Board gender diversity and family firms' corporate environmental responsibility: does "critical mass" matter?

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Received 05 December 2022 – Accepted 27 December 2022

Sommario

Il presente studio analizza l'impatto della diversità di genere nel consiglio di amministrazione (CdA) sull'impegno delle imprese familiari nelle pratiche di responsabilità ambientale. Il ruolo della diversità di genere nei CdA riguardo le politiche di responsabilità ambientale d'impresa è stato esplorato alla luce della teoria della massa critica, identificando la soglia di quota femminile nel CdA che può influenzare l'impegno ambientale delle imprese familiari. Adottando un'analisi di regressione a effetti fissi su un campione globale di 171 imprese familiari, nel periodo di studio 2015-2020, i nostri risultati dimostrano che quando la diversità di genere nei CdA raggiunge una certa soglia, ossia la massa critica, l'impegno delle imprese familiari in materia di responsabilità ambientale aumenta. Queste evidenze fanno progredire la letteratura precedente sul legame tra diversità di genere nei CdA e responsabilità ambientale d'impresa, fornendo al contempo ulteriori indicazioni per i manager, i policy makers e le imprese familiari che cercano di ottenere migliori prestazioni ambientali.

Parole chiave: massa critica, diversità di genere nei consigli di amministrazione, responsabilità ambientale d'impresa, ricchezza socioemozionale (SEW), imprese familiari, obiettivi di sviluppo sostenibile (SDGs)

Abstract

The current study investigates the impact of board gender diversity (BGD) on family firms' (FFs) engagement in corporate environmental responsibility (CER) practices. The role of BGD in CER policies has been explored in light of the critical mass theory by identifying the threshold of women share on board that can influence

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Corporate Governance and Research & Development Studies, n. 2-2022
(ISSN 2704-8462-ISSNe 2723-9098, DOI: 10.3280/cgrds2-2022oa15066)

the environmental commitment of FFs. By employing a fixed-effect (FE) regression analysis on a global sample of 171 FFs, over the 2015–2020 study period, our findings show that when BGD reaches a certain threshold, i.e. critical mass, the CER engagement of FFs increases. This evidence advance prior literature on the link between BGD and CER while providing additional indications for managers, policy makers and FFs seeking the best CER performance.

Key words: critical mass, board gender diversity, corporate environmental responsibility, SEW, family firms, SDGs

1. Introduction

The global warming, the climate change and scarcity of natural resources are important environmental challenges for society. The ecological crisis has indeed increased the need for CER integration into business logic of organizations (UNEP, 2021). In this scenario, the role of family businesses may be significant for the global economy since they encompass the 70-90 % of the annual global GDP and the 50-80% of the overall employment jobs (Deloitte, 2022).

The CER values are more likely to be nurtured within FFs due to their inclination to pursue socioemotional wealth (SEW) goals. The SEW distinguishes FFs from non-FFs as it relies on firms' non-financial aspects that meet the family's affective needs, such as the family's image, binding social ties and emotional attachment to the firm (Zellweger *et al*., 2012). In preserving SEW, FFs may be motivated to improve their environmental performance for several reasons. First, the FFs' image constitutes a matter of relevance to family members (Campopiano *et al*., 2019), and CER might contribute to the corporate reputation (Sanchez-Medina and Díaz-Pichardo, 2017). Second, family companies attribute high priority to social ties by strengthen collective social capital and trust among the stakeholders (Marques *et al*., 2014). From this perspective, this type of firms demonstrates a greater interest in pursuing welfare for the wider range of stakeholders (Berrone *et al*., 2012; Agostino and Ruberto, 2021). Third, family management may operate to pass the business on to next generation. Hence, the CER strategies should be adopted as they will favour the stability of the FFs (Delmas and Gergaud, 2014) reducing the company risk.

