# The Impact of Board Gender Diversity on Environmental, Social, and Governance Ratings: The Asian Perspective[1]

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**Abstract.** This study investigates the impact of Board Gender Diversity (BGD) on Environmental, Social, and Governance (ESG) performance in India and Japan. The main question is how BGD affects ESG performance in these countries. Using panel data models and fixed effects regressions on data from 105 Indian and 150 Japanese public firms, the analysis reveals that BGD significantly enhances ESG performance. The study found a more pronounced effect in Japan compared to India. A positive relationship between BGD and ESG performance was observed in both countries, with Japanese firms showing an inverse U-shaped relationship and Indian firms showing a U-shaped relationship. These findings indicate that while increasing female representation on boards generally improves ESG performance, the impact varies by country, suggesting that cultural and contextual factors play a significant moderation role.

**Keywords.** Board Gender Diversity, ESG, India, Corporate Governance

**JEL Codes.** G34, M14, Q56

## Introduction

This paper focuses on the relationship between Board Gender Diversity (BGD) and Environmental, Social, and Governance (ESG) performance in the Asian context, specifically in India and Japan. This approach gives equal weight to economic, environmental and social dimensions. In recent years, sustainability has become one of the most discussed global societal challenges, particularly in a business context. Consequently, ESG performance has become a major point of focus for scholars, investors and policymakers alike (Abdelkader, Gao, & Elamer, 2024; Yarram & Adapa, 2022). This has led to a significant surge in research within this field, with a particular emphasis on corporate governance, or more specifically, board characteristics and their impact on both ESG and Corporate Social Responsibility (CSR) (e.g. Abdelkader et al., 2024; Katmon et al., 2017; Yarram & Adapa, 2022). In addition, the impact of BGD on firms' financial performance has been extensively analysed by researchers, showing consensus on average in findings establishing a positive correlation (e.g. Marinova, Plantenga, & Remery, 2015; Reguera-Alvarado, de Fuentes, & Laffarga, 2015).

Over the past decades, different board characteristics have been studied, such as CEO duality (e.g. García-Ramos and García-Olalla, 2011), director independence (e.g. de Andres, Azofra, and Lopez, 2005), or board size (e.g. García-Ramos and García-Olalla, 2011; O'Connell and Cramer, 2010). However, one of the most researched board characteristics on the board of directors is board gender diversity. Research on this topic is separated into two categories, one focusing on developed countries and the other on developing countries. While findings for developed nations show a consensus around a positive relationship between BGD and firm sustainability performance (Jizi, 2017; Nerantzidis et.al., 2022; Yarram & Adapa, 2022), studies investigating emerging markets present less consistent findings (Abdelkader et al., 2024) and are less abundant (Campopiano, Gabaldón, & Gimenez-Jimenez, 2022). More specifically, literature on less developed markets includes positive (Yasser, Al Mamun, &

Ahmed, 2017), negative (Abdelkader et al., 2024) and insignificant findings in the BGD-ESG relationship (e.g. A. A. Zaid et al., 2020; Hussain, Rigoni, & Orij, 2018). Abdelkader et al., (2024) provide some explanations for these discrepancies. For instance, women directors are said to improve boardrooms through greater diversity in perspectives, particularly when facing environmental challenges such as climate change and environmental sustainability. Evidence shows that female directors exceed the capabilities of their male counterparts due to their greater capacity to take care of stakeholders and ethics (Campopiano, Gabaldón, & Gimenez-Jimenez, 2022; Rodriguez-Dominguez et al., 2009). However, Byron and Post (2016) find that this is dependent on contextual factors, stating that firms in countries where there are stronger shareholder protection mechanisms and higher gender parity are more likely to make use of the specific benefits women directors can bring to boardrooms. Meanwhile, in emerging markets, women directors are considerably under-represented and experience more gender-related discrimination (Abdelkader et al., 2024), mitigating positive influences.

The lack of consensus in the literature on developing nations calls for additional research to help clarify the relationship between BGD and the sustainability performance of firms in the context of emerging markets (Abdelkader et al., 2024; Wasiuzzaman and Subramaniam, 2023). Additionally, the majority of papers in emerging markets focus on the effect of BGD on ESG or CSR disclosure (Fu, Wang, & Zhou, 2024; Wasiuzzaman & Subramaniam, 2023; Wasiuzzaman & Wan Mohammad, 2019; Zahid et al., 2020). It is therefore important to provide insights into other sustainability performance measures such as ESG performance (ESG Score). Thus, the following research question emerges:

How does BGD affect a firm's ESG rating in the context of an emerging market, namely India, compared to a developed nation, such as Japan?

The paper aims to provide useful insights into best practices in the context of BGD and ESG performance while enabling policymakers to better understand the mechanisms behind the relationship. Additionally, findings will inform businesses in emerging markets about the implications of BGD on their performance. This will help firms in selecting directors who align with the companies' strategic ambitions.

The rest of the paper is organised in the following manner. I begin with a Literature Review, discussing existing literature and highlighting its current state. Next, I describe and contextualise the theories within the field. I develop the hypotheses this paper aims to investigate throughout the theoretical framework. I then describe the data and variables considered for the analysis. Additionally, I outline the methodology behind our empirical approach to improve transparency and facilitate easier replication. Lastly, I analyse and discuss the findings, followed by a critical reflection on the limitations and possible extensions of the paper.

## Literature Review

### Influence of Gender on Sustainability Behaviour

To study the relationship between BGD and ESG performance, and its implications on environmental, social and governance concerns, it is vital to analyse the effects of gender on sustainability behaviour. Over the past few decades, various studies have established a significant correlation between gender diversity and sustainability behaviour in the corporate context (e.g. Luchs & Mooradian, 2011). For instance, a study conducted by Foutty, Creary, & Mitchell (2023), highlights that gender diversity in leadership can enhance decision-making processes, particularly in areas like sustainability. Studies by Kawgan-Kagan (2020) and Zelezny, Chua & Aldrich (2000) reinforce the idea that women tend to be more

environmentally conscious, and therefore a positive relationship exists between women's presence in boardrooms and ESG performance.

Furthermore, research indicates that males may exhibit a certain level of scepticism towards sustainable consumption, considering it feminine and therefore potentially a threat to their status (Bloodhart & Swim, 2020; Swim, Gillis, & Hamaty, 2019).

**Board Gender Diversity on ESG Performance**

With the increase in sustainability concerns, ESG metrics and practices have become essential for the prosperity and growth of many companies (Wasiuzzaman & Subramaniam, 2023). This can be attributed to the increasing number of investors who scrutinise firms and their operating models, carbon footprints or even their exposure to climate change (KPMG, 2019). Some studies such as Eccles, Ioannou, & Serafeim (2014) indicate that firms that adopt and implement higher standards and transparency on long-term oriented ESG-related matters, seemingly outperform firms that do not, both in accounting and stock market performance. This is in line with the globally visible trend towards the widespread implementation of ESG metrics, with the introduction of initiatives such as the Green Deal or Paris Agreement. ESG performance has therefore also been studied by researchers, policymakers, and investors over the last decades (Pacelli, Pampurini, & Quaranta, 2022; Rajesh, 2020). Cambrea, Paolone, & Cucari (2023) and Nadeem, Zaman, & Saleem (2017), among others, indicate that boardroom structure in the form of board gender diversity is one of the key determinants of ESG. Furthermore, literature primarily associates a positive influence of female directors on ESG, due to their distinct interpersonal traits and social orientation (Romano et al., 2020), unlike their male counterparts (Cordeiro, Profumo, & Tutore, 2020; Marano, Sauerwald, & Essen, 2022). Even though the empirical evidence on BGD benefits is sound, there still appear to be contradicting results depending on the countries' economic status (Abdelkader et al., 2024).

Studies focusing on developed economies mostly support a positive relationship between BGD and ESG performance (Velte, 2016; Romano et al., 2020), while those examining developing economies often lack consistency in their reports (Abdelkader et al., 2024). For example, Yasser et al., (2017) found a positive relationship between BGD and corporate social performance of companies across three emerging economies, namely Malaysia, Pakistan and Thailand. However, other studies indicate that this relationship is insignificant (A. A. Zaid et al., 2020). This paper analyses the relationship in Palestine over the period 2013 to 2018, highlighting gender discrimination in the workplace. In addition, findings of a negatively correlated relationship between BGD and ESG can be seen in the study conducted in the context of South Africa from 2015 to 2020 by Abdelkader et al. (2024). These seemingly contradictory positions underline the importance of distinguishing and understanding the dynamics and inner workings of BGD and ESG performance, in the context of the economic status of countries (Abdelkader et al., 2024).

**Board Gender Diversity on ESG performance in developed countries.** As mentioned previously, a remarkable corpus in the literature shows a positive relationship between BGD and ESG performance in developed countries such as Norway, Australia and Italy (Khatri, 2022; Nadeem et al., 2017; Provasi & Harasheh, 2020). For instance, studies such as the one conducted by Romano et al. (2020) in Italy for non-financial companies listed on Mercato Telematico Azionario, confirm that greater BGD leads to an improvement in ESG performance. This study shows that diverse boards can contribute more effectively to a company's sustainability practices, thus reinforcing the role of corporate governance characteristics in the value-creation process. Similar results can be found by Velte (2016), indicating that female members in the Board of Directors (BoD) do in fact have a positive effect on ESG performance. The study was conducted on both German and Austrian firms listed in

the Prime Standard of the Frankfurt and Vienna Stock Exchange respectively, for the business years 2010-2014.

**Board Gender Diversity on ESG performance in developing countries.** Goyal et al., (2021) report on negative stereotypes and gender discrimination being particularly pronounced in contexts of high underrepresentation of women in the workforce. This might encourage women to come up with strategies on how to combat these stereotypes. Through this, Abdelkader et al. (2024) postulate that in developing economies, women serving on boards tend to lean towards short-term projects which yield immediate outcomes, as a means to battle stereotypes and win the respect and favour of their fellow board members. This kind of behaviour in developing economies was also described by Venkatraman, (1989) reflecting the validity of the results. In addition to this, Markóczy, Sun, & Zhu (2019) further describe how female board directors can even deviate from decisions that might be perceived as reflecting gendered perspectives. With all these findings combined, it is not a stretch to imagine certain circumstances in which female directors might even exert a negative influence on ESG ratings, however, this is theorised to be seen mainly in the short term (Abdelkader et al., 2024). Another important aspect to consider here is board tenure, as described by Sun and Bhuiyan (2020), where tenured female directors deviate from trying to uproot stereotypes, towards a typically more philanthropically driven director (Abdelkader et al., 2024).

## Theory and Hypotheses Development

### Resource Dependency Theory and Agency Theory

Resource Dependency Theory (RDT) is commonly used throughout the fields of Corporate Governance (CG) and BGD (Terjesen, Sealy, & Singh, 2009). The theory postulates that a firm's survival depends on the exchange and acquisition of resources (Pfeffer, &

Salancik, 1978; Terjesen, et al., 2009). Acting as a guidance mechanism for managers, the BoD holds significance in setting a firm's strategic goals. Following Pfeffer and Salancik (1978), the firm's performance relies on the particular resources that directors bring to the board. Greater board (gender) diversity promises a wider perspective and resource base such as expertise on specific topics, leading to improved board capabilities (Lu & Herremans, 2019). Thus, in the context of this paper, this translates to women directors being more involved in sustainability-related topics (Kirsch, 2018) and thus bringing expertise to the boardroom, leading to an improvement in the firm's resource base.

Most studies in the field of CG, however, are based on Agency Theory (AT), an economic theory that revolves around the relationship and conflicts between principals and agents (Fama and Jensen, 1983). In the context of CG, shareholders are the principals and agents are the firm's managers. The conflict arises from incomplete contracts between owners and managers. While shareholders hire managers to direct a firm's daily operations in their best interest, managers may engage in selfish and opportunistic behaviours. This may include excessive risk-taking in firm-level decisions in hopes of enhanced recognition and reputation amongst their peers. To mitigate these issues, shareholders hire a board of directors to act as intermediaries. The role of directors is to monitor managers to ensure their actions are aligned with the needs and goals of the company as a whole. Costs associated with principal-agent conflicts are called agency costs, which include direct costs such as the hiring of directors, and intangible costs such as excessive risk borne by the firm from a manager's opportunistic behaviour. The role of female directors is particularly important in the context of principal-agent issues since women can enhance the monitoring capabilities of boardrooms (Kirsch, 2018), resulting in more efficient operations (Kirsch, 2018).

