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Examining Airlines' Environmental and Social Disclosure: Does Board Gender Diversity Matter?

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ABSTRACT

This study investigates the influence of board gender diversity (BGD) on environmental and social disclosure (ESD) within the airline industry, an area that remains underexplored despite increasing stakeholder scrutiny. We apply automated textual analysis to annual reports of Skytrax's top global airlines from 2016 to 2022 to measure the extent of ESD and examine its association with female board representation. The results show a positive and significant relationship between BGD and ESD, with a critical mass of at least four female directors required to drive meaningful improvements in disclosure practices. These findings extend the predictions of gender socialization theory (GST) and critical mass theory (CMT) and offer practical implications for policymakers and airline managers, including the adoption of diversity quotas and leadership development initiatives to enhance corporate transparency and accountability.

1 | Introduction

The growing demand for corporate accountability on environmental and social issues has intensified pressure on companies from a diverse range of stakeholders, including investors, employees, civil society organizations, and regulators (Baalouch et al. 2019; Yu et al. 2018). In response, firms are increasingly using multiple communication channels such as annual reports, standalone sustainability reports, and corporate websites to disclose their environmental and social performance (Tiwari and Khan 2020; Bravo and Reguera-Alvarado 2019). Effective environmental and social disclosure (ESD) is particularly important as it reduces information asymmetry, improves investor confidence, and enhances corporate legitimacy (Cheng et al. 2014; Salama et al. 2011).

Despite the growing body of research on ESD, studies examining its determinants from a corporate governance perspective remain limited. Previous studies have explored characteristics such as board independence, board size, and gender diversity (Yarram and Adapa 2021; Muttakin et al. 2022). Most of the studies on board gender diversity (BGD) and disclosure levels have situated the research focus and sample on single and mixed industries such as the financial sector, consumer retail, technology, telecommunications, utility, and healthcare, among others (Bravo and Reguera-Alvarado 2019; Qureshi et al. 2020; Tingbani et al. 2020). In all these studies, one of the industries that has received less attention in investigating the association between board characteristics, specifically BGD and ESD levels, is the aviation industry.

Prior work on ESD has highlighted the role of board characteristics, such as independence, size, and diversity, in shaping corporate disclosure practices (Ortas et al. 2015; Velte et al. 2020). In particular, BGD has emerged as an important driver of ethical decision-making and stakeholder-oriented strategies, given evidence that female directors are more attuned to communal values and social responsibility (Agyei-Mensah 2021; Muttakin et al. 2022).

However, while sectors such as finance, retail, and technology have been widely studied (Bravo and Reguera-Alvarado 2019; Qureshi et al. 2020; Tingbani et al. 2020), the airline industry has received limited attention. This is surprising, considering the industry's significant environmental footprint, including its 2% contribution to global CO_2 emissions (IEA 2023), and its complex stakeholder ecosystem. The few studies in the aviation industry have, however, mainly focused on sustainability reporting (Zieba and Johansson 2022; Karaman et al. 2018), exploring the impact of ESG disclosure on firm value (Cregan et al. 2023; Abdi et al. 2022; Abdi et al. 2020), CSR reporting and CSR impact on firm financial performance (Kuo et al. 2021; Kuo et al. 2016), nonfinancial reporting practices (Abhayawansa and Adams 2021; Ringham and Miles 2018), and COVID-19 impact on social and environmental reporting (Mintah and Gulko 2023). Despite the significance of these studies to the airline industry, studies investigating the association between board characteristics such as BGD and ESD in the airline industry are limited. Again, there have been calls for studies to investigate the impact of board characteristics on ESD in the context of the aviation industry (Mintah and Gulko 2023; Rinaldi et al. 2020; Okumus et al. 2020; Ilkhanizadeh and Karatepe 2017) owing to the limited studies in this area. A recent review by Zieba and Johansson (2022) confirmed that academic studies on airlines' sustainability and ESD practices remain scarce, with few exploring the influence of board composition.

This study addresses this gap by examining whether BGD influences ESD among leading global airlines. Using longitudinal data from 2016 to 2022, we investigate both the general association between female board representation and ESD and the critical threshold of female directors needed to generate a meaningful impact. Our analysis contributes to the literature by extending gender socialization theory (GST) and critical mass theory (CMT) in the context of aviation, while also providing actionable insights for industry regulators and practitioners.

Our study contributes to the existing literature in several ways. First, this study directly responds to calls for studies on board characteristics such as gender diversity association to ESD in the airline industry (e.g., Mintah and Gulko 2023; Rinaldi et al. 2020) and offers longitudinal insights into a relatively limited area of ESD over a longer period (2016–2022), thereby shedding light on some governance characteristics influence on ESD. Second, we provide empirical evidence on the relationship between BGD and ESD in the context of the aviation industry. Whereas some studies have generally investigated the association between female directors and subdimensions of ESD such as carbon disclosure (Moussa et al. 2020), biodiversity disclosure (Haque and Jones 2020), ESG and CSR reporting as standalone studies (Zieba and Johansson 2022; Abhayawansa and Adams 2021), and its relationship with firm financial performance and value (Cregan et al. 2023; Abdi et al. 2022), this study provides new evidence to the existing literature on the relationship between governance and ESD in general in the airline industry.

Our results show that the levels of ESD have seen an increasing trend from 2016 to 2022. We find that boards with greater female representation are positively and significantly associated with ESD, which is consistent with the GST supporting the view that women are more sensitive to communal ethos and ethics. Subsequently, airline companies with a greater proportion of female directors are more likely to encourage and disclose environmental and social information. However, a critical mass of at least four female directors is necessary before any positive impact can be observed. The results are robust to alternative regression specifications. Our study adds to the debate concerning the importance of gender diversity by incorporating the concept of the positive influence of heterogeneity on ESD.

The remainder of this paper is as follows: Section 2 discusses recent ESD in the airline industry. Section 3 outlines the theoretical framework and hypotheses development. Section 4 discusses the research design, and Section 5 provides empirical results and discussion. The final section provides our conclusion and suggests directions for future research.