Consistent with previous studies (Graafland, 2020; Orazalin and Baydauletov, 2020), effective Corporate Governance (CG) mechanisms are driver of greater CER engagement. These mechanisms are mainly related to the board, and its characteristics, because boards play a determinant role in the effective promotion of CER policies. For instance, prior studies demonstrate

that CG mechanisms such as the BGD can drive toward a higher CER performance (Lu and Herremans, 2019; Nadeem *et al.*, 2020).

In European corporate boards, the Gender Diversity Index has improved from 0.56 in 2020 to 0.59 in 2021 (EWOB, 2021). This evidence indicates that, on average, the percentage of women on corporate boards is the 35%, suggesting that the year-on-year progress is slow and board composition remains largely male-dominated. Consequently, the European Commission has recently promoted equal gender opportunities in terms of board representation by introducing procedural requirements based on transparency and merit (10521/1/22 Directive). Despite FFs could constitute a favourable climate for CER orientation, the role of women on board and, consequently, its relevance as CER driver, still remains poorly investigated.

To fill this gap, we adopt both a theoretical and empirical approach. At theoretical level, we firstly discuss the role of female directors and their CER propensity in FFs. Then, drawing on the critical mass theory (Kanter, 1977), we argue that FFs need to achieve a critical mass of women on board in order to increase their CER.

At empirical level, we analyse the impact of the critical mass on CER engagement of FFs by identifying the needed threshold of women on board enough to exert influence on environmental business decisions. By employing a FE panel regression analysis, we focus on a sample of 171 worldwide FFs, gathered from the database provided by the Family Capital platform and observed for a 6 year-time-span (2015 to 2020), for a total of 1.614 firm-year observations.

Our findings highlight that, approximately, a 30% of women on board (critical mass) ensures a higher CER commitment in managerial practices. This empirical evidence sheds light on the percentage that BGD needs to reach in order to make the board minority group of women strong enough for enhancing the quality of board decision-making processes in terms of CER engagement.

The current study has a twofold contribution.

First, our study contributes to the research stream dealing with the role of BGD and its impact on CER engagement by testing the critical mass framework within FFs' context.

Second, our results corroborate the vision of female presence on board as an important human resource favouring CER engagement.

These findings provide important insights for both FFs and policymakers, indicating that FFs can find in greater female representation on board a driver of CER.

The remainder of the paper is structured as follows. Section 2 provides

the theoretical background. Section 3 is dedicated to the methodology. Section 4 shows empirical results, and Section 5 includes discussion and conclusive remarks.

2. Theoretical Background

2.1. The women involvement in CG and CER in FFs

The role of women in FFs' top management positions has been affected by the past societal bias relying on the family owners' culture and traditions. Indeed, in some FFs, women have covered the role of "chief emotional officer" since they have taken care of the emotional needs and of the perpetuation of values, traditions and organizational culture of the founding families (KPMG, 2020). Furthermore, the female position in FFs have traditionally been conceived closer to the family (i.e. spouse, mother), whereas formal managerial position, such as CEO, have traditionally been more associated to male family members (Bjuggren *et al*., 2018).

The approach to family managerial issues differs between women and men due to several gender stereotype characteristics. Indeed, gender differences occur in the perception of ethical values and social claims (Glass *et al*., 2016; Kassinis *et al*., 2016). For instance, women are likely to show loyalty for family members, sensitivity to the social needs and better conflict-resolution capacity (Eagly, 1987), thus incorporating traits of a leadership style that may be useful for managing family business through the preservation of SEW. The SEW refers to the family's stock of social, emotional, and affective endowments vested in the firm, such as the opportunity to pass the business on to future family generations, reputational advantages from being associated with the firm, and the preservation of benevolent ties among family members and with other stakeholders (Gomez-Mejia *et al*., 2018). Due to the socially- and family orientation of women (Glass *et al*., 2016), the role of female directors may be relevant for family business corporate decisions. Indeed, the female managerial attitudes can allow the preservation of SEW as they help to strengthen the stakeholders' relationships and, at the same time, improve the family image (Garcìa-Meca and Santana Martin, 2022).

