The relationship between gender diversity and employee representation at board level and non-financial performance - A cross-country study*

Abstract

This paper examines the relationship between the presence of employee representatives and female directors at the board level and a firm's environmental and corporate social responsibility (CSR) performance. Using an international sample of firms from 23 developed countries between 2001 and 2014, we find evidence that the presence of labor representatives, a higher proportion of women at the board level, and female labor representatives are positively related to CSR and environmental performance. Including an interaction term between female board members and labor representation, we find no substitutional relationship between the two, implying that both jointly foster a firm's CSR performance. Additionally, the effect for gender-diverse firms at the board level is negative when there are fewer than three women on the board, suggesting that three women constitute a critical mass. Given that the discussion around the importance of codetermination and the presence of women at the board level is still controversial in Europe as well as in Anglo-Saxon countries, our study has implications for shareholders, employers, employees and policymakers. Our findings illustrate that the legislation of some non-Anglo-Saxon countries is beneficial and could be introduced in Anglo-Saxon countries where employee representation rights are limited and women are still a minority at the board level.

Keywords: Co-determination ● Two-tier board system ● Gender diversity ● Employee representation ● Environmental performance ● CSR

1 Introduction

"Each type of diversity broadens the scope of action and brings more perspectives to board's attention."[1]

This study examines the relationship between a firm's board[2] composition and its corporate social responsibility (hereafter: CSR) and environmental performance. Early studies on the determinants of a firm's CSR and environmental performance focus on firm-specific characteristics such as financing cost, leverage, information asymmetries and the level of competition (Johnson and Greening, 1999; McWilliams and Siegel, 2000). Recent studies provide evidence that firms' non-financial performance is associated with the unique managerial style of various board members (Cronqvist and Yu, 2017; Kang, 2017). Other studies document that board members' unique managerial style can affect various strategic choices such as tax avoidance (Dyreng et al., 2010), voluntary financial disclosures (Bamber et al., 2010; Brochet et al., 2011; Yang, 2012), and forecasts and language tone in earnings conference calls (Davis et al., 2015). Considerably less is known about how different groups of board members differ in terms of their incentives and their actual contribution to their firm's non-financial performance. In this paper, we shed more light on two groups of board members: female board members and employee representatives. We argue that their distinct attitudes, interests and risk preferences foster non-financial performance at firm level.

Women are known to make different strategic choices than men (Bass and Avolio, 1994; Matsa and Miller, 2013; Oakley, 2000; Terjesen et al., 2009). Empirical evidence for across-gender differences exists in various dimensions. The presence of women on the board or an audit committee leads to more conservative reporting, higher level of social and environmental disclosure, less tax aggressiveness and higher audit fees (Khlif and Achek, 2017). Previous studies also provide evidence that women bring a number of strengths to the board with an increased sensitivity to CSR (Williams, 2003) and participative decision-making styles (Konrad et al., 2008), which contributes to enhanced CSR strength ratings (Bear et al., 2010).[3] Most previous studies that examine the relationship between women directors and CSR or social performance have concluded there is a positive relationship (Bear et al., 2010; Byron and Post, 2016). As a result of decreasing information asymmetries, such a relationship has also been found for environmental and CSR reporting (Bear et al., 2010;

[1] Srinidhi et al., (2011), p. 1611.

[2] Hereafter, we use the term "board" for both the board of directors in one-tier board systems (which consists of supervising and executive managers) and for supervisory boards in two-tier board systems.

[3] For an overview regarding gender issues in accounting research including social and environmental disclosure over the period of 1994-2016, we refer to a literature review by (Khlif and Achek, 2017).

Webb, 2004), especially when the number of female directors equals three or more (e.g., Brewer and Kramer, 1985; Kanter, 1977; Kramer et al., 2006). Firms that engage in more CSR activities build investor confidence as it decreases information asymmetry, as documented by Lopatta et al. (2016). However, the beneficial effect of female board members on sustainability performance could be mainly mechanically driven by the fact that CSR performance measures include a social pillar that already considers gender diversity at board level. We address this issue by focusing not only on CSR performance but also on environmental performance. Neither is it clear whether gender diversity at board level is positively related to CSR and environmental performance beyond the effect of stakeholder diversity, namely codetermination. Therefore, we also consider board level employee representation (hereafter: BLER)[4] and test for interdependences between these two diversity dimensions.

The requirement that at least one third employee representation exists in some member states of the European Organisation for Economic Co-operation and Development (hereafter: OECD), mostly in countries with a two-tier board system where the supervisory board is separated from the managing board (e.g., Germany, Slovenia, Netherlands, Austria and Denmark).[5] These employee representatives enjoy access to information that helps them to take decisions and enables them to participate in firm-specific strategic investments subject to certain criteria. By contrast, in most countries with a one-tier board system, the board comprises supervising and executive managers but no employee representatives. Some countries (such as the United States) eye these employee representation systems with suspicion (Lobel and Lofaso, 2013). Even in Germany, which has the strongest board-level employee representation rights at of all European countries, the number of firms switching from a German to a foreign legal form or relocating their headquarters to circumvent codetermination requirements for efficiency reasons is increasing (Sick and Pütz, 2011). Studies on the economic consequences of codetermination have generally focused on the German setting and on the relationship between labor representation at the board level and financial performance (e.g., Fauver & Fuerst, 2006; Gorton & Schmid, 2000; Kraft & Ugarkovic, 2006; Renaud, 2007) or the impact on corporate financial policies (e.g., Claassen, 2016; Kim et al., 2014; Lopatta et al., 2018). However, the results are not consistent and show either positive, neutral or negative relationships between the presence of labor representatives

[4] In this study, we use the term codetermination or BLER for one third employee representation at supervisory board level in two-tier board systems or at management board level when a one-tier board system applies.

[5] For an overview of country-specific regulations on Board Level Employee Representation, refer to A1 in the appendix.

at the board level and the dependent variables due to the different methodological frameworks, empirical measures and panel data used (Conchon, 2011; Renaud, 2007). To our knowledge, no study has yet tested the effect on non-financial performance, such as a firm's environmental performance. We argue that CSR activities are an important underlying force that moderates the relationship between labor representation at board level and financial performance, which may at least partly explain the ambiguous findings of prior studies. As they have a different risk profile than investors and managers, we expect that employee representatives would accept smaller profits in the short term in order to save their jobs in the long term (Lin et al., 2018).

Lin et al. (2018) suggest that the risk profile of employee representatives is similar to that of debt providers. Due to their asymmetric participation in a firm's profits and losses – e.g., only part participation in profits through variable compensation components but maximum losses due to job losses of all employees in case of bankruptcy – they are keen on reducing risk factors that may put the long-term survival of a firm in danger even if this would mean lower (short-term) profits. From the perspective of employee representatives, lower profits seem tolerable if it helps the firm to survive in the long term. Indeed, risks related to sustainability are known to potentially endanger the long-term survival of a firm (Kim et al., 2014). With the asymmetric profit-loss participation of employees (asymmetrically strong benefit from risk reduction) and a symmetric participation in profit and losses by investors (e.g., unlimited profit and loss participation up to a complete loss of the investment), we expect employee representatives have a higher optimum of CSR performance than shareholders or top executives.

It is important to note that we do not claim that female board members or employee representatives are necessarily better decision-makers when it comes to CSR and environmental performance. However, in line with Srinidhi et al. (2011), we argue that it is the gender and stakeholder diversity of a board that fosters a firm's decision-making process and hence its non-financial performance. In our empirical analysis, we therefore do not estimate individual style effects, but rather approximate the relationship between board-level gender and diversity of stakeholders on the board (e.g., labor representatives) and non-financial performance.

We approximate gender diversity with the proportion of female board members and implement labor representation with an indicator variable that captures whether the company has to comply with a legal requirement, referred to as co-determination, for one-third

employee representatives on boards.[6] Using an international sample of firms from various OECD states between 2001 and 2014, we find evidence that firms with codetermination and a higher proportion of women on the board have better CSR and environmental performance. In our additional analysis, we find that firms have significantly stronger environmental and CSR performance when the number of women on the board is equal to or above three, which extends previous literature in illustrating that such results can also be observed in an international sample and in firms with labor representation.

Indeed, when examining effects of codetermination and gender diversity on CSR performance, firm size, the board member selection procedure or the institutional setting in different countries can cause endogeneity issues. Thus, we implement several mitigation measures. First, we lag all our exogenous variables (quarterly and yearly) throughout all our models (using quarterly and yearly data) to rule out simultaneous reversed effects. Such a model property is common in studies dealing with determinants and consequences of sustainability (Dhaliwal et al., 2011). Second, the employee representation requirement is in most countries linked to specific size criteria such as number of employees. An increase in CSR and environmental performance may be not driven by employee representatives at the overseeing board level, but may rather present a size effect. To separate the effects of labor representatives from the effects of size growth, we also use a matched sample of similar firms applying a propensity score matching of the nearest neighbor within the same industry. Third, we employ the Generalized Method of Moments (hereafter: GMM) estimation to account for the effect of gender diversity as firms that already have strong sustainability and environmental performance may especially recruit women. To ensure that this potential association does not drive our main results, we employ the estimator of Arellano-Bover/Blundell-Bond, which builds on two distinct equations: the original equation (level equation) and an equation where all regressors are differenced (system GMM) (Arellano and Bover, 1995; Blundell and Bond, 1998), which is a common estimation approach when endogeneity may be a potential issue for samples with a short time period but many distinct firms (Lopatta and Kaspereit, 2014; Roodman, 2009). In another specification, we also use female employee representatives as the intersection of gender diversity and employee representatives as our exogenous variable of interest. We furthermore perform sensitivity tests excluding certain OECD states that may cause different results (e.g., nuclear disasters or other CSR and voluntary labor representation). Our main findings hold in all these specifications.

[6] The Organisation for Economic Cooperation and Development (OECD) is a group of 34 member countries that discuss and develop economic and social policy. OECD members are democratic countries that support free market economies.

Our study contributes to research on codetermination and non-financial performance in the following four ways. First, we are the first to investigate the link between employee representation at board level and non-financial performance. Our results suggest that employee representation increases a firm's CSR performance because employee representatives are more risk-averse and primarily concerned about the long-term survival of the firm (Lin et al., 2018).