2 | Literature Review

2.1 | ESD in the Airline Industry

ESD serves as a critical medium for communicating corporate accountability to stakeholders (Boiral and Heras-Saizarbitoria 2020). Global standards, particularly the Global Reporting Initiative (GRI), have enhanced the structure and comparability of ESD (Perello-Marin et al. 2022; Machado et al. 2023). However, the diversity of environmental and social performance indicators and disparities in reporting frameworks often result in significant variability across industries (Antolín-López et al. 2016). The introduction of sector-specific reporting guidelines has been critical to demystifying the challenges, and this has resulted in the increasing trend of ESD in recent times (Khan et al. 2021). To provide an inclusive appraisal of companies' ESD practices and enhance transparency and accountability (Nirino et al. 2021; Barkemeyer et al. 2023), firms have increasingly utilized annual reports, company websites, social media platforms, and standalone sustainability reports. These mediums help users of environmental and social information assess companies' performance, evaluate alignment with global reporting standards and targets, and inform and influence investors' decisions (Kimbrough et al. 2022; Clementino and Perkins 2021; Schiemann and Tietmeyer 2022). Prior literature has established evidence of interest in exploring the association between board characteristics and disclosure practices and levels (Fahad and Rahman 2020; Katmon et al. 2019).

The aviation sector is arguably one of the biggest sectors in terms of revenue and employment, with the airline industry playing a significant role in the transportation and tourism sector (Papatheodorou 2021). Prior to the COVID-19 pandemic, the airline industry's global passenger transport reached 4.5 billion in 2019, accounting for \$838 billion, with 2023 revenue figures nearing prepandemic levels, currently standing at \$803 billion (International Air Transport Association [IATA] 2023). While the airline industry has proven to be a significant enabler of transportation, a report from the International Energy Agency

(IEA) revealed that in 2022, the aviation sector, with the airlines as major players, accounted for 2% of global energy-related CO_2 emissions; this figure has surpassed rail, road, or shipping in recent decades, raising environmental concerns (IEA 2023). In addition, the diversity and complexity of the supply chain of the airlines' activities evidence a plethora of stakeholders involved in the day-to-day operations. This justifies the call for ESD practices in the airline industry.

However, the KPMG (2020) sustainability tracking report reveals that the airline industry is part of the transportation and leisure sector and accounts for the lowest sustainability reporting rate of 71% compared to other industries. Further, in 2022, the transportation and leisure sector still lagged at the bottom of sustainability reporting across industries (KPMG 2022). Although there has been a recent increasing trend of ESD in the airline industry, disclosure levels in the industry have been historically limited as the implementation of reporting practices has been slower (Karagiannis et al. 2019; Ringham and Miles 2018; Mintah and Gulko 2023). Comparing the size of the industry and disclosure levels results in a discrepancy and disproportionate association between the industry size and impact and ESD levels. This, among other reasons such as the significant contribution of the airline industry to climate change and other social concerns such as employees' welfare, diversity, and inclusion, accounts for the pressure from stakeholders on the industry to disclose their environmental and social information (Tilt 2016; Cowper-Smith and de Grosbois 2011).

Scholarly research on the link between firm and financial characteristics and ESD in the airline industry remains limited, with only a few studies examining governance factors such as gender diversity. Kuo et al. (2021) identified a nonlinear relationship between ESG performance and corporate financial performance. Karaman et al. (2018) found that firm size and leverage positively influence sustainability reporting, though such reporting does not affect firm value. Conversely, Abdi et al. (2022) reported that airline participation in ESD activities enhances financial efficiency, with firm size moderating the effect of sustainability reporting on both firm value and financial performance. Notably, governance characteristics and their role in ESD have received little attention. Abdi et al. (2020) highlighted this gap by finding a positive link between environmental and governance pillar scores, calling for further investigation into governance factors like BGD in the airline industry. Our study thus investigates the association between BGD and ESD in the airline industry and responds to the calls for research into board characteristics and ESD (Mintah and Gulko 2023; Rinaldi et al. 2020; Okumus et al. 2020; Ilkhanizadeh and Karatepe 2017). Thus, this study provides further empirical evidence on BGD and female representation by airline companies regarding their ESD.

2.2 | Theoretical Framework and Hypotheses Development

2.2.1 | GST

Scholars investigating the influence of women on corporate boards have employed various theoretical frameworks, including resource dependence theory (Hillman et al. 2000; Reguera-Alvarado et al. 2017), agency theory (Ararat et al. 2015; Ntim 2015), stakeholder theory (Al-Shaer and Zaman 2016; Liao et al. 2015), and legitimacy theory (Moussa et al. 2020; Deegan and Rankin 1996). However, these theories have been critiqued for offering a limited perspective on the role of women as board directors. Resource dependence theory, for example, is often viewed as a general approach to addressing power imbalances on boards rather than specifically explaining gender dynamics (Reguera-Alvarado et al. 2017). Legitimacy theory focuses primarily on how companies attempt to address legitimacy concerns (Deegan and Rankin 1996), while agency theory emphasizes female board representation mainly as a mechanism to improve disclosure and reduce agency costs (Liao et al. 2015). Stakeholder theory, on the other hand, has been recognized as suitable for examining stakeholder concerns, including issues related to investment and disclosure such as ESD (Freeman 2010). Given the ethical dimensions inherent in ESD, this study adopts GST as the guiding framework for hypothesis development and model construction.

The core argument of GST is that women exhibit greater ethical sensitivity than men (Cumming et al. 2015), demonstrating heightened awareness of ethical issues and concerns compared to their male counterparts. GST suggests that the distinct gender roles and socially constructed values to which men and women are exposed from childhood shape differences in moral values, as reflected in the contrasting traits of masculinity and femininity (Moussa et al. 2023). For example, men tend to be more achievement oriented, while women are more community focused, fostering stronger interpersonal and social relationships (Allam et al. 2024). Moreover, men's competitive nature and pursuit of business success often lead to vulnerability and a higher likelihood of compromising ethical principles, in contrast to women (Radtke 2000). Women's ethical sensitivity is largely attributed to their socialization, which prioritizes communal values and relationship building, thereby reinforcing the notion that women are more likely to act ethically than men in various circumstances (Mason and Mudrack 1996; Radtke 2000).

Recent studies examining the ethical influence of women's representation on corporate boards provide strong support for the rationale of GST. Evidence shows that gender-diverse boards are associated with a lower likelihood of financial malfeasance (Wahid 2019), earnings mismanagement (Gull et al. 2018), and excessive consumption of nonrenewable energy (Atif et al. 2020). Similarly, female representation has been linked to a reduced severity of security fraud (Cumming et al. 2015). Research on ethical compliance further indicates significant gender-based differences, with females demonstrating stronger alignment with codes of ethics compared to males (Shohaieb et al. 2022). Liu (2018) also finds that higher female board representation is negatively associated with environmental violations. Although Radtke (2000) challenges the notion of women's influence on ethical decision-making, this study is limited by its narrow scope, focusing on only 51 accountants in a highly regulated industry. In contrast, broader evidence from other sectors supports the positive role of female board members in enhancing ethical practices (Terjesen et al. 2009; Hazaea et al. 2023). Given this substantial body of accounting and governance literature, it is reasonable to assert that female directors are generally more likely to act ethically than their male counterparts.