The board of directors is the main CG body where corporate sustainability practices are discussed (Naciti, 2019). The role of BGD, i.e. the equitable or fair representation of men and women on board (Nuber and Velte, 2021), has frequently been investigated with reference to the implementation of corporate social responsibility (CSR) policies (Amorelli and García-Sánchez, 2020; Orazalin and Baydauletov, 2020). Specifically, several CSR studies

highlight the importance of women in the BOD for the achievement of high CER performance (Kassinis *et al*., 2016; Burkhardt et al., 2020). In this regard, several studies (Eagly, 1987; Nadeem *et al*., 2020; Nuber and Velte, 2021; Kassinis *et al*., 2016) confirm the existence of gender differences in approaching managerial issues, including CER ones. Indeed, prior evidence on females in top management positions shows that a greater BGD leads to higher CER engagement (Graafland, 2020; Orazalin and Baydauletov, 2020; Gangi et al., 2022), because women would be more stakeholder engaged and supportive regarding CER issues (Kassinis *et al*., 2016; Burkhardt et al., 2020). Moreover, female leadership style is associated to higher perception of environmental risks and pro-activism in meeting the environmental stakeholder needs (Nadeem *et al*., 2020; Nuber and Velte, 2021). Thus, as the board of directors acts as decision making body (Naciti, 2019), the eco-friendly behavioural traits of female directors can be reflected in the board discussion by orienting the board toward the adoption of CER-oriented decisions.

Therefore, due to the CER proactivity of female directors (Lu and Herremans, 2019; Gangi et al., 2022), FFs may support the presence of women on board for both CER and SEW goals. The CER of FFs may be increased as female directors may reflect their green attitude in managerial choices. In turn, this may foster FFs' SEW as CER engagement, thus strengthen relationships with stakeholders and accrue family intangible assets (Surroca *et al*., 2010), such as family reputation and identity (Gomez-Mejia *et al*., 2018).

According to gender studies (Birindelli *et al*., 2019; Joecks *et al*., 2013), the women behaviour can influence business decisions regarding environmental concerns when BGD reaches a certain threshold, or properly the "critical mass" (Kanter, 1977). Indeed, when BGD reaches the desired critical mass (Kramer *et al*., 2006; Konrad *et al*., 2008), women can affect FFs' board decisions, enriching the board discussion by adding their perspectives and opinions, and reflecting their green inclination in decision-making process.

2.2 The role of Critical Mass of women on board and CER in FFs

The critical mass theory (Kanter, 1977) represents a theoretical support to understand whether and to what extent a consistent proportion of women directors (critical mass) contribute to the level of FFs' CER engagement. Drawing on the tokenism theories, Kanter (1977) focuses on women behaviors in a male-dominated group and on how their actions may impact on the group dynamics. The theory predicts that when the size of the minority group reaches a certain threshold, its influence increases. Thus, if minorities of

women are consistent, they can bring new perspectives, experience and skills to the group that, in turn, may significantly impact on group interactions and performance. Regarding the gender, the author does not establish a numerical threshold of critical mass, but identifies four different categories of groups based on the composition: (1) uniform group, which contains people sharing the same gender, thus all group members are either male or female; (2) skewed group, one gender (men) prevails over another (women), thus women represent of up to 20%; (3) titled group, providing less extreme distributions as it consists of 20-40% women; (4) balanced group, where women representation corresponds at least 40%.

At board level, prior studies (Kramer *et al*., 2006; Konrad *et al*., 2008) suggest that the critical mass of women is reached when the board includes "at least three women". In line with Torchia *et al*. (2011), when the number of female directors grows by reaching the "critical mass", women presence positively affects the firms' innovation level. Focusing on the banking sector, Birindelli *et al*. (2019) found that the reaching of the above numerical threshold is necessary to exert a significant power on board and to influence the board activity toward environmental issues. Under this theoretical basis, Joecks *et al*. (2013) advances on previous studies by identifying the critical mass threshold as 30% women on the board, beyond which the mixture of female and male attributes may take place and, in turn, induce successful discussions and can hence positively affect group performance.