Therefore, while women directors bring more attention to sustainability-related operations (Resource Dependency Theory), their improved monitoring capabilities (Agency

Theory) are still crucial to see benefits materialise. Thus, according to extant literature as well as both RDT and AT, a positive relationship between BGD and ESG rating is expected in Japan:

**H1a**: Board Gender Diversity positively affects ESG Rating in a developed nation such as Japan

For less developed nations such as India, however, literature presents mixed findings. Nevertheless, economic theory suggests a positive relationship, thus resulting in the following hypothesis:

**H1b**: Board Gender Diversity positively affects ESG Rating in a developing nation such as India

**Cultural and Contextual Moderation**

Furthermore, as outlined by Byron and Post (2016), the contextual setting in developing nations likely inhibits or limits the effectiveness of gender diversity. Specifically, the lack of gender parity, institutional weakness, and gender-based discrimination are problematic (Byron & Post, 2016). As a result, boardroom dynamics in developing nations should differ significantly from those in developed nations. Due to the influence of cultural and contextual factors on the BGD-ESG relationship, typical governance advantages derived from board (gender) diversity are likely diminished in developing nations.

**H2**: The BGD-ESG relationship is moderated by contextual and cultural factors, limiting the impact of women directors.

## Critical Mass Theory

The topic of women in corporate boards has gained international attention in both practice and academic literature (Torchia, Calabrò, & Huse, 2011). The majority of authors in this field agree that women directors on boards offer many contributions (Bilimoria, 1995). Most notably, according to Rosener (1990), women can bring in new ideas, more communication, or even a change in the management style leading to an increase in the firm performance (Farrell and Hersch, 2005). Critical Mass Theory (CMT) is derived from group dynamics theories, where minority and majority influences are considered in a group decision-making process (Torchia et al., 2011). In this way, we also consider women board directors as a minority subgroup within a larger group. Studies that investigated the effects of a majority in a group showcase that it has much stronger power than minorities (Kalven and Zeisel, 1967). In fact, minorities are often viewed through a negative rather than positive or neutral lens (Maass and Clark, 1984). On the other hand, majorities are shown to have greater influence due to their greater size (Moscovici, 1980). Importantly, Latané (1981) describes that the amount of influence produced by either the minority or majority is a function of strength, immediacy, and number of members. It is clear to see that the size of the subgroup seems to matter in this context (Torchia et al., 2011). CMT comes into this context as it was promoted by various influential papers (Greed, 2000; Kanter, 1977), and its main contribution is that the impact of a minority subgroup becomes much clearer and more immediate once a certain threshold has been achieved – the so-called "critical mass". Through this mass, there is a qualitative change in the interactions between group members, as the minority slowly asserts itself and influences the group culture, norms, and values (Norris and Lovenduski, 2001).

Torchia et al. (2011) also empirically tested the arguments of Critical Mass Theory and concluded that their findings support the general theories. Research has converged, in this regard, establishing that only after there are at least 3 women on the board or 30% of women

representation, women directors can collectively make a real difference (Joecks, Pull, and Vetter, 2012; Konrad, Kramer, and Erkut, 2008; Torchia et al., 2011).

Additionally, the required critical mass threshold of women directors to significantly contribute to boardrooms may be substantially higher if there exists less gender parity and more gender-based discrimination, following Byron & Post's (2016) argument. This suggests more gender-biassed societies need a considerably larger presence of women directors in boardrooms to realise the benefits of greater (gender) diversity. Given this discussion, I hypothesise that the BGD-ESG relationship differs across different settings and follows a U-shaped. Specifically, there exists a higher critical mass threshold in the U-shaped BGD-ESG relationship for India than Japan:

**H3**: Due to contextual factors, the critical mass threshold in India is higher than in Japan.

## Methodology

### Data

The initial sample includes 500 public firms included in India's BSE500 index and 400 public firms from the Japanese Nikkei400 index from 2019-2023. Board director information is collected manually from firms' annual reports and gender is assigned using a three-step-approach. Specifically, I collect the full name of each director[2] for each year, including prefixes (e.g. "Mr.", "Ms.", "Mrs.", etc.), when available. First, directors are assigned a gender by their respective prefixes (e.g. "Mr." is Male), given that these were included in the annual reports. For all directors without a prefix, I checked the annual report for sections in which this director

[2] Auditors were not accounted for.

is described; terms such as “He”, “His”, “She”, “Her” were then employed to infer the gender. If this was also not present, I cross-referenced the first names to determine the director's gender. To do this, I employed three different name-gender lists names[3]. This approach was sufficient to assign the gender to each director[4].

Information on ESG Score, Total Assets, Return on Equity, and Industry is collected from EikonRefinitiv[5]. Additionally, to have a measure for cultural and contextual settings, I retrieved *Worldwide Governance Indicators* from the World Bank. Finally, firm age was collected via numerous websites, such as Yahoo Finance or FactSet, while for the industry identifier, I created industry classification codes by collecting all unique industries from my sample and assigning numbers from 1 to 14 respectively[6].

I limit both samples to only those companies which have complete information (e.g. ESG Score and firm financial information) for all years in the interval to provide a more balanced dataset. This results in 105 BSE-listed, and 234 Nikkei-listed firms. Finally, a random sample of 150 firms from the 234 Nikkei-listed firms will be included in the final analysis. This is done using the Excel “rand()” function which randomly assigns values between 0 and 1 to each firm. This assignment is done independently of other values which were returned by the function, which means that the value in one cell does not have any effect on another (Winston, 2024). Following this, I sort the firms by rand value from largest to smallest and select the first 150 firms. This results in 105 Indian, and 150 Japanese firms in my final sample.

[3] The lists comprise a total of over 100,000 combinations of name-gender, respectively.
[4] The gender-name lists categorise names based on their probability of being male or female. If the gender of the name is unclear, it shows a tendency towards one gender.
[5] EikonRefinitiv is one of the largest databases having 150,000 data sources (LSEG, n.d.)
[6] See Appendix A, Table A1 for an overview of the industry classification.

**Variables**

In terms of dependent variables, extant literature is mostly focused on CSR measures (e.g. Katmon et al., 2017; Yarram & Adapa, 2022; Campopiano et al., 2022). However, as I strive to provide new insights into the impact of BGD on ESG performance, I will employ ESG Score as the dependent variable. This score is retrieved from EikonRefinitiv and is composed of different categories and data points[7], weighted differently across industries. Environmental factors include emissions, innovation and resource use, which are benchmarked against industry medians (London Stock Exchange Group, 2022, p. 10). Aspects such as community, human rights, workforce and product responsibility assigned based on transparency and quantitative industry data are covered in the social dimension (London Stock Exchange Group, 2022, p. 10). Lastly, the governance pillar revolves around CSR strategy, management structure, and shareholder rights, using data point counts in governance categories (London Stock Exchange Group, 2022, p. 10).

The most commonly used independent variables to measure BGD are the proportion of women on a board (e.g. Beji, Yousfi, Loukil, & Omri, 2020; Ben-Amar, Chang, & McIlkenny 2015; Yarram & Adapa, 2022), the number of female directors (e.g., Bear, Rahman, & Post, 2010; Ben-Amar et al., 2015; Yarram & Adapa, 2022), and the Blau Index (e.g. Miller & Del Carmen Triana, 2009). To ensure sufficient consistency with existing literature, I will also apply the ratio of women directors as the independent variable. Additionally, as **H2** and **H3** investigate or control for the quadratic relationship between ESG and BGD, a quadratic term of the women ratio variable will be applied for those hypotheses. **H2** further requires an interaction term between women ratio (WR), a dummy for India (India), and the average governance indicator score (GOV).

[7] See Appendix A, Table A2 for further clarifications.

As mentioned previously, a dummy variable is created to separate Indian and Japanese firms for **H1** and **H3**. As well as that, I make use of the World Bank's *Worldwide Governance Indicators* as a moderator in **H2**. In total, there are six governance indicators[8]: Voice and Accountability, Political Stability/No Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption, which are based on more than 30 other data sources (Kaufmann & Kraay, 2023). A score of -2.5 implies very weak governance, while a measure of 2.5 implies very strong governance performance (Kaufmann & Kraay, 2023). Additionally, it is important to note that due to the nature of these measures, they are in a different hierarchical layer than the other variables used in this paper. Specifically, governance indicators are a country-wide measure. Additionally, the indicators only change slightly across years. Moreover, due to data availability issues, the indicators are only available up until and including 2022. In order to maintain manageability of variables, I averaged all 6 measures for each country and each year, creating a composite average measure of governance strength (*GOV*).

Lastly, in line with existing studies, control variables will include board size (*BSIZE)* (e.g. Ben-Amar et al., 2015), which is manually computed, total assets as a measure of firm size (Ben-Amar et al., 2015), Return on Equity (*ROE*) as measure of firm performance, as well as firm age (*FAGE*) (e.g. Abdelkader et al., 2024), and industry (*IND*) (e.g. Bear et al., 2010). However, it is important to note that the industry variable does not change within firms (i.e. it is time invariant), which is why I cluster my regression by firm industry rather than include it into the regression model where it would be omitted due to Fixed Effects[9]. However, an

[8] See Appendix A, Table A3 for further clarifications.
[9] Fixed Effects estimation and its implications are further discussed in the Empirical Approach section.

exception for H2 is made, where I can apply Industry as a control variable due to the application of Ordinary Least Squares (OLS).

For all regressions, I derive the natural logarithm of total assets due to its scale. This approach will ensure a better regression fit, limiting the effect of outliers, while providing a more normalised distribution, and more stabilised variance (Wooldridge, 2010). Table 1 shows a full variable overview.

**Table 1***: Overview of Variables*

| Variable Name | Definition | Collection Method/Source | Notes | Variable Type |
|---|---|---|---|---|
| **ESG** | Environmental, Social, and Governance score (0-100) | EikonRefinitiv | Measures ESG performance | Dependent |
| **WR** | Ratio of women in boardroom (0%-100%) | Company Reports | Computed manually | Independent |
| **GOV** | Average governance score | The World Bank | Varies by country and year | Moderator |
| **ROE** | Return on Equity (%) | EikonRefinitiv | Indicator of profitability | Control |
| **BSIZE** | Number of board members | Company Reports | | Control |
| **FSIZE** | Total assets of the firm (in USD) | EikonRefinitiv | Indicator of firm size | Control |
| **ln_FSIZE** | Natural log of total assets | Derived | Adjusted for scale, indicator of firm size | Control |
| **FAGE** | Age of the firm | Various Sources | Years since establishment | Control |
| **IND** | Industry classification code | EikonRefinitiv | Categorical variable | Control |
| **India** | Dummy Variable | Computed manually | Takes 1 for India and 0 for Japan | Control |

## Empirical Approach

This paper employs panel data models, which consist of repeated observations over time on the same cross-section of firms, to control for endogeneity issues (Wooldridge, 2010). Specifically, there are a number of factors, such as the culture of a firm and the country-specific context, which are unobservable (Yarram & Adapa, 2022).

I aim to compare the implications of the cause-and-effect relationship between BGD and ESG scores using various models. Therefore, to ensure the reliability of my findings, I employ three Fixed Effects (FE) models for each hypothesis, starting with a model containing today's women ratio as the dependent variable. This is then followed by a regression with yesterday's women ratio as the independent variable, since it is likely that the effect of women directors would not materialise immediately (Liu, Wei, & Xie, 2014). Lastly, I analyse a model with today's WR term as the independent variable but controlling for yesterday's WR. Only for the investigation of H2, I do not employ Fixed Effects estimation since the nature of the GOV variable, as described above, leads to its omission, using FE and Random Effects (RE).

**OLS.** We first consider the OLS estimator and follow the method as outlined by Wooldridge (2010), given the following base model:

$$ESG_{i,t} = \beta_0 + \beta_1 * BGD_{i,t} + \beta_2 * Controls + \beta_3 * \varepsilon_{i,t}$$

where ESG is the ESG score of firms, and $\beta_0$ through $\beta_3$ are unknown parameters. With sufficient data, however, we can graph this relationship using the OLS estimator. The intercept is represented by $\beta_0$, and the slope coefficient is represented by the sum of parameters $\beta_1$ through $\beta_3$. Lastly, is the model error term, as any relationship estimated using OLS will not perfectly align with all data points. Graphically the difference between the estimated relationship (line) and the data points can be considered the residual. The values that we estimate for $\beta_0$ through $\beta_3$, are such that the squared vertical distances between the line and the data points (Residuals) are minimised. This can be expressed as:

$$\sum_{i=1}^{N} \varepsilon_i^2$$

where N is the number of observations in the sample. The resulting values for $\beta_1$ can be interpreted as the partial effect of the independent variable on the dependent variable.

Furthermore, OLS operates under a number of assumptions (Wooldridge, 2010), where the two most important for panel data analysis are:

**Assumption 2**: *No Autocorrelation between error terms*. If this assumption were to not hold, there would be autocorrelation between error terms, implying that there are omitted variables in the error term or that the error term is truly not random.

**Assumption 3**: *Homoscedasticity of the error term*. Homoscedasticity refers to the constant variance of $\varepsilon$. The variance of $\varepsilon$ is a constant equal to $\sigma^2$. If this would not be the case, we consider the error term to be heteroskedastic.

Given that these assumptions are violated, the reliability and robustness of my findings become questionable, but further explanation on how I avoid this follows in the Robustness section below.