2.2.2 | BGD and ESD

Recent empirical research has examined the link between BGD and corporate disclosures, consistently indicating a positive relationship between female board representation and disclosure levels. Nadeem (2020) found that female directors actively promote information sharing, which enhances the quality of CSR disclosures, particularly when female representation on the board is higher (Cabeza-García et al. 2018). Nadeem's (2020) assertion regarding women's role in fostering transparency supports not only the broader discourse on CSR disclosure but also more specific aspects such as ESDs and other related characteristics. For instance, prior studies have reported positive associations between BGD and biodiversity reporting (Haque and Jones 2020), the readability of US companies' 10-K filings (Nadeem 2022), the frequency and quantity of disclosures (Ahmed et al. 2017), modern slavery disclosure (Moussa et al. 2022), gender issues reporting (García-Sánchez et al. 2020), environmental and social performance (Cordeiro et al. 2020; Orazalin and Baydauletov 2020), voluntary GHG disclosures (Tingbani et al. 2020), reporting quality (García-Sánchez et al. 2019), carbon emissions disclosure (Kılıç and Kuzey 2019), and public reporting on climate change-related risks (Ben-Amar et al. 2017). Owing to the ethical implications of ESD and the communal values and ethical sensitivity of women, which have proven to have solid empirical evidence of a positive relationship between BGD and corporate disclosure, the study predicts a positive relationship between BGD and ESD.

Hypothesis 1. *Ceteris paribus, BGD is positively associated with airline companies' ESD.*

2.3 | The Critical Mass of Female Directors

There have been a few studies that have examined BGD under the CMT. CMT argues that the size of a minority group is critical in measuring its impact and sphere of influence on a larger group in terms of representation of ideas and decision-making (Atif et al. 2020). Thus, a minority group reaching a critical mass as a minimum threshold is influential in altering the dynamics of interaction and impact on, for example, the board's strategic decisions especially on nonfinancial disclosure and performance. This argument is supported based on the evidenced facts that minority groups are often considered as "tokens" to tick the box, for impression management and reputation reasons (Terjesen et al. 2009). This leaves their opinions ignored limiting their participation owing to a notion this study describes as feeling "a minority of the minority," literally explained as a small representation of the small group. Several studies have evidenced the strategic and critical importance of numerical representation on boards. For example, while the presence of one or two females on the board may or may not be enough to exert enough pressure on a male-dominated board in terms of decision-making and ESG disclosure (Kassinis et al. 2016), previous studies have found a positive relationship between women presence on higher CSR commitment (Cook and Glass 2018). For instance, Erkut et al. (2008) questioned the nexus between female numeracy and impact examining what influence one, two, or three women will make on the board. The authors suggested a critical mass of at least three females to enhance proactivity on the board as Kristie (2011) opined that "one woman on the board is a token, two is a presence, and three is a voice." Numerous studies have provided credence to this assertion (Nadeem 2022; Yarram and Adapa 2021; Cabeza-García et al. 2018; Gyapong et al. 2021). For example, whereas the studies of Joecks et al. (2013) found that a critical mass of three females improved disclosure performance, Yarram and Adapa (2021) confirmed no association with disclosure under "token female representation" but revealed positive influence with three females on the board. Consistent results have also been reported by Liu et al. (2014) and Cabeza-García et al. (2018) on the association of the critical mass of females on the board and CSR disclosure levels. The study thus predicts a critical mass of females at a certain threshold to influence ESD.

Hypothesis 2. *Ceteris paribus, a critical mass of at least three female directors on the board is positively associated with airline companies' ESD.*

3 | Research Design

3.1 | Sample and Data

Our sample is derived from Skytrax's list of the world's top-rated airlines, a widely recognized industry benchmark for global airline performance (Skytrax 2023). We use data from Skytrax for the following reasons. First, in the airline literature, the dataset from Skytrax has been used extensively to investigate diverse dimensions of airline-related studies from customer satisfaction and passenger experience, among others (Punel et al. 2019; Song et al. 2020; Pérezgonzález and Gilbey 2011; Merkert and Pearson 2015). Second, the large size in terms of revenue, passenger turnover, and influence of the airlines on the Skytrax list evidences them as global carriers with the substantial environmental and social impact of their operational scale, while also ensuring data quality given their higher likelihood of publicly available annual reports.

Of the initial sample, a total of 400 company-year observations were excluded because of missing annual reports for the years under consideration. A further 176 company-year observations were excluded due to missing financial and governance data. The final sample size of 124 observations, derived from the annual reports of Skytrax's global best airline companies from 2016 to 2022, ensures data quality and relevance despite the initial dataset of 400 potential observations being reduced due to missing data and inconsistencies. This sample size is robust enough for statistical analysis, allowing for the detection of significant relationships between BGD and ESD, providing adequate statistical power given the longitudinal nature of the data. However, the focus on leading airlines may lead to sample bias and limit the generalizability of the findings to the broader industry, which includes smaller and regional carriers. Overall, the sample size represents a balanced compromise, enabling hypothesis testing while acknowledging limitations in generalizability, suggesting that future research could benefit from a more diverse sample of airlines. Table 1 shows the sample and geographical distribution of the airlines. We collected the annual reports from the companies' websites. We obtained BGD measures and other

TABLE 1 | Sample selection and geographical distribution.

Airline	Geographical region
Air Arabia	Middle East
Emirates Airlines	
Qantas Airlines	
Turkish Airlines	
Hawaiian Airlines	Americas
Air Canada	
Air Transat	
Southwest Airlines	
Wizz Air	Europe
Ryanair	
SAS Scandinavian	
EasyJet Airlines	
Lufthansa Airlines	
TUI Airlines	
China Airlines	Asia
China Eastern Airline	
Korean Air	
Cathay Pacific Airlines	
Air Astana Airlines	
Rex Airlines	Oceania

company-specific governance and financial data from the Eikon Refinitiv database.