Second, previous studies that look at the board-level and effects on the non-financial performance focus mostly on specific persons' styles (e.g., CEOs) (Cronqvist and Yu, 2017; Kang, 2017) or the existence of female board members (Bear et al., 2010; Webb, 2004). We extend their findings by providing evidence that it is not only the style of the top executive that shapes a firm's non-financial performance, but also the overall board diversity in different dimensions. We consider the two dimensions of board diversity that we assume to be the strongest drivers for CSR performance: gender diversity and diversity of stakeholder representation at board level (e.g., employee representation). Our results indicate that both gender diversity as well as employee representation at board level foster a firm's non-financial performance. We also include an interaction term between gender diversity and employee representation and find that the interaction term is – depending on the model's specification – either insignificant or economically minor compared to the other two variables of interest. Hence, gender diversity as well as employee representation jointly positively affect CSR and environmental performance beyond the effect of the respective other diversity dimension and do not substitute each other.

Third, previous findings suggesting that the presence of female board members and strong corporate governance enhances non-financial performance, which may merely represent a mechanical effect: CSR performance measures include variables that capture corporate governance and gender diversity at board level. This link makes it impossible to disentangle the effect of female board members on non-financial performance beyond gender diversity and corporate governance. To ensure previous findings are not only driven by this mechanical link, we also employ environmental performance as a dependent variable as gender diversity and corporate governance are not part of this sustainability pillar (usually part of the social and governance/economics pillar). With this alternative measurement approach, we hence mitigate the risk that significant results are caused by the rather mechanical links between CSR on the one hand and social and governance pillars on the other hand.

Fourth, we base our study on a cross-national setting with OECD states that have either one-

tier or two-tier systems, which enables us to compare different institutional backgrounds.[7] Highlighting that the presence of one-third employee representatives and at least three women on the board is positively related to CSR and environmental performance, our study provides new insights for policy-makers and managers regarding codetermination rights, which still vary across countries or do not exist at all in a large number of OECD states (mostly Anglo-Saxon). Our study has an international impact in that our results will be of interest not only to policy-makers but also firms domiciled in various OECD states with varying legal settings that do not consider employee representation or gender diversity to be beneficial to a firm's sustainability performance and reputation.

In the next section, we provide insight into different levels of codetermination rights across OECD states. This is followed by a survey of prior studies on gender diversity, codetermination and CSR performance; our hypothesis development; research design; data analysis; and results. We conclude the paper and provide suggestions for future research.

2 Board level employee representation across OECD states

Unlike in most Anglo-Saxon countries, where a one-tier board system and no board-level employee representation rights apply, in some European countries a two-tier board system is mandatory. Here, the supervisory board of a firm oversees the management board, strict employment protection rules exist, and employees are provided with seats and voting rights at board level. Codetermination rights are strong in Germany (Lopatta et al., 2018) but also exist in other European countries, although the extent of voting rights differs, as does the board system and the priority given to shareholder wealth maximization in corporate governance (Conchon, 2011; Denis and McConnell, 2003; Kim et al., 2017). In this study, we focus on OECD states (e.g., Germany, Slovenia, Netherlands, Austria, Poland, Denmark), where firms have to admit a minimum of one-third employee representatives to boards[8] once certain criteria are fulfilled (ETUI, 2014).[9] For example, German firms have to provide employee representatives with one-third voting rights once the threshold of 500 domestic employees is met (German One-Third Codetermination Act, 2004). This rises to 50 percent once firms have 2,000 domestic employees or more (German Codetermination Act, 1976).[10] A more special

[7] Included countries are marked in A1 in the appendix.

[8] Supervisory board in two tier systems and the management board in one-tier board systems.

[9] For an overview of existing or non-existing codetermination rights in the OECD states included in this study, please refer to Table 1 and A1 in the appendix.

[10] For German firms in the coal, steel and iron industry, the "Montan" Codetermination Act of 1951 applies, which gives employees 50 percent voting rights on supervisory boards once the threshold of 1,000 employees is exceeded.

form of codetermination exists in Sweden (one-tier board system).[11] It is interesting to note that most countries with BLER rights are non-Anglo-Saxon countries, where a two-tier system applies. In a two-tier board system, the management board (consisting of managing directors) and the supervisory board (non-executive directors) are separate (Denis and McConnell, 2003; Tripathi, 2013). The supervisory board functions as a corporate governance mechanism whose key function is to monitor management's actions (Denis & McConnell, 2003).

Most countries without any BLER rights are Anglo-Saxon (e.g., UK, U.S., Canada, New Zealand, Australia, Ireland), with a one-tier board system where the board of directors comprises both managing as well as non-executive or supervising directors (Denis & McConnell, 2003; Tripathi, 2013). Nevertheless, BLER rights are also absent in countries such as Belgium, Estonia, Iceland, Japan, Latvia, Lithuania, South Korea and Switzerland. In some remaining European countries (e.g., Italy, France and Finland) a rather hybrid system exists and firms can choose between a one-tier and a two-tier board system. We exclude states with voluntarily existing codetermination at the board level to rule out self-selection bias.[12] The various levels of BLER rights and number of observations for board systems across OECD states are presented in Table 1.

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3 Literature Review and Hypothesis Development

3.1 CSR and Board Diversity

The literature on the determinants and consequences of CSR performance is inconclusive in many dimensions (Plumlee et al., 2015).[13] One of the few consensus opinions in current literature is that CSR is not implemented strictly for the purpose of maximizing profits. On the contrary, stakeholder interests as well as board members' personal values are assumed to shape a firm's CSR performance (Hemingway and Maclagan, 2004; Kang, 2017). These individuals have both an individual as well as an aggregated, emergent effect. Using a fixed effects estimation model in line with the seminal methodology of Bertrand and Schoar (2003),

[11] In Sweden, firms with more than 25 employees that have a collective agreement with a union must have two board members who are chosen by the unions. This rises to three in companies with 1,000 or more employees. However, employee members can never have a majority on the board (see also A1).

[12] We exclude states where BLER is introduced voluntarily rather than by law, as well as states where labor representatives have voting rights amounting to less than one third. For a BLER ranking of OECD states and further information on codetermination rights, please refer to Table 1 and Table A1 in the appendix.

[13] This already confusing picture is obscured by inconsistent CSR definitions. Past literature has identified at least 37 different definitions of CSR (Carroll, 2015; Dahlsrud, 2008; Sprinkle and Maines, 2010).

Kang (2017) finds a significant effect of CEO-specific styles on a firm's CSR performance. Consequently, sustainability performance is determined beyond firm-level characteristics. With this finding, Kang (2017) adds to the rapidly growing literature on managerial styles and their economic effects (Bamber et al., 2010; Benmelech and Frydman, 2015; Davis et al., 2015; Dyreng et al., 2010; Yang, 2012).

Building on managerial style literature, a fairly new string of literature argues that there is an emergent element arising from managerial style: board diversity. Most previous literature identifies one main dimension of board diversity that impacts CSR and environmental performance, namely gender diversity (Bear et al., 2010; Liao et al., 2015; Webb, 2004). For instance, recent evidence suggests that board diversity has a beneficial effect on both firm risk and financial performance (Bernile et al., 2018). In their study, Bernile et al. (2018) argue that more diverse boards adopt more persistent and less risky financial policies. We extend this string of literature and analyze how gender diversity is related to a firm's CSR and environmental performance in an international setting. We also extend previous literature in focusing on another important diversity dimension that is likely to affect a firm's CSR activities - stakeholder diversity (Coffey and Wang, 1998; Huse et al., 2009). In this context, labor is an economically meaningful and important production factor which has been largely overlooked by previous literature (Jung et al., 2014). Employees have a strong interest in CSR as it influences the attractiveness of a firm as an employer, but also may help employees to find a better job elsewhere (Albinger and Freeman, 2000). CSR performance increases the ability of firms to attract the most talented employees (Albinger and Freeman, 2000). Several studies document that codetermination reduces information asymmetry and better informs the supervisory board or supervising directors by contributing important operational knowledge to the supervisory board's work (Acharya et al., 2011; Fauver & Fuerst, 2006; Overland & Samani, 2016). Thus, employee representatives can introduce a more informed monitor to the board and identify additional CSR opportunities resulting in better CSR performance, which is worth exploring.

Evidence on the joint effect of the gender and stakeholder diversity dimensions is still rare. Arguing that female board members and employee representatives may both have a significant effect on a firm's CSR activities, Huse et al. (2009) focus more on the input side of board members, namely the involvement in discussions during board meetings. Their Norwegian study suggests that discussions on CSR are more intense in the presence of women and labor representatives. However, it remains unclear whether (1) these intensified discussions lead to higher or lower CSR activities at firm level and (2) whether the results can

be transferred to an international context. On the one hand, more intense discussions could foster CSR performance if they help to identify additional CSR investment opportunities with a positive net present value. On the other, the opposite effect is also conceivable. If intense discussions raise additional concerns with CSR projects, this may lead to weaker CSR performance. This may especially emerge because the costs of CSR are usually incurred in the short run and directly measurable, whereas the benefits are only realized in the long-term and usually indirectly (e.g., higher customer satisfaction or loyalty) (Sprinkle and Maines, 2010). Hence, whether these two board diversity dimensions foster a firm's CSR performance or not ultimately remains an empirical question, which our study answers. Before we introduce our methodology, the next two sections summarize the literature on women (gender diversity) and CSR as well as on employees (stakeholder diversity) and CSR. We derive our hypothesis based on these studies.

3.2 Gender diversity and sustainability

Studies on the differences between women and men have found women to care more about others and hence to have stronger pro-social utility preferences (Cronqvist and Yu, 2017). Empirical evidence that women have stronger social preferences exists both for society as a whole and for corporate executives. For instance, Beutel & Marini, (1995) examine gender differences for multiple value orientations over time and find there are differences between women and men and that they are stable over time. For instance, women are found to express concern and responsibility for others more often than men. Adams and Funk (2012) illustrate that female executives foster pro-social firm activities more than male executives. Their finding is founded on earlier studies that have found women are generally more concerned with environmental issues than men (Diamantopoulos et al. 2003; Mainieri et al. 1997; Wehrmeyer & McNeil, 2000).