**Fixed & Random Effects.** Wooldridge (2013) describes two methods for estimating unobserved effects panel data. Fixed effects are similar to regressing in first-difference form; however, it is more efficient when the idiosyncratic error $\varepsilon$ is serially correlated and homoscedastic. The fixed effects transformation (or within transformation) is described as:

$$\ddot{y}_{it} = \beta_1 \ddot{x}_{it1} + \ldots + \beta_k \ddot{x}_{itk} + \ddot{u}_{it},$$

where

$$\ddot{y}_{it} = y_{it} - \bar{y}_i.$$

This is the same for $\ddot{x}_{it}$ and $\ddot{u}_{it}$, and we consider this to be time-demeaned data. Under strict exogeneity, the fixed effects estimator is unbiased, as the error $u_{it}$ is uncorrelated across all periods. This estimator, based on Wooldridge (2013), allows for arbitrary correlation between $\beta_0$ and the explanatory variables in any time period. Time constant variables drop out due to the transformation (such as the intercept or dummy variables).

On the other hand, the Random effects estimator is described by the equation:

$$y_{it} = \beta_0 + \beta_1 x_{it1} + \ldots + \beta_k x_{itk} + v_{it}$$

where $v_{it}$ is the composite error term (Wooldridge, 2013), and is equal to $a_i + u_{it}$. Here, $a_i$ is unobserved and is referred to as the individual effect. Random effects estimation falls back on the same set of assumptions as Fixed effects do, except for the addition of the assumption that $a_i$ is independent of all explanatory variables in all periods. Therefore, if we believe that the unobserved effect $a_i$ is not exogenous (but rather correlated with an explanatory variable), it is advised to use Fixed Effects rather than Random Effects. However, due to the stricter assumptions of the random effects estimator, I employ Fixed Effects estimation throughout my analyses.

**Robustness**

To ensure the validity of my regressions, I make use of a number of different model specifications as well as estimation methods. In this section, I will detail my approach to ensure robustness of findings.

**Multicollinearity.** One potential validity concern in regression analysis is (perfect) multicollinearity, which may lead to a number of issues (Wooldridge, 2010). First, the model may suffer inflated standard errors complicating the detection significant effects (in other words, rejecting the null hypothesis). Additionally, the estimated coefficients may become unstable, which means that small differences in data can result in significant changes in coefficients. Lastly, if variables are highly correlated (multicollinear), it becomes difficult to distinguish the effect of each variable separately. Typically, a correlation above 0.8 or 0.9 is considered problematic (Wooldridge, 2010). Table 2: Correlation Matrices shows the correlation between all variables for the whole dataset, as well as India and Japan individually.

The highest correlation present is 0.98 between the Women Ratio and the BLAU Index, which is no surprise, given how similar they are in computation. However, these terms will not be used within the same regression models, meaning their correlation will not be problematic. All other correlations are below 0.35. Therefore, I can conclude that multicollinearity is not an issue.

**Serial Correlation and Heteroskedasticity.** Potential serial correlation and heteroskedasticity also pose challenges to retain robust regression analyses (Wooldridge, 2010). Serial correlation refers to the correlation of error terms across time periods, which can lead to inefficient estimates in standard errors, similar to strong multicollinearity. Heteroskedasticity, on the other hand, occurs when the variance of the error terms varies across observations, which can also lead to biassed standard errors, complicating the rejection of the null hypothesis. To prevent these issues, I use the "cluster(IND)" option in Stata for all regressions. This clustering at the industry level adjusts the standard errors for potential serial correlation and heteroskedasticity within clusters. This method is widely used throughout research (e.g. Abdelkader et al., 2024) and provides more robust and reliable regression results.

**Additional robustness measures.** To ensure the reliability of outcomes, each hypothesis is tested using three different regression models: one with the standard women ratio term, and the other with the lagged women ratio term, and a third with this year's women ratio as the independent variable and last year's women ratio as a control variable. Next, as extant literature uses a number of differing independent variables to measure BGD, I conducted further robustness analyses by substituting my main independent variable, Women Ratio, with the BLAU Index, as an alternative measure in the replicated models of **H1** through **H3**.

***Table 2:*** *Correlation Matrices*

**India & Japan**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) ESG Score | 1.00 | | | | | | | | | |
| (2) Women Ratio | 0.19 | 1.00 | | | | | | | | |
| (3) Blau Index | 0.20 | 0.98 | 1.00 | | | | | | | |
| (4) Governance Score | 0.17 | -0.25 | -0.27 | 1.00 | | | | | | |
| (5) Return on Equity | -0.00 | 0.02 | 0.03 | -0.04 | 1.00 | | | | | |
| (6) Board size | 0.02 | -0.11 | -0.09 | -0.14 | -0.00 | 1.00 | | | | |
| (7) Firm size | 0.16 | 0.02 | 0.03 | 0.18 | -0.00 | 0.17 | 1.00 | | | |
| (8) ln(Firm size) | 0.37 | -0.08 | -0.07 | 0.41 | -0.05 | 0.22 | 0.61 | 1.00 | | |
| (9) Firm age | 0.26 | -0.06 | -0.06 | 0.30 | 0.01 | -0.08 | -0.01 | 0.14 | 1.00 | |
| (10) Industry Identifier | -0.17 | -0.14 | -0.12 | -0.06 | -0.06 | 0.11 | 0.07 | 0.16 | 0.07 | 1.00 |

**India**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) ESG Score | 1.00 | | | | | | | | | |
| (2) Women Ratio | 0.22 | 1.00 | | | | | | | | |
| (3) Blau Index | 0.22 | 0.97 | 1.00 | | | | | | | |
| (4) Governance Score | 0.17 | 0.09 | 0.08 | 1.00 | | | | | | |
| (5) Return on Equity | 0.00 | 0.00 | 0.01 | 0.03 | 1.00 | | | | | |
| (6) Board size | 0.09 | -0.20 | -0.21 | 0.02 | 0.00 | 1.00 | | | | |
| (7) Firm size | 0.25 | -0.08 | -0.08 | 0.03 | -0.02 | 0.23 | 1.00 | | | |
| (8) ln(Firm size) | 0.33 | -0.06 | -0.05 | 0.05 | -0.05 | 0.23 | 0.72 | 1.00 | | |
| (9) Firm age | 0.09 | -0.07 | -0.07 | 0.03 | 0.07 | 0.14 | 0.04 | -0.01 | 1.00 | |
| (10) Industry Identifier | -0.31 | -0.29 | -0.29 | -0.00 | -0.09 | 0.07 | 0.14 | 0.20 | 0.00 | 1.00 |

**Japan**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) ESG Score | 1.00 | | | | | | | | | |
| (2) Women Ratio | 0.26 | 1.00 | | | | | | | | |
| (3) Blau Index | 0.29 | 0.98 | 1.00 | | | | | | | |
| (4) Governance Score | 0.09 | 0.25 | 0.27 | 1.00 | | | | | | |
| (5) Return on Equity | 0.01 | 0.05 | 0.05 | 0.19 | 1.00 | | | | | |
| (6) Board size | 0.02 | -0.12 | -0.08 | 0.00 | -0.07 | 1.00 | | | | |
| (7) Firm size | 0.13 | 0.12 | 0.13 | 0.02 | 0.04 | 0.23 | 1.00 | | | |
| (8) ln(Firm size) | 0.34 | 0.09 | 0.11 | 0.04 | 0.01 | 0.37 | 0.68 | 1.00 | | |
| (9) Firm age | 0.28 | 0.05 | 0.06 | 0.02 | -0.03 | -0.13 | -0.08 | 0.04 | 1.00 | |
| (10) Industry Identifier | -0.05 | -0.05 | -0.04 | -0.00 | 0.01 | 0.13 | 0.08 | 0.22 | 0.14 | 1.00 |

# Results

## Summary Statistics

As depicted in Table 3, ESG scores differ significantly within the data set with the minimum and maximum values of the whole sample being 3.07 and 92.665, respectively. While the minimum score differs more between India and Japan (9.27 vs 3.07), the maximum scores are nearly identical (92.665 vs 91.138, respectively). Yet, the mean ESG score in Japan is 61.99 compared to 57.03 in India, indicating better ESG performance in the developed nation.

Furthermore, the average Women Ratio in boardrooms across the entire data set is at a mere 15%, with India averaging 18% compared to Japan's 13%. This result is surprising as India is a developing nation with a vastly different contextual and cultural setting, where less gender parity exists (Byron and Post, 2016). This is supported by the Gender Inequality Index (GII), conducted by the United Nations Development Programme (UNDP), which is composed of the dimensions of reproductive health, empowerment and labour market (United Nations, 2024). The UNDP appointed India with 0,450 on the GII, showcasing a gender gap in labour force participation rate of -48.1% in 2021. Additionally, the Women Ratio in India ranges from a minimum of 0% to a maximum level of 54.5%, while Japan also has a minimum of 0% and a maximum of 45.5%. Overall, while there are some differences, the women ratio appears quite similar across the two countries showcasing a significant underrepresentation of women in boardrooms.

The measure for contextual and cultural differences, GOV, shows that India scored between -0.153 to -0.067, and Japan scored between 1.29 and 1.375 across the years. For comparison, China, the United States, Germany, and Rwanda scored between -0.37 to -0.27,

0.95 to 1.07, 1.36 to 1.43, and -0.06 to 0.03, respectively. This clearly shows that India's governance performance is poor, while Japan's is quite strong.

On one hand, the board size is similar in both countries, with India having a mean board size of 11 and Japan having around 10. On the other hand, firm size differs drastically, as the mean firm size in Japan is about three times the mean Indian firm size. Lastly, the mean firm age in Japan is about 30 years older than in India.

**Table 3***: Summary Statistics India & Japan*

| | N | Mean | Std. Dev. | min | max |
|---|---|---|---|---|---|
| Indian & Japanese Firms | | | | | |
| ESG Score | 1275 | 59.95 | 16.82 | 3.07 | 92.67 |
| Women Ratio | 1269 | .15 | 0.09 | 0 | .55 |
| Governance Score | 1020 | .73 | 0.71 | -.15 | 1.37 |
| Return on Equity | 1275 | 12.2 | 27.29 | -748.7 | 282.98 |
| Board size | 1269 | 10.57 | 2.59 | 3 | 22 |
| Firm size | 1274 | 22123262 | 55660588.56 | 195228.39 | 6.257e+08 |
| Ln(Firm size) | 1274 | 15.87 | 1.39 | 12.18 | 20.25 |
| Firm Age | 1275 | 72.31 | 46.15 | 1 | 433 |
| Industry Identifier | 1275 | 5.84 | 2.88 | 1 | 14 |
| Indian Firms | | | | | |
| ESG Score | 525 | 57.03 | 16.06 | 9.27 | 92.67 |
| Women Ratio | 524 | .18 | 0.09 | 0 | .55 |
| Governance Score | 420 | -.13 | 0.03 | -.15 | -.07 |
| Return on Equity | 525 | 14.02 | 41.03 | -748.7 | 282.98 |
| Board size | 524 | 11.04 | 2.82 | 6 | 22 |
| Firm size | 524 | 10651093 | 20921788.61 | 195228.39 | 1.976e+08 |
| Ln(Firm size) | 524 | 15.2 | 1.36 | 12.18 | 19.1 |
| Firm Age | 525 | 56 | 28.65 | 1 | 144 |
| Industry Identifier | 1275 | 5.84 | 2.88 | 1 | 14 |
| Japanese Firms | | | | | |
| ESG Score | 750 | 61.99 | 17.05 | 3.07 | 91.14 |
| Women Ratio | 745 | .13 | 0.09 | 0 | .45 |
| Governance Score | 600 | 1.32 | 0.03 | 1.29 | 1.37 |
| Return on Equity | 750 | 10.92 | 9.21 | -69.4 | 116.5 |
| Board size | 745 | 10.24 | 2.37 | 3 | 20 |
| Firm size | 750 | 30138484 | 69307153.75 | 651588.95 | 6.257e+08 |
| Ln(Firm size) | 750 | 16.34 | 1.21 | 13.39 | 20.25 |
| Firm Age | 750 | 83.73 | 52.26 | 6 | 433 |
| Industry Identifier | 750 | 5.69 | 2.60 | 1 | 14 |

## Main Regression Findings

**Women Ratio and ESG Ratings.** H1a confirmed a positive relationship between the women ratio and ESG score in Japan. This is supported throughout models (1), (2) and (3) in Output 1. Model (1) analyses the relationship between BGD and Women Ratio, model (2) uses the lag of WR as the independent variable, and model (3) is composed by a combination of both models (1) and (2), therefore including this year's WR as the independent, and last year's WR as a control variable. As presented in Output 1, the coefficient on the Women Ratio and lagged Women Ratio is significant at the 5% level for models (1) and (2). In model (1), the Women Ratio coefficient of 14.17 implies that a 0.01 (one percentage point) increase in WR is associated with a 0.1417-point increase in the ESG score, ceteris paribus. In other words, if a company were to increase its boardroom women ratio by 10 percentage points, the expected increase in the ESG score would be about 1.417 points. As I use the lagged term of Women Ratio to refine the estimation for model (2), this effect drops to a 0.1390 ESG point increase this year for each one percentage point increase in last year's Women Ratio, ceteris paribus, or 1.390 points, if the change in Women Ratio in a firm's board is 10 percentage points. Moving on, model (3) shows significant results, showcasing a coefficient for Women Ratio of 10.56 at a 10% significance level, indicating that a one percentage point increase in the Women Ratio is associated with a 0.1059 ESG score point increase, ceteris paribus or 1.059 points, given a 10-percentage point WR increase. Therefore, the analysis provided evidence of a positive relationship between BGD and ESG rating for Japanese firms, as anticipated.