3.2 | Construction and Measurement of ESD

The study's dependent variable of interest is the level of ESD in annual reports. We construct a disclosure wordlist for environmental and social using the bag of words model (Zhang et al. 2010; Qader et al. 2019) which has been used in other disclosure studies (Shohaieb et al. 2022; Karim et al. 2021). We developed the wordlist from three main sources: first, from all sustainability reports of the initial sample of airline companies; second, using the GRI sector Group 3: transport, infrastructure, and tourism for airlines (GRI Sector 2021) environmental and social categories; and third, we reviewed articles and literature reviews on ESD in the airline industry (Mintah and Gulko 2023; Zieba and Johansson 2022). The authors conducted this step individually, cross-checked the word choice, and then agreed on the shared word choice. We measure ESD by the proportion of sentences related to ESDs in a firm's annual report, scaled against the report's total number of sentences. This method is superior to simple word counts, as it captures the narrative structure and contextual emphasis of disclosures, reducing noise from repetitive or incidental keyword mentions. This was used in the construction of an environmental and social wordlist, as shown in Appendices 1 and 2. The study adopted an automated content analysis software, Corporate Financial Information Environment ($CFIE_1$) developed by El-Haj et al. (2019) which has recently been used in accounting literature (Elmarzouky et al. 2022; Lewis and Young 2019). We test run an automated textual analysis using the environmental and social wordlist to capture the scores. We randomly selected some annual reports to make a comparison of the sections that contain environmental and social information and find an association with the scores captured by the CFIE software. To ensure the validity of our approach, we conducted a thorough manual review process. For each keyword, 10 sets of disclosures were randomly selected, verifying the accuracy of our CFIE-based extraction process, which showed no errors. Our findings contribute to a reliable and efficient way to measure the ESD of firms.

3.3 | Measuring BGD

The study's independent variable, BGD, uses two proxy variables for measurement. One, we measure the proportion of females on boards by dividing the number of female directors by the total number of directors in line with previous studies (Ben-Amar et al. 2017; Francoeur et al. 2019). Two, to test our second hypothesis, we employ four dummy variables (*One_fem*, *Two_fem*, *Three_fem*, and *Four_fem*) as different measures of the effect of female directors' critical mass on ESD. *One_fem* is a dummy variable that equals 1 when there is one female director on the board and 0 otherwise. The same definition applies to *Two_fem*, *Three_fem*, and *Four_fem*, with the number of female directors on the board equal to 1 when there are two, three, or four or more, respectively, and 0 otherwise (Nadeem 2022; Yarram and Adapa 2021; Cabeza-García et al. 2018; Ben-Amar et al. 2017; Liu et al. 2014).

3.4 | Control Variables

In line with prior research (Moussa et al. 2022; Francoeur et al. 2019; Ben-Amar et al. 2017; Kassinis et al. 2016), this study included a range of firm and financial characteristics and governance mechanisms as control variables. These include company size (*FSize*) calculated as a natural logarithm of total assets, company profitability using return on asset (*ROA*) and return on equity (*ROE*), current ratio (*CR*), leverage (*LEV*), market-to-book value (*MTBV*), and governance mechanisms such as board size (*BSize*) and board independence (*BIND*). The study also accounts for the effects of the year. Table 2 includes the definitions of all these variables.

3.5 | Model Specification

To test our hypotheses of BGD on ESD, we run the following models using ordinary least squares (OLS); to reduce the standard error as well as prevent the effect of omitted variable bias, we also rerun our regressions using fixed-effect (FE) and Tobit regression models.

$$ENV\_SOCT_{it} = a_0 + \beta_1 BGD_{it} + \beta_i Controls_{it} + \varepsilon_{it}, \quad (1)$$

$$ENV\_SOCT_{it} = a_0 + \beta_1 One\_fem_{it} + \beta_2 Two\_fem_{it} + \beta_3 Three\_fem_{it} + \beta_4 Four\_fem_{it} + \beta_i Controls_{it} + \varepsilon_{it}, \quad (2)$$

where ENV_SOCT_{it} indicates the ESD score for a company i in year t and BGD_{it} is a proxy of the BGD. One_fem_{it}, Two_fem_{it}, $Three\_fem_{it}$, and $Four\_fem_{it}$ are dummy variables representing one, two, three, and four or more female directors on the board, respectively. $Control_{it}$ refers to a vector of company-level control variables. All continuous variables are winsorized at 1% and 99% to mitigate the influence of outliers.

4 | Empirical Results

4.1 | Airlines ESD in Practice

Table 3 reports the ESD of the sampled airline companies over the study period. Both ESD have seen an overall increasing trend from the year 2016 to 2022. The mean ESD started at 183.556% and 449.111% in 2016 and steadily rose to 617.895% and 788.526% in 2022 for environmental and social, respectively. This progression in mean values indicates a significant advancement in airline companies ESD over these years.

TABLE 2 | Variable definitions.

Variables	Symbols	Definitions
Environmental disclosure	*ENV_Total*	Total environmental disclosure in annual report using CFIE
Social disclosure	*SOC_Total*	Total social disclosure in annual report using CFIE
Environmental disclosure	*ENV_Chair*	Environmental disclosure in Chairs' statement using CFIE
Social disclosure	*SOC_Chair*	Social disclosure in chairs' statement using CFIE
Environmental and social	*ENV_SOCT*	Combined total of environmental and social disclosure in annual reports
Environmental and social	*ENV_SOCC*	Combined total of environmental and social disclosure in chairs' statement
Company size	*FSize*	Natural log of total assets of the company
Profitability	*ROA/ROE*	Percentage of net income to total assets
Leverage	*LEV*	Percentage of total debt to total assets
Current ratio	*CR*	Percentage of current asset to current liability
Board size	*BSize*	Number of directors on board
Board independence	*BIND_1*	Percentage of independent directors on the board of a company
Board gender diversity	*BGD*	Percentage of female directors on board
One female director	*One_fem*	A dummy variable that is equal to 1 if there is one female director on board and 0 otherwise
Two female directors	*Two_fem*	A dummy variable that is equal to 1 if there are two female directors on the board and 0 otherwise
Three female directors	*Three_fem*	A dummy variable that is equal to 1 if there are three female directors on the board and 0 otherwise
Four female directors	*Four_fem*	A dummy variable that is equal to 1 if there are at least four female directors on the board and 0 otherwise
Year	*Year*	Year dummy to control for year effects

TABLE 3 | Summary statistics of dependent variable: ESD (%).