Further evidence on women having a beneficial effect on CSR is delivered by Bear et al. (2010). In a sample of 51 health care companies on the Fortune's 2009 Most Admired List, Bear et al. (2010) analyze how gender affects firm reputation, both directly as well as indirectly, through higher CSR ratings. They find evidence that the presence of more female board members enhances critical board processes including decision-making, and that the number of female board members is positively associated with CSR.[14] In a more recent study,

[14] Their measure for CSR, CSR strength ratings, is obtained from the KLD database (now MSCI ESG database) and is based on ratings of strengths in a number of areas including community, corporate governance, diversity, employee relations, the environment, and products. From our point of view, both the technical and social strength ratings used in their study include factors (corporate governance, diversity) that are correlated with the

Nadeem et al. (2017) also find a significant positive relationship between female representation on boards and corporate sustainability practices for an Australian sample between 2010 and 2014.

The positive impact of female board members on CSR is also found for specific instruments and subcategories of CSR. In a sample of Australian firms, Galbreath (2011) documents that female board members are better able to engage with multiple stakeholders and respond to their needs, but that women directors are not significantly associated with environmental quality. However, in one of the few studies to do so, Hayes (2001) finds no significant effect of women' and men' attitudes towards the environment. Liao et al. (2015) again examine the relationship between corporate board characteristics and the voluntary disclosure of greenhouse gas (hereafter: GHG) emissions in the form of a Carbon Disclosure Project report. They find a significant positive association between gender diversity (measured as the percentage of female directors on the board) and the propensity to disclose GHG information as well as the extensiveness of that disclosure.

Summarizing these studies, the vast majority of literature on gender and gender differences suggests that the differences between women and men are considerably larger than the differences among women and among men (Arfken et al., 2004; Huse et al., 2009; McCabe et al., 2006; Ruigrok et al., 2007). These gender differences in core values are found to be robust across countries with different cultures (Schwartz and Rubel, 2005). Recent evidence, however, indicates that under specific circumstances these gender differences can be mitigated: female values can rub off on males through parenting a daughter (Cronqvist and Yu, 2017). Yet, as this is a second-order effect, it is likely that women are still more caring about others and hence are more involved in CSR.

These findings on women, their values and preferences for CSR are accompanied by recent studies that argue that it is not only a person's gender that affects the actions of a company but also the mix of genders in a team. For instance, Konrad et al. (2008) as well as Kramer et al. (2006) find evidence that women only have a significant effect on corporate governance when there are at least three women on board, suggesting that a critical mass is needed for a significant impact of gender diversity.

Altogether, it is likely that we find a significant positive effect of female board members on CSR and environmental performance, which may be even stronger the more women are on

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independent variables (gender diversity or the number of women on the board) anyway, which should have been considered in their setting.

the board. When the number of female board members increases, communication barriers are reduced and the minority voice becomes more assertive (Konrad et al., 2008; Kramer et al., 2006). Psychology papers point out that the mere presence of a single female director may not be sufficient because minority group members, often considered tokenistic, may find it more difficult to voice their opinions (Brewer and Kramer, 1985; Kanter, 1977). Nevertheless, women are sensitive to a firm's engagement in CSR activities and their social preferences depend more on the situation than men's (Croson & Gneezy, 2009; Williams, 2003). Additionally, women tend to be risk-averse and are likely to reduce financial risk and probability weights (Croson & Gneezy, 2009; Fehr-Duda et al. 2006; Jianakoplos & Bernasek, 1998). We expect high gender diversity to be positively related to more environmental and CSR activities, as women are more sensitive to those activities than their male counterparts. While this would generally essentially confirm the findings of previous literature, we additionally argue that gender diversity will still have a positive effect on CSR and environmental performance of a firm, once we control for employee representatives (see next section) as another dimension of board diversity (stakeholder diversity). So far, no study has looked at the joint effect of these two dimensions on a firm's CSR performance, although previous literature has shown that both dimensions jointly affect how a board discusses CSR (Huse et al., 2009). Assuming that a stronger discussion culture on CSR will at least on average lead to the identification of new CSR opportunities and hence stronger CSR performance, we suggest following hypothesis:

H_1: High gender diversity at the board level is positively related to a firm's CSR and environmental performance even after controlling for employee representation as another diversity dimension (stakeholder diversity).

3.3 Employee representatives and CSR

A firm has numerous stakeholder groups such as shareholders, consumers, employees, the community, and suppliers, all of whom have at least partly different interests (Carroll, 1991). Previous literature has identified CSR as a means to appease stakeholders and satisfy their varying interests (Carroll, 2015). Apart from this complementary notion of stakeholder management and CSR, the literature also highlights that different stakeholder groups have varying CSR interests. Specifically, shareholders and management may be skeptical when it comes to strong CSR performance.[15] This skeptical view may emerge as CSR activities almost inevitably incur direct costs, but the benefits may be difficult to measure and may

[15] For anecdotal evidence that at least some investors are quite critical when it comes to strong CSR performance, see Borelli, (2017).

occur only in the long run (Sprinkle and Maines, 2010). Furthermore, not only do these costs cause cash outflows but also opportunity costs given cash constraints; other projects with a positive NPV may hence be cancelled or delayed (Sprinkle and Maines, 2010). Indeed, empirical evidence on how CSR affects financial performance is quite mixed (Aupperle et al., 1985). However, a majority finds a rather beneficial effect (Friede et al., 2015).

It is also often said that CSR helps recruit, motivate and retain employees (Bauman and Skitka, 2012; Sprinkle and Maines, 2010), hence CSR has a rather direct bottom-line benefit (Sprinkle and Maines, 2010) when it translates into better and more efficient employee engagements. From this perspective, employees are an important stakeholder in terms of improving CSR performance as they are primary stakeholders who directly contribute to the success of a firm (Bauman and Skitka, 2012). CSR performance also signals to employees whether the company is likely to act opportunistically or whether it rather honors psychological contracts (Bauman and Skitka, 2012), which is why it is fair to claim that CSR can signal job security. In such a vein, poor CSR performance may be perceived by employees as a risk they will be exploited or may lose their jobs due to management's opportunistic conduct (Bauman and Skitka, 2012). In boardroom discussions, employee representatives could hence potentially push for stronger CSR commitment.

Altogether, the literature takes the common view that employees have an interest in strong CSR performance. Yet surprisingly, to our knowledge there is no empirical evidence on the relationship between labor representatives and environmental or CSR performance in previous literature. Prior studies on codetermination only look at the relationship between BLER and financial performance or firm value (Bermig & Frick, 2011; Fauver & Fuerst, 2006; Gorton & Schmid, 2000; Gurdon & Rai, 1990; Kraft & Ugarkovic, 2006; Vitols, 2006, 2008), productivity and profits (Gurdon & Rai, 1990; Renaud, 2007) or abnormal returns (Petry, 2015). Yet so far there is no empirical evidence of an impact on CSR and environmental performance. Our study responds to these gaps.

Jensen and Meckling (1979) argue that codetermination is a cost factor because employees' and shareholders' interests may be heterogeneous, so discussions and consensus-finding may take longer. Indeed, homogeneous groups cooperate more freely and face fewer emotional conflicts, which can facilitate decision-making and result in efficiency (Lau and Murnighan, 1998). As mentioned above, board diversity ensures that the minority voice is more assertive (Konrad et al., 2008; Kramer et al., 2006). People from a non-mainstream background may ask other questions than directors with a traditional background (Fama and Jensen, 1983).

Arguments in favor of codetermination include labor representation on supervisory boards providing opportunities for engagement with organization-level issues such as investment policy, technology, and corporate strategy (Levine and Tyson, 1990; Machin and Wood, 2005). With this study, we empirically examine whether employee representatives actually foster a firm's CSR performance (e.g., by arguing for additional CSR activities at board meetings or by using informal communication channels to the management).

In this paper, we go further and argue that employee representatives are not only interested in CSR, but that they are even more interested in it than shareholders and the management because stakeholders have a different risk function (Lin et al., 2018). Shareholders have a more symmetric risk-return participation as they participate fully in both profits and losses (up to total losses), with managers' compensation usually closely tied to firms performance (Bartov and Mohanram, 2004). By contrast, employees and hence employee representatives have an asymmetric risk function: they only participate to a very limited extent from higher profits, as their compensation is usually fixed, but their risk is unlimited as they would lose their jobs in case of bankruptcy (Lin et al., 2018). This argument is empirically supported by a recent study by Graham et al. (2016) who show that the human costs of bankruptcy are economically significant. Therefore, employees may have a special interest in lowering a firm's overall risk.

CSR is known to be such an instrument to lower a firm's risk (Husted, 2005; Lee and Faff, 2009). In their study on the influence of CSR performance, Kim et al. (2014) find a negative association between CSR and systematic risk, with the effect even more pronounced for firms with less effective governance. Beside the systematic risk, Husted (2005) argues that CSR provides additional real options for risk management. Understood this way, CSR allows for a direct reduction in business risk including a time option (e.g., proactive vs. reactive CSR activities). As CSR helps to significantly lower various risk dimensions, employee representatives may even be willing to accept lower profits as they only asymmetrically (less) suffer from these profit decreases. We therefore hypothesize:

H_2: One-third employee representation at the board level is positively related to a firm's CSR and environmental performance

4 Methodology

4.1 Data

We obtain international data on companies' characteristics by merging three databases. Our

initial sample consists of all companies from OECD countries for which environmental and CSR performance data are available in the ASSET4 Thomson Reuters and MSC ESG STATS (former KLD STATS) databases. Next, we match these firms with quarterly financial data derived from COMPUSTAT GLOBAL. To ensure there is no survivorship bias, we include both active as well as inactive (dead) companies.[16] Then we merge the gender diversity score taken from ASSET4. In line with Simintzi et al. (2015), we focus on a sample of firms domiciled in an OECD states so we are more likely to compare firms in countries with similar reported strategies for undertaking sustainability activities. At this stage, the sample includes 42,582 firm-quarter observations from 23 countries between 2001 until 2014. After reducing the sample by financials and real estate firms, the sample comprises 34,224 observations of 2,020 unique firms. Excluding emerging countries like Mexico, Chile and Turkey reduces the number of observations to 33,410 observations of 1,950 firms. Finally, we eliminate firms from the sample for which no information on female board members is available. This reduces the sample to 24,485 firm-quarter observations.

