

## RESEARCH ARTICLE



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# Board gender diversity and ESG decoupling: Does religiosity matter?

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## Abstract

In this paper, we examine the relationship between board gender diversity and environmental, social, and governance (ESG) decoupling and the moderating effect that religiosity has on this relationship. We utilise an international sample of 26,176 firm-year observations that cover the period from 2005 to 2019. Consistent with the upper echelon theory and the gender socialisation theory, we provide evidence that firms with a more gender-diversified board of directors tend to engage less in ESG decoupling, and this relationship is more pronounced among firms domiciled in countries with a low level of religiosity. We also find that the effect of religiosity on the relationship between board gender diversity and ESG decoupling is more pronounced for firms that engage in greenwashing and those operating in controversial industry sectors. Our study contributes to the growing debate on ESG decoupling, offering policy insights to regulators and policymakers into the role of board gender diversity and religiosity in reducing unethical managerial behaviour.

## KEYWORDS

board gender diversity, brownwashing, ESG decoupling, greenwashing, religiosity

## 1 | INTRODUCTION

Different groups of stakeholders exercise pressure on firms to exceed their level of environmental, social, and governance (ESG) practices and increase their impact on society and the environment (Cho et al., 2015; Luo et al., 2017). This rising pressure led many firms to disclose their ESG activities to gain legitimacy and improve their reputation (Clarkson et al., 2013; Crilly et al., 2016; Gibson & O'Donovan, 2007; Murray et al., 2006; Plumlee et al., 2015; Tata & Prasad, 2015). While ESG disclosure of a firm is assumed to truly and fairly represent its ESG performance, some firms may opportunistically use ESG disclosure to misrepresent their actual ESG

performance—known as ESG “decoupling” (Graafland & Smid, 2019; Sauerwald & Su, 2019). ESG decoupling is the gap between firm's ESG disclosure and its actual ESG performance. This irresponsible behaviour has created a wave of criticism about the role top managers and boards of directors play in firm's ESG practices (e.g., Deegan, 2017; Deegan & Shelly, 2014). However, research on the role of top managers and boards of directors in ESG decoupling is still limited. For example, Shahab et al. (2021) find a positive relationship between CEO power and ESG decoupling. Sauerwald and Su (2019) also find a positive relationship between CEO overconfidence and ESG decoupling.

The debate on board gender diversity has increasingly received attention from different stakeholders, including policymakers, practitioners, and academics who investigate whether board gender diversity could affect firms' outcomes (e.g., Gabaldon et al., 2016; He & Jiang, 2019; Nadeem et al., 2017, 2020). The main reason for this

**Abbreviations:** CEO, chief executive officer; CSR, corporate social responsibility; ESG, environmental, social, and governance; VIF, Variance Inflation Factors; WVS, World Values Survey.

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interest is that women have been under-represented in leadership roles, including the board of directors (Adams, 2016; Adams & Ferreira, 2009). Prior studies use different psychological and social-based theories to suggest that homogeneity in the boardroom negatively impacts firms' outcomes (e.g., Kirsch, 2018; Wahab et al., 2018). Consequently, some countries have mandated board gender diversity quotas to improve the female representation level on the board, such as Norway that has mandated 40% female board representation. This led to a sharp increase in the number of appointments of female directors on firms' boards (Deloitte, 2022; Lee et al., 2015).

According to the upper echelons theory and the gender socialisation theory, women have different characteristics from men, including risk aversion and positive ethical behaviour, which in turn affects their decision-making capacity (Boulouta, 2013). So, it is expected that female directors on boards would play a crucial role in protecting stakeholders' interests (McGuinness et al., 2017) and reducing unethical behaviour such as earnings management and fraud (Cumming et al., 2015; Gul et al., 2011; Gull et al., 2018; Labelle et al., 2010; Srinidhi et al., 2011; Zalata et al., 2022). However, the impact of board gender diversity on ESG decoupling remains an unexplored research question. Therefore, we aim to examine whether board gender diversity mitigates ESG decoupling. A better understanding of this relationship represents a critical research question that needs further investigation in order to evaluate the impact of board gender diversity as a corporate governance mechanism in the business world.

We also aim to examine the effect of an informal institutional factor, that is, religiosity, on the relationship between board gender diversity and ESG decoupling (Dyregang et al., 2012; Terzani & Turzo, 2021; Wu et al., 2016). Extant literature demonstrates that religiosity level affects the behaviour of managers and employees because individuals comply with their community ethical norms (Terzani & Turzo, 2021; Wu et al., 2016; Zattoni et al., 2020). Several studies call for further research on how religious differences among countries influence corporate decisions (Farooq et al., 2019; Zattoni et al., 2020). In particular, prior studies indicate that there is little attention to how informal institutional factors, in combination with internal corporate governance, affect firms' outcomes (Choi, 2020; Isidro et al., 2020; Zattoni et al., 2020). For example, using a systematic review approach, Zattoni et al. (2020) and Isidro et al. (2020) suggested that the role played by informal institutions is largely neglected in the accounting and finance literature.

Supporting the views of Isidro et al. (2020) and Zattoni et al. (2020), a stream of studies provides evidence on how the institutional context in which the firm is located shapes female behaviour towards CSR-related issues (Grosvold & Brammer, 2011; Mateos de Cabo et al., 2012; Seierstad & Opsahl, 2011; Terjesen et al., 2015). These studies document that the role of female directors varies with the level of stakeholder orientation in the country, likelihood of pollution, enforcement, and investor protection levels (Fernandez et al., 2018; García-Sánchez et al., 2018; Li et al., 2017). Furthermore, using the findings of 87 empirical studies, Byron and Post (2016) conclude that a positive relationship exists between female directors and CSR practices, and this relationship is stronger in countries that have higher

levels of shareholder protection. However, the effect of informal institutions, such as religiosity, on the relationship between board gender diversity and ESG decoupling remains an open research question. We are motivated by the critical role that religiosity plays in mitigating corporate unethical behaviour. Prior studies show that high religiosity levels shape managerial behaviour and affect firms they manage since religiosity directs corporate managers towards making ethical decisions. Given that religious norms can translate feelings of shame and guilt into a sense of responsibility and accountability among firm managers (Abdelsalam et al., 2021; Kanagaretnam, Lobo, Wang, & Whalen, 2015b), we argue that the level of religiosity is central to female directors' ethical choice to engage in ESG decoupling.

Using a sample of 26,176 firm-year observations from 29 countries and covering the period from 2005 to 2019, we find that, consistent with the upper echelon theory and the gender socialisation theory, firms that have more board female directors are likely to engage less in ESG decoupling. Our findings also indicate that the role of board gender diversity to mitigate ESG decoupling is more pronounced in countries with a low level of religiosity. We further demonstrate that the impact of board gender diversity is more pronounced for firms that engage in greenwashing and those operating in controversial industry sectors. Our main findings are robust to using different measures of board gender diversity, such as Blau's (1977) diversity index, female power in a firm's board of directors, and gender diversity of the CSR committee. We further apply the instrumental variable estimation (IV) method and the propensity score matching approach to mitigate the potential endogeneity problem. We find that endogeneity concerns are not likely to be affecting our main findings.

Our study makes the following contributions to the literature. First, while prior studies provide evidence of the significant impact of board gender diversity on improving firms' level of either ESG performance or disclosure (Elmagghi et al., 2019; Nekhili et al., 2017), our study focuses on a different ethical dilemma related to whether firms with more gender-diversified boards tend to engage less in the manipulative behaviour of camouflaging ESG disclosure to show high ESG commitment while their actual ESG performance is weak and vice versa. Therefore, our paper adds to the literature on the areas of CSR and board gender diversity by examining the relationship between board gender diversity and ESG decoupling. Furthermore, the literature on ESG practices implies a lack of research investigating ESG decoupling, with limited evidence reported on this phenomenon so far (García-Sánchez et al., 2021; Sendlhofer, 2020; Shahab et al., 2021; Zhang, 2022). Therefore, this paper draws attention to an under-researched area that is "ESG decoupling," which investigates how directors acknowledge the importance of ethical values when reporting ESG practices and their adherence to the faithful representation of ESG disclosure.

Second, our study extends the literature on the role of informal institutions on firms' outcomes using an international sample from 29 countries that counterbalances country-specific factors. More specifically, we address the moderating effect of religiosity on the relationship between board gender diversity and ESG decoupling. Until

now, the literature has focused mainly on the moderating effect of formal institutions on the relationship between board gender diversity and CSR practices without accounting for the role of informal institutions, for example, religion (Elmagrhi et al., 2019; Nekhili et al., 2017). Therefore, examining the effect of informal institutions, that is, religiosity, in different countries should help better understand the effect of contextual attributes on the relationship between board gender diversity and ESG decoupling.

Finally, our study contributes to the broader literature on mandatory gender diversity quotas and female representation in senior management positions. While social pressure is accumulating on firms to have more female directors on the board, only 30 countries worldwide have either mandatory or voluntary gender diversity quota requirements (Marisetty & Prasad, 2022). Understanding the significant positive impact of board gender diversity on firms' outcomes is pivotal in evaluating the desirability of similar legislation worldwide. Our study provides evidence that firms domiciled in countries with mandatory board gender diversity quotas tend to engage less in ESG decoupling. This finding provides additional insights to policy makers and regulators by emphasising the effectiveness of the proactive measures adopted by many countries to decrease the gender representation gap on corporate boards.

The remainder of this paper is structured as follows: In Section 2, we review the related literature and develop hypotheses. Section 3 explains the research design. Section 4 discusses our main results. Section 5 discusses our additional and robustness tests. Finally, Section 6 concludes.

## 2 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 2.1 | Board gender diversity and ESG decoupling

There is a mainstream in the literature supporting the view that gender differences in leadership positions affect firms' outcomes (e.g., Kirsch, 2018; Wahab et al., 2018). These studies use two prominent theories in their arguments: the upper echelon theory and the gender socialisation theory. According to the upper echelons theory, board composition plays an essential role in formulating and implementing the main strategies that affect firms' outcomes (Graham et al., 2017; Perryman et al., 2016). This is because the main determinant of the board's decision-making capacity is the knowledge and experience of board members (Farag & Mallin, 2016; Post & Byron, 2015). Existing evidence suggests that having women on the board who are sensitive to manipulation and the environment can help make better decisions (Graham et al., 2017) by bringing diverse perspectives to the decision-making process (Nadeem et al., 2017; Ntim & Soobaroyen, 2013).