Year	All	2016	2017	2018	2019	2020	2021	2022
ENV_Total								
Mean	183.556	183.556	190.188	204.562	335.562	389.684	550.7	617.895
Minimum	0	0	13	8	11	8	34	63
Maximum	412	412	423	483	1215	1277	1827	1491
SOC_Total								
Mean	449.111	449.111	448.688	470.938	595.062	670.263	774.05	788.526
Minimum	2	2	4.4	40	41	51	88	139
Maximum	984	984	1047	1200	1449	1683	1837	1996

Likewise, the minimum values have also been veering upwards, indicating that even the least reporting companies in these years have improved their ESD scores. The minimum ESD scores went up from 0 and 2 in 2016 to 63 and 139 in 2022. Furthermore, the maximum values of the ESD scores also went up from 412 and 984 in 2016, demonstrating an upward trajectory to 1491 and 1996 in 2022, respectively. This shows that companies that disclosure more evidenced this over the period. In summary, the increasing trend in the mean, minimum, and maximum values of the ESD from 2016 to 2022 evidences a total progression in companies' ESD. This increase in disclosure levels over time is consistent with literature (Mintah and Gulko 2023; Abhayawansa and Adams 2021; Ringham and Miles 2018), suggesting that management through disclosure attempts to establish their social acceptance, legitimization of their operations, and management of stakeholders' perceptions through more disclosures. This is indicative of a growing emphasis on the airline companies environmental and social responsibility and accountability.

4.2 | Descriptive Statistics and Bivariate Correlation Analyses

Table 4 summarizes the statistics for all the study's independent and control variables to be employed in the analysis. We find that the percentage of female directors on the board (BGD) ranges from a minimum of 0% to a maximum of 46.15%, with a mean of 20.045% and a standard deviation of 14.00; this result sheds light on the narrow variation of female representation on the board among the sampled companies. Our results also show that 0.42% of the sample companies have one female director (*One_fem*), 0.16% have two female directors (*Two_fem*), 0.48% have three female directors on the board (*Three_fem*), and 0.392% have four or more female directors on the board (Four_fem) among the airline companies. The table further shows that the average board size of the companies is around 12 board members and that approximately 51% of the board members are independent. These results are consistent with previous studies (Haque and Jones 2020; Tauringana and Chithambo 2015). The mean values for the firm and financial control variables are as follows: Company size (*FSize*) is 17.711; profitability (*ROA*) and (*ROE*) are 1.097% and −11.635%, respectively; *CR* is 0.978%; and leverage (*LEV*) is 35.187%.

TABLE 4 | Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
ENV_Total	364.089	359.054	0	1827
SOC_Total	609.008	397.036	2	1996
ENV_Chair	9.076	13.238	0	78
SOC_Chair	14.975	20.655	0	117
FSize	17.711	2.529	12.347	24.063
CR	0.978	0.435	0.22	2.44
ROA	1.097	7.701	−25.43	16.69
ROE	−11.635	120.906	−1124.4	512.62
LEV	35.187	19.31	0	79.37
BSize	12.208	3.913	8	21
BIND_1	50.614	29.769	0	92.86
BGD	20.045	14.009	0	46.15
Female	2.674	2.284	0	9.131
One_fem	0.042	0.202	0	1
Two_fem	0.016	0.125	0	1
Three_fem	0.048	0.214	0	1
Four_fem	0.392	0.489	0	1

Table 5 presents the Pearson pairwise correlation analysis for all variables utilized in our regression analyses. The BGD measure is significantly positively correlated with ESD, with correlation coefficients of 0.294 and 0.359 and p values <0.004 and 0.000, respectively. The correlation between the presence of female director (female) and ESD is significantly positively correlated with 0.289 and 0.542 and p values <0.005 and 0.000, respectively. Whereas the board size (*BSize*) shows a significantly positive correlation, the percentage of independent directors (*BIND*) shows a negative low correlation values with ESD. Further, the financial control variables, including company size (*FSize*), profitability (*ROA*), and leverage (*LEV*), also show low correlation values with ESD. Low correlation values among all independent and control variables indicate that no significant multicollinearity issue exists. We further confirm this by calculating variance inflation factors (VIFs), and the results, though not reported for brevity, revealed no evidence of multicollinearity, as all VIF values do not exceed 2. In addition, we use residual plot and Q–Q plot to test for linearity and normality, respectively, and Durbin–Watson statistics to test for error independence. The results, again not reported for brevity, indicate no significant violations of these linear assumptions.

All variable definitions are presented in Table 2.

4.3 | Multivariate Results

As shown in Table 6, the study applies both univariate (correlation) and multivariate analyses (regression). We run OLS, FE, and Tobit regression models. All regressions are run with robust standard errors clustered by country and using year-fixed effects to address cross-sectional dependence or time effects (heteroscedasticity). We used FEs based on the Hausman test (Winship and Western 2016). As our dependent variable, ESD, in all our models fell on one side (absolute), no score for ESD is negative or below zero. We therefore chose to use Tobit regression. The Tobit model, similarly named censored regression model, is designed to estimate linear relationships between variables when there is either left or right censoring in the dependent variable only (Winship and Western 2016).

Using the proportion of female directors as a proxy for BGD, the OLS, FE, and Tobit evidence that BGD has a statistically significant positive relationship with ESD ($\beta = 39.17$, $p < 0.001$; $\beta = 23.75$, $p < 0.005$; and $\beta = 39.17$, $p < 0.001$, respectively).