4.2 Research design

To test our hypotheses, namely whether gender diversity at the board level (H_1) and one-third labor representation at the board level (H_2) are positively related to CSR and environmental performance, we use a linear regression model with a lead dependent variable and an ordinary least squares (OLS) specification based on the model of Dhaliwal et al. (2011):

$$A4_CSR_{i,t+1}/A4_ENV_{i,t+1} = \beta_0 + \beta_1 GENDIV_{i,t} + \beta_2 LABOR_{i,t} + \beta_3 ROA_{i,t} + \beta_4 TOBINQ_{i,t} + \beta_5 LEVERAGE_{i,t} + \beta_6 LIQUIDITY_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 LITIGATION_{i,t} + \beta_9 COMPETITION_{i,t} + \beta_{10} GLOBAL_{i,t} + \beta_{11} FIN_{i,t} + \beta_{12} ABS_EM_{i,t} + \beta_{13} CORPGOV_{i,t} + \sum TIME_t + \sum INDUSTRY_{i,t} + \sum STATE_{i,t} + \varepsilon_{i,t+1}, \quad (1)$$

where we use either $A4_CSR_{i,t+1}$ or $A4_ENV_{i,t+1}$ as continuous dependent variables. $A4_CSR_{i,t+1}$ reflects the Thomson Reuters ASSET4's equal weighted rating of a company's CSR performance in its four constituent areas: economic, environmental, social and corporate governance. The environmental pillar of Thomson Reuters ASSET4 ($A4_ENV_{i,t+1}$) measures a company's impact on living and non-living natural systems, including air, land and water, as well as on complete ecosystems.[17] The independent variables are led by one period under the

[16] Failure to do so would bias our results in that we would only measure the impact of female board members and labor representatives on CSR and environmental performance for successful firms but would not consider their effect on CSR and environmental performance for unsuccessful (e.g., bankrupt) firms.

[17] Thomson Reuters ASSET4's environmental score reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long-term shareholder value.

assumption that the board must be in its composition some time to have an impact on CSR, environmental activities, and company reputation (Bear et al., 2010). Including a time lag between the dependent and independent variable also helps us to mitigate endogeneity issues (Dhaliwal et al., 2011). $LABOR_{i,t}$ is our first variable of interest and measures the effect of employee board level representation on CSR performance. It is a binary variable that equals one if a firm has a minimum of one-third labor representatives on is (supervisory) board and zero otherwise.[18] Data on the presence of labor representation at the board level is manually collected by screening the financial statements of all sample firms. Our second variable of interest, $GENDIV_{i,t}$, is a continuous variable representing the proportion of women on the board of directors (in unitary, one-tier systems) or supervisory board (in two-tier systems) and is derived from Thomson Reuters' ASSET4 database. As an additional test, we replace $LABOR_{i,t}$ and $GENDIV_{\mathrm{i,t}}$ with a variable of interest in their intersection: namely the proportion of female employee representatives on a firm's board ($FEMEMP_{i,t}$). Since CSR performance and CSR reporting are closely linked, we base our model including the control variables on the seminal paper of Dhaliwal et al. (2011), which is specified in Table 2.

>Please insert Table 2 about here<

We include $ROA_{i,t}$, as firms with better financial performance are expected to spend more on CSR investments and thus perform better on CSR. On the one hand, Tobin's Q ($TOBINQ_{i,t}$) is included, since firms with growth opportunities may have fewer available resources for CSR activities. On the other, growth firms may tend to engage in more CSR to attract potential investors. Since debt-holders demand disclosure and the debt ratio plays a monitoring role, we also control for a firm's leverage ($LEVERAGE_{i,t}$) (Leftwich et al., 1981). In addition, we include $LIQUIDITY_{i,t}$ as managers may be incentivized to increase CSR performance to foster the liquidity of their firm's stocks (e.g., to attract more investors before issuing new shares). In this context, liquidity can be increased through improved transparency and more information for investors using CSR reporting as a sub-element of CSR performance. Further, we include $SIZE_{i,t}$ because firm size may be positively related to CSR performance due to public pressure or size-related additional financial resources (Lang and Lundholm, 1993). Our regression also includes $LITIGATION_{i,t}$, because firms with a higher litigation risk are more likely to issue voluntary disclosures on their CSR performance and increase their CSR performance to preempt potential lawsuits (Skinner, 1997). Since proprietary costs arising from product market competition can reduce disclosure incentives and stronger competition

[18] Board employee representation information is hand-collected. Information about different BLER rights across OECD countries are provided in A1 and A2.

may limit capacities for additional CSR activities (Dye, 1985), we include $COMPETITION_{i,t}$, which is the Herfindahl-Hirschman Index multiplied by -1. Firms operating in emerging markets face greater pressure to commit to stronger CSR performance (Dhaliwal et al., 2011). Hence, we include $GLOBAL_{i,t}$, which is a binary variable indicating whether a firm reports foreign income. Since firms that raise capital in the public market have a greater propensity to engage voluntarily in additional activities (e.g., CSR performance and reporting) (Frankel et al., 1995), we include $FIN_{i,t}$. Finally, we control for the possibility that CSR performance is related to financial transparency. Thus, we include a variable that proxies for firm financial disclosure quality ($ABC_EM_{i,t}$) and use the absolute value of abnormal accruals from the modified Jones (1991) model, based on Dechow, Sloan, and Sweeney (1995), to proxy for earnings quality (Francis, Nanda, & Olsson, 2008). To reduce the risk of omitted variables, we include a variable that captures the strength of a firm's corporate governance. Therefore, we include the corporate governance score provided by the ESG MSCI database ($CORPGOV_{i,t}$). In addition, we use State, Time (quarterly), and Industry (based on SIC codes) fixed effects. Unlike prior studies that use management forecasts as a direct measure of a firm's disclosure policy (Dhaliwal et al., 2011; Rogers and Van Buskirk, 2009), we do not include a proxy for voluntary disclosure practices, since CSR and environmental performance ought to be uncorrelated to a firm's management forecasts. Lastly, all continuous variables are winsorized at the 1 and 99 percent level.

5 Results

5.1 Descriptive statistics

Table 3, Panel A represents descriptive statistics for the full sample. The Thomson Reuters ASSET4 CSR score ($A4_CSR_{i,t}$) has a mean (median) of 0.63 (0.73)), which means that on average, firms in our sample cover 63 percent of the CSR factors and indicators (0.00-1.00), whereas one means all indicators are fulfilled. The mean (median) of the environmental pillar score ($ENVSCORE_{i,t}$) is equal to 0.66 (0.78), indicating that, on average, the firms in our sample cover more than half of the environmental indicators. The mean (median) of $MSCI_CSR_{i,t}$ is 4.44 (4.00), reflecting the perception that more than half of the firms' CSR performance rating is moderate. The mean (median) of $MSCI_ENV_{i,t}$ is 2.31 (1.60), which is lower than the overall CSR rating. However, the environmental rating is one of the social and governance performance ratings that are combined in the CSR ratings. The mean of $GENDIV_{i,t}$ at the board level is around nine percent, which indicates the percentage of women at the board level is nine percent, so women are still in the minority. Only 15 percent of all firms have three or more women on the board ($MIN3FEM_{i,t}$). The mean of $LABOR_{i,t}$ (binary

variable) indicates that ten percent of the full sample have at least one third employee representatives on their supervisory board and 90 percent have no codetermination rights. More than half of the firms have no liquidity risk since the mean (median) of $LIQUIDITY_{i,t}$ is 7.59 (median: 8.02), but weak financial performance, since the mean (median) of *ROA* is 0.01 (0.01). The mean (median) of $TOBINQ_{i,t}$ is 1.03 (0.52). The mean (median) of firms' debt ratio ($LEVERAGE_{i,t}$) is 0.57 (0.58), indicating that firms are on average less risky. The mean of the logarithm of firm size ($SIZE_{i,t}$) is 23.36. 18 percent of all firms operate in a high-litigation industry ($LITIGATION_{i,t}$). Most of the firms have a low but still positive level of financing, as $FIN_{i,t}$ has a mean (median) of 0.17 (0.00)). This implies that firms have either sold more common and preferred shares than they purchased or have issued more long-term debt than they reduced. Half of the sample (mean: 0.50) is active in emerging industries ($GLOBAL_{i,t}$). The mean (median) of $ABS_EM_{i,t}$ is 0.00 (0.00), which represents high earnings quality. 28 percent of all firms observe no industry competition ($COMPETITION_{i,t}$). The corporate governance score is on average 2.97 (median: 1.6), which is relatively low considering a scale ranging from one (minimum value) to ten (maximum value) ($CORPGOV_{i,t}$).

>Please insert Table 3 about here<

Table 3, Panel B represents the descriptive statistics for the matched sample. The means (medians) of the $A4_CSR_{i,t}$, $A4_ENV_{i,t}$ and $A4_CSR_{i,t}$ are slightly higher than in the full sample's means in Panel A. By contrast, the mean (median) of $MSCI_ENV_{i,t}$ is 2.23 (median: 1.60) which is only slightly lower than the full sample's mean. By construction, half of the sample consists of codetermined firms since we compare two similar groups of firms that differ in terms of labor representation at board level ($LABOR_{i,t}$ = 0.5). The mean of the proportion of women at the board level is around ten percent. The means (medians) of most control variables only slightly differ from the full sample represented in Table 3, Panel A. As presented in Table 3, Panel C, the mean of the propensity score (P-score) is 0.12, which reflects the similarity among the firms in the matched sample.