Models (4), (5) and (6) analyse the relationship between BGD and ESG in the context of India (H1b). Following the same methodology as for Japan, model (4) uses Women Ratio as the independent variable, model (5) contemplates the lagged value of WR as the independent variable, and model (6) combines both models. As visualised in Output 1, models (4) and (5)

find an insignificant relation between and ESG performance in India, suggesting that the variation of the Women Ratio within firms over time is not associated with changes in ESG scores. However, the main model (6) shows significant results for Women Ratio at a 5% level, with a coefficient of 11.70, meaning that a one percentage point increase in the Women Ratio is associated with an increase of 0.1170 ESG score points, all else equal, or a 1.170 ESG score increase, given a 10-percentage point increase in female representation.

Therefore, these findings also provide evidence in favour of H1, such that there is a positive relationship between BGD and ESG score in Indian firms.

***Output 1:*** *Board gender diversity and ESG performance*

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| VARIABLES | ESG | ESG | ESG | ESG | ESG | ESG |
| WR | 14.17** | | 10.56* | 8.598 | | 11.70** |
| | (4.939) | | (5.289) | (4.790) | | (3.809) |
| Lagged WR | | 13.90** | 11.35** | | 4.293 | 2.330 |
| | | (5.035) | (5.024) | | (4.426) | (4.062) |
| Return on Equity | -0.0343 | -0.0225 | -0.0228 | 0.00615*** | 0.00365 | 0.00392 |
| | (0.0237) | (0.0288) | (0.0278) | (0.00105) | (0.00293) | (0.00271) |
| Board size | 0.0801 | 0.195 | 0.193 | -0.187 | -0.258* | -0.282* |
| | (0.104) | (0.144) | (0.157) | (0.123) | (0.122) | (0.132) |
| ln(Firm size) | 8.520*** | 5.822 | 5.589 | 0.759 | 2.095* | 2.323* |
| | (2.163) | (3.398) | (3.406) | (1.877) | (1.134) | (1.152) |
| Firm age | 0.895** | 0.607 | 0.482 | 2.528*** | 2.789*** | 2.700*** |
| | (0.318) | (0.397) | (0.413) | (0.285) | (0.468) | (0.441) |
| Constant | -155.1*** | -87.12** | -73.88** | -95.42** | -129.2*** | -129.2*** |
| | (32.27) | (30.79) | (33.57) | (35.42) | (27.62) | (26.65) |
| Observations | 745 | 595 | 595 | 523 | 417 | 417 |
| R-squared | 0.152 | 0.072 | 0.077 | 0.391 | 0.367 | 0.375 |
| Number of ID | 150 | 150 | 150 | 105 | 105 | 105 |
| Sample | Japan | Japan | Japan | India | India | India |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Contextual and Cultural Moderation.** H2 investigates whether the relationship between the Women Ratio and ESG scores is moderated by contextual and cultural factors

(proxied by governance indicators), potentially limiting the impact women directors can have. The results are presented in Output 2. Models (1) through (3) study this relationship in the context of Japan, while models (4) through (6) focus on India. The final three models (6 through 9) use the full sample, presenting the three-way interaction between BGD, GOV and India dummy.

Each sample is composed of three models. The respective first models (1, 4, 7) use Women Ratio as the independent variable, and therefore I use the squared term of WR, the GOV variable and the interaction term between GOV and WR. In contrast, the lagged term of WR is used as independent variable in the respective second models (2, 5, 8), while the last model of each sample (models 3, 6 and 9) combines both approaches. This means that these models employ WR as the independent variable but include the lags of WR and squared WR as part of the control variables.

Taking a look at Japan, models (1 through 3) indicate an insignificant relationship between BGD and ESG performance. As well as that, the F-test finds joint insignificance, indicating that there is no evidence of a moderating effect of governance on the BGD-ESG relationship. Similar results can be found in the context of India (models 4 through 6), which present an insignificant relationship between the dependent and independent variables. However, the F-tests find strong evidence for a moderating effect of GOV across all three models at a 1% significance level. As mentioned before, models (7) through (9) analyse the moderating effect of both countries, using the full sample. In this context, models (7) and (9) show that WR is statistically insignificant, while model (8), which uses the lagged term of WR as independent variable, finds a Women Ratio coefficient of 187.5 at a 10% level. Thus, a one percentage point increase in last year's Women Ratio is associated with an increase of 1.875 score points on today's ESG score, ceteris paribus. The F-tests for models (7) through (9) confirm the moderating effect of governance on ESG performance and BGD at the 1%

significance level. For further comprehension at the interpretation of these complex interactions, I use predictive margins for models (7) through (9). As can be seen in Appendix A, Table A4, I input a female ratio of 15% and a GOV value of 0.725 for the predictive margins of model (7) and (9) - both these values are the mean for their respective variables across the full sample. For model (8), values of 14% for WR and 0.725 for GOV were used. For model (7), in contrast to our previous findings, this returned a margin of 165.3 at a 1% significance level for Japan, and a statistically insignificant margin of -28.6 for Indian companies. This means that model (7) provides evidence for the moderating effect on BGD-ESG in Japan but rejects this relationship for India. In the case of Model (8), a margin of 216.6 with a p-value of 0.000 for Japan can be seen, while for India, it showcases a margin of -77.6 at 10% significance level. Lastly, similar results can be found in model (9), where Japanese companies hold a margin of 215.7 with a p-value of 0.000, and Indian firms have a margin of -71.8 at a 5% level. Thus, these findings provide evidence for a statistically significant moderating effect of governance indicators on the BDG-ESG relationship for both Japan and India. While the effect is significantly more predominant and positive in the context of Japan, the margins indicate that the effect is negative for Indian firms (margins of 215 compared to -71).

The differing results of the split sample and full sample analyses can be explained by the larger sample size which is present in the full sample analysis. Specifically, the larger sample size makes it easier to detect significant relationships, which is why these are my preferred models for this hypothesis.

**Critical Mass Theory.** The results for H3 investigates the non-linear relationship of BGD on ESG for Japan and India, as can be seen from Output 3. In particular, model (1), (2) and (3) illustrates this relationship in the context of Japan, while model (4), (5) and (6) takes only into account the Indian firms. The initial model (1), which contains Women Ratio and the

quadratic term of women ratio, finds that the WR coefficient of 26.82 is significant at the 10% level along with the Women Ratio interaction term, which has a statistically insignificant coefficient of -39.57. The F-test, which determines joint significance of the WR and quadratic WR terms, confirms joint significance at the 5% significance level. Therefore, as the women ratio increases, the negative quadratic term suggests a positive, but diminishing effect, or an inverse U-shape. In this case, as the linear coefficient is positive, and the quadratic term is negative, the inflection point will show the percentage of women directors at which their positive effect on ESG scores starts to change signs. For model (1), this is at a Women Ratio of 33.9%, which is mostly in line with extant literature (e.g. Arvanitis et al., 2022). For model (2), the lagged Women Ratio and squared lagged Women Ratio are used as independent variables. This model shows similar outcomes, with a lagged WR coefficient of 32.56 at the 1% significance level, and a quadratic lagged WR coefficient of -62.26 at the 5% significance level, indicating an inversely U-shaped relationship. The F-test confirms joint significance at the 5% level. Thus, as last year's Women Ratio increases, the effect on today's ESG score is decreasingly positive, until the women ratio reaches 26.1%, at which point the effect starts to change direction. Model (3) finds a positive and statistically significant (10% level) WR coefficient of 27.43, while the squared WR coefficient is statistically insignificant at negative (-51.13). The F-Test confirms joint significance at the 5% level, however, indicating that the inversely U-shaped relationship could, in fact, be causal. The inflection point, at about 27%, is once again, in line with existing research (e.g. Arvanitis et al., 2022).

**Output 2***: Moderating effect on BGD-ESG*

| VARIABLES | (1) ESG | (2) ESG | (3) ESG | (4) ESG | (5) ESG | (6) ESG | (7) ESG | (8) ESG | (9) ESG |
|---|---|---|---|---|---|---|---|---|---|
| WR | -102.7 | | -151.7 | 5.265 | | 15.54 | 103.8 | | 104.4 |
| | (170.9) | | (203.6) | (41.73) | | (31.82) | (72.14) | | (110.6) |
| Squared WR | -203.1* | | -80.63 | 12.25 | | -32.12 | 9.145 | | -2.991 |
| | (107.0) | | (54.60) | (109.0) | | (68.99) | (32.68) | | (34.39) |
| WR * GOV | 156.4 | | 149.4 | -134.6** | | -134.9** | -69.38 | | -68.09 |
| | (142.5) | | (162.5) | (58.37) | | (60.16) | (58.70) | | (86.79) |
| Lagged WR | | -2.147 | 69.52** | | 53.33 | 17.76 | | 185.5* | 11.98 |
| | | (271.4) | (27.42) | | (37.24) | (25.45) | | (97.38) | (10.14) |
| Squared Lagged WR | | -196.5* | -150.0* | | -23.56 | -10.68 | | -0.0684 | -3.477 |
| | | (107.2) | (72.43) | | (107.6) | (81.66) | | (26.76) | (28.32) |
| Lagged WR * GOV | | 75.93 | | | 147.9** | | | -127.6 | |
| | | (220.3) | | | (61.96) | | | (78.22) | |
| GOV | -12.26 | -19.02 | -33.92 | 104.2*** | 60.08** | 107.3*** | -105.1*** | -182.6*** | -183.0*** |
| | (22.20) | (25.53) | (23.53) | (16.28) | (19.87) | (21.43) | (34.63) | (43.86) | (41.77) |
| India (1) | | | | | | | -141.3*** | -254.6*** | -254.8*** |
| | | | | | | | (50.30) | (64.61) | (60.24) |
| India (1) * WR | | | | | | | -112.6 | | -107.4 |
| | | | | | | | (76.07) | | (118.8) |
| India (1) * GOV | | | | | | | 61.15*** | 54.69*** | 86.76*** |
| | | | | | | | (13.39) | (14.73) | (15.06) |
| India (1) * WR * GOV | | | | | | | -38.92 | | -69.36 |
| | | | | | | | (88.06) | | (95.57) |
| India (1) * Lagged WR | | | | | | | | -179.8* | |
| | | | | | | | | (101.8) | |
| India (1) * Lagged WR * GOV | | | | | | | | 136.7 | |
| | | | | | | | | (98.39) | |
| Return on Equity | 0.00828 | 0.0359 | 0.0377 | -0.00460 | -0.00767 | -0.00872 | 0.00833*** | 0.00724* | 0.00685** |
| | (0.0781) | (0.0792) | (0.0767) | (0.0152) | (0.0112) | (0.0121) | (0.000955) | (0.00372) | (0.00346) |
| Board size | -0.475 | -0.299 | -0.307 | 0.233 | 0.294 | 0.330 | 0.0495 | 0.0780 | 0.0778 |
| | (0.297) | (0.303) | (0.332) | (0.320) | (0.356) | (0.377) | (0.0656) | (0.118) | (0.107) |
| Ln(Firm size) | 5.141*** | 4.580*** | 4.546*** | 4.657*** | 4.393*** | 4.399*** | 4.516*** | 4.337*** | 3.732*** |
| | (0.854) | (0.775) | (0.809) | (0.940) | (1.042) | (1.041) | (0.512) | (0.545) | (0.529) |
| Firm age | 0.0884*** | 0.0869*** | 0.0863*** | 0.0532 | 0.0651 | 0.0657 | 0.0907*** | 0.0908*** | 0.0826*** |
| | (0.0225) | (0.0223) | (0.0222) | (0.0419) | (0.0447) | (0.0448) | (0.0257) | (0.0264) | (0.0199) |
| Industry Identifier | -1.046 | -1.046 | -1.033 | -1.769*** | -1.738*** | -1.701*** | -1.465*** | -1.466*** | |
| | (0.708) | (0.689) | (0.691) | (0.507) | (0.502) | (0.493) | (0.563) | (0.543) | |
| Constant | -11.68 | 7.029 | 25.49 | -1.696 | -5.444 | -2.239 | 119.7** | 227.3*** | 228.9*** |
| | (30.56) | (33.05) | (29.29) | (19.06) | (21.58) | (23.43) | (50.61) | (65.28) | (59.85) |
| Observations | 598 | 448 | 448 | 419 | 313 | 313 | 1,017 | 761 | 761 |
| R-squared | 0.279 | 0.266 | 0.271 | 0.322 | 0.305 | 0.309 | | | |
| Sample | Japan | Japan | Japan | India | India | India | Full | Full | Full |
| Joint Significance | No | No | No | Yes*** | Yes*** | Yes*** | Yes*** | Yes*** | Yes*** |
| Firm FE | No | No | No | No | No | No | No | No | No |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Number of ID | | | | | | | 255 | 255 | 255 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As mentioned previously, the outcomes for India are represented in models (4), (5), and (6) of Output 3. These three models follow the same structure used for Japan, meaning that model (4) contains WR and quadratic WR as independent variables, model (5) uses the lags of those two variables as independent variables and model (6) combines both previous models. Model (4) presents statistically insignificant positive coefficients on WR and statistically insignificant negative coefficients on the quadratic women ratio term, indicating a U-shaped relationship. While the stand-alone variables appear insignificant, the F-Test confirms joint significance at the 10% level. The computed inflection point is expected at about 0.42% female representation, which would imply that the negative impact is not realised as it lies mostly outside of the range of the gender diversity measure, which ranges from 0% to 100% (i.e. 0 to 1). Similarly, model (5) presents a negative coefficient for the lagged Women Ratio, and a positive coefficient for the squared lagged variable, indicating a U-shaped relationship. However, unlike model (4), both terms are statistically significant at the 10%, and 5% levels, respectively. The F-Test further confirms joint significance at the 10% level. Additionally, the inflection point, at which the effect stops being negative is estimated at about 15%. Finally, model (6) finds statistically insignificant positive terms for both WR (5.33) and the quadratic women ratio term (18.08). The F-test confirms joint significance at the 5% level. The inflection point, however, is found at about -15%, which lies outside the interval for the women representation measure. Since both the WR and quadratic WR terms are positive, this negative inflection point indicates that Indian firms experience a U-shaped BGD-ESG relationship, like models (4) and (5) suggested. However, model (6) now indicates that increasing female representation on boards would always have a beneficial effect on ESG performance. The reason being that the left-hand side of the U-shape (i.e. the negative slope) is never realised, as it lies outside the gender diversity measure's range.