In the same vein, the gender socialisation theory explains the differences in behaviour between males and females (Boulouta, 2013). It proposes that the psychological characteristics between women and men are significantly different. Supporters of this theory argue that women deal better in situations relating to ethical problems as they are less aggressive, more risk-averse, and more prone to show concerns

over ethical issues than men to protect their reputation (Cumming et al., 2015; Krishnan & Parsons, 2008; Radtke, 2000; Zalata & Abdelfattah, 2021). Further, these studies advocate that the presence of women on boards enhances the quality of discussions in board meetings as women better prepare for board meetings (Huse & Solberg, 2006), challenge other directors' opinions (Bilimoria & Wheeler, 2000), and create debate over controversial issues (Ingley & Van Der Walt, 2005).

Based on the psychological differences between women and men, the majority of studies find a positive effect of board gender diversity on firms' outcomes. More specifically, these studies provide evidence that female directors are connected with less corporate fraud (Capezio & Mavisakalyan, 2016; Lenard et al., 2017; Wahid, 2019), fewer financial restatements (Pucheta-Martínez et al., 2016), less earnings management and higher earnings quality (Cumming et al., 2015), and less aggressive tax avoidance activities (Francis et al., 2014; Lanis et al., 2017). In addition, women have a greater sense of responsibility regarding environmental issues, for example, by overseeing water resources effectively (del Mar Alonso-Almeida, 2012), working towards decreasing firms' carbon emissions (Nuber & Velte, 2021), and decreasing corporate social irresponsibility activities (Jain & Zaman, 2020; Tauringana et al., 2017).

In contrast to the above-mentioned studies, few studies find either no or a negative relationship between board gender diversity and firms' ESG performance or disclosure (e.g., Cucari et al., 2018; Giannarakis, 2014; Husted & de Sousa-Filho, 2019; Khan, 2010). For example, Giannarakis (2014) and Khan (2010) find no significant relationship between board gender diversity and the level of CSR disclosure. Cucari et al. (2018) also find a positive relationship between board gender diversity and ESG disclosure and linked these findings to the low representation of women on Italian firms' boards and their less expertise.

Collectively, female directors are expected to be more ethical and protect the interests of different stakeholders. They are less likely to involve in unethical behaviour, and therefore, they are expected to play an important role in mitigating ESG decoupling. So, we propose the following hypothesis.

**H1.** There is a significant negative relationship between board gender diversity and ESG decoupling.

### 2.2 | The moderating effect of religiosity

Extant literature indicates that corporate governance mechanisms and informal institutions affect firms' outcomes, including ESG practices and their related decisions (Albassam & Ntim, 2017; Baldini et al., 2016; Dyreng et al., 2012; Elamer, Ntim, & Abdou, 2020; Elamer, Ntim, Abdou, & Pyke, 2020; Eliwa et al., 2021; McGuire et al., 2012). In particular, McGuire et al. (2012) find that one of the main social mechanisms that control the behaviours and beliefs of individuals is religion, which is more likely to help mitigate unethical behaviour, such as incidences of financial reporting irregularities. Similarly, Dyreng et al. (2012) find a significant negative relationship between

religious adherence and the likelihood of financial restatement and misrepresentation. Likewise, Kanagaretnam, Lobo, and Wang (2015) and Elghuweel et al. (2017) find that religiosity reduces earnings management and improves earnings quality. Elamer, Ntim, and Abdou (2020) find that religiosity affects the level of bank risk disclosure. Albassam and Ntim (2017) find that firms with greater commitment towards Islamic religious beliefs engage in higher voluntary corporate governance disclosures. Therefore, by extending this intuition to ESG decoupling, it is likely that religious social norms, as a source of morality and ethical behaviour, is to mitigate ESG decoupling behaviour by firms.

Although the direct link between religiosity and ESG decoupling is theoretically clear, the role of the interdependency between gender diversity and religiosity in this relationship is an interesting unexplored research question. Supporting this view, two recent systematic reviews conclude that considerable attention is needed to understand the interplay between informal institutions, corporate governance mechanisms, and firms' outcomes (Isidro et al., 2020; Zattoni et al., 2020). Indeed, several studies that address the role of corporate governance, such as board gender diversity or independence, ignore the potential interdependency between corporate governance mechanisms and informal institutions (Choi, 2020; Isidro et al., 2020; Zattoni et al., 2020). Supporting the importance of addressing gender diversity in combination with other contextual factors, Fernandez et al. (2018) find that the role of gender diversity varies between different organisational contexts. Their results imply that female directors play an important role in a context that values their communal orientation. Therefore, it is unlikely that gender diversity will uniformly mitigate ESG decoupling across all contexts.

In this regard, the institutional theory is expected to provide a context for understanding the moderating effect of religiosity on firms' outcomes (Farooq et al., 2019; Meyer, 2010; Meyer & Höllerer, 2014; Scott, 2008). However, prior studies employing institutional theory provide inconclusive evidence on the moderating effect of religiosity on the relationship between board gender diversity and firms' outcomes. On the one hand, a stream of research argues that operating within contexts where morality is high and unethical behaviour is unacceptable patterns of behaviours, female directors may play an important role in mitigating firms' unethical behaviour (García-Sánchez et al., 2018; Lewellyn & Muller-Kahle, 2020). Consistent with this view, we argue that female directors may play an important role in mitigating ESG decoupling. Therefore, religiosity strengthens the impact of board gender diversity on ESG decoupling.

On the other hand, female directors might have a less obvious role in countries with high levels of religiosity (Ridgeway, 2009). Notably, Deng et al. (2013) conclude that in societies where religion plays a major role, the likelihood that religion affects both individuals and corporate decision-making is higher. In the same vein, individuals in countries with higher levels of religiosity tend to adopt views supporting traditional gender roles (Lindsey, 2005). Another stream of research supports the role of religion in maintaining the imbalanced distribution of power between male and female directors that is in favour of men (Chizema et al., 2015; Woodhead, 2006). Compared to

male directors, female directors are allocated fewer board seats, have less board experience, and are perceived to have less impact on board decisions (e.g., Burgess & Fallon, 2003; Ridgeway, 2006; Singh et al., 2008; Torchia et al., 2011). In this regard, institutional and social contexts, such as religiosity, play a significant role in framing power dynamics between male and female directors (Ridgeway, 2009). Consequently, the presence of female directors in countries with high levels of religiosity is expected to have a less obvious impact on ESG decoupling.

Therefore, investigating the interdependency between religious social norms and board gender diversity can further extend our understanding of how the context in which firms operate influences not only ESG decoupling but also the behaviour of female directors. Based on the above discussion, we propose the following hypothesis:

**H2.** Religiosity moderates the relationship between board gender diversity and ESG decoupling.

### 3 | RESEARCH DESIGN

#### 3.1 | Variables measurement

##### 3.1.1 | ESG decoupling (*ESG-gap*)

The ESG decoupling variable (*ESG-gap*) measures to what extent a firm's ESG performance and ESG disclosure are inconsistent. ESG performance ratings are obtained from the Refinitiv ESG database. These ratings are calculated as the total score awarded to firms' commitment to three different ESG dimensions (environmental, social, and governance) based on publicly available information and the Thomson Reuters ESG controversy score (Eliwa et al., 2021; Refinitiv, 2021).<sup>1</sup> We also use the Bloomberg ESG disclosure score, which is calculated using information obtained from CSR reports, annual reports and corporate websites. ESG disclosure scores are calculated annually to reflect firms' ESG disclosure (Eliwa et al., 2021; Huber & Comstock, 2017).<sup>2</sup>

To make both ESG performance and ESG disclosure scores more comparable and better capture variations in the data, we utilise similar approaches used in prior studies (e.g., García-Sánchez et al., 2021; Hawn & Ioannou, 2016; Sauerwald & Su, 2019; Tashman et al., 2019) and standardise rating on a scale of 1 to 10. Therefore, ESG decoupling for each firm-year observation is calculated as the absolute difference between the ESG performance score and ESG disclosure score.

##### 3.1.2 | Board gender diversity

The main independent variable in this study is board gender diversity. We measure board gender diversity (*FEMALE*) by the percentage of

<sup>1</sup>For more details on Refinitiv ratings methodology, visit: [https://www.refinitiv.com/content/dam/marketing/en\\_us/documents/methodology/refinitiv-esg-scores-methodology.pdf](https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf).

<sup>2</sup>For more details on Bloomberg scores, visit: <https://www.bloomberg.com/professional/dataset/global-environmental-social-governance-data/>.

female directors on the firm's board of directors. We also employ alternative proxies of board gender diversity in our robustness tests. Firstly, gender diversity of the CSR committee (*FEMALE-CSR*) is measured by the percentage of female directors on the CSR committee in a firm. Using this measure is important to examine the impact of gender diversity on ESG decoupling because of the direct link between ESG strategy and CSR committee of the firm. A board with a CSR committee is expected to be more ESG responsive, resulting in more transparent ESG reporting by the firm. The second proxy of board gender diversity is the diversity index suggested by Blau (1977), which is calculated as  $BLAU = 1 - \sum_{i=1}^n P_i^2$ , where  $n = 2$  representing male and female categories, and  $P_i$  = the proportion of each category to the total board size. A maximum value of .5 represents a balanced gender-diverse board, while 0 represents a male-only board. Finally, we use female power in a firm's board of directors (*FEMALE-power3*), measured as the presence of three or more female directors on the board. This proxy of board gender diversity draws on the critical mass theory suggesting that female directors cannot effectively do their monitoring role unless a specific threshold of females on the board is achieved (Kanter, 1977a, 1977b). Prior studies provide evidence that in order to encourage effective communication and discussions during board meetings and improve the monitoring role of the board, it should include at least three female directors (e.g., Adhikari et al., 2019; Ben-Amar et al., 2017; Fan et al., 2019; Wiley & Monllor-Tormos, 2018).