TABLE 5 | Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) *ENV_Total*	1.000												
(2) *SOC_Total*	0.730	1.000											
	(0.000)												
(3) *ENV_Chair*	0.082	−0.071	1.000										
	(0.470)	(0.537)											
(4) *SOC_Chair*	0.029	0.114	0.718	1.000									
	(0.802)	(0.317)	(0.000)										
(5) *FSize*	0.198	0.176	0.342	0.058	1.000								
	(0.037)	(0.063)	(0.003)	(0.624)									
(6) *CR*	−0.019	−0.155	−0.061	−0.137	−0.102	1.000							
	(0.849)	(0.115)	(0.624)	(0.272)	(0.196)								
(7) *ROA*	−0.231	−0.224	−0.262	−0.267	0.017	0.118	1.000						
	(0.014)	(0.018)	(0.025)	(0.022)	(0.829)	(0.137)							
(8) *ROE*	−0.218	−0.157	−0.053	−0.034	0.015	0.104	0.460	1.000					
	(0.025)	(0.109)	(0.663)	(0.777)	(0.849)	(0.203)	(0.000)						
(9) *LEV*	0.399	0.308	0.258	0.269	0.330	−0.031	−0.556	−0.315	1.000				
	(0.000)	(0.001)	(0.028)	(0.021)	(0.000)	(0.000)	(0.000)	(0.000)					
(10) *BSize*	0.083	0.424	−0.220	−0.082	−0.127	−0.213	−0.096	0.069	−0.018	1.000			
	(0.429)	(0.000)	(0.083)	(0.524)	(0.131)	(0.013)	(0.252)	(0.422)	(0.830)				
(11) *BIND_1*	−0.011	−0.216	−0.214	−0.314	−0.421	0.062	0.016	−0.147	−0.062	−0.367	1.000		
	(0.918)	(0.012)	(0.093)	(0.012)	(0.000)	(0.468)	(0.845)	(0.085)	(0.460)	(0.000)			
(12) *GenDiv_1*	0.294	0.359	−0.475	−0.330	−0.549	−0.091	−0.133	−0.174	−0.082	0.409	0.399	1.000	
	(0.004)	(0.000)	(0.000)	(0.008)	(0.000)	(0.291)	(0.112)	(0.042)	(0.328)	(0.000)	(0.000)		
(13) *Female*	0.289	0.542	−0.423	−0.152	−0.446	−0.179	−0.151	−0.082	−0.058	0.747	0.078	0.881	1.000
	(0.005)	(0.000)	(0.001)	(0.235)	(0.000)	(0.037)	(0.072)	(0.339)	(0.488)	(0.000)	(0.357)	(0.000)	

TABLE 6 | Board gender diversity and ESD.

	(OLS)	(FE)	(Tobit)
Variables	***ENV_SOCT***	***ENV_SOCT***	***ENV_SOCT***
BGD	39.17***	23.75**	39.17***
	(6.398)	(9.906)	(6.074)
BSize	−32.47	−0.302	−32.47
	(23.71)	(63.12)	(22.51)
BIND_1	−12.45***	−7.764	−12.45***
	(3.134)	(10.72)	(2.975)
ROE	0.498	0.259	0.498
	(0.443)	(0.387)	(0.421)
FSize	57.72	787.7***	57.72
	(46.92)	(227.8)	(44.55)
CR	490.6***	239.7	490.6***
	(169.4)	(175.7)	(160.8)
LEV	19.03***	13.62***	19.03***
	(4.338)	(4.916)	(4.119)
Constant	−731.1	−13,139***	−731.1
	(880.9)	(3770)	(836.2)
R^2	0.515	0.552	0.045

Note: Table 2 outlines variable definitions. Robust standard errors are shown in parentheses.
***Statistical significance at 1% level.
**Statistical significance at 5%.

Table 6 presents the results of the OLS, FEs, and Tobit regression models, which examine the relationship between BGD and ESD. The coefficients for BGD are positive and statistically significant across all models (OLS: 39.17, FE: 23.75, Tobit: 39.17), indicating that higher female representation on the board is associated with increased levels of ESD. This means that for each additional female board member, there is an approximate 39.17% increase in the proportion of ESDs in the firm's annual report, as indicated by the OLS and Tobit models. The FE model, with a coefficient of 23.75, also supports this positive relationship, although the magnitude is slightly lower, which might be due to the model's adjustment for time-invariant characteristics. These findings suggest and support the notion that female directors contribute significantly to enhancing a firm's transparency and commitment to environmental and social issues, beyond mere statistical significance (Haque and Jones 2020; Tauringana and Chithambo 2015; Al-Shaer and Zaman 2016; Cabeza-García et al. 2018). These results support our Hypothesis 1 that women directors on the board have a positive relationship with ESD and confirm prior GST literature (Nadeem 2020; Moussa et al. 2023). We use OLS, FEs, and Tobit regressions for our analysis. OLS is employed for its simplicity and effectiveness in estimating linear relationships. FE models control for unobserved heterogeneity by accounting for time-invariant characteristics, thus addressing potential endogeneity. Tobit regression is used to handle the censored nature of ESD data, ensuring robustness against omitted variable bias. These models collectively enhance the credibility and reliability of our findings. We used FEs to control for any omitted variable bias, ensuring that our results are robust and reliable in the absence of any omitted variables. However, future research may include additional control variables such as industry-specific factors (e.g., airline type and regional regulations) that might influence ESD independently of BGD for a comprehensive understanding of the determinants of ESDs in the airline industry. Furthermore, this result also evidences consistency with the notion of the GST and ethicality theory which advances the position that female members on the board have the proclivity to show greater sensitivity to communal ethos and ethics, are empathetic towards social concerns and information sharing which evidences the improvement in ESD (Cumming et al. 2015; Mintah and Gulko 2023; Al-Shaer and Zaman 2016; Cabeza-García et al. 2018).

Table 7 focuses on the impact of reaching a critical mass of female directors on the board on ESD. The coefficients for one or two female directors (*One_fem*: −723.6, *Two_fem*: −144.7) are not statistically significant, indicating that having only one or two female directors does not substantially influence ESD. However, the presence of three female directors (*Three_fem*: 466.2) shows a positive and significant effect at the 10% level, suggesting a moderate improvement in ESD. The most substantial impact is observed when there are at least four female directors on the board (*Four_fem*: 740.1), which is statistically significant at the 1% level. Practically, this indicates that having a critical mass of at least four female directors can significantly enhance the level of ESDs by approximately 740.1%, emphasizing the importance of substantial female representation on corporate boards to drive meaningful disclosure practices. This supports CMT, suggesting that a higher threshold of female representation is necessary to achieve a significant influence on corporate governance and disclosure outcomes. The finding of a significant impact with at least four female directors is intriguing and aligns with CMT, which posits that a minority group must reach a certain threshold to exert meaningful influence. This specific threshold might be effective due to several behavioral theories and industry-specific dynamics. According to GST, women are generally more attuned to ethical, social, and environmental issues, which could explain their significant influence on ESD when they reach a critical mass. In smaller numbers, female directors might be seen as token representatives and may lack the necessary support to drive substantial changes. However, with at least four female directors, there is likely a stronger coalition that can effectively champion for comprehensive ESD initiatives, overcoming potential resistance from a male-dominated board. This finding is in line with GST and is supported by recent literature. Studies by Moussa et al. (2023), Cabeza-García et al. (2018), and Nadeem (2022) have consistently shown that greater female representation on boards enhances corporate governance and leads to better social and environmental performance. These studies indicate that a critical mass of female directors is crucial for effective advocacy and implementation of ESD policies, as it allows them to form strategic alliances, foster collaboration, and bring diverse perspectives that enrich board discussions and decision-making processes. Therefore, the threshold of four female directors appears to be a pivotal

TABLE 7 | Critical mass of female directors on the board and ESD.