5.2 Univariate statistics

In Panel A of Table 4, we present descriptive statistics for firms with a one-tier board system, while Panel B of Table 4 displays the statistics for firms with a two-tier system.[19] When comparing both systems, the percentage of women on the board ($GENDIV_{i,t}$) is 4 percent

[19] As explained above, a one-tier board system means executive and non-executive directors serve together on one board of directors, while in a two-tier board system, the supervisory board with non-executive directors operates separately, monitoring the management board, which consists of executive directors.

lower, with a mean of 9 percent, while the existence of codetermination at board level ($LABOR_{i,t}$) is, at three percent, 82 percent lower in a one-tier board system (Panel A) than in firms with a two-tier board system (Panel B). As a consequence, the proportion of female employee representatives to all board members ($FEMEMP_{i,t}$) is 6 percent in Panel B, which is 5.9 percent higher than the mean in Panel A (untabulated). The tables show that labor representatives indeed are rarely represented on the board in one-tier board systems yet considerably more frequently represented in two-tier board systems, where the supervisory board, which includes employee representatives, is separate from the management board. When looking at our dependent variables, the CSR and environmental score provided by the Thomson Reuters Asset 4 database ($A4_CSR_{i,t}$ and $A4_ENV_{i,t}$) and the ESG MSCI database ($MSCI_CSR_{i,t}$ and $MSCI_ENV_{i,t}$) is on average lower in countries with a one-tier board system (Panel A = 0.63; 0.65 and 4.33, 2.31; Panel B = 0.70, 0.77 and 4.83 and 2.63).

>Please insert Table 4 about here<

Table 5 shows the full sample's Pearson correlations between our control variables, our main variables of interest, and our dependent variables. In line with our hypotheses, the correlations between $GENDIV_{i,t}$ and our dependent variables ($A4_ENV_{i,t+1}$, $A4_CSR_{i,t+1}$, $MSCI_CSR_{i,t+1}$, $MSCI_ENV_{i,t+1}$), as well as between $LABOR_{i,t}$ and our dependent variables are positive and significant at the one percent level. The same relationship is presented between $FEMEMP_{i,t}$ and all our dependent variables. Whether these significant correlations hold in a multivariate model while controlling for further firm-level determinants of CSR and environmental performance will be discussed in the next subsection.

>Please insert Table 5 about here<

5.3 Regression results

5.3.1 Women at board level and sustainability performance

In this section, we test our first hypothesis (H_1), which suggests that gender diversity at board level is positively related to CSR and environmental performance. Results are presented in Table 6.

>Please insert Table 6 about here<

When the percentage of women on board is the only variable of interest, the coefficient on $GENDIV_{i,t}$ is significantly positive at the one percent level for $A4_CSR_{i,t+1}$ (column (3): 0.409, robust SE = 0.018) and $A4_ENV_{i,t+1}$ (0.358, robust SE = 0.019) in column (4). As presented in

column (5) and (6), we test our full equation and include the codetermination dummy variable ($LABOR_{i,t}$). As expected, the coefficient on $GENDIV_{i,t}$ is also positive and significant (0.004, robust SE = 0) for both dependent variables. Results are consistent with the first hypothesis that the proportion of women on the board is positively related to higher CSR and environmental performance. The effects of control variables that mitigate the risk of omitted variables when analyzing the association with the firms' CSR performance (column (1), (3), and the full model in column (5)) in the subsequent quarter are presented in the following. $ROA_{i,t}$, $LEVERAGE_{i,t}$, $SIZE_{i,t}$ $LITIGATION_{i,t}$, and $CORPGOV_{i,t}$ are positively related to CSR performance in $t+1$. Coefficients on $TOBINQ_{i,t}$, $FIN_{i,t}$, and $GLOBAL_{i,t}$ are negative and significant for $A4_CSR_{t+1}$. Coefficients on $ABS_EM_{i,t}$, $LIQUIDITY_{i,t}$ are positive and $COMPETITION_{i,t}$ negative but all three variable coefficients are insignificant. Effects of control variables are almost similar compared to the effects on the environmental performance in models (2), (4) and (6), except for $ROA_{i,t}$, which is negative and significant for $A4_ENV_{i,t+1}$, indicating that operating performance is negatively related to environmental performance but positively related to CSR performance. Moreover, the coefficients of $FIN_{i,t}$ are positive and significant for $A4_ENV_{i,t+1}$, indicating that environmental performance is positively influenced by the firms' issuance of shares and debt capital being on average higher than their purchase. Given that the sample mean of $A4_CSR_{i,t+1}$ is 0.63 and $A4_ENV_{i,t+1}$ is 0.66, the economic effect of $GENDIV_{i,t}$ (0.004) on the dependent variables in columns (5) and (6) are relatively low. The explanatory power is above 38 percent in all columns, except for model (3), which is considerably lower.[20]

Results can be interpreted as follows. Women may evaluate higher CSR performance positively as it improves a firm's reputation (Bear et al., 2010). A good reputation in turn is important for the firm's ability to attract job applicants (Gatewood et al., 1993), influences employees' intention to leave their organizations (Riordan et al., 1997), enhances corporate branding, enabling a company to use its brand equity to launch new products and enter new markets (Dowling, 2006). Results of prior studies indicate the differences between women and men are considerably larger than the differences among women and among men (Arfken et al., 2004; Huse et al., 2009; McCabe et al., 2006; Ruigrok et al., 2007). The positive relationship between women at board level and CSR and environmental performance indicates (1) that women care more about CSR than men (Adams and Funk, 2012; Beutel and Marini, 1995; Cronqvist and Yu, 2017) and (2) women are interested in increasing CSR

[20] For robustness, we test whether the results remain significant when CSR and environmental performance is provided by a different database (ESG MSCI). Results are discussed in Section 6.5.

performance, as they tend to be risk-averse and more likely to reduce financial risk and probability weights (Croson & Gneezy, 2009; Fehr-Duda et al. 2006; Jianakoplos & Bernasek, 1998). With stronger female board representation, women also have the chance to lower communication barriers and enhance critical board processes including decision-making (Bear et al., 2010; Kramer et al., 2006).

Although the number of women at the board level may be higher in some firms, in most firms they may still be in the minority. Not being the only woman on the board may make it less difficult to be heard and assert a different opinion (Brewer and Kramer, 1985; Kanter, 1977; Konrad et al., 2008; Kramer et al., 2006). In our additional analysis (Section 6.3.3), we aim to find out whether the relationship between female representation and non-financial performance varies when the number of women on the board is below or above the critical mass of three.

5.3.2 One-third labor representation at board level and environmental performance

Furthermore, we test our second hypothesis (H_2), which suggests that one-third labor representation at the board level is positively related to CSR and environmental performance. Results are presented in Table 6. The results of column (1) in Table 6 show the coefficient on $LABOR_{i,t}$ is 0.095 (robust SE: 0.016) and 0.088 (robust SE: 0.016) in our main model (including $GENDIV_{\mathrm{i,t}}$) in column (5), implying a positive and significant relationship with CSR performance at the one percent level. Results in column (2) show the coefficient on $LABOR_{i,t}$ is also positive (0.087, robust SE: 0.016) and significant at the one percent level for the environmental performance ($ENV_{i,t+1}$) of the subsequent quarter. This holds when we include the percentage of women on the board as a variable of interest in column (6), which represents our main model. Then, the coefficient is slightly lower (0.088, robust SE: 0.016). The results support our second hypothesis that one-third employee representation is positively related to a firm's CSR and environmental performance in the subsequent quarter (and year). The effects of the control variables are presented above. The economic effect of the presence of one-third labor representatives at the board level on our main dependent variables is slightly higher than that of $GENDIV_{i,t}$. As presented in Table 6, the model's explanatory power varies between 37.1 and 39.3 percent in columns (1), (2), (5) and (6).[21]

[21] For robustness, we test whether the results remain significant when CSR and environmental performance are measured with a different methodology. For this purpose, we obtain sustainability and environmental performance data from the ESG MSCI database. The results of this robustness test are discussed in Section 6.5.

The results show that firms with employee representation at the board level have better CSR and environmental performance than firms without. Hence, employee representatives seem to have a higher optimal CSR and environmental performance level than managers and shareholders. Employees represent an important stakeholder group when discussing determinants of CSR as they are primary stakeholders who directly contribute to the success of a firm (Bauman and Skitka, 2012). Results can be interpreted based on the asymmetric risk function of employees, as they only participate to a limited extent from higher profits as their compensation is usually fixed but their risk is unlimited, as they would lose their job in case of bankruptcy (Lin et al., 2018). CSR represents a real option for risk management (Husted, 2005), as good CSR performance directly reduces business risk including a time option. Our results mainly support prior literature on the employee and CSR relationship, which documents that CSR helps recruit, motivate and retain employees (Bauman and Skitka, 2012; Sprinkle and Maines, 2010). Our results extend prior literature in the context of employee representation on supervisory boards, which focuses mainly on firms' financial performance or firm value (e.g., Bermig & Frick, 2011; Fauver & Fuerst, 2006; Gorton & Schmid, 2000; Gurdon & Rai, 1990; Kraft & Ugarkovic, 2006; Vitols, 2006, 2008). Overall, our results indicate that codetermination enables firms to receive beneficial knowledge at board level, as employee representatives are a liaison between the workforce and the shareholder representatives as well as management (Fauver and Fuerst, 2006; Lopatta et al., 2018; Overland and Samani, 2016).

5.4 Additional analyses

5.4.1 The joint effect of female board members and codetermination at board level

With the results displayed in Table 6, we demonstrate that both dimensions of board diversity have a significant effect on CSR and environmental performance after controlling for the level of the other respective diversity dimension. A question arises, what happens when both dimensions simultaneously become more diverse? Will both dimensions still have significant positive coefficients or will there be a substitutional relationship? We answer these questions by including an interaction term between female board members and labor representatives to test for interdependences between the two dimensions. Should it not be the specific board diversity dimension but the general diversity of a board independent from the concrete dimensions that matters to CSR performance (e.g., a board being more diverse in one dimension would already be a sufficient condition for enhanced CSR performance), we would expect to find a substitutional relationship between the two (e.g., a significant negative interaction term). However, if it really is the diversity dimension that matters, we would

expect to find either an insignificant or positive coefficient of the interaction term between $GENDIV_{i,t}$ and $LABOR_{i,t}$. This would show that the beneficial effect of an increase in one diversity dimension on CSR and environmental performance is not reduced or even offset by a simultaneous increase in the other. In our theoretical framework we argue that both female board members and labor representatives have a unique interest in CSR. Finding an insignificant or positive interaction term with the coefficients for female board members and labor representatives remaining positive would consequently confirm our two hypotheses. Table 7 presents the results for this alternative model specification for both CSR and environmental performance for both databases (Asset4 and ESG MSCI).