### 3.1.3 | Religiosity (*RELIG*)

We utilise religiosity based on firms' headquarters location as it is where corporate strategies are formulated (Abdelsalam et al., 2021; Pirinsky & Wang, 2006). Following the literature (Abdelsalam et al., 2021; Kanagaretnam, Lobo, Wang, & Whalen, 2015b; McGuire et al., 2012; Parboteeah et al., 2008), we define religiosity by capturing its three distinct components, namely, the cognitive that reflects the religious knowledge and beliefs, the affective that reflects emotional feels of individuals regarding religion, and the behavioural that emphasises prayer attendance or regular religious activities.

Our measure of religiosity (*RELIG*) is based on the responses to three primary questions that asked by the World Values Survey (WVS) that covers the three components of religiosity: (1) *REL-IMP*: How important is religion in your life? (cognitive); (2) *REL-MEMB*: Would you say you are a religious person (affiliated with a religion)? (affective); and (3) *REL-SERV*: How often do you attend religious services? (behavioural). Our primary variable of interest (*RELIG*) is measured as the first principal component of the three individual dimensions *REL-IMP*, *REL-MEMB*, and *REL-SERV*.

### 3.1.4 | Control variables

To test our main hypotheses, we include control variables that can be classified into either firm-level or country-level variables. For firm-

level variables, we include firm size (*SIZE*), measured as the natural logarithm of a firm's total assets. Larger firms are more visible to stakeholders and, hence, firms are more keen to export a favourable image to them (Sauerwald & Su, 2019; Tashman et al., 2019). Therefore, we expect *SIZE* to be negatively associated with ESG decoupling. Return on assets (*ROA*) is measured as net income divided by total assets. More profitable firms are expected to have strong ESG performance (Tashman et al., 2019) and, hence, less pressures and incentives to engage in ESG decoupling. Leverage (*LEV*) is measured as a firm's debt deflated by total assets. We expect risky firms to engage in more unethical behaviour, such as ESG decoupling (Abdelsalam et al., 2021; Cornett et al., 2009; Leventis & Dimitropoulos, 2012). Firm growth (*Growth*) is measured as a natural logarithm of one plus a firm's growth in the book value of equity over the previous year. Increased growth opportunities are expected to be less linked with unethical behaviour (Lai, 2009). The number of analysts following a firm (*ANALYST*) is measured as 1 year lag of the number of a firm's 1-year ahead EPS forecast estimates. *ANALYST* is used to control for firm's visibility and media coverage (Hawn & Ioannou, 2016). Size of the board of directors (*B-SIZE*) is measured as the number of members included in the board of directors. Larger boards usually suffer from high coordination costs and free-rider issues, which might decrease the effectiveness of the board's monitoring role (Sauerwald & Su, 2019) and, hence, is positively associated with ESG decoupling. Prior studies also show that well-governed firms are less likely to behave unethically (Canyon & He, 2016). Accordingly, we include board independence and the presence of CSR committee as corporate governance variables that would deter firms to engage in ESG decoupling. Board independence (*B-indep*) is measured as the ratio of the number of nonexecutive independent directors to the total board size (Adhikari et al., 2019; Luo et al., 2020; Zalata et al., 2018). The presence of a firm's CSR committee (*CSR-presence*) is measured as a dummy variable that is equal to 1 when the firm has a corporate social responsibility committee; 0 otherwise.

Furthermore, we control for a number of country-level variables, such as mandatory board gender diversity, as obviously that the existence of a mandatory female quota in a country would impact board gender diversity of firms located in these countries (Marisetty & Prasad, 2022). Mandatory board gender diversity (*QUOTA*) is measured as a dummy variable that is equal to 1 when a firm is located in a country where a mandatory board gender diversity law has been issued, 0 otherwise. Our second country-level variable is Brown et al. (2014) index that captures the differences between countries regarding accounting enforcement. It consists of two main parts; the auditing environment quality and the level of accounting enforcement strength in each country (for details, see Brown et al., 2014; Preiato et al., 2015). We also control for the country-level control of corruption (*CORRUPT*) as we expect it to mitigate the tendency of firms to engage in ESG decoupling. This variable captures perceptions of the extent to which public power is exercised for private gain. It includes both grand and petty forms of corruption, along with capturing of the state by elites and private interests. We also control for the total population of each country (*POP*) and the annual growth in GDP (*GDP-*

growth) (Hilary & Hui, 2009; Kanagaretnam, Lobo, Wang, & Whalen, 2015). Finally, we control for year and industry dummies.

### 3.2 | Sample and data

Given that our main variable of interest is ESG decoupling (dependent variable), our initial sample contains 5751 listed firms with ESG scores available in either Refinitiv or Bloomberg ESG databases from 45 countries (49,211 firm-year observations). This covers the period from 2005 to 2019 as before 2005 ESG data availability in both Refinitiv and Bloomberg ESG databases is very limited. All firms domiciled in countries with no religiosity data available were deleted, leaving 5039 listed firms from 29 countries (40,145 firm-year observations). All listed firms that do not have both ESG performance and ESG disclosure data required to calculate ESG decoupling were dropped from the sample, leaving 4352 listed firms (32,855 firm-year observations). Finally, we exclude financial institutions from our sample due to the different interpretation of high leverage for these institutions. After excluding financial institutions, our final sample comprises of 3902 listed firms (translated into 27,786 firm-year observations) (see Panel A of Table 1).

Panel B of Table 1 reports the number of firm-year observations per country. Our data show that Argentina, Peru, Poland, and Chile, are the least represented countries in the sample, with only 21, 23, 109, and 117 firm-year observations, respectively. These four countries represent 0.97% of the total sample size. In contrast, the United States (8486 firm-year observations, 30.54% of the total sample size) and Japan (4407 firm-year observations, 15.68% of the total sample size) are the most represented countries in the sample. To check for biased results due to the high representation of these two countries in the sample, a robustness test is conducted by excluding firms listed in the United States, Japan, and in both countries from the sample.

Religiosity data are obtained from WVS, specifically data from waves 5, 6, and 7, covering the period from 2005 to 2020. ESG performance observations are obtained from the Refinitiv database, while ESG disclosure are obtained from Bloomberg. Data related to control variables (*SIZE*, *ROA*, *LEV*, *Growth*, *ANALYST*, *B-SIZE*, *B-indep*, *CSR-presence*) are obtained from the Refinitiv database. Data about *QUOTA* are obtained from Marisetty and Prasad (2022). Finally, data for *CORRUPT*, *POP*, *GDP-growth* are obtained from the World Bank open data. To mitigate concerns that outliers might be influential, all continuous variables are winsorised at the 1st and 99th percentiles.

### 3.3 | Research model

The following main model is used to test the relationship between board gender diversity and ESG decoupling, and the moderating role that religiosity has on this relationship. More specifically, we use model (1) to test H1 related to examining the relationship between board gender diversity and ESG decoupling, while H2 related to

**TABLE 1** Sample description

Panel A: Sample selection			
Selection criteria	Firms	Observations	
Start: Listed firms from 45 countries (2005–2019) with ESG data available	5751	49,211	
Less observations of firms:			
Without religiosity data	(712)	(9066)	
Without both ESG performance and ESG disclosure data	(687)	(7290)	
Operating as financial institutions	(450)	(5069)	
Final sample	3902	27,786	
Panel B: Country distribution of firm-year observations			
No	Country	Firm-year observations	Per cent
1	Argentina	21	0.08
2	Australia	1815	6.53
3	Brazil	352	1.27
4	Chile	117	0.42
5	China	1149	4.14
6	Finland	278	1
7	France	943	3.39
8	Germany	903	3.25
9	Hong Kong	1067	3.84
10	Indonesia	267	0.96
11	Italy	264	0.95
12	Japan	4407	15.86
13	Malaysia	340	1.22
14	Mexico	274	0.99
15	Netherlands	276	0.99
16	New Zealand	207	0.74
17	Norway	266	0.96
18	Peru	23	0.08
19	Poland	109	0.39
20	Russia	211	0.76
21	South Korea	801	2.88
22	Spain	363	1.31
23	Sweden	453	1.63
24	Switzerland	494	1.78
25	Taiwan	1057	3.8
26	Thailand	225	0.81
27	Turkey	184	0.66
28	United Kingdom	2434	8.76
29	United States	8486	30.54
Total sample		27,786	100

Note: This table presents firm-year observations distribution as per country. The sample consists of 27,786 firm-year observations over the period 2005 to 2019 (eight industries).

examining the moderating role that religiosity has on the relationship between ESG decoupling and board gender diversity is examined by adding the interaction term *FEMALE\*RELIG* to the model.

$$\begin{aligned}
 ESG-gap_{it} = & \alpha + \beta_1 FEMALE_{it} + \beta_2 RELIG_{it} + \beta_3 SIZE_{it} + \beta_4 ROA_{it} \\
 & + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \beta_7 ANALYST_{it} + \beta_8 B-size_{it} \\
 & + \beta_9 B-indep_{it} + \beta_{10} CSR-presence_{it} + \beta_{11} QUOTA_{it} \\
 & + \beta_{12} ENFORCE_{it} + \beta_{13} CORRUPT_{it} + \beta_{14} GDP-growth_{it} \\
 & + \beta_{15} POP_{it} + \beta_{16} YearEffect_t + \beta_{17} IndustryEffect_i + v_{it}
 \end{aligned}
 \tag{1}$$

Appendix A outlines variables definition and their data sources.

## 4 | EMPIRICAL RESULTS AND DISCUSSIONS

### 4.1 | Descriptive statistics

Summary statistics are reported in Tables 2 and 3. Mean values of ESG decoupling (*ESG-gap*), as per country, are presented in column 1 of Table 2. The table shows that Peru, Spain, and Thailand have the lowest levels of *ESG-gap*, while Taiwan, Chile, and Japan have the highest levels *ESG-gap*. Column 2 of Table 2 shows the mean values of board gender diversity (*FEMALE*) as per country. It shows that Argentina and South Korea are the least to have women sitting on corporate board of directors, while Sweden and Norway have the highest female representation on the corporate board of directors. Furthermore, column 3 of Table 2 shows that China, Sweden, and Japan are among the countries with the lowest religiosity levels, while Brazil, Indonesia, and Malaysia have the highest religiosity levels.