Following the social identity theory (Tajfel, 1982), as complement to critical mass theory, individuals use demographic attributes (e.g., gender) to classify themselves into various social categories (e.g., female and male) and construct a social identity as group-members of a social category. By identifying themselves as members of a group, the behaviour of individuals may be influenced by their membership of the social categories with which they identify. This suggest that women on boards act following their female stereotype that they are more CER-oriented, emotional and empathic than men (Eagly, 1987), contributing different perspectives and heterogeneity to the decision-making process (Amorelli and Garcia-Sanchez, 2020). As consequence, when women constitute a cohesive and consistent minority, they can exert a social influence (Moscovici and Lage, 1976). Thus, when the "critical mass" board is realized, there is higher probability that the focus on sustainability practices will be stronger in board discussion.

Relative to board group interaction, the critical mass needs to be reached to make women active agents, able to boost change and affect the majority's knowledge and perceptions (Moscovici and Lage, 1976). Otherwise, their opinions and perspectives risk to be overshadowed by those of the majority (i.e. men). Drawing on previous studies (Bär *et al*., 2011; Mäs *et al*., 2014),

the reaching or the lack of a critical mass may generate two opposite effects in the group interaction process that can regard CER issues: group shift and diversification of opinions. The critical mass on board can allow women to pursue enough visibility to share new ideas and different perspectives with board members (Sah and Stiglitz, 1988), fostering the diversification of opinions regarding CER practices. Conversely, when a critical mass is not reached, the group shift may prevail (Hogg *et al*., 1990). Specifically, as the women minority is inconsistent, the focus of board discussion risk to be shifted on the opinions of majority group. Thus, women could decrease their critical sense and may conform their thoughts to those of the majority (Kerr, 1992).

By approaching to Kanter theory, several authors test the effects of the critical mass of female directors on the level of CER. By analysing a sample of Canadian listed companies, Ben-Amar *et al*. (2017) found that the critical threshold women on boards increases the likelihood to provide public disclosures about climate change related risks and strategies. In support to critical mass theory, recent studies (He and Jiang, 2019; Cordeiro *et al*., 2020) reveal that when the number of female directors grows, the board of director exhibit a higher propensity towards CER innovative policies.

Accordingly, we posit the following hypothesis:

H1: The critical mass of women on board needs to be reached to increase FFs' CER engagement

3. Methodology

3.1 Data collection and sampling procedure

The empirical analysis refers to a sample of family-owned firms extracted from the World's Top 750 Family Businesses ranking surveyed by Family Capital Analytics, a company providing data on the family enterprise at global level. The sampling procedure started by selecting all the public FFs. In this way, we achieve an initial sample of 404 FFs. To test H1, we collected CER and corporate governance data from Refinitiv Asset4-ESG database. Thus, we proceeded by gathering the Refinitiv Identifier Code (RIC) for each FFs sampled and excluded the ones with a not available RIC, leading to a sample of 334 firms. Then, we collected firm-level financial performance and country-level data from Refinitiv Worldscope the World Bank databases, respectively. Consistent with the aim of the study, we consider only those companies for which Asset-4 reports data on CER for at least one fiscal

year over the study period (2015 to 2020). Finally, by merging the different sources, we obtain a final data set of 171 FFs (1,614 firm-year observations).

3.2 Variable operationalization

To proxy FFs' CER, we adopt the overall environmental score (*CER*), measuring company impact on living and non-living environmental systems, including air, land and water. It reflects how effectively a firm uses managerial practices to avoid ecological risks and to capitalize on pro-environmental policies. This is a discrete quantitative variable that takes values between 0 and 100.

