.0426)	0.1971*** (0.0437)	-0.0461 (0.0454)	0.2397*** (0.0413)	0.1162*** (0.0426)	0.0993** (0.0467)	0.1832*** (0.0495)	0.4650*** (0.0533)	0.1337** (0.0546)	0.1464*** (0.0453)
ln(analysts)	3.2841*** (0.3878)	3.6371*** (0.3711)	0.1755 (0.3886)	5.4505*** (0.3756)	1.9246*** (0.3580)	3.0836*** (0.3760)	2.4806*** (0.4480)	2.5429*** (0.4156)	1.2012*** (0.4622)	3.0499*** (0.4065)
Board gender diversity*ln(analysts)	0.0266 (0.0173)	0.0434** (0.0177)	0.0644*** (0.0186)	0.0145 (0.0161)	0.0443** (0.0178)	0.0653*** (0.0183)	0.0026 (0.0200)	0.0654*** (0.0203)	0.0091 (0.0216)	0.0461** (0.0186)
Board size	5.8265*** (0.8260)	7.5267*** (0.8369)	4.3824*** (0.8016)	6.0031*** (0.8003)	5.7677*** (0.7625)	3.9667*** (0.7728)	3.5997*** (0.8968)	-3.6107*** (0.8946)	-1.2799 (0.8519)	6.8526*** (0.8900)
Firm Size	10.3252*** (0.1712)	10.0545*** (0.1716)	5.5842*** (0.1885)	6.0987*** (0.1641)	7.2325*** (0.1809)	6.2260*** (0.1594)	5.1682*** (0.1977)	2.9934*** (0.1938)	1.4657*** (0.2050)	10.0655*** (0.1806)
Profitability	1.0831*** (0.2446)	1.2477*** (0.2537)	0.2438 (0.2826)	0.2372 (0.2566)	1.0039*** (0.2722)	0.2841 (0.2344)	0.1670 (0.3007)	1.1328*** (0.2719)	0.3259 (0.3154)	0.9203*** (0.2746)
Leverage	-4.1549*** (0.9207)	-3.9130*** (0.9082)	-0.6746 (0.9339)	-3.5061*** (0.9713)	0.3885 (0.9352)	1.7683** (0.8473)	-1.3906 (1.0534)	1.5367 (1.0565)	4.2248*** (1.1714)	-1.3575 (0.9127)
Investment	-8.5212*** (2.5324)	-14.8739*** (2.7320)	-6.589*** (2.2460)	-5.7887** (2.5883)	-7.5480*** (2.4735)	-7.0138*** (2.6772)	-21.782*** (2.8564)	-6.389* (3.3018)	9.409*** (3.1583)	-8.542*** (2.8196)
GDP	9.7768*** (1.6910)	7.3050*** (1.7615)	0.2719 (1.7765)	4.7142*** (1.6978)	-2.6728 (1.7438)	-4.9534*** (1.7063)	-2.7211 (2.1005)	12.2810*** (2.0019)	-3.9087* (2.0983)	6.1460*** (1.9038)
GDP growth	-0.7982*** (0.1565)	-0.8055*** (0.1509)	-0.2133 (0.1591)	-0.5436*** (0.1453)	0.1436 (0.1641)	-0.2497 (0.1590)	-0.2769 (0.1767)	-0.1258 (0.1629)	-0.2188 (0.1773)	-0.8144*** (0.1635)
Constant	-434.36*** (49.2355)	-363.07*** (51.2717)	-88.21* (51.7319)	-211.59*** (49.3946)	-35.43 (50.8570)	75.60 (49.6976)	21.245 (61.2046)	-359.56*** (58.2777)	137.24** (61.0383)	-329.92*** (55.4045)
Year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	17,674	17,674	16,797	17,674	17,674	17,674	17,674	17,674	17,674	17,674
R-squared	0.5312	0.5134	0.3419	0.4307	0.4461	0.4098	0.2599	0.1553	0.0544	0.4711

This table displays the results for Model (2), which studies the moderating effect of information asymmetry on the link between board gender diversity and ESG sub-dimensions: emissions, resource use, environmental innovation for the environmental category; workforce, community, human rights, and product responsibility for the social category; and shareholders, management, and CSR strategy for governance category. The natural logarithm of the number of analysts following a firm is used as a proxy for information asymmetry. Robust standard errors are used and reported between parentheses. \*, \*\*, \*\*\* represent statistical significance at the 1%, 5%, 10%, resp.