	(1)	(2)	(3)	(4)
Variables	***ENV_SOCT***	***ENV_SOCT***	***ENV_SOCT***	***ENV_SOCT***
One_fem	−723.6			
	(461.7)			
Two_fem		−144.7		
		(414.0)		
Three_fem			466.2*	
			(246.9)	
Four_fem				740.1***
				(210.4)
BSize	44.84*	45.53*	49.88**	6.824
	(24.04)	(24.80)	(23.87)	(25.30)
BIND_1	−2.512	−1.986	−2.477	−1.343
	(3.185)	(3.271)	(3.149)	(2.961)
ROE	0.0220	−0.00647	−0.0497	−0.0372
	(0.527)	(0.536)	(0.524)	(0.496)
FSize	−63.42	−66.24	−42.50	−23.46
	(51.37)	(52.38)	(52.33)	(49.69)
CR	248.8	276.1	328.7	452.5**
	(199.8)	(209.1)	(201.7)	(195.7)
LEV	20.61***	20.14***	19.26***	19.85***
	(5.246)	(5.363)	(5.237)	(4.931)
Constant	891.3	877.0	376.2	271.0
	(1022)	(1050)	(1040)	(972.3)
R^2	0.289	0.267	0.300	0.372

Note: Table 2 outlines variable definitions. Robust standard errors are shown in parentheses.
*Statistical significance at 10% level.
**Statistical significance at 5% level.
***Statistical significance at 1% level.

point where their collective influence becomes robust enough to drive significant improvements in ESDs.

4.4 | Robustness Tests

The robustness checks, using subsamples based on board size and firm size, confirm the consistency of our findings. Specifically, the positive association between BGD and ESD is stronger in firms with higher governance quality (coefficient: 42.73) and larger firm size (coefficient: 59.55). In contrast, companies with lower governance quality and smaller firm size show a weaker but still positive relationship (coefficients: 30.16 and 26.06, respectively). These consistent results, as shown in Table 8, across different subsamples and models, reinforce the reliability of our findings, indicating that the impact of female directors on ESD is robust and significant across varying corporate contexts.

Additionally, we run a robustness check to examine this association using a subsample of board size (BSize) and firm size (*FSize*) under and over the mean score as shown in Table 8. The results show that the association between BGD and ESD is higher when the company has a higher governance (42.73) compared to a lower governance (30.16) and high firm size (59.55) compared to a low firm size (26.06).

The study finally considers the potential effects of endogeneity in our results which may occur from omission of variable bias, multicollinearity, heteroscedasticity, simultaneity, and reverse causality. To tackle this, we apply FE model in the regression to detect endogenous regressors and the FE results remains significant. We further run a dynamic GMM to control for endogeneity related to the governance variable, BGD, which may have been impacted by companies' previous performance. Results shown in Table 9 are consistent with that of Table 6. Further, reverse causality that explains a backward causation

TABLE 8 | Robustness analysis using board size and firm size.

Variables	High governance ENV_SOCT	Low governance ENV_SOCT	High firm size ENV_SOCT	Low firm size ENV_SOCT
BGD	42.73***	30.16***	59.55**	26.06***
	(9.979)	(7.461)	(20.53)	(7.249)
BSize	−182.1**	−140.7*	−86.09	−4.722
	(66.23)	(71.81)	(53.29)	(27.66)
BIND_1	−34.52***	−3.215	−26.69	−11.99***
	(7.857)	(4.494)	(17.25)	(3.275)
ROE	1.063	0.534	0.0953	0.899
	(2.267)	(0.421)	(0.901)	(0.629)
FSize	−510.7**	60.50	277.9*	61.17
	(192.7)	(47.72)	(146.5)	(70.62)
CR	863.7***	545.3***	415.4	331.5*
	(239.0)	(199.4)	(530.1)	(178.1)
LEV	36.00**	20.39***	29.16	21.09***
	(14.09)	(4.324)	(20.54)	(4.121)
Constant	11,775**	−217.2	−4670	−630.3
	(4480)	(915.8)	(2807)	(1121)

Note: Standard errors in parentheses.
*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.

TABLE 9 | Endogeneity test.

Variables	(GMM) L.ENV_SOCT	(2SLS) ENV_SOCT
BGD	32.45***	39.22***
	(5.967)	(6.076)
BSize	−25.98	−31.31
	(24.59)	(23.07)
BIND_1	−10.17***	−12.38***
	(3.100)	(2.988)
ROE	−0.0518	0.471
	(0.432)	(0.437)
FSize	57.46	55.03
	(51.52)	(46.03)
CR	361.9**	488.7***
	(172.9)	(160.9)
LEV	12.93**	19.63***
	(5.139)	(4.864)
Constant	−626.5	−727.1
	(958.3)	(836.1)
R^2	0.474	0.515

Note: Standard errors in parentheses.
**$p < 0.05$.
***$p < 0.01$.

of ESD rather driving BGD is tackled in the study using the two-stage least squares (2SLS) IV approach as widely used in previous accounting studies (Larcker and Rusticus 2010). Results shown in Table 9 are significant and consistent and support results in Table 6 evidencing the validity of our instrument used and the robustness of our model to any potential endogeneity issues.

5 | Conclusions

Our study contributes to the existing literature in several ways. First, we directly respond to recent calls for research examining the association between board characteristics, particularly gender diversity, and ESDs (e.g., Zieba and Johansson 2022; Mintah and Gulko 2023). By providing longitudinal insights over the period 2016–2022, our study sheds light on how governance characteristics, and specifically BGD, influence ESD in the aviation sector. This focus on a relatively underexplored industry context enhances our understanding of the role of board composition in shaping corporate sustainability reporting.