**Output 3***: Non-linearity*

| VARIABLES | (1) ESG | (2) ESG | (3) ESG | (4) ESG | (5) ESG | (6) ESG |
|---|---|---|---|---|---|---|
| WR | 26.82* | | 27.43* | -2.449 | | 5.332 |
| | (13.26) | | (14.04) | (8.793) | | (12.39) |
| Squared WR | -39.57 | | -51.13 | 28.89 | | 18.08 |
| | (37.62) | | (39.87) | (17.73) | | (29.43) |
| Lagged WR | | 32.56*** | 26.90** | | -22.26* | -25.48** |
| | | (10.21) | (10.19) | | (10.46) | (9.773) |
| Squared Lagged WR | | -62.26** | -51.13** | | 74.26** | 77.27** |
| | | (20.94) | (20.29) | | (30.95) | (31.31) |
| Return on Equity | -0.0352 | -0.0278 | -0.0249 | 0.00615*** | 0.00379 | 0.00408 |
| | (0.0239) | (0.0277) | (0.0249) | (0.00113) | (0.00291) | (0.00274) |
| Board size | 0.0357 | 0.123 | 0.0644 | -0.161 | -0.262* | -0.273* |
| | (0.0965) | (0.139) | (0.143) | (0.120) | (0.118) | (0.140) |
| Ln(Firm size) | 8.229*** | 5.671 | 5.218 | 0.769 | 2.208* | 2.470* |
| | (2.078) | (3.346) | (3.404) | (1.907) | (1.186) | (1.187) |
| Firm age | 0.857** | 0.534 | 0.370 | 2.504*** | 2.721*** | 2.609*** |
| | (0.332) | (0.396) | (0.413) | (0.281) | (0.473) | (0.451) |
| Constant | -147.3*** | -78.55** | -58.76 | -93.73** | -125.2*** | -124.1*** |
| | (32.07) | (30.38) | (37.55) | (36.05) | (28.31) | (27.96) |
| Observations | 745 | 595 | 595 | 523 | 417 | 417 |
| R-squared | 0.155 | 0.078 | 0.086 | 0.392 | 0.374 | 0.383 |
| Number of ID | 150 | 150 | 150 | 105 | 105 | 105 |
| Sample | Japan | Japan | Japan | India | India | India |
| Joint Significance | Yes** | Yes** | Yes* | Yes* | Yes* | Yes** |
| CMT | 33.9% | 26.1% | 26.8% | 0.42% | 14.9% | -14.7% |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## Discussion

### Summary of Key Findings

This study confirmed a positive relationship between BGD and ESG performance in both Japan and India, with a more pronounced effect in Japan. The moderating role of governance was significant, enhancing the positive impact of WR on ESG in Japan and a negative impact in India. Critical Mass Theory was corroborated, showing an inverse U-shape

relationship in Japan, with an inflection point of around 30%, and a U-shape relationship for India. Robustness checks using Blau Index supported these findings[10].

**H1: Women Ratio and ESG**

The analysis of the linear BGD-ESG relationship provided evidence for a causal relationship both for Japanese and Indian firms. First, the analysis on the Japanese firm sample presented a consistently significant relationship between BGD and ESG, indicating that a 10-percentage point increase in the female representation in the boardroom is associated with a 1.06-point ESG score improvement. This is in line with the findings of other scholars (Khatri, 2022; Nadeem et al., 2017).

As discussed, findings in a developing nation context provide mostly mixed results (Abdelkader et al., 2024) but while my analysis of the Indian firm sample was less consistent, a statistically significant relationship between BGD and ESG was ultimately confirmed. In particular, a 10-percentage point increase in the women ratio of a firm's board is associated with a 1.17-point ESG score improvement, suggesting that Indian firms' ESG scores benefit more from increased female representation than Japanese firms do. Both of these findings provide evidence for the predicted positive relationship. This is in line with both AT and RDT, which posited that women directors bring more attention to sustainability-related operations (RDT), while their superior monitoring capabilities (AT) are a reason for these effects materialising.

The differences in effects between India and Japan could be explained by the fact that Indian firms, on average, present lower ESG scores (see Table 3: Summary Statistics India & Japan). Therefore, increasing female representation on boards might have a more substantial

[10] See Appendix B for Robustness checks.

impact on ESG performance, while in Japan, where the ESG scores are higher, increased BGD may lead to smaller improvements only.

Furthermore, as discussed by Abdelkader et al. (2024), women who are on the board of directors of firms in developing nations, tend to focus on short term initiatives which present immediate results as a way of gaining respect of other male directors to prevent discrimination based on stereotypes. While the limited time frame of my analysis does not allow me to comment on the short-term focus, Abdelkader's (2024) argument aligns with my results. Specifically, it appears that women directors in India have a greater impact on ESG performance, which could be driven by the need of women to disprove stereotypes by focusing on more pronounced but short-term goals.

**H2: BGD-ESG GOV Moderation**

Overall, H2 provided evidence in favour of a moderating effect of contextual and cultural factors on the BGD-ESG relationship in both India and Japan, while it is more pronounced across Indian firms, as outlined in Appendix A, Table A. This further illustrated that the moderating effect is positive in Japan but negative in India.

The hypothesis, based on Byron and Post (2016), suggested that the contextual and cultural factors would moderate the BGD-ESG relationship, which was indeed confirmed, indicating that the setting plays a crucial role in shaping the effectiveness of women directors on ESG outcomes.

In Japan, the positive moderation of GOV on the BGD-ESG relationship could be explained by RDT, which posits that diverse boards bring a wider range of perspective and resources, resulting in better firm capabilities to respond to environmental and social challenges (Abdelkader et al., 2024). In a developed economy such as Japan, which is characterised by strong governance (GOV) (see Table 3: Summary Statistics), the inclusion of more women

further enhances a firm's resource base and decision-making, resulting in improved ESG performance.

In contrast, Indian firms experience a negative moderation of GOV on the BGD-ESG relationship, suggesting that challenges faced by women directors in less developed nations may outweigh the benefits predicted by theories such as RDT and AT. Despite regulatory initiatives in India to promote board gender diversity (i.e. The Companies Act, 2013), social and cultural barriers may still create an environment where female directors face significant resistance due to stereotyping (Byron and Post, 2016). This may limit women's abilities to significantly contribute to improved ESG outcomes, effectively suppressing the beneficial effects. Simultaneously, the addition of more women directors also creates tensions in the boardroom (Arvanitis et al., 2022; Kanter, 1977). Specifically, Arvanitis et al., 2022 discuss that following Social Identity Theory (SIT), people group with others who have similar attributes (e.g. gender), which can lead to miscommunication and a lack of cooperation amongst other issues (Tajfel, 1978). This may ultimately result in poorer firm outcomes, such as ESG performance. Overall, the combination of suppressed benefits and potential downsides to BGD (e.g. SIT) may tip the scale in favour of a negative effect of BGD on ESG performance.

**H3: Non-Linearity**

In H3 I hypothesised that, following Critical Mass Theory, I expect a U-shaped relationship between BGD and ESG score in both Japan and India. In particular, women directors only start influencing firm outcomes significantly once a critical mass threshold is achieved which is often found to be around one third female board representation (e.g. Arvanitis et al., 2022; Kanter, 1977). Additionally, due to contextual and cultural differences between developing (i.e. India) and developed (i.e. Japan) countries, as outlined by Byron and

Post (2016), I predicted that there would be a higher critical mass threshold in India, as women face more hurdles in developing nations.

Findings revealed that there is evidence of a non-linear relationship between BGD and ESG in Japanese firms. However, contrary to expectations, the analysis suggests that the relationship is inversely U-shaped. These findings are in opposition to CMT, as they imply that the effect of women directors is only beneficial to a firm's ESG score until a certain female representation is reached, after which the effect becomes negative. Though contrary to CMT, a number of papers have presented similar inverse U-shaped relationships (e.g. Arvanitis et al., 2022; Nguyen, 2015), which indicates that the potential benefits of more female directors, as predicted by AT and RDT, are outweighed by negative effects of greater diversity (Arvanitis et al., 2022). Arvanitis et al. (2022) argue that this result follows Social Identity Theory (SIT). Specifically, SIT posits that people naturally group with others who have similar attributes, such as gender or age (Arvanitis et al., 2022). In turn, this can be the cause of several issues, such as a lack of cooperation or miscommunication (Tajfel, 1978), harming the board's capabilities to make the most optimal decisions, potentially leading to poorer ESG performance. My findings also revealed a critical mass threshold of around 30% for all Japanese models, which is indeed in line with the critical mass findings of Arvanitis et al. (2022) and similar to Nguyen et al., (2015).

The analysis of Indian firms, on the other hand, provided evidence for a U-shaped relationship, as originally predicted, in line with CMT. The computation of the critical mass threshold in Indian firms, however, provided mixed findings, with the main model reporting an inflection point at -15%. In practice, this implies that the marginal effect of adding an extra woman director to a boardroom would never diminish ESG scores.

Therefore, findings suggest that the effect of women directors in Japanese firms is only beneficial to a firm's ESG score until a certain female representation is reached (around 30%),

after which the effect becomes negative, while for Indian firms, this effect is opposite and the threshold is significantly lower or non-existent, which is in opposition to H3. However, the significant variations in findings for Indian firms put into question the reliability of the results, which could be because of the limited sample size for Indian firms, consisting of only 105 observations.

## Contributions

The study contributes to improving the understanding of the BGD-ESG relationship in a number of ways. First, this paper provides insights which enhance the understanding of the relationship between BGD and ESG by investigating and comparing two Asian countries, where India represents the context of developing nations, and Japan represents developed nations. This is important because extant literature mostly focuses on Western contexts such that research on developing nations is much less abundant (Campopiano, Gabaldón, & Gimenez-Jimenez, 2022) - a void which this paper fills.

Furthermore, this research further explores the non-linearity of the BGD-ESG relationship in different contextual and cultural regions, suggesting that there are significant differences between the two differing settings, explaining why findings on the "shape" of the relationship tend to be mixed (e.g. Arvanitis et al., 2022 versus Joecks, et al., 2013).

Empirically, I provide robust evidence on the BGD-ESG relationship by accounting for potential endogeneity issues by employing Fixed Effects estimation as well as the inclusion of past BGD terms. This ensures that the estimated impact of BGD on ESG performance is more accurate and less biassed, such that the contributions to literature are as reliable as possible.

Moreover, findings also offer important insights to policy-making and corporate governance practices. Specifically, the evidence of a beneficial effect of women directors on corporate boards on firm ESG performance suggests that policies in both Japan and India

should advocate promoting gender diversity to achieve more sustainable firm practices. In Japan, however, a more nuanced approach is required since this paper provides evidence in favour of a limit on the beneficial effects of BGD on ESG performance.

Implications are also of great importance to CG practitioners since Indian firms can significantly improve their ESG performance by increasing the proportion of women directors, while Japanese firms must ensure to strike the right balance.

## Limitations

The findings of this study, however, should be considered cautiously, as there are a number of limitations which may have affected the validity and generalisability of the outcomes. Therefore, it is crucial to acknowledge and inform about these limitations.