We provide descriptive statistics for the pooled sample in Table 3. The mean value of our main dependent variable, which is ESG decoupling (*ESG-gap*) is 1.824, and the median is 1. The mean value of the main independent variable, which is *FEMALE* is 0.136, and the median is 0.111. Religiosity (*RELIG*) has a mean value of 0.637, and the median is 0.449, which is consistent with prior studies (Abdelsalam et al., 2021; Du et al., 2014, 2016). Furthermore, the mean value of firm size (*SIZE*) is 14.974, and the median is 14.992. The mean value of return on assets (*ROA*) is 0.094, and the median is 0.107. On average, firms exhibit a positive growth (*GROWTH*) of 0.079, while the median is 0.069. Also, firms are, on average, followed by 12 financial analysts (*ANALYST*), while the median is 12, and have, on average, a board of directors' size of 10 members (*B-size*) of which 54% are independent (*B-indep*) directors, while the median is 9 members for *B-size* and 56% for *B-indep*.

Table 4 reports Pearson correlation coefficients between *ESG-gap*, *FEMALE*, *RELIG*, and control variables. Consistent with our expectations, we find a significant negative correlation between *ESG-GAP* and both *FEMALE* and *RELIG*. Moreover, there is a significant negative correlation between *ESG-gap* and control variables, such as *ENFORCE*, *SIZE*, *LEV*, *ANALYST*, *B-indep*, *CSR-presence*, *QUOTA*, and *ENFORCE*. However, *ESG-gap* exhibits a significant positive correlation with *B-size*, *GDP-growth*, *POP*, and *GROWTH*, and an insignificant correlation with *ROA*. The largest correlation is found between *SIZE* and *ANALYST* (.518), and *SIZE* and *B-size* (.514). We calculate the Variance Inflation Factors (VIFs), and the results indicate that multicollinearity does not exist in our analyses.

**TABLE 2** Mean values of ESG decoupling, board gender diversity, and religiosity, as per country

No	Country	(1) <i>ESG-gap</i>	(2) <i>FEMALE</i>	(3) <i>RELIG</i>
1	Argentina	2.053	0.075	0.795
2	Australia	1.586	0.153	0.364
3	Brazil	1.599	0.088	2.266
4	Chile	2.724	0.052	0.485
5	China	2.224	0.108	0.033
6	Finland	1.495	0.274	0.141
7	France	1.536	0.278	0.172
8	Germany	1.673	0.187	0.110
9	Hong Kong	1.774	0.096	0.417
10	Indonesia	1.706	0.064	2.478
11	Italy	1.438	0.218	0.577
12	Japan	2.358	0.032	0.101
13	Malaysia	1.563	0.156	2.771
14	Mexico	1.706	0.072	1.299
15	Netherlands	1.269	0.199	0.281
16	New Zealand	1.490	0.223	0.385
17	Norway	1.392	0.349	0.148
18	Peru	1.150	0.036	0.983
19	Poland	1.936	0.143	0.514
20	Russia	2.335	0.058	0.125
21	South Korea	2.228	0.012	1.398
22	Spain	1.184	0.159	0.257
23	Sweden	1.280	0.302	0.084
24	Switzerland	1.359	0.139	0.173
25	Taiwan	2.936	0.091	0.567
26	Thailand	1.221	0.116	1.384
27	Turkey	1.463	0.093	1.146
28	United Kingdom	1.737	0.171	0.561
29	United States	1.636	0.163	1.027
	Total sample	1.876	0.136	0.637

Note: This table presents the mean values of ESG decoupling, board gender diversity, and religiosity. The sample consists of 27,786 firm-year observations over the period 2005 to 2019 (eight industries). Appendix A outlines variables definition.

### 4.2 | Multivariate tests: Results and discussions

In this section, we examine the relationship between board gender diversity and ESG decoupling. We further examine the moderating effect of religiosity on this relationship. The primary results are reported in Table 5.

#### 4.2.1 | Board gender diversity and ESG decoupling

In this section, we investigate the relationship between board gender diversity and ESG decoupling (*H1*). The results of the main analysis of

Variable	N	25th	Mean	Median	75th	S.D.
<i>ESG-gap</i>	27,786	1	1.824	1	3	1.626
<i>FEMALE</i>	27,786	0	0.136	0.111	0.222	0.130
<i>RELIG</i>	27,786	0.136	0.637	0.449	0.926	0.023
<i>SIZE</i>	27,786	14.039	14.974	14.992	15.976	0.561
<i>ROA</i>	27,769	0.043	0.094	0.107	0.183	1.551
<i>LEV</i>	27,768	0.096	0.240	0.224	0.348	0.335
<i>GROWTH</i>	27,767	-0.028	0.079	0.069	0.169	0.181
<i>ANALYST</i>	27,354	6	13	12	17	0.206
<i>B-size</i>	27,705	8	10	9	12	3.413
<i>B-indep</i>	27,786	0.333	0.544	0.565	0.800	0.275
<i>ENFORCE</i>	27,705	34	44.319	49	56	3.414
<i>CORRUPT</i>	27,705	1.215	1.218	1.381	1.694	0.804
<i>GDP-growth</i>	27,786	1.491	2.293	2.170	2.996	12.145
<i>POP</i>	27,786	17.922	18.546	18.663	19.593	2.313

Note: This table presents descriptive statistics of the continuous variables used in our main analysis. The sample consists of 27,786 firm-year observations over the period 2005 to 2019 (eight industries). All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

H1 are reported in column 1 of Table 5. The coefficient of *FEMALE* is significantly negative at the 5% level ( $\beta = -.20$ ;  $p < .05$ ). This indicates that firms that have more board female directors are likely to engage less in ESG decoupling. This finding is consistent with the upper echelon theory and the gender socialisation theory, which suggest that women have different characteristics, including risk aversion and ethical behaviour, from men as women are sensitive to manipulation and hence avoid ESG decoupling. The finding is also consistent with empirical evidence indicating that high gender-diversified boards are expected to better manage their firms' stakeholders' interests (Nadeem et al., 2020) and improve their ESG performance (McGuinness et al., 2017). Therefore, H1 is accepted.

Regarding control variables presented in column 1 of Table 5, most relationship directions are consistent with our predication. The results show a significant negative relationship between *ESG-gap* and *RELIG*, indicating that more religious firms tend to engage less in ESG decoupling, which is consistent with prior studies that find that firms located in highly-religious communities are less likely to involve in financial misreporting practices (Hilary & Hui, 2009; Callen et al., 2011; McGuire et al., 2012; Dyreng et al., 2012; Du et al., 2014; Kanagaretnam, Lobo, Wang, & Whalen, 2015b). *ANALYST* exhibits a negative a significant negative relationship with *ESG-gap* as firms that have higher visibility and media coverage avoid the increased risk associated with ESG decoupling (Hawn & Ioannou, 2016; García-Sánchez et al., 2021). We also find that firms with a higher ratio of board independence and has a CSR committee tend to engage less in ESG decoupling. This is consistent with prior studies indicating that board independence and the presence of a CSR committee are negatively associated with corporate unethical behaviour (Adhikari et al., 2019; Luo et al., 2020; Marisetty & Prasad, 2022; Zalata et al., 2018).

**TABLE 3** Descriptive Statistics of ESG decoupling, board gender diversity, and religiosity, and control variables

Firms domiciled in a country where a mandatory board gender diversity law engage less in ESG decoupling. *ENFORCE* has a negative a significant negative relationship between *ESG-gap*, indicating that firms located in countries with a high-quality enforcement tend to engage less in ESG decoupling. Results also show positive and significant coefficients of *B-size*, *GDP-growth*, and *POP* show a positive and significant impact on *ESG-gap*. Finally, *SIZE*, *ROA*, *CORRUPT*, and *GROWTH* are found to have no impact on *ESG-gap*.

#### 4.2.2 | The moderating effect of religiosity

In this section, we extend our analysis by examining the moderating role that religiosity has on the relationship between board gender diversity and ESG decoupling (H2). In the previous section, we provide evidence that board gender diversity is negatively associated with ESG decoupling. In this section, we add the interaction term *FEMALE\*RELIG* to our main analysis. The results of testing H2, reported in column 2 of Table 5, show that the interaction term *FEMALE\*RELIG* has a significant positive coefficient ( $\beta = .52$ ;  $p < .01$ ). We interpret this finding as an indication that the impact of board gender diversity on ESG decoupling is relatively strong (weak) in countries with low (high) levels of religiosity. This means that, in the case of countries with low levels of religiosity, the role of women on corporate boards is more important in adjusting the behaviour of managers who decide to engage in ESG decoupling, while it plays a less significant role for countries with high levels of religiosity. We interpret this finding as an indication that religiosity, as an informal institution, plays an important role in framing the gender-based power dynamics in the boardroom by maintaining the imbalanced distribution of power between male