>Please insert Table 7 about here<

The empirical estimates are quite similar across all four specifications with the control variables having similar estimated effects as the main regression's results. The coefficient for $GENDIV_{i,t}$ is significantly positive in all four and $LABOR_{i,t}$ significantly positive in three out of four specifications (all at the one percent significance level). The effect of the interaction term is economically negligible as both $GENDIV_{i,t}$ and $LABOR_{i,t}$ are considerably larger than the coefficient of the interaction term in all four specifications. Furthermore, the interaction term is also statistically insignificant in three out of four estimations even at the ten percent significance level. These results are in line with the argument that both diversity dimensions – gender and stakeholder diversity – foster a firm's CSR and environmental performance beyond the beneficial effect of the respective other diversity dimension. Firms that aim to strengthen their CSR and environmental performance should hence attempt to increase the share of both female board members and employee representatives.

5.4.2 The critical mass of women at board level

Research should explore how board processes including decision-making and social cohesion evolve as the number of female board members increases (Bear et al., 2010). We expect the presence of employee representatives and a critical mass of women at board level (at least 3) (Konrad et al., 2008; Kramer et al., 2006) to be positively related to CSR and environmental performance. Simultaneously, we expect the relationship between women and our dependent variables to be negative when there are fewer than three women on board. We use the full sample to test whether the relationship with the dependent variables is negative when the number of women on the board is above or below the critical mass of three (Konrad et al., 2008; Kramer et al., 2006). We include $MIN3FEM_{i,t}$ as an additional variables of interest, but exclude the continuous variable $GENDIV_{i,t}$. Our binary variable, $MIN3FEM_{i,t}$, is equal to one

if the number of women on the supervisory board or board of directors is equal to or above three, and zero otherwise. The dependent variables and control variables equal those of Equation (1). We again include $LABOR_{i,t}$, because we still expect a positive relationship between codetermination and CSR as well as environmental performance. When we include an indicator variable for a minimum of three women on board, we expect a positive relationship between $MIN3FEM_{i,t}$ and a firm's CSR and environmental performance.

>Please insert Table 8 about here<

In line with our expectations and main regressions, the coefficient on $LABOR_{i,t}$ is positive and statistically significant for the firms' CSR and environmental score from two different databases in columns (1) to (8). As presented in column (1) of Table 8, the coefficient on $MIN3FEM_{i,t}$ is positive and significant at the one percent level for the CSR score (e.g., column (1): 0.027; robust SE: 0.004) and for the environmental score (e.g., column (2): 0.027; robust SE: 0.005). In terms of control variables in columns (1) and (5), effects of $ROA_{i,t}$, $LEVRAGE_{i,t}$, $SIZE_{i,t}$, and $LITIGATION_{i,t}$ are positive and statistically significant at the one percent level. The coefficients on $TOBINQ_{i,t}$, $FIN_{i,t}$, $GLOBAL_{i,t}$ and $CORGOV_{i,t}$ are negative and statistically significant at the one percent level. Coefficients on all other control variables are statistically insignificant. In contrast, for the environmental score ($A4_ENV_{i,t+1}$) in columns (2) and (6), coefficients on $ROA_{i,t}$ are negative and on $LITIGATION_{i,t}$ and $FIN_{i,t}$, are negative but insignificant. However, $COMPETITION_{i,t}$ is negatively and statistically significantly related to $A4_ENV_{i,t+1}$ which implies that firms in competitive situations have weaker environmental performance on average. In line with this, coefficients on $LABOR_{i,t}$ and $MIN3FEM_{i,t}$ show a positive and significant relationship with the dependent variables when we use data from the MSCI database (columns (3) and (4), Table 8).[22] All in all, the model's explanatory power is moderate at around 37 percent in columns (1) and (2) but at 15 percent in column (3). The explanatory power is 5 percent in column (4). Our additional analysis also shows that the results are robust to the use of different databases and inclusion of an alternative variable of interest for sensitivity and the effects of a critical mass of three women on the board. Moreover, the results support both of our hypotheses that one-third labor representation and a minimum number of three women at the board level are positively related to a firm's CSR and environmental performance. We follow the line of argumentation of prior studies that document that a female critical mass on the board is important since the minority voice becomes more assertive, the tone in board meetings is more conversational and

[22] Results indicate a negative relationship with our dependent variables when the number of female board members is fewer than three. Results are available upon request.

less hierarchical, and as a result all directors are better informed (Kanter, 1977; Konrad et al., 2008; Kramer et al., 2006). Women tend to take action to reduce perceived environmental risks (Bord & O'Connor, 1997; Fukukawa et al., 2007) which in turn improves not only the firm's environmental performance but also its reputation (Bear et al., 2010).

To make sure our results are not biased due to a functional form misspecification (Shipman et al., 2017), we also control for a non-linear relationship between the presence of women and our dependent variables. We include a variable controlling for the squared proportion of female representation ($GENDIV_SQ_{i,t}$) and hereby control for a non-linear relationship of gender diversity and our dependent variables. As presented in Table A6, the squared proportion of female representatives does not strongly influence our dependent variables and hence only slightly alters our results. Also, the linear variables of interest remain qualitatively similar, suggesting that we are not prone to functional form misspecification (Shipman et al., 2017).

5.4.3 Female employee representatives at board level and environmental performance

In the theoretical framework of this paper, we argue that women are more sensitive towards sustainability issues and employee representatives are more risk-averse and are interested in sustainability activities as a vehicle to increase the firm's probability of long-term survival by reducing risks associated with sustainability (Husted, 2005). Both board member groups presumably have distinct reasons to foster CSR and environmental performance. If our claim is valid that both female board members as well as employee representatives contribute to an improvement in a firm's non-financial performance, we also should find evidence for the intersection, namely that female employee representatives foster non-financial performance. But also their joint occurrence in a board may cause an emergent element. Srinidhi et al. (2011) argue that various dimensions of diversity at board level enhance the scope of action by bringing more perspectives to board discussions. This effect may be especially beneficial for CSR and environmental investments as the costs are usually easy to determine but the benefits are not as they are often realized over a long period and in indirect ways (Friede et al., 2015). Results confirming a beneficial effect of female employee representatives on CSR performance are presented in Table 9.

>Please insert Table 9 about here<

Using $A4_CSR_{i,t}$ as the dependent variable, the coefficient on $FEMEMP_{i,t}$ is 0.319 (robust SE: 0.067) in column (1), suggesting a positive and significant relationship between the proportion of female employee representatives and CSR performance at the one percent level.

When we use environmental performance as the dependent variable (column (2), the economic effect is slightly weaker but still significant at the one percent level (0.212, robust SE: 0.069). The effects of the control variables are similar to those presented in Section 4.3.1. As presented in Table 9, the model's explanatory power is around 37 percent in column (1) and (2). For robustness, we use CSR and environmental performance data from the ESG MSCI database as dependent variable. The explanatory power is 15.2 percent for the CSR performance (column (3)) and 4.5 percent for the environmental performance (column (4)).

As expected, the presence of female employee representatives is positively related to a firm's non-financial performance. The results indicate that CSR and environmental performance are stronger the higher the proportion of female employee representatives on the board. This shows that the combination of both delivers a significant but also economically stronger effect on our dependent variables than the proportion of gender diversity or employee representation alone.

5.4.4 One-tier vs. two-tier board system

The results in our main regressions are based on the full sample that combines countries with one-tier and two-tier board systems. However, as presented in Table 1, codetermination is not common in countries where one-tier board systems are in place. Specifically, the proportion of firms that are codetermined and operate in a one tier-board system is three percent, while it is on average 85 percent of firms in two-tier board systems. As presented above, the proportion of women on board is 4 percent higher in firms that operate in two-tier systems. To test, whether a combination of both board systems in our sample is appropriate, we split the sample into firms that operate in one-tier and two-tier board systems and rerun our regressions separately. Results are presented in Table A5. In line with our main regressions, the coefficient on the variable that represents the proportion of women ($GENDIV_{i,t}$) and presence of employee representatives on the board ($LABOR_{i,t}$) is positive and significant when we split the sample between one-tier (columns (1) to (4) and two-tier system (columns (5) to (8) for the firms' CSR ($A4_CSR_{i,t+1}$) as well as the environmental performance of the subsequent quarter ($A4_ENV_{i,t+1}$). The relationship between the proportion of female employee representatives ($FEMEMP_{i,t}$) and our dependent variables is positive, but only significant in the two-tier board system, which may be caused by the low number of codetermined firms in one-tier board systems. Indeed, the average proportion of female employee representatives to total number of board members ($FEMEMP_{i,t}$) in the one-tier board system is 0.1 percent compared to 6 percent in the two-tier board system (Table 4). Due to the fact that results hold

when we include corporate governance index as a control variable and split the sample into one- and two-tier board systems, we conclude that codetermination, gender diversity and the presence of female employee representatives at board level are beneficial for a firm's CSR and environmental performance, even when codetermination and gender diversity occur less often in one-tier board systems and the board structures differ across countries.

5.4.5 Change analysis

Based on our main results that we present in Section 5.3, we test whether there is a positive relationship between changes in the existence of employee representation or changes from a lower proportion of women at board level to a higher proportion and a firm's change in CSR and environmental performance the subsequent year. To answer this question, we construct a change model with two distinct features. First, in line with previous studies (e.g., Dhaliwal et al. (2011), we transform all variables into changes and lead the dependent variable by one period to mitigate reversed causality concerns. Second, to obtain results that are robust against autocorrelation and heteroscedasticity, we employ GMS estimators. Our dependent variables reflect the percentage change in the firms' CSR and environmental performance in the subsequent year ($\Delta A4_CSR_{i,t+1}$ and $\Delta A4_ENV_{i,t+1}$). We use the change in the proportion of female board members ($\Delta GENDIV_{i,t}$), female employee representatives ($\Delta FEMEMP_{i,t}$) and the change in employee representation in general ($\Delta LABOR_{i,t}$) as variables of interest. In this context, variables of interest and control variables are lagged over one year. Also, we control for the changes in control variables that are used in our main regressions (Equation (1)). Untabulated means indicate that firms on average change the proportion of (female) employee representatives at board level less than 0.1 percent during our observation period, while on average the change in the proportion of female board members (both shareholder and employee representatives) is on average 2.8 percent from 2001 to 2014. Hence, the economic power of employee-related variables is relatively low, because this variable is constant over time. However, the direction of the coefficients is still expected to be positive.