Second, our empirical findings highlight the critical threshold of female representation required on boards to positively influence ESD. From a policy perspective, these results have significant implications for regulatory bodies such as the IATA, the International Civil Aviation Organization (ICAO), and National Civil Aviation Authorities. For example, implementing mandatory gender diversity quotas could ensure a minimum level of female representation. Our results suggest that a threshold of at least four female directors may be particularly effective. Complementary measures could include incentives such as tax benefits or public recognition for companies that achieve gender diversity goals, as well as enhanced reporting requirements that compel firms to disclose their board composition and diversity initiatives. By adopting such measures, companies can respond more effectively to the increasing scrutiny of the aviation industry regarding its environmental and social impacts.

Beyond policy, there are managerial implications. Firms can take a proactive approach by voluntarily adopting internal quotas and investing in leadership development programs designed to prepare women for board positions. These initiatives may include mentorship, specialized training, and networking opportunities, all of which create a pipeline of qualified female candidates. Additionally, companies should critically review their board selection processes to address unconscious biases or structural barriers that impede female appointments. Cultivating a corporate culture that values diversity and inclusion, sets measurable diversity goals, and provides equitable career advancement opportunities can further enhance board effectiveness and sustainability outcomes.

Third, our study offers theoretical implications by reinforcing the argument that a critical mass of female directors significantly enhances ESD. This finding supports both GST and CMT, providing empirical evidence of their relevance in corporate governance and sustainability contexts. Future research could examine whether the observed positive relationship between BGD and ESD extends to other industries, particularly those facing similarly high environmental and social pressures. Moreover, exploring how these theoretical perspectives operate in different cultural or regulatory environments could yield deeper insights into the mechanisms through which gender diversity shapes corporate transparency and ethical practices.

Despite these contributions, our study is not without limitations. First, our sample is limited to firms within the aviation industry, which may constrain the generalizability of our findings to other sectors. Future studies could extend this analysis to industries with varying levels of regulatory oversight or environmental sensitivity to test the robustness of our conclusions. Second, while we employ longitudinal data, the study focuses primarily on board-level gender diversity, potentially overlooking other governance attributes or cultural factors that might influence ESD. Further research could integrate additional board characteristics, such as expertise in sustainability or international experience, to offer a more nuanced understanding. Finally, our analysis is based on publicly available disclosures, which may not fully capture the internal sustainability initiatives undertaken by firms. Future work could benefit from combining textual analysis of annual reports with qualitative interviews or surveys to triangulate findings and enrich the interpretations.

In conclusion, our study demonstrates that BGD plays a pivotal role in driving enhanced ESD within the aviation sector. By highlighting both theoretical and practical implications, and by acknowledging the limitations of our research, we hope this work encourages further investigations into how diverse leadership can promote greater corporate accountability and sustainability in the face of global challenges.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Appendix 1

Environmental				
Aichi target	Carbon Footprint	coastal habitat	Emission Reporting	Forest degradation
Air Emission	Carbon Information	Composition of energy consumption	Emissions	Fuel
Air pollution	Carbon Monoxide	Composition of fuel	Emissions Data	Fuel Consumption
Air quality	Carbon neutral	Composition of Gas	Emissions In Tonnes	Gas Composition
Associated Emission	Carbon Offset	Conservation	Emissions Information	Gas Emissions
Biodiversity	Carbon Reporting	Decarbonisation	Emissions Sources	Gas Protocol
Biofuel Consumption	Carbon Stories	Deforestation	Energy Consumption	Gas Reporting
biological diversity	Carbon Unit	Ecological	Energy efficiency	Gas Tco2e
Carbon	Carbon-offsetting	Direct Emission	Energy Emission	Genetic diversity
Carbon Code	Clean energy	Disposal of Waste	Energy Generation	Geneva Protocol
Carbon Credit	Clean water	Eco-friendly	Energy Reporting	GHG
Carbon Dioxide	Climate change	ecosystem	Energy Savings	Ghg Emissions
Carbon emission disclosure	Climate Disclosure	Eco-systems	Energy Sources	GHG Protocol
Carbon emissions	CO_2	Electric	Environment	GHG Reduction
Aichi target	Co2 Emission	Electricity	Environmental	GHG Reporting
Air Emission	Co2 equivalent	Emission Disclosure	Environmental investment	GHG Trade
Air pollution	coastal biodiversity	Emission Pollutants	Fiber sourcing	Global warming
Air quality	coastal ecosystem	Emission Reduction	Food waste	Greener
Greenhouse Gas	Kyoto Protocol	Material Emission	Paris agreement	Resource depletion
Greenhouse gas (GHG) emissions	Land remediation	Montreal Protocol	Plastics	resource efficiency
GRI Standard	Low Carbon	natural habitat	Quality Emissions	resource efficient
Hydrogen	Low Energy	Nature	Recycle	responsible consume
Indirect Emissions	Marine	Net Emissions	Reduction Target	responsible consumption
Indirect GHG	marine ecosystem	Net Zero	Reforestation	Sanitation
Intensity Ratios	marine pollution	ocean	Renewable Electricity	Scope 1
Scope 2	Solar energy	Sustainable	sustainable sourcing	water discharge
Scope 3	Solar power	sustainable consume	Tco2e	Water pollution
Sofia Protocol	species	sustainable consumption	Tonnes of Carbon	Water quality
Solar	Sustainability	sustainable energy	Waste	Wildlife
Wind energy	Wind energy			

Note: Appendix 1 presents the keyword list used to measure the level of environmental disclosure.

Appendix 2

Social				
BAME	Economic inclusion	Financial inclusion	Human rights	Modern slavery
Bribery	economic inequality	Forced labour	Inclusion	Pay gap
Child labour	Education	Gender	Income inequality	peace
Community	Employees	Gender balance	Inequalities	People
Compensation	Employment	Gender discrimination	Job creation	Perks

Social				
Compulsory labour	Equal opportunity	Gender equality	justice	Philanthropy
Corruption	Equal pay	Gender pay	Labour standard	Poverty
Crime	Equality	global wealth	law	Quality education
Customer	Equity	Health	Learning	Racial discrimination
Decent work	ethnic minorities	Health and safety	LGBTQA+	recognition
Discounts	ethnicity	Health and Wellbeing	Literacy	Religious discrimination
Diversity	Female leader	Healthcare	Loyalty	Remuneration
reward	security	Skilled staff	Slavery	Social responsible investment
Safety	sexual discrimination	Skilled workforce	Social	Society
Salary	Skilled people	Skills development	Social inclusion	torture
Training	Unemployment	Wages	Wellbeing	Working conditions
Unemployed	violence	Welfare	Women	Workplace harassment
Female	Zero hunger			

Note: Appendix 2 presents the keyword list used to measure the level of social disclosure.