The first key limitation is the relatively small sample size. This is especially problematic for Indian firms, of which there are only 105 compared to the 150 Japanese firms. As outlined by Wooldridge (2010), small sample sizes can result in unreliable estimates, potentially affecting the robustness and generalisability of the findings. Hence, I recommend future researchers to consider larger sample sizes to avoid the adverse effects. Furthermore, despite the rigorous and careful gender identification process there is still possibility for human error in classifying the genders, potentially skewing results.

Next, as discussed by Eccles et al., (2014), the ESG scores themselves can vary significantly depending on their source, with Thomson Reuters, for instance, considering fewer criteria, resulting in higher ESG scores. This implies that findings may not be robust across other ESG score measures. Thus, further analysis with several ESG score measures could shed more light on the robustness of my findings.

Third, the data covers a relatively short time frame of five years, which also includes the COVID-19 pandemic, likely affecting the data. Therefore, the generalisability of findings

may be reduced. Hence, a larger time frame is recommended for further research. Additionally, this paper's findings may not be applicable across other countries with different contextual and cultural settings as I, in line with Byron and Post (2016) confirmed that these differing contexts have a significant effect on the effectiveness of board gender diversity.

Moreover, hypotheses H1 and H3 are estimated using Fixed Effects estimation, which controls for time-invariant unobserved heterogeneity, such that only the within variation in firms is estimated (Wooldridge, 2010). However, if little variation exists, such as few changes in gender diversity of boardrooms within firms, then the FE model may not present robust and reliable findings.

Furthermore, Yarram and Adapa (2022) discuss the dynamics between BGD and ESG/CSR. Firstly, a feedback mechanism may exist, such that BGD influences ESG/CSR, and vice versa. Additionally, bigger firms with more resources may have more gender-diverse boards as they put a greater emphasis on sustainability due to increased public, financial or legislative pressures (Yarram & Adapa, 2022).

Therefore, to ensure robust results, I recommend an Instrumental Variable approach, such as the two-step Generalised Methods of Moments (GMM) (Yarram & Adapa, 2022; Wooldridge, 2010). The advantage of the GMM estimator is that it can address endogeneity issues between the dependent and the explanatory variables in a dynamic panel model (Cheng & Bang, 2021). What can be achieved by using the GMM estimator is to use lagged values of endogenous variables as instrumental variables for the model. This proves an advantage as it increases flexibility for the implementation of the model, however, it also raises concerns because it leaves the estimator sensitive to the procedure and moment restrictions that were chosen (Cheng & Bang, 2021). The GMM estimator, according to Cheng and Bang (2021), considers a dynamic panel data model with a lagged dependent variable as the regressor.

The last notable limitation of this study is that BGD is included in the Governance (G) pillar of ESG, which contributes 35% to the overall ESG score (London Stock Exchange Group, 2022, p. 6). Within the Governance component, the Management category, which includes diversity, makes up a substantial portion of the Governance pillar. However, the specific contribution of diversity within Management is relatively small compared to other factors such as Structure and Compensation (as part of the G-pillar).

This may lead to upward biased results, as the diversity factor directly affects overall ESG performance metrics. To address this limitation, future research should aim to isolate the Environmental (E) and Social (S) components of the ESG score, which was not possible in this paper due to data availability restrictions. By focusing on these aspects independently, researchers can obtain a clearer understanding of the distinct contributions of BGD.

## Conclusion

The study aimed to explore the relationship between BGD and ESG performance in firms from Japan and India. The primary research question addressed whether BGD positively affects ESG performance and how contextual and cultural settings may moderate this relationship. The main findings indicate a positive relationship between BGD and ESG performance in both countries, with a more pronounced effect in Japan. The contextual and cultural setting was found to play a significant moderating role, enhancing the positive impact in Japan and reducing it in India. The results also partially supported CMT, showing a U-shaped relationship in India, but an inversely U-shaped relationship in Japan.

Theoretically, this research contributes to existing literature by providing evidence of the BGD-ESG relationship in a non-Western context, while highlighting the importance of the contextual setting. Practically, the findings suggest that policymakers and corporate governance practitioners should promote gender diversity on boards to enhance ESG

performance. However, a nuanced approach is still necessary, especially in Japan, where the benefits of BGD may have a limit beyond which additional diversity may not yield further benefits.

Moreover, several limitations should be acknowledged. First, the sample size, particularly for Indian firms was relatively small, potentially affecting the reliability of findings. Second, the data covers a limited timeframe only, which includes the COVID-19 pandemic, possibly affecting outcomes. Lastly, the robustness of my fixed effects models which I employed throughout the analyses may suffer from too little within variation in either ESG scores or BGD measure.

The findings have important implications for policy and practice. In Japan, policies promoting gender diversity should consider the identified threshold to avoid diminishing returns. For Indian firms, promoting gender diversity could significantly improve ESG performance, but social and cultural barriers need to be addressed to maximise these benefits. Policymakers should therefore tailor their strategies to the specific contextual and cultural setting of each country.

Future research should consider a larger sample size to improve the generalisability and robustness of findings. Additionally, investigating a longer timeframe could provide deeper insights into the BGD-ESG relationship. Furthermore, research in other developing and developed countries would help validate the findings and provide a broader understanding of the impact of BGD on ESG performance.

In conclusion, this study underscored the importance of BGD in enhancing ESG performance, with significant implications for CG practices and policymaking. By promoting gender diversity, firms can improve their sustainability performance, and contribute to broader societal and environmental goals. Future research should continue to explore this relationship, considering various contextual factors that influence its dynamics.

## References


A. A. Zaid, M., Wang, M., Adib, M., Sahyouni, A., & T. F. Abuhijleh, S. (2020). Boardroom nationality and gender diversity: Implications for corporate sustainability performance. Journal of Cleaner Production, 251, 119652. doi:10.1016/j.jclepro.2019.119652

Abdelkader, M. G., Gao, Y., & Elamer, A. A. (2024). Board gender diversity and ESG performance: The mediating role of temporal orientation in South Africa context. Journal of Cleaner Production, 440, 140728. doi:10.1016/j.jclepro.2024.140728

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance☆. Journal of Financial Economics, 94(2), 291–309. doi:10.1016/j.jfineco.2008.10.007

Almazan, A. and Suarez, J. (2003) 'Entrenchment and severance pay in optimal governance structures', The Journal of Finance, 58(2), pp. 519–547. doi:10.1111/1540-6261.00536.

Ameer, R., Ramli, F., & Zakaria, H. (2010). A new perspective on board composition and firm performance in an emerging market. Corporate Governance: The International Journal of Business in Society, 10(5), 647–661. doi:10.1108/14720701011085607

Arvanitis, S. E., Varouchas, E. G., & Agiomirgianakis, G. M. (2022). Does board gender diversity really improve firm performance? evidence from Greek listed firms. Journal of Risk and Financial Management, 15(7), 306. doi:10.3390/jrfm15070306

Arya, B., & Zhang, G. (2009). Institutional reforms and investor reactions to CSR announcements: Evidence from an emerging economy. Journal of Management Studies, 46(7), 1089–1112. https://doi.org/10.1111/j.1467-6486.2009.00836.x

Bear, S., Rahman, N., & Post, C. (2010). The impact of board diversity and gender composition on corporate social responsibility and firm reputation. Journal of Business Ethics, 97(2), 207–221. doi:10.1007/s10551-010-0505-2

Beji, R., Yousfi, O., Loukil, N., & Omri, A. (2020). Board diversity and Corporate Social Responsibility: Empirical evidence from France. Journal of Business Ethics, 173(1), 133–155. doi:10.1007/s10551-020-04522-4

Beloskar, V. D., & Rao, S. V. (2022). Did ESG save the day? evidence from India during the COVID-19 crisis. Asia-Pacific Financial Markets. doi:10.1007/s10690-022-09369-5

Ben-Amar, W., Chang, M., & McIlkenny, P. (2015). Board gender diversity and corporate response to sustainability initiatives: Evidence from the Carbon Disclosure Project. Journal of Business Ethics, 142(2), 369–383. doi:10.1007/s10551-015-2759-1

Pfeffer, J. and Salancik, G. (1978) The External Control of Organizations: A Resource Dependence Perspective. Harper & Row.

Bilimoria, D. (1995). Women directors: The quiet discrimination. Corporate Board, 16(93), 10-14.

Bhagat, S., & Black, B. S. (1997). The uncertain relationship between board composition and Firm Performance. SSRN Electronic Journal. doi:10.2139/ssrn.11417

Bloodhart, B., & Swim, J. K. (2020). Sustainability and consumption: What's gender got to do with it? Journal of Social Issues, 76(1), 101–113. doi: 10.1111/josi.12370

Byron, K., & Post, C. (2016). Women on boards of directors and Corporate Social Performance: A meta-analysis. Corporate Governance: An International Review, 24(4), 428–442. doi:10.1111/corg.12165

Cambrea, D. R., Paolone, F., & Cucari, N. (2023). Advisory or monitoring role in ESG scenario: Which women directors are more influential in the Italian context? Business Strategy and the Environment, 32(7), 4299–4314. https://doi.org/10.1002/bse.3366

Campbell, K., & Mínguez-Vera, A. (2007). Gender diversity in the boardroom and firm financial performance. Journal of Business Ethics, 83(3), 435–451. doi:10.1007/s10551-007-9630-y

Campopiano, G., Gabaldón, P., & Gimenez-Jimenez, D. (2022). Women directors and Corporate Social Performance: An integrative review of the literature and a future research agenda. Journal of Business Ethics, 182(3), 717–746. doi:10.1007/s10551-021-04999-7

Cheng, N. and Bang, Y. (2021) 'A comment on the practice of the arellano-bond/blundell-bond generalized method of moments estimator in is research', Communications of the Association for Information Systems, 48(1), pp. 423–442. doi:10.17705/1cais.04838.

Čiarnienė, R., Vienažindienė, M., & Adamonienė, R. (2020). Sustainable behaviour: Evidence from Lithuania. Engineering Management in Production and Services, 12(1), 80–92. doi:10.2478/emj-2020-0007

Cordeiro, J. J., Profumo, G., & Tutore, I. (2020). Board gender diversity and corporate environmental performance: The moderating role of family and dual-class majority ownership structures. Business Strategy and the Environment, 29(3), 1127–1144. https://doi.org/10.1002/bse.2421

Cucari, N., Esposito De Falco, S., & Orlando, B. (2017). Diversity of Board of Directors and Environmental Social Governance: Evidence from Italian listed companies. Corporate Social Responsibility and Environmental Management, 25(3), 250–266. doi:10.1002/csr.1452

De-Andres, P., Azofra, V., & Lopez, F. (2005). Corporate Boards in OECD countries: Size, composition, functioning and effectiveness. Corporate Governance, 13(2), 197–210. doi:10.1111/j.1467-8683.2005.00418.x

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. Management Science, 60(11), 2835–2857. doi:10.1287/mnsc.2014.1984

Edgerton, D., & Shukur, G. (1999). Testing autocorrelation in a system perspective testing autocorrelation. Econometric Reviews, 18(4), 343–386. https://doi.org/10.1080/07474939908800351

Fama, E. F., and Jensen, M. C. (1983). Separation of ownership and Control. The Journal of Law and Economics, 26(2), 301–325. doi:10.1086/467037

Farrell, K. A., & Hersch, P. L. (2005). Additions to corporate boards: The effect of gender. Journal of Corporate Finance, 11(1–2), 85–106. https://doi.org/10.1016/j.jcorpfin.2003.12.001

Foutty, J. F., Creary, S. J., & Mitchell, K. (2023, April 3). How diversity can boost board effectiveness. MIT Sloan Management Review. https://sloanreview.mit.edu/article/how-diversity-can-boost-board-effectiveness/

Fu, B., Wang, K., & Zhou, T. (2024). A controversy in sustainable development: How does gender diversity affect the ESG disclosure? Applied Economics and Policy Studies, 669–678. doi:10.1007/978-981-97-0523-8_64

García-Ramos, R., and García-Olalla, M. (2011). Board characteristics and firm performance in public founder- and nonfounder-led family businesses. Journal of Family Business Strategy, 2(4), 220–231. doi:10.1016/j.jfbs.2011.09.001

G., C.E.C. & Simpson, K.N. (2006) Methods and designs for outcomes research. Bethesda, MD: American Society of Health-System Pharmacists.