TABLE 4 Pearson correlation matrix

Variables	ESG-gap	FEMALE	RELIG	SIZE	ROA	LEV	GROWTH	ANALYST	B-size	B-indep	CSR-presence	QUOTA	ENFORCE	CORRUPT	GDP-growth
FEMALE	-.115***														
RELIG	-.050***	-.008													
SIZE	-.015**	.038***	-.088***												
ROA	-.006	.029***	.037***	.116***											
LEV	-.028***	.048***	.088***	.240***	-.026***										
GROWTH	.014**	-.048***	.008	-.026***	.267***	-.072***									
ANALYST	-.120***	.129***	.035***	.518***	.116***	.001	-.013**								
B-size	.042**	-.007	-.131***	.514***	.047***	.118***	-.041***	.232***							
B-indep	-.103***	.254***	.149***	-.080***	-.006	.043***	-.013**	.049***	-.093***						
CSR-presence	-.041**	.097***	.025***	.066***	.011*	.020***	-.014**	.055***	.033***	.008					
QUOTA	-.050***	.204***	-.263***	.129***	.029***	-.019***	-.030***	.062***	.145***	-.049***	.020***				
ENFORCE	-.152***	.283***	.097***	-.199***	-.034***	.013**	.028***	.011*	-.186***	.280***	.057***	-.158***			
CORRUPT	-.064***	.215***	-.422***	-.135***	-.030***	-.069***	-.024***	-.024***	-.056***	.154***	.012**	.191***	.495***		
GDP-growth	.060***	-.001	.108***	-.063***	.035***	-.015**	.096***	-.045***	-.103***	-.035***	-.026***	-.145***	-.251***	-.335***	
POP	.097***	-.117***	.224***	.033***	-.012**	.028***	.035***	-.101***	.061***	.028***	-.024***	-.252***	-.039***	-.366***	.295***

Note: This table presents correlation coefficients of the variables used in our main analysis. The sample consists of 27,786 firm-year observations over the period 2005 to 2019 (8 industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

and female directors that is in favour of men (Chizema et al., 2015; Woodhead, 2006). This finding is also consistent with the view that individuals in countries with higher levels of religiosity tend to adopt views supporting traditional gender roles between men and women (Lindsey, 2005), suggesting a less influential role for female directors in such settings (e.g., Burgess & Fallon, 2003; Ridgeway, 2006; Singh et al., 2008; Torchia et al., 2011). Therefore, H2 is accepted.

Regarding control variables presented in column 2 of Table 5, the coefficients have a similar sign and significance level to the analysis presented in column 1 of Table 5. We find *ANALYST*, *B-indep*, *CSR-presence*, *QUOTA*, and *ENFORCE* have significant negative relationships with *ESG-gap*. *B-size*, *GDP-growth*, and *POP* show a positive and significant impact on *ESG-gap*. Finally, *SIZE*, *ROA*, *CORRUPT*, and *GROWTH* are found to have no impact on *ESG-gap*.

**TABLE 5** The relationship between ESG decoupling, board gender diversity, and religiosity

	(1) <i>ESG-gap</i>	(2) <i>ESG-gap</i>
<i>FEMALE</i>	−0.20** (−2.20)	−0.65*** (−5.28)
<i>RELIG</i>	−0.13*** (−5.97)	−0.22*** (−7.99)
<i>FEMALE*RELIG</i>		0.52*** (5.33)
<i>SIZE</i>	−0.012 (−1.27)	−0.014 (−1.45)
<i>ROA</i>	−0.038 (−1.09)	−0.040 (−1.17)
<i>LEV</i>	−0.20*** (−3.40)	−0.20*** (−3.28)
<i>GROWTH</i>	0.067 (1.29)	0.070 (1.36)
<i>ANALYST</i>	−0.024*** (−15.4)	−0.024*** (−15.2)
<i>B-size</i>	0.010*** (3.03)	0.0096*** (2.78)
<i>B-indep</i>	−0.32*** (−7.60)	−0.30*** (−7.10)
<i>CSR-presence</i>	−0.20*** (−3.30)	−0.19*** (−3.17)
<i>QUOTA</i>	−0.097*** (−3.33)	−0.082*** (−2.80)
<i>ENFORCE</i>	−0.014*** (−12.5)	−0.015*** (−12.7)
<i>CORRUPT</i>	0.031 (1.62)	0.019 (0.96)
<i>GDP-growth</i>	0.012* (1.91)	0.013** (2.17)
<i>POP</i>	0.11*** (12.8)	0.099*** (11.2)
<i>INTERCEPT</i>	1.54*** (6.90)	1.82*** (7.96)
<i>N</i>	26,176	26,176
Adj. R <sup>2</sup>	.061	.062
Year dummies	Yes	Yes
Industry dummies	Yes	Yes

Note: This table reports the results of testing the relationship between ESG decoupling and board gender diversity. The analysis of the relationship between ESG decoupling (*ESG-gap*) and board gender diversity is presented in column 1, and the interaction term *FEMALE\*RELIG* is added to the analysis in column 2. The sample contains 26,176 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. *t* statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

## 5 | ADDITIONAL AND ROBUSTNESS TESTS

### 5.1 | Addressing endogeneity

To address endogeneity concerns, we conduct two tests. First, we employ the two-stage least squares (2SLS) to the main model. We construct two instrumental variables that we expect to affect board gender diversity. The first instrumental variable is the industry mean of the percentage of females on a firm's board of directors (*FEMALE-ind-mean*). Prior studies suggest that firms in the same industry have a similar proportion of female directors at the industry level. Therefore, the appointment of female directors may depend on the industry instead of firm-level factors (Compton et al., 2019; Wang & Zhang, 2020). It is assumed that *FEMALE-ind-mean* is exogenous because the industry mean of the percentage of females on a firm's board of directors is not expected to have any relationship with a firm's decision to engage in ESG decoupling. The second instrument we use is the percentage of female residents in the country (*FEMALE-pop*). The rationale for using *FEMALE-pop* is that firms are expected to recruit more qualified female directors if they are located in countries with a high female resident ratio. Additionally, it is unlikely that *FEMALE-pop* would affect the level of firms' ESG decoupling.

The first-stage estimation results are reported in column 1 of Table 6. In stage 1, the dependent variable is *FEMALE*, and explanatory variables include the two instrumental variables *FEMALE-ind-mean* and *FEMALE-pop*, as well as the same control variables in model 1. Both instrumental variables have significant positive relationships with board gender diversity at the 1% level. This indicates that a firm has a higher percentage of females on the board of directors if its industry mean of the percentage of females on a firm's board of directors increases and the percentage of female residents in the country where the firm is domiciled is greater. The second-stage estimates are reported in column 2 where the dependent variable is *ESG-gap*. Results show that *FEMALE* is significantly and negatively related to *ESG-gap* at the 1% level ( $\beta = -1.423$ ;  $p < .01$ ). This result is in line with our main analysis results, implying that board gender diversity is more likely to deter managers from engaging in ESG decoupling. This also suggests that our main results are not unduly influenced by omitted variable bias.

The second test we use to address endogeneity concerns is the propensity score matching method. Propensity score matching is used to ensure that the results are not driven by firm-specific factors and to control for differences in characteristics between firms with female directors on the board (treatment group) and firms with no female directors (control group). The matched sample is chosen according to the year, the industry, and the nearest-neighbour technique, which consists of choosing the firm having female directors that is closest in terms of the probability of firms with no female directors (that is, its propensity score) and match with replacement at a calliper distance of .05. This probability is calculated using a logit model where the presence of female directors on the board represents the dependent variable, and all the control variables in our primary model (1) represent

**TABLE 6** The relationship between ESG decoupling, board gender diversity, and religiosity using IV-2SLS

	Instrumental variable two-stage least squares (IV-2SLS) approach	
	Stage 1 FEMALE	Stage 2 ESG-gap
FEMALE-pop	0.098*** (4.35)	
FEMALE-ind-mean	0.951*** (105.91)	
FEMALE		-1.423*** (-10.21)
RELIG	0.001 (0.78)	-0.079*** (-3.68)
SIZE	0.006*** (11.81)	-0.005 (-0.59)
ROA	0.006*** (3.10)	-0.006 (-0.20)
LEV	-0.013*** (-3.81)	-0.227*** (-3.83)
GROWTH	-0.018*** (-6.39)	0.035 (0.70)
ANALYST	0.001*** (8.07)	-0.019*** (-12.79)
B-size	0.001*** (4.91)	0.018*** (5.31)
B-indep	0.011*** (4.45)	-0.243*** (-5.66)
CSR-presence	0.024*** (6.83)	-0.151** (-2.45)
QUOTA	-0.003** (-2.26)	-0.170*** (-6.07)
ENFORCE	0.001*** (3.82)	-0.014*** (-12.43)
CORRUPT	0.005*** (4.29)	0.108*** (5.89)
GDP-growth	0.001 (1.30)	0.011** (2.42)
POP	-0.002*** (-3.72)	0.086*** (10.52)
INTERCEPT	-0.192*** (-9.26)	1.390*** (7.26)
N	26,176	26,176
Partial R <sup>2</sup>	.3735	
Adj. R <sup>2</sup>		.0487
F statistics	49.08***	
Cragg-Donald Wald F statistic (Weak identification test)	5892.09	
Stock and Yogo (2005) ID test for critical values: 10% maximal IV	19.93	
Anderson canon. corr. LM statistic for underidentification test	8134.10***	
Year dummies	Yes	Yes
Industry dummies	Yes	Yes

Note: This table reports the results of the robustness test of our main findings on the relationship between ESG decoupling and board gender diversity to problems related to omitted variable bias. The sample consists of 26,176 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. *t* statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

the independent variables. Finally, we rerun our main regressions using the matched samples. Results are reported in columns 2 and 3 of Table 7. The results are consistent with our main findings indicating that they are robust to the propensity score matching method.