Results and variable definitions are presented in Table A7. As expected, a change in employee representation ($\Delta LABOR_{i,t}$) is positively and significantly related to firms' CSR performance at the five percent level (0.749, robust SE = 0.367). However, the results do not hold for all models, which is not surprising because $LABOR_{i,t}$ is a dummy variable that is on average constant over time. As expected, the positive change in the proportion of female board members ($\Delta GENDIV_{i,t}$) is positively related to firms' CSR and environmental performance in all columns. Surprisingly, the coefficient on $\Delta GENDIV_{i,t}$ is only significant

when environmental performance is the dependent variable, which is robust across two different databases (column (2): 0.028, SE = 0.014; column (4): 0.130, robust SE = 0.040). Moreover, a positive change in the proportion of female employee representatives is only positively significantly related to firms' CSR performance (column (5)). In line with the $\Delta LABOR_{i,t}$ variable, this may be caused by low number of female employee representatives and also small changes in the number of female employees in our sample.

Specifically, our change analyses not only suggest that this paper's claim is valid that the existence of employee representation is positively related to firms' environmental performance, it also reduces the risk that our results are driven by endogeneity as we have tested for the effect of current period's changes of our independent variables on next period's changes of our dependent variable (Dhaliwal et al., 2011). To further reduce the risk of endogeneity, we employ a GMM model, which we discuss in the following.

5.4.6 GMM Model

A common issue with studies on CSR performance is endogeneity (Dhaliwal et al., 2011; Garcia-Castro et al., 2010), which may cause invalid inferences from our empirical results. Out of our two variables of interest, we believe that only "female board members" is a potential endogenous variable. Whether to have employee representatives on board is a regulatory decision (Botero et al., 2004), which can be seen as fairly exogenous from the perspective of an individual firm. If firms are close to the threshold – e.g., the requirement to have labor representatives above a certain workforce size – we believe that firms do not manipulate workforce growth for two reasons. First, if firms want to grow, they cannot avoid codetermination as growth in firm size and revenues eventually also requires workforce growth. Second, there is empirical evidence that firms do not manipulate the number of employees around the threshold (Lin et al., 2018). This evidence was found when applying a density test of continuity of the running variable density function around the threshold (McCrary, 2008). We also assume that the selection of labor representatives is no significant source of endogeneity as these board members are elected by employees (German One-Third Codetermination Act, 2004). What remains as a potential source of endogeneity are female board members.

In our setting, both gender diversity and CSR performance may be simultaneously determined and CSR performance may not be the causal output of female labor representatives, but rather represent the joint outcome of a strategic decision. The fundamental issue arising in our context is that the sources of potential endogeneity are manifold. For instance, stakeholders of

the firms may require both gender-diverse boards as well as strong CSR performance. As different board members are known to have different styles (Bertrand and Schoar, 2003; Davis et al., 2015) – especially when it comes to CSR-related decisions (Cronqvist and Yu, 2017; Kang, 2017) – CEOs are another potential source of endogeneity. CEOs with a tendency towards sustainability may try to increase the share of female representatives on the board while improving the firm's CSR performance. In this case, significant findings would merely indicate a correlation. In our theoretical background and hypothesis development, we argue why we assume a causal link between female labor representatives and CSR performance.

Nevertheless, to mitigate these endogeneity issues, we address endogeneity as follows. First, we create the dependent variable as a lead variable (Dhaliwal et al., 2011). We test for the effect of female labor representatives on the subsequent period's CSR performance. With this model, endogeneity only remains to the extent that changes in subsequent periods' CSR performance cause changes in board composition (e.g., more female or more labor representatives). We believe this reverse causality link to be weak, if it exists at all. Second, we employ a differenced GMM which generates unbiased estimators, even if the independent variables – in our case potentially female board representatives – are not strictly exogenous (e.g., the independent variables are correlated with past and possibly current realizations of the error (Roodman, 2009) In our study, we rely on a specification strategy common in CSR studies (e.g., Lopatta and Kaspereit, 2014) by employing a GMM estimation including a differenced equation. Hereby, we integrated the estimator of Arellano-Bover/Blundell-Bond, which builds up on two distinct equations: the original equation (level equation) and an equation where all regressors are differenced (system GMM) (Arellano and Bover, 1995; Blundell and Bond, 1998). Such a procedure is commonly used for samples with few time periods and many individual observations where the independent variables are not strictly exogenous (e.g., correlated with past and potentially also current error term realizations) (Roodman, 2009). To make sure our results are not downward-biased, we also employ a finite-sample correction as suggested in Windmeijer (2005). We furthermore verify that our idiosyncratic disturbance term (e.g., within individuals/firms) has no autocorrelation of a higher order. By construction, first-order autocorrelation is not an issue but higher-order autocorrelation may lead to invalid instruments.

To test that first-order differences in our GMM system (second equation with differenced regressors) are sufficient (e.g., we do not need to use larger lags), we test for second-order autocorrelation and find no significant autocorrelation at the one percent significance level for

the estimation, with CSR performance as an endogenous variable. However, the Arellano-Bond test for autocorrelation is significant for second-order autocorrelation at the ten percent level in the estimation for environmental performance. We therefore estimate this equation by increasing the lag limit by one period as recommended by Roodman (2009) to avoid invalid instruments. In this case, only autocorrelation of the third or higher order would cause invalid instruments. However, the Arellano-Bond test for autocorrelation becomes insignificant for autocorrelation of third and higher orders. In both specifications, gender diversity is significant with a positive coefficient. Employee representation is only significant in the specification in the model with environmental performance (for the results see Table A8 in the appendix). Hence, GMM confirm our main findings even when taking potential endogeneity into account and are in line with the fact that our significant results are not primarily driven by endogeneity (e.g., reversed causality).

5.4.7 Matched sample

Furthermore, we test whether one-third employee representation ($LABOR_{i,t}$) has the same explanatory power for our non-financial performance indicators when we compare firms with existing codetermination and an increased number of three or more women at board level in firms without codetermination but a consistently high number of women on the board. Our matching approach is based on the one applied by Lopatta et al. (2018). Having identified two group of firms, we perform a one-to-one nearest neighbor matching based on covariates (firm characteristics) which is a tool to mitigate selection bias due to observables (Heckman et al., 1998) and minimize the total distance between matched pairs (Rosenbaum, 1989). Our matched sample is composed of firms that change to three or more women on the board and have at least one-third employee representatives at board level (group 1) as well as of a group of firms that are not codetermined but have consistently more than three women at board level (group 2).[23] To find the nearest neighbor for group (1), we conduct subsamples for each codetermined firm that switches to three or more women on the board and all possible control firms with the same fiscal year and industry classification. Secondly, we create a propensity score (P-score) that is calculated based on the following model:

$$MIN3FEM_{i,t} = \beta_0 + \beta_1 AVGSIZE + \beta_2 AVGLEV + \beta_3 AVGLIQ + \sum TIME + \sum INDUSTRY + \sum STATE + \varepsilon. \quad (2)$$

[23] Three or more women represents a critical mass, as examined by Konrad et al. (2008) and Kramer et al. (2006) using interviews with female board members.

where $MIN3FEM_{i,t}$ is equal to one if the number of women on the supervisory board or board of directors is equal to or above three, and zero otherwise. $AVGSIZE_{i,t}$ is the three-year average of $SIZE_{i,t}$, $AVGLEV_{i,t}$ is the three-year average of $LEVERAGE_{i,t}$ and $AVGLIQ_{i,t}$ is the three-year average of $LIQUIDITY_{i,t}$. In line with our main regression, we control for time, industry, and state fixed effects. Once the P-score is defined we use it as the covariate in our matching approach, where each firm that switches to three or more women on the board and is codetermined is paired with one firm that is the closest in terms of P-score, has three or more women on the board, and is not codetermined. Technically, we sort the list of firms in group two in descending order by distance (in the P-score) to group one. We keep only the first two firm-year observations. Finally, the matched sample of firms consists of similar in terms of size, financial structure and liquidity, and high number of women at the board level.[24]

The matching procedure results in a sample of 52 firms. We require all firms to have two (at least one) firm-year observations in the period prior to the switch to three women and three (at least one) firm-year observations in the period afterwards. Using 242 firm-year observations, we estimate our empirical model (Equation (1)). Our main variable of interest is $LABOR_{i,t}$, because we expect a positive relationship between codetermination and CSR as well as environmental performance even when we use a sample of similar firms. Results are presented in the Appendix.[25]

In the matched sample, $LABOR_{i,t}$, has a positive and statistically significant average treatment effect (ATET) at the 1 percent level (0.001, robust SE: 0.00), which indicates that the presence of one-third labor representatives is positively related to the sustainability performance (CSR) of the subsequent year, when firms are compared to similar firms without codetermination. Also, the coefficient on $LABOR_{i,t}$ is positive and significant for the environmental performance of the subsequent year (0.001, robust SE: 0.00). As the ATET considers only the effect on the treated firms and hence limits the generalizability of the estimated effect, we also estimate the average treatment effect (ATE) for the whole population. Again, for both models we find a positive and significant coefficient.

In both models, the coefficients on $GENDIV_{i,t}$ have no significant effect on the dependent variables, which we expect because we compare two groups of firms that are similar in terms

[24] Using a matched sample of similar firms reduces concerns about dissimilar firms by controlling for state, time and industry fixed effects, but also for characteristics that affect the probability of firm growth and of correlated omitted variables (Dehaan et al., 2013).
[25] We refer to Appendix A9.

of gender diversity. More so, the results indicate that the presence of at least one-third labor representation is positively related to CSR or environmental performance compared to firms without codetermination at the board level, even when gender diversity is high in all firms. Most variables that are included in the P-score ($SIZE_{i,t}$, $LIQUIDITY_{i,t}$) have no significant coefficients, which indicates the firms are indeed very similar in terms of size and liquidity. All in all, model (1) has 30.7 percent explanatory power and model (2) has 44.8 percent. The results support our second hypothesis.