Goyal, R., Kakabadse, N., Kakabadse, A., & Talbot, D. (2021). Female Board Directors' Resilience Against Gender Discrimination. Gender, Work & Organization, 30(1), 197–222. https://doi.org/10.1111/gwao.12669

Greed, C. (2000). Women in the construction Professions: Achieving critical mass. Gender, Work & Organization, 7(3), 181–196. https://doi.org/10.1111/1468-0432.00106

Gurol, B., & Lagasio, V. (2022). Women board members' impact on ESG disclosure with Environment and Social Dimensions: Evidence from the European Banking Sector. Social Responsibility Journal, 19(1), 211–228. https://doi.org/10.1108/srj-08-2020-0308

Hussain, N., Rigoni, U., & Orij, R. P. (2018). Corporate Governance and sustainability performance: Analysis of Triple Bottom Line Performance. Journal of Business Ethics, 149(2), 411–432. doi:10.1007/s10551-016-3099-5

Husted, B. W., & Sousa-Filho, J. M. (2019). Board structure and environmental, social, and governance disclosure in Latin America. Journal of Business Research, 102, 220–227. https://doi.org/10.1016/j.jbusres.2018.01.017

Jizi, M. (2017). The influence of board composition on Sustainable Development disclosure. Business Strategy and the Environment, 26(5), 640–655. doi:10.1002/bse.1943

Joecks, J., Pull, K., and Vetter, K. (2012). Gender diversity in the boardroom and firm performance: What exactly constitutes a "Critical mass?" Journal of Business Ethics, 118(1), 61–72. doi:10.1007/s10551-012-1553-6

Kalven, H., Jr., & Zeisel, H. (1967). The American jury. Washington and Lee Law Review, 24(1), 158. Available at: https://scholarlycommons.law.wlu.edu/wlulr/vol24/iss1/18

Kanter, R. M. (1977). Some effects of proportions on group life: Skewed sex ratios and response to token women. American Journal of Sociology 82: 965–90.

Kanter, R. M. (1987). Men and Women of the Corporation Revisited: Interview with Rosabeth Moss Kanter. Human Resource Management, 26(2), 257–263. https://doi.org/10.1002/hrm.3930260209

Katmon, N., Mohamad, Z. Z., Norwani, N. M., & Farooque, O. A. (2017). Comprehensive Board Diversity and quality of Corporate Social Responsibility Disclosure: Evidence from an emerging market. Journal of Business Ethics, 157(2), 447–481. doi:10.1007/s10551-017-3672-6

Kaufmann, D., & Kraay, A. (2023). Worldwide Governance Indicators, 2023 Update. Retrieved from http://www.govindicators.org

Kawgan-Kagan, I. (2020). Are women greener than men? A preference analysis of women and men from major German cities over Sustainable Urban Mobility. Transportation Research Interdisciplinary Perspectives, 8, 100236. doi:10.1016/j.trip.2020.100236

Khatri, I. (2022). Board gender diversity and sustainability performance: Nordic evidence. Corporate Social Responsibility and Environmental Management, 30(3), 1495–1507. https://doi.org/10.1002/csr.2432

Kirsch, A. (2018). The gender composition of Corporate Boards: A review and research agenda. The Leadership Quarterly, 29(2), 346–364. https://doi.org/10.1016/j.leaqua.2017.06.001

Konrad, A. M., Kramer, V., & Erkut, S. (2008). Critical mass: Organizational Dynamics, 37(2), 145–164. doi:10.1016/j.orgdyn.2008.02.005

KPMG. (2019). Impact of ESG disclosures. available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2019/09/impact-of-esgdisclosures.pdf

Latané, B. (1981). The psychology of social impact. American Psychologist, 36(4), 343–356. https://doi.org/10.1037/0003-066X.36.4.343

Liu, Y., Wei, Z., & Xie, F. (2014). Do women directors improve firm performance in China? Journal of Corporate Finance, 28, 169–184. doi:10.1016/j.jcorpfin.2013.11.016

London Stock Exchange Group. (2022). Refinitiv ESG scores methodology. Retrieved from https://www.lseg.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

LSEG. (n.d.). Eikon Financial Analysis & Trading Software. Retrieved from https://www.lseg.com/en/data-analytics/search/eikon-trading-software

Lu, J., & Herremans, I. M. (2019). Board gender diversity and environmental performance: An industries perspective. Business Strategy and the Environment, 28(7), 1449–1464. doi:10.1002/bse.2326

Luchs, M. G., & Mooradian, T. A. (2011). Sex, personality, and sustainable consumer behaviour: Elucidating the gender effect. Journal of Consumer Policy, 35(1), 127–144. doi:10.1007/s10603-011-9179-0

Maass, A., & Clark, R. D. (1984). Hidden impact of minorities: Fifteen Years of minority influence research. Psychological Bulletin, 95(3), 428–450. https://doi.org/10.1037/0033-2909.95.3.428

Marano, V., Sauerwald, S., & Essen, M. V. (2022, February 7). The influence of culture on the relationship between women directors and Corporate Social Performance - Journal of International Business Studies. SpringerLink. https://link.springer.com/article/10.1057/s41267-022-00503-z

Marinova, J., Plantenga, J., & Remery, C. (2015). Gender diversity and firm performance: Evidence from Dutch and Danish boardrooms. The International Journal of Human Resource Management, 27(15), 1777–1790. doi:10.1080/09585192.2015.1079229

Markóczy, L., Sun, S. L., & Zhu, J. (2019). The glass pyramid: Informal gender status hierarchy on boards. Journal of Business Ethics, 168(4), 827–845. https://doi.org/10.1007/s10551-019-04247-z

Miller, T., & Del Carmen Triana, M. (2009a). Demographic diversity in the boardroom: Mediators of the board diversity–firm performance relationship. Journal of Management Studies, 46(5), 755–786. doi:10.1111/j.1467-6486.2009.00839.x

Moscovici, S. (1980). Toward a theory of conversion behavior. In Advances in Experimental Social Psychology (pp. 209–239). https://doi.org/10.1016/s0065-2601(08)60133-1

Nadeem, M., Zaman, R., & Saleem, I. (2017). Boardroom gender diversity and corporate sustainability practices: Evidence from Australian Securities Exchange listed firms. Journal of Cleaner Production, 149, 874–885. https://doi.org/10.1016/j.jclepro.2017.02.141

United Nations (2024). Gender inequality index. Human Development Reports. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII

Nerantzidis, M., Tzeremes, P., Koutoupis, A., & Pourgias, A. (2022). Exploring the black box: Board gender diversity and Corporate Social Performance. Finance Research Letters, 48, 102987. doi:10.1016/j.frl.2022.102987

Nguyen, T., Locke, S., & Reddy, K. (2015). Does boardroom gender diversity matter? evidence from a transitional economy. International Review of Economics & Finance, 37, 184–202. doi:10.1016/j.iref.2014.11.022

Norris, P., & Lovenduski, J. (2001). Blair's Babes: Critical mass Theory, gender, and Legislative life. Social Science Research Network. https://doi.org/10.2139/ssrn.288548

O'Connell, V., and Cramer, N. (2010). The relationship between firm performance and board characteristics in Ireland. European Management Journal, 28(5), 387–399. doi:10.1016/j.emj.2009.11.002

Pacelli, V., Pampurini, F., & Quaranta, A. G. (2022). Environmental, social and governance investing: Does rating matter? Business Strategy and the Environment, 32(1), 30–41. doi:10.1002/bse.3116

Provasi, R., & Harasheh, M. (2020). Gender diversity and corporate performance: Emphasis on Sustainability Performance. Corporate Social Responsibility and Environmental Management, 28(1), 127–137. https://doi.org/10.1002/csr.2037

Rajesh, R. (2020). Exploring the sustainability performances of firms using environmental, social, and governance scores. Journal of Cleaner Production, 247, 119600. doi:10.1016/j.jclepro.2019.119600

Reguera-Alvarado, N., de Fuentes, P., & Laffarga, J. (2015). Does board gender diversity influence financial performance? evidence from Spain. Journal of Business Ethics, 141(2), 337–350. doi:10.1007/s10551-015-2735-9

Rehal, V. (2023). Test of endogeneity: Durbin-wu-Hausman Test. Retrieved from https://spureconomics.com/test-of-endogeneity-durbin-wu-hausman-test/

Rodriguez-Dominguez, L., Gallego-Alvarez, I., & Garcia-Sanchez, I. M. (2009). Corporate governance and codes of Ethics. Journal of Business Ethics, 90(2), 187–202. https://doi.org/10.1007/s10551-009-0035-y

Romano, M., Cirillo, A., Favino, C., & Netti, A. (2020). ESG (environmental, social and governance) performance and Board Gender Diversity: The moderating role of CEO Duality. Sustainability, 12(21), 9298. https://doi.org/10.3390/su12219298

Rosener, J. B. (1990). Ways women lead. Harvard Business Review. https://hbr.org/1990/11/ways-women-lead

Simićević, J., Milosavljević, N., & Djoric, V. (2016). Gender differences in travel behaviour and willingness to adopt sustainable behaviour. Transportation Planning and Technology, 39(5), 527–537. doi:10.1080/03081060.2016.1174367

Sun, X. S., & Bhuiyan, Md. B. (2020). Board tenure: A Review. Journal of Corporate Accounting & Finance, 31(4), 178–196. https://doi.org/10.1002/jcaf.22464

Swim, J. K., Gillis, A. J., & Hamaty, K. J. (2019). Gender bending and gender conformity: The social consequences of engaging in feminine and masculine pro-environmental behaviors. Sex Roles: A Journal of Research. https://doi.org.ezaccess.libraries.psu.edu/10.1007/s11199- 019-01061-9.

Tajfel, H. (1978). Differentiation between social groups: Studies in the social psychology of intergroup relations. New York, NY: Academic Press

Temiz, H., & Acar, M. (2023). Board gender diversity and corporate social responsibility (csr) disclosure in different disclosure environments. Corporate Social Responsibility and Environmental Management, 30(5), 2247–2264. doi:10.1002/csr.2481

Terjesen, S., Sealy, R., & Singh, V. (2009). Women directors on corporate boards: A review and research agenda. Corporate Governance: An International Review, 17(3), 320–337. doi:10.1111/j.1467-8683.2009.00742.x

Torchia, M., Calabrò, A., & Huse, M. (2011). Women directors on corporate boards: From tokenism to critical mass. Journal of Business Ethics, 102(2), 299–317. https://doi.org/10.1007/s10551-011-0815-z

Velte, P. (2016). Women on Management Board and ESG performance. Journal of Global Responsibility, 7(1), 98–109. https://doi.org/10.1108/jgr-01-2016-0001

Venkatraman, N. (1989). Strategic orientation of business enterprises: The construct, dimensionality, and measurement. Management Science, 35(8), 942–962. https://doi.org/10.1287/mnsc.35.8.942

Wasiuzzaman, S., & Subramaniam, V. (2023). Board gender diversity and environmental, social and governance (ESG) disclosure: Is it different for developed and developing nations? Corporate Social Responsibility and Environmental Management, 30(5), 2145–2165. doi:10.1002/csr.2475

Wasiuzzaman, S., & Wan Mohammad, W. M. (2019). Board gender diversity and transparency of environmental, social and governance disclosure: Evidence from Malaysia. Managerial and Decision Economics, 41(1), 145–156. doi:10.1002/mde.3099

Winston, W. (2024). Retrieved from https://www.becker.com/blog/cpe/how-to-take-a-random-sample-in-excel

Wooldridge, J. M. (2013). Introductory econometrics: A modern approach. Cengage Learning.

Wooldridge, J. M (2010). Econometric Analysis of Cross Section and Panel Data, second edition.

Yarram, S. R., & Adapa, S. (2022). Women on boards, CSR and risk-taking: An investigation of the interaction effects of gender diversity and CSR on business risk. Journal of Cleaner Production, 378, 134493. doi:10.1016/j.jclepro.2022.134493

Yasser, Q. R., Al Mamun, A., & Ahmed, I. (2017). Corporate Social Responsibility and gender diversity: Insights from Asia Pacific. Corporate Social Responsibility and Environmental Management, 24(3), 210–221. doi:10.1002/csr.1400

Zahid, M., Rahman, H. U., Ali, W., Khan, M., Alharthi, M., Imran Qureshi, M., & Jan, A. (2020). Boardroom gender diversity: Implications for corporate sustainability disclosures in Malaysia. Journal of Cleaner Production, 244, 118683. doi:10.1016/j.jclepro.2019.118683

Zelezny, L. C., Chua, P. P., & Aldrich, C. (2000). New ways of thinking about environmentalism: Elaborating on gender differences in environmentalism. Journal of Social Issues, 56(3), 443–457. https://doi.org/10.1111/0022-4537.00177

Zhao, Z., Gong, Y., Li, Y., Zhang, L., & Sun, Y. (2021, November 3). Gender-related beliefs, norms, and the link with green consumption. Frontiers. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.710239/full

# Appendices

## Appendix A: Variable Information Tables

### Table A1: Industry Classifications

| Industry Classification Code | Industry Name |
|---|---|
| 1 | Professional, Scientific, and Technical Services |
| 2 | Information |
| 3 | Health Care and Social Assistance |
| 4 | Retail Trade |
| 5 | Manufacturing |
| 6 | Real Estate and Rental and Leasing |
| 7 | Administrative and Support and Waste Management and Remediation Services |
| 8 | Finance and Insurance |
| 9 | Construction |
| 10 | Wholesale Trade |
| 11 | Transportation and Warehousing |
| 12 | Accommodation and Food Services |
| 13 | Mining, Quarrying, and Oil and Gas Extraction |
| 14 | Utilities |

**Table A2: ESG scores methodology**

| Pillars | Categories | Themes | Weight method |
|---|---|---|---|
| Environmental | Emission | - Emissions<br>- Waste<br>- Biodiversity*<br>- Environmental management systems* | Quant industry median |
| | Innovation | - Product innovation<br>- Green revenues, research and development (R&D) and capital expenditures (CapEx) | Transparency weights & Quant industry median |
| | Resource use | - Water<br>- Energy<br>- Sustainable packaging*<br>- Environmental supply chain* | Quant industry median |
| Social | Community | - Equally important to all industry groups, hence a median weight of five is assigned to all | Equally important to all industry groups |
| | Human rights | - Human rights | Transparency weights |
| | Product responsibility | - Responsible marketing<br>- Product quality<br>- Data privacy | Transparency weights |
| | Workforce | - Diversity and inclusion<br>- Career development and training<br>- Working conditions<br>- Health and safety | Quant industry median & Transparency weights |
| Governance | CSR strategy | - CSR strategy<br>- ESG reporting and transparency | Count of data points in each governance category and governance pillar |
| | Management | - Structure (independence, diversity, committees)<br>- Compensation | |
| | Shareholders | - Shareholder rights<br>- Takeover defences | |

**Note:** Adapted from "Environmental, Social and Governance Scores from Refinitiv" by London Stock Exchange Group, 2022, p. 10. Copyright 2022 by LSEG.