## 5.2 | Alternative measures of gender diversity

In our main analysis, we use the percentage of female directors on the board in a listed company (*FEMALE*) to measure board gender diversity, and we find that *FEMALE* has a significant negative relationship with ESG decoupling, and that religiosity plays a moderating role in this relationship. In this section, we use alternative measures of board gender diversity, namely, gender diversity of the CSR committee (*FEMALE-CSR*), Blau's (1977) diversity index (*BLAU*), and finally, female

power in a firm's board of directors (*FEMALE-power3*). Table 8 reports the results of testing the relationship between *ESG-gap* and the three alternative measures. Columns 1 and 2 of Table 8 show that *FEMALE-CSR* has a significant negative relationship with ESG decoupling. However, we find a positive but insignificant coefficient for *FEMALE-CSR\*RELIG*, indicating that religiosity does not have a moderating impact on the association between the gender diversity of the CSR committee and ESG decoupling. For Blau's (1977) diversity index, results presented in columns 3 and 4 of Table 8 show similar results to *FEMALE*. We find a significant relationship between *BLAU* and *ESG-gap*, and a significant positive coefficient for *BLAU\*RELIG*, indicating that board gender diversity is more important in countries with low religiosity. Moreover, results for female power in a firm's board of directors (*FEMALE-power3*) are presented in columns 5 and 6 of Table 8. In column 5, we find that *FEMALE-power3* has no impact on

**TABLE 7** The relationship between ESG decoupling, board gender diversity, and religiosity using a propensity score matched sample

	(1) Logit (NoFEMALE) prediction model	One-to-one matched sample analysis	
		(2) ESG-gap	(3) ESG-gap
FEMALE		-0.45*** (-2.64)	-0.93*** (-3.52)
RELIG	0.56*** (16.4)	-0.25*** (-6.46)	-0.31*** (-6.65)
			0.77** (2.37)
SIZE	0.090*** (5.96)	-0.053*** (-3.24)	-0.054*** (-3.31)
ROA	0.49*** (8.34)	0.019 (0.30)	0.020 (0.32)
LEV	0.71*** (7.21)	-0.052 (-0.50)	-0.040 (-0.38)
GROWTH	-0.75*** (-8.90)	0.0016 (0.017)	-0.00024 (-0.0026)
ANALYST	0.030*** (11.8)	-0.029*** (-10.2)	-0.029*** (-10.1)
B-size	0.14*** (25.2)	0.027*** (4.29)	0.026*** (4.14)
B-indep	1.25*** (20.8)	-0.22*** (-3.04)	-0.22*** (-3.06)
CSR-presence	0.95*** (7.21)	-0.20 (-1.09)	-0.19 (-1.03)
QUOTA	0.53*** (11.0)	-0.060 (-1.02)	-0.063 (-1.07)
ENFORCE	0.056*** (32.9)	-0.019*** (-9.40)	-0.019*** (-9.40)
CORRUPT	0.52*** (18.3)	0.055 (1.57)	0.052 (1.49)
GDP-growth	0.22*** (23.7)	0.019* (1.80)	0.019* (1.80)
POP	-0.042*** (-3.15)	0.11*** (7.57)	0.11*** (7.47)
INTERCEPT	-8.35*** (-23.5)	2.22*** (4.79)	2.31*** (4.97)
N	26,176	9114	9114
Pseudo R <sup>2</sup>	.220		
Adj. R <sup>2</sup>		.076	.076
Year dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes

Note: This table reports the results of the robustness test of our main findings on the relationship between ESG decoupling and board gender diversity using a matched sample based on the propensity of nonfemale board of directors. Column 1 presents results of the probit regression used to calculate propensity scores. The analysis of the relationship between ESG decoupling (*ESG-gap*) and board gender diversity (*FEMALE*) is presented in column 2, while the interaction term board gender diversity *FEMALE\*RELIG* is added to the analysis in column 3. The size of the one-to-one matched sample consists of 9114 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. *t* statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

ESG decoupling. However, in column 6, after adding the interaction term *FEMALE-power3\*RELIG* to the model, we find that *FEMALE-power3* has a significant negative relationship with *ESG-gap* while *FEMALE-power2* (when a firm has only two or more female directors on the board) shows no impact on ESG decoupling. Consistent with our main findings, we find *FEMALE-power3\*RELIG* to show a positive and significant coefficient, indicating that the critical mass of 3 women on boards has its impact on ESG decoupling more obvious in countries with low religiosity.

### 5.3 | Type of ESG decoupling (greenwashing versus brownwashing)

In our main analysis, ESG decoupling (*ESG-gap*) is measured as the absolute difference between ESG performance and ESG disclosure. This measure does not differentiate between the two types of ESG decoupling, namely, greenwashing or brownwashing. In this section,

we examine whether the relationship between board gender diversity and ESG decoupling differs between greenwashing and brownwashing. On the one hand, corporate managers may decide to engage in greenwashing in response to pressures from different groups of stakeholders if their ESG performance is poor. On the other hand, brownwashing could be used when managers are concerned about the investors adversely reactions to the high costs of ESG performance, so they decide to devalue their actual ESG performance (Eliwa et al., 2021; Kim & Lyon, 2014).

To test the relationship between board gender diversity and the different types of ESG decoupling, we create two subsamples: (1) Firms engaged in greenwashing, identified as firms that have ESG disclosure scores that is higher than their ESG performance scores; and (2) firms engaged in brownwashing, identified as firms that have ESG performance score that is higher than its ESG disclosure score. Our results, presented in columns 1 and 2 of Table 9, show a negative and significant relationship between *FEMALE* and greenwashing only ( $\beta = -.45$ ;  $p < .01$ ). This finding is supported by the coefficients of the

**TABLE 8** The relationship between ESG decoupling, board gender diversity, and religiosity using alternative measures of diversity

	FEMALE-CSR		BLAU		FEMALE-power	
	(1) ESG-gap	(2) ESG-gap	(3) ESG-gap	(4) ESG-gap	(5) ESG-gap	(6) ESG-gap
FEMALE-CSR	-0.90*** (-2.13)	-1.34** (-2.03)				
FEMALE-CSR*RELIG		0.89 (0.87)				
BLAU			-0.23*** (-3.30)	-0.55*** (-5.69)		
BLAU*RELIG				0.27*** (4.78)		
FEMALE-power3					0.023 (0.76)	-0.094** (-2.13)
FEMALE-power2					0.0033 (0.12)	0.0048 (0.18)
FEMALE-power3*RELIG						0.019*** (3.63)
RELIG	-0.12*** (-5.56)	-0.12*** (-5.61)	-0.13*** (-5.83)	-0.22*** (-7.54)	-0.13*** (-5.77)	-0.15*** (-6.56)
SIZE	0.026*** (2.73)	0.026*** (2.73)	-0.011 (-1.21)	-0.013 (-1.37)	-0.012 (-1.29)	-0.013 (-1.41)
ROA	-0.018 (-0.53)	-0.018 (-0.54)	-0.035 (-1.02)	-0.037 (-1.08)	-0.041 (-1.18)	-0.043 (-1.24)
LEV	-0.22*** (-3.74)	-0.22*** (-3.74)	-0.20*** (-3.36)	-0.19*** (-3.26)	-0.21*** (-3.49)	-0.20*** (-3.43)
GROWTH	0.0063 (0.12)	0.0067 (0.13)	0.063 (1.21)	0.066 (1.27)	0.081 (1.57)	0.082 (1.58)
ANALYST	-0.021*** (-13.8)	-0.021*** (-13.8)	-0.024*** (-15.3)	-0.024*** (-15.0)	-0.025*** (-15.7)	-0.024*** (-15.5)
B-size	0.012*** (3.57)	0.012*** (3.57)	0.011*** (3.15)	0.010*** (2.91)	0.0099*** (2.79)	0.010*** (2.83)
B-indep	-0.33*** (-8.09)	-0.33*** (-8.09)	-0.31*** (-7.40)	-0.29*** (-6.97)	-0.34*** (-8.18)	-0.32*** (-7.72)
CSR-presence	-0.42*** (-19.1)	-0.42*** (-19.1)	-0.20*** (-3.23)	-0.19*** (-3.14)	-0.21*** (-3.51)	-0.21*** (-3.41)
QUOTA	-0.057** (-1.97)	-0.056* (-1.94)	-0.094*** (-3.23)	-0.081*** (-2.79)	-0.11*** (-3.63)	-0.091*** (-3.13)
ENFORCE	-0.018*** (-15.8)	-0.018*** (-15.8)	-0.014*** (-12.1)	-0.014*** (-12.2)	-0.015*** (-12.9)	-0.015*** (-13.1)
CORRUPT	0.056*** (2.89)	0.055*** (2.87)	0.034* (1.77)	0.022 (1.11)	0.042** (2.18)	0.039** (2.02)
GDP-growth	0.0032 (0.53)	0.0032 (0.54)	0.013** (2.11)	0.015** (2.42)	0.011* (1.86)	0.012* (1.93)
POP	0.10*** (11.8)	0.100*** (11.7)	0.11*** (12.8)	0.099*** (11.2)	0.12*** (13.5)	0.11*** (12.9)
INTERCEPT	1.37*** (6.19)	1.38*** (6.22)	1.51*** (6.77)	1.78*** (7.73)	1.49*** (6.62)	1.59*** (6.99)
N	26,176	26,176	26,176	26,176	26,003	26,003
Adj. R <sup>2</sup>	.074	.074	.061	.062	.060	.061
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of testing the relationship between ESG decoupling and alternative measures of board gender diversity. Columns 1 and 2 show the results of using gender diversity of the corporate social responsibility committee (FEMALE-CSR). Columns 3 and 4 show the results of using the Blau index of diversity (BLAU). Columns 5 and 6 show the results of using the power of female in the board of directors (FEMALE-power3). The sample ranges between 26,176 and 26,003 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. t statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

interaction term *FEMALE\*RELIG* that is added to the analysis to examine whether the type of ESG decoupling (greenwashing and brownwashing) influences the significance of the impact of board gender diversity on the gap in the presence of the moderating effect of religiosity. Results, presented in columns 3 and 4 of Table 9, show a significant moderating effect of *RELIG* on the relationship between *FEMALE* and greenwashing, while this moderating effect does not exist in the case of brownwashing. These results indicate that the impact of board gender diversity on the type of ESG decoupling is more significant for countries where there is low religiosity.