Following Kanter (1977), we rely on the approach of Joecks *et al*. (2013) to construct the independent variable. Indeed, we created four dummy variables reflecting the different measurement of BGD (i.e. the percentage of women on board): *Uniform*, equal to 1 if a board has no woman, 0 otherwise; *Skewed*, equal to 1 if a board has at least one woman but the value of the BGD is less than 20% women, 0 otherwise; *Tilted*, equal to 1 if BGD is at least 20%, but less than 40 %, 0 otherwise; *Balanced*, equal to 1 if the BGD is at least 40%, 0 otherwise. Furthermore, in our sample, none of the boards have 100% female representation. Specifically, there are not boards with more than 80% women.

To avoid model misspecification, we control for several variables that could influence the relationship between critical mass and CER. Following previous studies (Gangi *et al*., 2020; Reguera-Alvarado and Bravo, 2017), we rely on BOD characteristics, as board size (*Board size*) measured by the total number of board directors, and CEO separation (*CEO separation*) by introducing a dummy variable equal to 1 if the CEO simultaneously chairs the board or has been the chairman of the board, 0 otherwise. Furthermore, additional controls regard the ratio between capital expenditure on sales (*Capex on sales*); the firm's degree of indebtedness (*Debt on Equity*); the percentage of total shares in issue available to ordinary investors (*Free Float*); the per capita GDP indicator (*GDPper*); finally, years, measured as the time effect (*Year*) with six (n-1) dummy variables.

3.3 Empirical strategy

To test the effect of critical mass on CER, we employ a pooled ordinary least squares (OLS) analysis. The Hausman test reveals that the FE estimators were more adequate model compared to random effects ones to evaluate the impact of the independent variables on the dependent variable by controlling for unobserved variables. Moreover, the independent variables are

lagged 1 year to mitigate reverse causality and simultaneous causation issues (Jo and Harjoto, 2012). The regression model can be expressed as follows:

$$CER_{i,t} = \alpha + \beta Critical\ Mass_{i,t-1} + \gamma X_{i,t-1} + \varepsilon \qquad (1)$$

where CER_t refers to the overall CER performance of family firm $_i$ at time $_t$, Critical Mass is the measure of critical mass of women on board of family firm $_i$ at time $_{t-1}$, X is the vector of control variables, and ε is a random error term. We estimate the Equation (1) four times, due to the adoption four critical mass measures (*Uniform*, *Skewed*, *Tilted* and *Balanced*).

4. Results

Table 1 provides the sample distribution by country. Based on the critical mass measures, Tables 2 shows the average degree of women representation on board across countries. In particular, relying on our sample, France (26.16%), Sweden (23.63%) and Luxembourg (21.1%) are the main countries where the BGD is more than 40% (balanced), while FFs belonging to Norway, South Africa and Turkey present, on average, tilted board (7.64%). Skewed board groups are mainly related to Brazil (9.95%), India (9.42%) and Malaysia (9.95%). Male-dominated boards primarily occur in countries such as Egypt (17.54%) and Singapore (12.46%).

Table 3 summarizes the descriptive statistics, while Table 4 reports the correlation and variance inflation factor (VIF) analysis. All variables have correlation coefficients below the conventional level of 0.70 (Ratner, 2009) and present an average VIFs (1.05) far from the threshold of 10 (McDonald and Moffitt, 1980). Thus, the study estimates are not biassed by multicollinearity.

Table 5 displays the estimates of the FE regression analysis. To test H1, we run four regressions with dummy variables and controls for Uniform, Skewed, Tilted and Balanced, from Model 1 to 4, respectively. The Uniform coefficient is negative and statistically significant at a confidence level of 95% (Model 1). This indicates that a 100% male board lead to a CER decreasing. Models 2 and 4 mirror that male-dominated skewed and gender balance board composition do not significantly affect the green orientation of FFs. Finally, the tilted groups positively impact on the FFs' CER engagement at the 5% significance level (Model 3). Thus, similar to Joecks *et al*. (2013), we find evidence that, in order to increase the CER engagement of FFs, the needed critical mass of women on board in tilted groups varies between 20 and 40 %, thus approximately 30%,.