**Table A3: Worldwide Governance Indicators**

| Indicator | Description |
|---|---|
| Voice and Accountability | Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. |
| Political Stability and Absence of Violence/Terrorism | Measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. |
| Government Effectiveness | Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. |
| Regulatory Quality | Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. |
| Rule of Law | Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. |
| Control of Corruption | Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. |

**Note:** Adapted from “Worldwide Governance Indicators” by Kaufmann and Kraay, 2023. Copyright 2024 by The World Bank.

**Table A4: Predictive Margins**

| Model | Country | Margin | T-value | P > \|t\| | 95% C.I. |
|---|---|---|---|---|---|
| (7) | Japan | 165.28*** | 6.71 | 0.000 | 111.6 – 218.9 |
| | | (24.64) | | | |
| (7) | India | -28.35 | -1.23 | 0.242 | -78.6 – 21.9 |
| | | (23.05) | | | |
| (8) | Japan | 216.35*** | 4.83 | 0.000 | 118.8 – 313.9 |
| | | (44.78) | | | |
| (8) | India | -77.62* | -1.80 | 0.097 | -171.5 – 16.3 |
| | | (43.11) | | | |
| (9) | Japan | 215.69*** | 6.49 | 0.000 | 143.2 – 288.1 |
| | | (33.26) | | | |
| (9) | India | -71.77** | -2.28 | 0.042 | -140.5 – -3.1 |
| | | (31.53) | | | |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## Appendix B: Robustness

**Blau Index Regression Findings.** To test the robustness of findings, I replaced the Women Ratio (WR) with the Blau Index of Diversity (BLAU) as my independent variable. The regression outputs for these analyses can be found in Appendix B, Output B1 for H1, Output B2 for H2 and Output B3 for H3.

First, the robustness check of H1 for Japanese firms confirms the positive relationship between BGD and ESG performance across all three models. Additionally, it further supports the original findings, as it also provides evidence of a statistically significant relationship between BGD and ESG in model (6) only.

Next, the robustness analysis for H2 was conducted, which aligns with the original findings. Specifically, the two-way interaction models for Japanese firms reveal no statistically significant moderation effect of the contextual and cultural setting (GOV) on the BGD-ESG relationship. Additionally, the models for Indian firms did provide evidence for this moderation, as suggested by the original models. Moreover, the three-way interaction suggests a significant moderation effect of GOV, similar to the WR models.

Lastly, the robustness test confirmed the inversely U-shaped relationship of the BGD-ESG relationship in Japanese firms, as suggested by the main models. In addition, the BLAU model also provides evidence for the U-shaped BGD-ESG relationship in Indian firms, further aligning with the original models.

Overall, the robustness analysis suggests that my findings are indeed robust across different BGD-measures.

**Output B1: Robustness Check H1**

| VARIABLES | (1) ESG | (2) ESG | (3) ESG | (4) ESG | (5) ESG | (6) ESG |
|---|---|---|---|---|---|---|
| BLAU | 10.98*** | | 8.804** | 5.731 | | 8.536** |
| | (3.543) | | (3.731) | (3.868) | | (3.279) |
| Lagged BLAU | | 11.20** | 9.135** | | 1.020 | -0.406 |
| | | (3.769) | (3.732) | | (3.339) | (2.843) |
| Return on Equity | -0.0350 | -0.0243 | -0.0235 | 0.00609*** | 0.00349 | 0.00373 |
| | (0.0237) | (0.0282) | (0.0268) | (0.00105) | (0.00292) | (0.00267) |
| Board size | 0.0561 | 0.172 | 0.150 | -0.193 | -0.257* | -0.293* |
| | (0.101) | (0.141) | (0.154) | (0.128) | (0.126) | (0.144) |
| Ln(Firm size) | 8.302*** | 5.651 | 5.324 | 0.731 | 2.064* | 2.255* |
| | (2.113) | (3.380) | (3.405) | (1.862) | (1.127) | (1.142) |
| Firm age | 0.861** | 0.548 | 0.397 | 2.551*** | 2.817*** | 2.749*** |
| | (0.328) | (0.399) | (0.413) | (0.292) | (0.474) | (0.447) |
| Constant | -148.8*** | -79.59** | -62.88* | -96.26** | -129.9*** | -130.5*** |
| | (32.26) | (30.56) | (34.92) | (35.46) | (27.43) | (26.51) |
| Observations | 745 | 595 | 595 | 523 | 417 | 417 |
| R-squared | 0.154 | 0.076 | 0.082 | 0.390 | 0.366 | 0.373 |
| Number of ID | 150 | 150 | 150 | 105 | 105 | 105 |
| Sample | Japan | Japan | Japan | India | India | India |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

## Output B2: Robustness Check H2

| VARIABLES | (1) ESG | (2) ESG | (3) ESG | (4) ESG | (5) ESG | (6) ESG | (7) ESG | (8) ESG | (9) ESG |
|---|---|---|---|---|---|---|---|---|---|
| BLAU | -145.3 | | -159.3 | -26.06 | | 0.312 | 99.64 | | 82.02 |
| | (161.1) | | (180.6) | (44.44) | | (46.50) | (71.79) | | (94.50) |
| Squared BLAU | -95.32 | | -21.54 | 92.95 | | 17.55 | 28.02 | | 11.10 |
| | (77.39) | | (36.38) | (59.68) | | (57.14) | (20.77) | | (22.35) |
| BLAU * GOV | 164.3 | | 140.3 | -112.6 | | -120.8 | -75.32 | | -57.23 |
| | (139.8) | | (144.2) | (87.18) | | (80.91) | (57.99) | | (75.49) |
| Lagged BLAU | | 27.12 | 54.05** | | 27.29 | 6.528 | | 129.1 | 6.511 |
| | | (202.1) | (22.86) | | (40.94) | (29.77) | | (84.67) | (7.578) |
| Squared Lagged BLAU | | -97.05 | -91.90 | | 53.31 | 24.39 | | 9.520 | 2.949 |
| | | (78.05) | (53.52) | | (68.40) | (60.03) | | (17.36) | (15.87) |
| Lagged BLAU * GOV | | 31.41 | | | 153.3** | | | -91.22 | |
| | | (170.9) | | | (64.10) | | | (68.11) | |
| GOV | -27.91 | -15.16 | -43.97 | 107.3*** | 41.02* | 112.9*** | -97.96** | -180.5*** | -184.2*** |
| | (34.28) | (33.78) | (34.48) | (25.46) | (22.29) | (28.64) | (38.58) | (44.41) | (42.74) |
| India (1) | | | | | | | -131.8** | -253.3*** | -254.6*** |
| | | | | | | | (55.37) | (64.90) | (61.63) |
| India (1) * BLAU | | | | | | | -119.1 | | -94.77 |
| | | | | | | | (76.91) | | (101.8) |
| India (1) * GOV | | | | | | | 61.27*** | 49.71*** | 95.28*** |
| | | | | | | | (17.35) | (17.65) | (18.25) |
| India (1) * BLAU * GOV | | | | | | | -18.96 | | -67.07 |
| | | | | | | | (77.39) | | (89.28) |
| India (1) * Lagged BLAU | | | | | | | | -127.6 | |
| | | | | | | | | (89.59) | |
| India (1) * Lagged BLAU * GOV | | | | | | | | 108.2 | |
| | | | | | | | | (83.32) | |
| ROE | -0.000638 | 0.00638 | 0.00761 | 0.00529 | 0.00421 | 0.00247 | 0.00845*** | 0.00764** | 0.00676** |
| | (0.0696) | (0.0698) | (0.0654) | (0.0172) | (0.0133) | (0.0146) | (0.000964) | (0.00384) | (0.00343) |
| Board size | -0.549* | -0.415 | -0.413 | 0.318 | 0.440 | 0.479 | 0.0584 | 0.0675 | 0.0786 |
| | (0.307) | (0.336) | (0.360) | (0.384) | (0.434) | (0.459) | (0.0684) | (0.112) | (0.109) |
| ln(Firm size) | 4.685*** | 4.150*** | 4.108*** | 3.827*** | 3.578*** | 3.628*** | 3.904*** | 3.718*** | 3.705*** |
| | (0.902) | (0.824) | (0.836) | (0.934) | (0.954) | (0.995) | (0.514) | (0.521) | (0.535) |
| Firm age | 0.0802*** | 0.0786*** | 0.0781*** | 0.0549 | 0.0660 | 0.0665 | 0.0826*** | 0.0824*** | 0.0824*** |
| | (0.0194) | (0.0195) | (0.0194) | (0.0359) | (0.0368) | (0.0371) | (0.0192) | (0.0195) | (0.0196) |
| Constant | 10.95 | 4.417 | 41.19 | -0.797 | -9.141 | -4.255 | 112.7** | 226.9*** | 230.6*** |
| | (47.50) | (46.23) | (45.23) | (21.93) | (23.51) | (29.67) | (53.82) | (63.46) | (60.56) |
| Observations | 598 | 448 | 448 | 419 | 313 | 313 | 1,017 | 761 | 761 |
| R-squared | 0.258 | 0.244 | 0.250 | 0.216 | 0.197 | 0.207 | | | |
| Sample | Japan | Japan | Japan | India | India | India | Full | Full | Full |
| Joint Significance | No | No | No | Yes*** | Yes*** | Yes*** | Yes*** | Yes*** | Yes*** |
| Firm FE | No | No | No | No | No | No | No | No | No |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Number of ID | | | | | | | 255 | 255 | 255 |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Output B3: Robustness Check H3**

| VARIABLES | (1) ESG | (2) ESG | (3) ESG | (4) ESG | (5) ESG | (6) ESG |
|---|---|---|---|---|---|---|
| BLAU | 10.85 | | 15.44 | -4.693 | | -1.151 |
| | (9.774) | | (8.842) | (9.070) | | (7.121) |
| Squared BLAU | 0.318 | | -15.91 | 21.16 | | 19.84 |
| | (21.76) | | (18.83) | (18.09) | | (16.72) |
| Lagged BLAU | | 17.45** | 13.27* | | -10.84 | -13.70 |
| | | (7.368) | (7.191) | | (9.747) | (11.71) |
| Squared Lagged BLAU | | -17.04 | -10.85 | | 25.69 | 28.24 |
| | | (14.48) | (14.32) | | (25.51) | (29.10) |
| Return on Equity | -0.0350 | -0.0265 | -0.0237 | 0.00608*** | 0.00367 | 0.00391 |
| | (0.0240) | (0.0286) | (0.0263) | (0.00113) | (0.00301) | (0.00286) |
| Board size | 0.0566 | 0.146 | 0.105 | -0.170 | -0.256* | -0.274* |
| | (0.102) | (0.141) | (0.148) | (0.120) | (0.121) | (0.129) |
| Ln(Firm size) | 8.304*** | 5.539 | 5.281 | 0.705 | 2.115* | 2.306* |
| | (2.101) | (3.376) | (3.407) | (1.878) | (1.146) | (1.164) |
| Firm age | 0.861** | 0.541 | 0.379 | 2.525*** | 2.777*** | 2.682*** |
| | (0.331) | (0.395) | (0.413) | (0.279) | (0.454) | (0.417) |
| Constant | -148.9*** | -77.17** | -60.89 | -93.67** | -127.4*** | -125.6*** |
| | (32.51) | (30.94) | (35.48) | (35.10) | (26.57) | (25.25) |
| Observations | 745 | 595 | 595 | 523 | 417 | 417 |
| R-squared | 0.154 | 0.077 | 0.084 | 0.391 | 0.368 | 0.376 |
| Number of ID | 150 | 150 | 150 | 105 | 105 | 105 |
| Sample | Japan | Japan | Japan | India | India | India |
| Joint Significance | Yes** | Yes** | Yes* | No | Yes* | Yes* |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1