## 5.4 | ESG decoupling of controversial industry sectors

Controversial industry sectors are usually characterised by social taboos, political pressures, and moral debates, including sinful industry sectors, such as tobacco, alcohol, and gambling, along with industry sectors engaged in emerging environmental, social, or ethical issues, such as weapons, cement, nuclear, biotech and oil (Cai et al., 2012; Conte et al., 2022). We argue that corporate motives to engage in ESG decoupling are greatly intensified for companies in controversial

**TABLE 9** The relationship between ESG decoupling type (greenwashing/brownwashing), board gender diversity, and religiosity

	(1) ESG-gap Greenwashing	(2) ESG-gap Brownwashing	(3) ESG-gap Greenwashing	(4) ESG-gap Brownwashing
FEMALE	-0.45*** (-3.66)	0.75*** (5.79)	-0.82*** (-4.97)	0.55*** (2.87)
RELIG	-0.23*** (-8.14)	0.21*** (5.89)	-0.30*** (-8.47)	0.18*** (3.79)
FEMALE*RELIG			0.73*** (3.36)	0.32 (1.40)
SIZE	0.0018 (0.14)	0.056*** (3.86)	-0.0010 (-0.082)	0.056*** (3.85)
ROA	-0.0067 (-0.13)	-0.021 (-0.44)	-0.0097 (-0.19)	-0.022 (-0.46)
LEV	-0.22*** (-2.71)	-0.0049 (-0.056)	-0.21*** (-2.63)	-0.0032 (-0.037)
GROWTH	0.056 (0.78)	0.092 (1.22)	0.058 (0.82)	0.093 (1.23)
ANALYST	-0.020*** (-9.71)	-0.019*** (-7.69)	-0.019*** (-9.46)	-0.019*** (-7.68)
B-size	0.011** (2.53)	-0.022*** (-3.84)	0.010** (2.37)	-0.022*** (-3.87)
B-indep	-0.37*** (-6.84)	-0.018 (-0.27)	-0.35*** (-6.55)	-0.0091 (-0.13)
CSR-presence	-0.0070 (-0.079)	-0.20** (-2.15)	0.0031 (0.035)	-0.20** (-2.14)
QUOTA	0.0051 (0.13)	-0.17*** (-3.74)	0.016 (0.43)	-0.17*** (-3.57)
ENFORCE	-0.026*** (-17.6)	-0.0031 (-1.61)	-0.026*** (-17.8)	-0.0032* (-1.65)
CORRUPT	0.042 <sup>†</sup> (1.75)	0.062 <sup>†</sup> (1.88)	0.029 (1.19)	0.058 <sup>†</sup> (1.76)
GDP-growth	0.0013 (0.17)	0.017 (1.61)	0.0026 (0.34)	0.018 <sup>†</sup> (1.67)
POP	0.099*** (8.96)	0.060*** (4.36)	0.090*** (7.93)	0.055*** (3.87)
INTERCEPT	2.37*** (7.62)	0.57 <sup>†</sup> (1.70)	2.63*** (8.20)	0.68** (1.98)
N	12,810	7840	12,810	7840
Adj. R <sup>2</sup>	.121	.057	.122	.057
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes

Note: This table reports the results of testing the relationship between the type of ESG decoupling (greenwashing/brownwashing) and board gender diversity. The analysis of the relationship between ESG decoupling (*ESG-gap*) and board gender diversity (*FEMALE*) is presented in columns 1 and 2, while the interaction term *FEMALE\*RELIG* is added to the analysis in columns 3 and 4. The sample ranges between 12,810 and 7840 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. *t* statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

industry sectors, whose business activities often inherently contradict the social and ecological interests of society. This growing stakeholders' demand and pressure for more ESG practices and the urgency for seeking legitimacy could push these firms to adopt more active ESG disclosure strategies to distinguish themselves from competitors. However, it is not clear whether these firms have a wider ESG performance-disclosure gap compared to firms operating in noncontroversial industries. Therefore, in this subsection, we investigate whether there are differences in the relationship between board gender diversity and ESG decoupling in two types of industry sectors, controversial and noncontroversial industry sectors.

To examine the relationship between board gender diversity and ESG decoupling, we create two sub-samples: (1) Firms operating in a controversial industry sector; and (2) operating in a noncontroversial industry sector. Our results, presented in columns 1 and 2 of Table 10, show that there is no significant difference between firms operating in controversial industry sectors and firms operating in noncontroversial industry sectors in their tendency to engage in ESG decoupling. This means that the mitigating effect of religiosity on decoupling is the same for firms operating in controversial industry

sectors compared to firms operating in noncontroversial industry sectors.

## 5.5 | Individual proxies of religiosity

In the main analysis, religiosity (*RELIG*) is measured as the first principal component of the three individual dimensions, namely, *REL\_IMP*, *REL\_MEMB*, and *REL\_SERV*. In this regard, we employ additional tests to check the robustness of our main findings for a negative and significant relationship with religiosity on ESG decoupling and use the individual proxies of *RELIG* as alternative measures of religiosity. These additional analyses are reported in Table 11, in which all individual components have significant negative relationships with ESG decoupling at the 1% level. Furthermore, the interaction term *FEMALE\*RELIG* of the three measures presented in columns 2, 4, and 6 of Table 11 are all positive and statistically significant at the 1% level. Overall, the results shown in Table 11 are consistent with our main findings that firms located in countries with higher religiosity tend to engage less in ESG decoupling.

**TABLE 10** The relationship between ESG decoupling of controversial industry sectors, board gender diversity, and religiosity

	(1) ESG-gap (controversial)	(2) ESG-gap (noncontroversial)
FEMALE	-0.97*** (-2.80)	-0.53*** (-4.08)
RELIG	-0.27*** (-3.62)	-0.21*** (-7.04)
FEMALE*RELIG	1.00** (2.51)	0.52*** (5.49)
SIZE	0.14*** (5.19)	0.0045 (0.44)
ROA	-0.040 (-0.48)	-0.043 (-1.14)
LEV	-0.60*** (-3.57)	-0.19*** (-3.03)
GROWTH	0.059 (0.44)	0.0021 (0.037)
ANALYST	-0.026*** (-5.53)	-0.020*** (-12.3)
B-size	-0.023* (-1.95)	0.015*** (4.25)
B-indep	-0.37*** (-3.10)	-0.28*** (-6.34)
CSR-presence	-0.33*** (-4.72)	-0.44*** (-18.7)
QUOTA	0.14 (1.62)	-0.061** (-1.98)
ENFORCE	-0.012*** (-3.26)	-0.020*** (-15.9)
CORRUPT	0.26*** (4.45)	0.018 (0.85)
GDP-growth	0.041** (2.22)	-0.00029 (-0.044)
POP	0.085*** (2.99)	0.088*** (9.46)
INTERCEPT	-1.20* (-1.74)	2.10*** (8.64)
N	2874	23,302
Adj. R <sup>2</sup>	.071	.080
Year dummies	Yes	Yes
Industry dummies	Yes	Yes

Note: This table reports the results of testing the relationship between ESG decoupling and board gender diversity for firms operating in controversial industry sectors (presented in column 1), and firms operating in in noncontroversial industry sectors (presented in column 2). The sample size ranges between 23,302 and 2874 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. *t* statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

**TABLE 11** The relationship between ESG decoupling, board gender diversity, and individual proxies of religiosity

	REL-IMP analysis		REL-MEMB analysis		REL-SERV analysis	
	(1) ESG-gap	(2) ESG-gap	(3) ESG-gap	(4) ESG-gap	(5) ESG-gap	(6) ESG-gap
FEMALE	-0.12 (-1.34)	-1.81*** (-8.81)	-0.028 (-0.30)	-2.20*** (-9.47)	-0.20** (-2.20)	-0.68*** (-5.36)
RELIG	-0.0043*** (-7.58)	-0.0082*** (-11.6)	-0.0064*** (-10.0)	-0.011*** (-14.1)	-0.014*** (-5.97)	-0.023*** (-7.99)
FEMALE*RELIG		0.038*** (9.14)		0.048*** (10.2)		0.086*** (5.33)
SIZE	-0.015 (-1.55)	-0.018* (-1.90)	-0.017* (-1.83)	-0.022** (-2.40)	-0.012 (-1.27)	-0.014 (-1.45)
ROA	-0.034 (-0.98)	-0.031 (-0.91)	-0.027 (-0.78)	-0.020 (-0.59)	-0.038 (-1.09)	-0.040 (-1.17)
LEV	-0.18*** (-2.99)	-0.16*** (-2.70)	-0.16*** (-2.76)	-0.15** (-2.48)	-0.20*** (-3.40)	-0.20*** (-3.28)
GROWTH	0.062 (1.20)	0.064 (1.23)	0.057 (1.09)	0.060 (1.16)	0.067 (1.29)	0.070 (1.36)
ANALYST	-0.024*** (-15.3)	-0.024*** (-15.1)	-0.024*** (-15.3)	-0.024*** (-15.5)	-0.024*** (-15.4)	-0.024*** (-15.2)
B-size	0.012*** (3.53)	0.010*** (2.97)	0.011*** (3.31)	0.0098*** (2.87)	0.010*** (3.03)	0.0096*** (2.78)
B-indep	-0.27*** (-6.40)	-0.24*** (-5.62)	-0.22*** (-4.97)	-0.20*** (-4.55)	-0.32*** (-7.60)	-0.30*** (-7.10)
CSR-presence	-0.19*** (-3.16)	-0.18*** (-2.95)	-0.18*** (-2.95)	-0.17*** (-2.78)	-0.20*** (-3.30)	-0.19*** (-3.17)
QUOTA	-0.11*** (-3.73)	-0.088*** (-3.01)	-0.12*** (-4.04)	-0.098*** (-3.36)	-0.097*** (-3.33)	-0.082*** (-2.80)
ENFORCE	-0.014*** (-12.4)	-0.015*** (-12.9)	-0.013*** (-11.5)	-0.014*** (-11.8)	-0.014*** (-12.5)	-0.015*** (-12.7)
CORRUPT	0.039** (2.15)	0.038** (2.12)	0.044** (2.53)	0.053*** (3.04)	0.031 (1.62)	0.019 (0.96)

(Continues)

TABLE 11 (Continued)

	REL-IMP analysis		REL-MEMB analysis		REL-SERV analysis	
	(1) ESG-gap	(2) ESG-gap	(3) ESG-gap	(4) ESG-gap	(5) ESG-gap	(6) ESG-gap
GDP-growth	0.012** (1.99)	0.021*** (3.34)	0.0052 (0.84)	0.015** (2.41)	0.012* (1.91)	0.013** (2.17)
POP	0.12*** (13.5)	0.098*** (11.1)	0.12*** (14.2)	0.11*** (12.4)	0.11*** (12.8)	0.099*** (11.2)
INTERCEPT	1.47*** (6.63)	1.98*** (8.65)	1.43*** (6.43)	1.91*** (8.44)	1.55*** (6.93)	1.83*** (7.99)
N	26,176	26,176	26,176	26,176	26,176	26,176
Adj. R <sup>2</sup>	.062	.065	.064	.067	.061	.062
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the results of the robustness test of our main findings on the relationship between ESG decoupling and board gender diversity by using individual proxies of religiosity. The analysis of the relationship between ESG decoupling (ESG-gap) and board gender diversity (FEMALE) is presented in columns 1, 3, and 5. The interaction term FEMALE\*RELIG is added to the analysis in columns 2, 4, and 6. The sample consists of 26,176 firm-year observations over the period 2005 to 2019 (eight industries). Values with asterisks \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively. *t* statistics in parentheses and italics. All continuous variables are winsorised at the first and 99th percentiles. Appendix A outlines variables definition.