Regarding control variables, Models 1-4 highlight that several CG mechanisms affect FFs' CER. Specifically, Board size and CEO separation are positive and significant predictors of FFs' environmental involvement. Regarding the firm characteristics, our results reveal that a higher free float predicts higher commitment in green practices by FFs (Models 1-4).

Overall, following our evidences, the undertaking of CER practices may depend on the presence of "critical mass" of female representatives on the FFs' board, which consists of approximately 30%. At the same time, the empirical analysis highlights that under the threshold of 20% of women on board, female directors do not significantly affect the board orientation toward CER issues. This evidence is supported by the group shift effect (Hogg et al., 1990). Indeed, in this case, women would represent an inconsistent minority and could be in situation of difficulty for exercising their voice rights. Hence, the board discussion could be dominated by the opinions of majority group (men), thus female directors' CER influence could be weakened, or even insignificant.

5. Discussion and Conclusion

The purpose of the current study is to provide a better understanding of the determinants CER in the FFs' context. Specifically, drawing on critical mass theory, our results show that reaching approximately the 30% of women on board (i.e. the critical mass), FFs would have a higher CER engagement. Moreover, the need for reaching the critical mass in FFs' board of directors is consistent with the EWOB (2021) evidence, which indicates 35% as the average of female representation on board at European level. From this perspective, in order to affect CER engagement, the further implementation of the increasing percentage of BGD, at least on average, would not be necessary in the family business context.

Our study provides several theoretical and practical implications. First, our evidences corroborate prior literature arguing that female directors show higher propensity on CER issues (Nadeem *et al*., 2020; Nuber and Velte, 2021; Kassinis *et al*., 2016). Furthermore, our results are consistent with the social identity theory, which suggest that female directors reflect their gender stereotype behaviours in board discussion. Hence, as women are more CER-oriented, emotional and empathic than men (Nadeem *et al*., 2020), the presence of critical mass of women on board can develop CER sensitivity in group debate.

Regarding practical aspects, FFs, by enhancing their CER standards, could promote gender equality on board. By increasing BGD, FFs can improve their image as more gender inclusive organizations. At the same time,

the women inclusion in FFs' CG could improve the family reputation in the area of CER practices. Furthermore, as CER contributes to improve family image and social ties (Sanchez-Medina and Díaz-Pichardo, 2017; Marques *et al*., 2014; Agostino and Ruberto, 2021), it can support the SEW preservation. Hence, by favouring the adoption of CER practices, the critical mass of female directors could provide an essential support in increasing the value of SEW. Furthermore, CER-oriented FFs could break the "glass ceiling", which limits the advancement of women the career progress of women compared to men. Accordingly, as women are obliged to overcome several psychological and sociological barriers to advance in their careers, the participation of women could be both a CER objective of family companies and an opportunity for women professional growth. At the same time, policymakers interested in CER issues could provide incentives supporting women in advancing their careers while removing invisible barriers and discrimination in the workplace, thus also improving the so-called internal CSR.

The current study has certain limitations. First, we focused on CER engagement without analysing its sub-pillars. Second, we do not consider contextual factors that can moderate the relationship between BGD and CER. Third, we gathered ESG information from the Asset4-ESG database, without considering the board members' perceptions of CER initiatives. Fourth, the current study focuses on specific clusters based on the percentage of women on board. Further empirical investigations could adopt other criteria for clustering the sample (e.g., percentage of women managers on board), as well as exploring the overall effect of BGD on CER engagement of FFs. Fifth, the findings show a positive effect between the presence of women on the board and CER policies from the perspective of critical mass theoretical framework. Further analyses could extend the current analysis observing women perceptions and gender differences regarding FFs' environmental policies in the context of family firms through appropriate methods. Hence, the aforementioned aspects may encourage to further clarify the topical theme of the link between women on board and CER in FFs' field.

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Appendix 1

Table 1. Sample distribution by country

Country	N	%
Australia	3	1.75
Austria	1	0.58
Belgium	7	4.09
Brazil	5	2.92
Canada	14	8.19
Chile	3	1.75
China	28	1.64
Egypt	2	1.17
Finland	1	0.58
France	10	5.85
Germany	16	9.36
Greece	3	1.75
Hong Kong	12	7.02
India	12	7.02
Indonesia	2	1.17
Israel	2	1.17
Italy	6	3.51
Japan	8	4.68
Luxembourg	2	1.17
Malaysia	2	1.17
Mexico	9	5.26
Norway	1	0.58
Portugal	3	1.75
Singapore	3	1.75
South Africa	1	0.58
Spain	3	1.75
Sweden	3	1.75
Switzerland	8	4.68
Turkey	1	0.58

Table 2. Women representation on board by country

	Uniform		*Skewed*		*Tilted*		*Balanced*	
Country	Mean	%	Mean	%	Mean	%	Mean	%
Australia	0.07	1.23	0.33	4.38	0.60	4.58	0	0
Austria	1	17.54	0	0	0	0	0	0
Belgium	0	0	0.17	2.25	0.77	5.88	0.06	2.53
Brazil	0.11	1.93	0.75	9.95	0.04	0.31	0.11	4.64
Canada	0.04	0.7	0.25	3.32	0.63	4.81	0.08	3.38
Chile	0.06	1.05	0.61	8.09	0.33	2.52	0	0
China	0.23	4.04	0.5	6.63	0.24	1.83	0.02	0.84
Egypt	1	17.54	0	0	0	0	0	0
Finland	0	0	0	0	0.83	6.34	0.17	7.17
France	0.02	0.35	0	0	0.35	2.67	0.62	26.16
Germany	0.11	1.93	0.15	1.99	0.66	5.04	0.08	3.38
Greece	0.33	5.79	0.33	4.38	0.33	2.52	0	0
Hong Kong	0.25	4.39	0.3	3.98	0.46	3.51	0	0
India	0	0	0.71	9.42	0	0	0	0
Indonesia	0.5	8.77	0	0	0.5	3.82	0	0
Israel	0	0	0.33	4.38	0.67	5.12	0	0
Italy	0	0	0	0	0.83	6.34	0.17	7.17
Japan	0.56	9.82	0.44	5.84	0	0	0	0
Luxembourg	0	0	0	0	0.5	3.82	0.5	21.1
Malaysia	0.17	2.98	0.75	9.95	0.08	0.61	0	0
Mexico	0.42	7.37	0.5	6.63	0.08	0.61	0	0
Norway	0	0	0	0	1	7.64	0	0
Portugal	0	0	0.27	3.58	0.73	5.58	0	0
Singapore	0.71	12.46	0.29	3.85	0	0	0	0
South Africa	0	0	0	0	1	7.64	0	0
Spain	0	0	0.35	4.64	0.65	4.97	0	0
Sweden	0	0	0	0	0.44	3.36	0.56	23.63
Switzerland	0.12	2.11	0.51	6.76	0.37	2.83	0	0
Turkey	0	0	0	0	1	7.64	0	0

Table 3. Descriptive statistics

Variable	Obs	Median	Mean	Std. Dev.
CER	1614	44.65	44.65	28.19
Uniform	1604	0.00	0.25	0.43
Skewed	1604	0.00	0.38	0.48
Tilted	1604	0.00	0.32	0.47
Balanced	1604	0.00	0.05	0.22
Board size	1612	11.00	11.52	4.05
CEO separation	1614	0.00	0.43	0.49
Debt on Equity	1614	0.72	2.61	55.72
Free Float	1611	53.00	57.08	23.88
Capex on Sales	1613	4.62	7.51	9.72
GDP per capita	1607	40113.06	34559.89	22654.07

Table 4. Correlation analysis and variance inflance factor (VIF).