## 6 | CONCLUSION

Our study aims to examine whether board gender diversity mitigates ESG decoupling and the moderating role that religiosity plays in this relationship. Using a large international sample, our empirical results show that firms with more female directors on their boards tend to engage less in ESG decoupling. This finding is consistent with the upper echelon theory and the gender socialisation theory in that board gender diversity not only improves firms' ESG practices but also mitigates the managerial opportunistic behaviour related to it, such as ESG decoupling. Therefore, we extend the empirical evidence on the role that female directors may play in the boardrooms. These results are particularly important in supporting the importance of appointing female directors as a means to improve ethical decisions related to ESG issues. Furthermore, we examine the moderating effect of informal institutions in shaping firms' outcomes by showing that religiosity plays a central role in the relationship between board gender diversity and ESG decoupling. Specifically, the impact of board gender diversity on ESG decoupling is stronger for firms located in countries with a low level of religiosity. These findings confirm the importance of addressing the interplay between informal institutions and corporate governance mechanisms to better understand corporate behaviour (Isidro et al., 2020; Zattoni et al., 2020). This finding is also consistent with prior studies indicating that individuals in countries with higher levels of religiosity tend to adopt views supporting traditional gender roles between men and women (Lindsey, 2005), suggesting a less influential role for female directors in such settings (e.g., Burgess & Fallon, 2003; Ridgeway, 2006; Singh et al., 2008; Torchia et al., 2011).

Our study contributes to the CSR literature by emphasising the significant effect of board gender diversity on ESG decoupling. Furthermore, our study contributes to the understanding of the institutional effect of religiosity on the relationship between board gender diversity and ESG decoupling. This contribution has strong implications for various stakeholders, including policymakers, governments,

practitioners, and academics. Policymakers and governments are responsible for board composition policies, laws and regulations. While 21% of our total sample is represented by countries that have a mandatory board gender diversity law issued, the remaining 79% of the sample is represented by countries that have no female directors' quotas. Therefore, our finding provides additional insights to the importance of improving gender diversity on boards and may motivate policymakers to mandate board gender diversity quotas. Furthermore, our study can greatly benefit practitioners and academics as it extends the explanation of institutional theory by addressing the interplay between internal corporate governance mechanisms and informal institutions and providing empirical evidence that informal institutions, that is, religion, are likely to moderate the relationship between corporate governance mechanisms represented in board gender diversity and firms' outcomes represented in ESG decoupling.

Our findings have the following limitations that represent avenues for future research. First, future research can examine the impact of "hard law" and "soft law" quotas on the relationship between board gender diversity and ESG decoupling, as these laws vary from country to country. Second, our study focuses solely on gender diversity as a main proxy for board diversity. However, other attributes of board diversity (e.g., age, ethnicity, nationality, financial, and industry expertise) have not been examined in this paper. Thus, future research can contribute to the existing literature by addressing the impact of other attributes of board diversity on ESG decoupling. Third, our study provides evidence on the role of religiosity as an important informal institution in the relationship between board gender diversity and ESG decoupling. However, other informal institutions such as culture and social capital or formal institutions such as national governance and the strength of enforcement systems are also central factors that may affect the relationship between board gender diversity and ESG decoupling. Therefore, future research can examine the role of other institutional factors in this relationship.



## AUTHOR CONTRIBUTIONS

All authors contributed to the study conception and design. Material preparation and data collection and analysis were performed by Yasser Eliwa, Ahmed Aboud, and Ahmed Saleh. The first draft of the manuscript was written by them. All authors read and approved the final manuscript.

## CONFLICT OF INTEREST

The authors have no relevant financial or nonfinancial interests to disclose.

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## APPENDIX A: VARIABLES DEFINITION

Variable	Definition
<b>ESG decoupling (dependent variable)</b>	
<i>ESG-gap</i>	is a measure of ESG performance-disclosure gap, calculated as the absolute difference between the 10-percentile ranked ESG performance score and the 10-percentile ranked ESG disclosure score. Data of ESG performance score are obtained from the Refinitiv database, while ESG disclosure score are obtained from Bloomberg.
<b>Board gender diversity (independent variables)</b>	
<i>FEMALE</i>	is a measure of a firm's board gender diversity, calculated as the percentage of female on the board of directors.
<i>FEMALE-CSR</i>	is a measure of a firm's corporate social responsibility committee gender diversity, calculated as the percentage of female on the corporate social responsibility committee.
<i>BLAU</i>	is an alternative measure of board gender diversity suggested by Blau (1977)
<i>FEMALE-power3</i>	is a measure of female power in a firm's board of directors, calculated as a dummy variable that is equal to 1 when a firm has three or more female directors on the board, 0 otherwise.
<b>Religiosity (moderating variables)</b>	
<i>RELIG</i>	is a measure of religiosity, calculated as the first principal component of <i>REL-IMP</i> , <i>REL-MEMB</i> , and <i>REL-SERV</i> . Data are obtained from the World Values Survey website: <a href="https://www.worldvaluessurvey.org">https://www.worldvaluessurvey.org</a> .
<i>REL-imp</i>	is the percentage of respondents that indicates religion is important to them. Data are obtained from the World Values Survey website: <a href="https://www.worldvaluessurvey.org">https://www.worldvaluessurvey.org</a> .
<i>REL-memb</i>	is the percentage of respondents saying that they are a religious person. Data are obtained from the World Values Survey website: <a href="https://www.worldvaluessurvey.org">https://www.worldvaluessurvey.org</a> .
<i>REL-serv</i>	is the percentage of respondents saying that they attend religious services. Data are obtained from the World Values Survey website: <a href="https://www.worldvaluessurvey.org">https://www.worldvaluessurvey.org</a> .
<b>Firm-level control variables</b>	
<i>SIZE</i>	is a measure of firm size, calculated as the natural logarithm of a firm's total assets. Data are obtained from the Refinitiv database.
<i>ROA</i>	is a measure of profitability, calculated as the net income of a firm deflated by its total assets. Data are obtained from the Refinitiv database.
<i>LEV</i>	is a measure of a firm's level of risk, calculated as the firm's total debt deflated by its total assets. Data are obtained from the Refinitiv database.
<i>GROWTH</i>	is a measure of a firm's financial performance, calculated as the natural logarithm of one plus the growth in book value of equity of a firm over the previous year. Data are obtained from the Refinitiv database.
<i>ANALYST</i>	is a measure of the number of analysts following the firm and representing a firm's degree of external monitoring that influence performance-disclosure gap, calculated as 1-year lag of the number of a firm's 1-year ahead EPS forecast estimates. Data are obtained from the Refinitiv database.
<i>B-size</i>	is a measure a firm's board size, calculated as the number of members included in the board of directors. Data are obtained from the Refinitiv database.
<i>B-indep</i>	is a measure of a firm's board independence, calculated as the ratio of number of nonexecutive independent directors to total board size
<i>CSR-presence</i>	is a measure of the presence of a firm's corporate social responsibility committee, calculated as a dummy variable that is equal to 1 when the firm has a corporate social responsibility committee; 0 otherwise.
<i>CONTRA-ind</i>	a dummy variable that is equal to 1 if a firm is operating in a controversial industry sector; and is equal to 0 if a firm is operating in a noncontroversial industry sector. Based on the Industry Classification Benchmark (ICB) subsector codes, firms in subsector codes 45101010, and 45101015 are alcohol firms. Firms in subsector code 45103010 are tobacco firms. Firms in subsector code 40501020 are gambling firms. Firms in subsector code 50201020 are weapon firms. Firms in subsector code 50101030 are cement firms. Firms in subsector code 45103010 are biotech firms. Firms in subsector codes 55102000, 60101000, 60101010, 60101015, 60101020, 60101030, 60101035, 60101040 are oil, gas, and coal firms.
<b>Macroeconomic control variables</b>	
<i>QUOTA</i>	is a measure of mandatory board gender diversity, calculated as a dummy variable that is equal to 1 when a firm is located in a country where a mandatory board gender diversity law has been issued, 0 otherwise.
<i>ENFORCE</i>	is a measure of the country's enforcement quality, calculated using an index developed by Brown et al. (2014), measuring both the auditing environment quality and the strength of accounting enforcement activity.

(Continues)

Variable	Definition
<i>CORRUPT</i>	is a measure of control of corruption per country. It captures 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. Data are obtained from the World Bank open data website: <a href="https://data.worldbank.org/">https://data.worldbank.org/</a> .
<i>GDP-growth</i>	is a measure of the annual growth rate of the country's GDP. Data are obtained from the World Bank: <a href="https://data.worldbank.org/">https://data.worldbank.org/</a> .
<i>POP</i>	is a measure of the natural logarithm of the country's population. Data are obtained from the World Bank: <a href="https://data.worldbank.org/">https://data.worldbank.org/</a> .

**Instrumental variables:**

<i>FEMALE-pop</i>	is a measure of the percentage of female residents in the country. Data are obtained from the World Bank: <a href="https://data.worldbank.org/">https://data.worldbank.org/</a> .
<i>FEMALE-ind-mean</i>	is a measure of the industry mean of the percentage of female on a firm's board of directors.