		1	2	3	4	5	6	7	8	9	10	VIF
1	Uniform	1.00										1.07
2	Skewed	-0.45***	1.00									1.07
3	Tilted	-0.40***	-0.53***	1.00								1.02
4	Balanced	-0.13***	-0.18***	-0.16***	1.00							1.03
5	Board size	-0.23***	0.20***	0.02	-0.03	1.00						1.05
6	CEO separation	0.09**	-0.06**	-0.06**	0.07**	-0.03	1.00					1.01
7	Debt on Equity	-0.02	-0.01	0.04	-0.01	0.05*	0.03	1.00				1.00
8	Free Float	-0.03	-0.03	0.07**	0.01	0.18***	0.04	-0.02	1.00			1.13
9	Capex on Sales	-0.06**	0.08**	-0.00	-0.05*	0.07**	-0.02	0.00	-0.07**	1.00		1.02
10	GDP per capita	-0.04*	-0.15***	0.13***	0.13***	-0.02	0.09**	-0.01	0.29***	-0.09**	1.00	1.12

Note: *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Fixed effects regression analysis

Variables	(1) CER(t)	(2) CER(t)	(3) CER(t)	(4) CER(t)
Uniform (t-1)	-3.76**			
	(-2.78)			
Skewed (t-1)		-0.08		
		(-0.08)		
Tilted (t-1)			2.24**	
			(2.02)	
Balanced (t-1)				2.18
				(0.84)
Board size (t-1)	1.05***	1.21***	1.19***	1.19***
	(4.63)	(5.42)	(5.38)	(5.41)
CEO separation (t-1)	3.91***	3.89***	3.74**	3.91***
	(3.65)	(3.62)	(3.48)	(3.64)
Debt on Equity (t-1)	-0.00	-0.00	-0.00	-0.00
	(-0.61)	(-0.60)	(-0.64)	(-0.60)
Free Float (t-1)	0.09**	0.08**	0.08**	0.08**
	(2.24)	(2.16)	(2.03)	(2.14)
Capex on Sales (t-1)	0.09	0.09	0.09	0.09
	(1.60)	(1.49)	(1.59)	(1.45)
GDP per capita (t-1)	0.00***	0.00**	0.00***	0.00***
	(15.02)	(15.41)	(15.19)	(15.43)
_cons	-15.67***	-19.38***	-18.88***	-19.33***
	(-3.74)	(-4.86)	(-4.74)	(-4.85)
Year	Yes	Yes	Yes	Yes
No. of Obs.	1617	1617	1617	1617
R-squared	0.39	0.39	0.39	0.39

This table shows the coefficients of the estimates from the fixed effects regression analysis for the independent variables Uniform, Skewed, Tilted and Balanced and dependent CER variable over a period from 2015 to 2020. The regression includes several control variables regarding corporate governance mechanisms, financial performance and country-level data.. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6. Description of variables

Variables	Description	Source
CER	Corporate Environmental Responsibility. It is a company score based on self-reported information in the environmental pillar.	Asset4 ESG Refinitiv
Uniform, Skewed, Tilted, Balanced	Four dummy variables, where (1) indicates no one woman; at least one woman but less than 20% women; at least 20%, but less than 40% women; at least 40% women on the board of directors, and (0) otherwise.	Asset4 ESG Refinitiv
Board Size	The total number of board members	Asset4 ESG Refinitiv
CEO separation	Dummy variable equal to 1 if a CEO chairs the board or if the chairperson of the board has been the CEO of the company	Asset4 ESG Refinitiv
Debt on Equity	Total debt divided by total equity	Worldscope Refinitiv
Free Float	The percentage of total shares in issue available to ordinary investors (i.e., the total number of shares less the strategic holdings).	Worldscope Refinitiv
Capex on Sales	Capital expenditures divided by total sales	Worldscope Refinitiv
GDP per capita	Gross Domestic Product based on current price/population	The World Bank