5.5 Further sensitivity tests

For sensitivity, we rerun our regressions using the environmental rating ($ENV_MSCI_{i,t+1}$) and CSR rating ($CSR_MSCI_{i,t+1}$) from the MSCI ESG (former KLD) database. In line with the ASST4 database, MSCI ranks firms' CSR performance in terms of environmental, social and governance (ESG) factors. Using $CSR_MSCI_{i,t+1}$ *or* $ENV_MSCI_{i,t+1}$ as dependent variables, coefficients on $LABOR_{i,t}$, (columns (1) and (2)) remain positive and significant. $GENDIVi_{,t}$ represents a positive and significant relationship with the subsequent quarters (columns (3) and (4)). The coefficients on $LABOR_{i,t}$ and $GENDIV_{i,t}$ remain significant between the one and five percent level when we include both variables of interests (columns (5) and (6)). Results are tabulated in Table A3 in Appendix 1 and support our first hypothesis that the proportion of women on the board is positively related to CSR and environmental performance. The explanatory power is around 15 percent for the CSR rating and around 4 percent for the environmental rating. All in all, the results support our hypothesis, even when we use CSR and environmental ratings from an entirely different database with different rating systems.

While it is necessary to include all OECD states to gain an international perspective on the relationship between labor representation at the board level and environmental performance as well as the CSR score, it is possible that certain countries may skew the results (Simnett et al., 2009). Hence, we create subsamples and again use Equation (1) to test whether the results hold when we exclude certain OECD countries that may influence the results. First, we exclude the U.S. because it has different CSR legislation, union power, and attitude towards labor representation (Lobel and Lofaso, 2013). Second, we exclude Sweden to delete observations where employee representation exists in a single-tier board system and may have a direct and stronger impact on executive directors than in countries with employee representatives on the supervisory board. We exclude Japanese firms because their CSR scores may have changed significantly compared to other OECD states after the nuclear disaster in 2011 (Betzer et al., 2013). As presented in Table A4, Panel A, the results are robust and the coefficients positive and significant for our dependent variables when we exclude

OECD states, as mentioned above. Also, in Germany union power and codetermination rights are strong since parity codetermination is mandatory for all firms with more than 2,000 domestic employees. We exclude all 1,457 German firm-quarter observations from our sample. The results remain robust as we find a significant positive relationship between $LABOR_{i,t}$ and our main dependent variables.[26]

Moreover, we split the sample into two samples and rerun the regressions (1) where there is no codetermination and (2) where no women are represented at the board level. As shown in Panel B, the coefficient on $GENDIV_{i,t}$ is positive and significant for all our dependent variables, even in firms without employee representatives. Also, the coefficient on $LABOR_{i,t}$ is positive and significant for our dependent variables, as presented in Panel C. The results indicate that the proportion of women and the proportion of labor representatives are separate factors that influence the CSR and environmental scores and do not necessarily have to be combined. The results support both of our hypotheses that female (H_1) and employee (H_2) representation is positively related to a firm's CSR and environmental performance.

As presented in Panel D of Table A4, the results are still significant when we exclude certain years in our panel data, such as the years of the financial crisis (2007 and 2008), as this controls for years in which firms may have had more financial problems and fewer resources to influence their non-financial performance. Except for the MSCI's environmental performance pillar ($MSCI_ENV_{i,t+1}$), the coefficients on our main independent variables are positive and significant at the one percent level, which is in line with our hypotheses.

6 Conclusion

This study examines how the presence of women at the board level and one-third employee representation are related to CSR and environmental performance in a sample of 23 OECD states. In this context, codetermination varies across countries as do the board systems and corporate governance mechanisms. We focus on firms that under codetermination legislation have to include at least one-third employee representatives on their supervisory boards and compare these with similar firms in countries where no codetermination rights apply. We find evidence that codetermined firms are positively related to higher CSR and environmental performance than firms with no codetermination. Furthermore, we find a positive and significant relationship between the presence of women on the board and a firm's CSR and environmental performance. Additional analyses support our hypotheses and show the relationship is positive when the number of women reaches the critical mass of three.

[26] Results available upon request.

We also shed more light on the joint effect of gender diversity and employee representation at board level on CSR. By including an interaction term between employee representatives and female board members, we show that there is no evidence for a substitutional relationship between the two diversity dimensions. Hence, our results are in line with the notion that both gender as well as stakeholder diversity enhance a firm's CSR and environmental performance beyond the beneficial effect of the respective other diversity dimension. Interestingly, when we focus on the intersection between labor representatives and female board members, namely female employee representatives, we find an even stronger economic effect on our dependent variables than when we explore the proportion of women or presence of employee representatives alone. Our robustness tests illustrate that the results hold when we use two different databases and compare firms that are from different OECD states but are similar in terms of fiscal year, size, leverage, and liquidity. We conclude that the positive relationship between CSR engagement and high gender diversity may be caused by women's greater sensitivity to CSR activities compared to men, and that the positive relationship between codetermination and firms' non-financial performance may be driven by employees' asymmetric risk-return function. Employee representatives have a stronger interest than shareholder representatives in the long-term survival of the firm and a weaker interest in short-term financial performance as they asymmetrically suffer less from lower short-term profits than shareholders who symmetrically benefit from both gains as well as losses.

To reduce the risk of systematic differences between OECD states or any self-selection bias that could affect our results, we exclude countries with hybrid board systems and voluntary codetermination rights. Among other tests, we use a propensity score matching approach, which exploits inter-temporal variations in labor laws across countries. Furthermore, we exclude countries with strong union power or a suspicious attitude towards codetermination rights and estimate the results with a system GMM estimation model. The results do not change.

Our study contributes to prior literature on codetermination, CSR and gender diversity. Since codetermination rights still vary across countries or do not exist at all in a large number of OECD states (mostly Anglo-Saxon countries), our study has implications for policy-makers and countries without any codetermination rights. Employee representatives may consider stakeholders' interests and function as an interface between a firm's workforce and shareholders and its executive management. For future research, we suggest examining the effects of female employee and shareholder representatives, respectively, on CSR engagement from a qualitative perspective using methods such as interviews. Qualitative research (e.g.,

interviews) could help to identify how employee representatives and women at board level find channels of CSR engagements beyond the official board meetings.

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8 Tables

Table 1: Linear regression sample details – Year, industry and country distribution

Countries and board systems						Industries		
				Board-system				
Country	Codetermination*	n	%	one-tier	two-tier	Industry	n	%
Austria	Yes	238	1.06	0	238	Mining	2,008	8.93
Australia	No	3,491	15.53	3491	0	Construction	1,004	4.47
Belgium	No	316	1.41	316	0	Manufacturing	10,888	48.42
Canada	No	2	0.01	2	0	Transportation, Communications,	3.930	17.48
Switzerland	No	1,030	4.58	1030	0	Electric, Gas & Sanitary Services.		
Czech Rep.	Yes	57	0.25	0	57	Retail Trade	1,826	8,12
Germany	Yes	1,457	6.48	0	1,457	Services	2,415	10.74
Denmark	Yes	345	1.53	60	285	Public Administration	414	184
Spain	No	805	3.58	805	0	Total	22,485	100.00
UK	No	5,896	26.22	5,896	0	**Observation period**		
Greece	No	213	0.95	213	0	Year	n	%
Hungary	No	38	0.00	0	38	2001	22	0.10
Ireland	No	205	0.91	205	0	2002	166	0.74
Israel	No	151	0.67	151	0	2003	348	1.55
Japan	No	4,919	21.88	4,919	0	2004	1,003	4.46
Rep. of Korea	No	793	3.53	793	0	2005	1,516	6.74
Lux	Yes	169	0.75	165	4	2006	1,777	7.90
Netherlands	Yes	588	2.62	521	67	2007	1,700	7.56
Norway	Yes	371	1.65	371	0	2008	1,807	8.04
New Zealand	Yes	250	1.11	250	0	2009	1,961	8.72
Portugal	No	216	0.96	216	0	2010	1,983	8.82
Sweden	Yes	908	4.04	908	0	2011	2,027	9.01
United States	No	27	0.12	27	0	2012	2,429	10.80
						2013	2,784	12.38
						2014	2,962	13.17
Total		22,485	100	20.339	2,146	Total	22,485	100.00

This table shows the sample distribution codetermination rights and board system across OECD states as well as industries and the observation period within the main sample. For detailed information about codetermination rights, we refer to Table A1 and A2 in the appendix.

Table 2: Variable definition

Variable	Definition and Measurement
$A4_CSR_{i,t}$	The CSR score ranks firms' CSR performance based on economic, environmental, social and governance factors (Source: Thomson Reuters ASSET4).
$A4_ENV_{i,t}$	Thomson Reuters ASSET4's environmental score reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long-term shareholder value (0-1) (Source: Thomson Reuters ASSET4).
$ABS_EM_{i,t}$	We use the absolute value of abnormal accruals from the modified Jones (1991) model, based on Dechow et al., 1995), to proxy for earnings quality (Francis et al., 2008) (Source: Compustat).
$AVGGR_{i,t}$	$AVGGR_{i,t}$ is the three-years-average of *growth in sales (sales t0 divided by sales t-1)*.
$AVGLEV_{i,t}$	$AVGLEV_{i,t}$ is the three-year average of $LEVERAGE_{i,t.}$
$AVGLIQ_{i,t}$	$AVGLIQ_{i,t}$ is the three-years-average of $LIQUIDITY_{i,t}$.
$AVGSIZE_{i,t}$	$AVGSIZE_{i,t}$ is the three-year average of $SIZE_{i,t}$.
$COMPETITION_{i,t}$	This index is computed as the sum of the squared fractions of sales of the 50 largest firms in an industry (industries are defined based on the two-digit SIC codes). In cases where there are fewer than 50 firms in an industry, we use all firms in the industry to calculate market shares (Source: Compustat).
$CORPGOV_{i,t}$	The governmental pillar scores are on an integer scale ranging from 0 to 1 and are interpreted as a metric variable. (Source: MSC ESG).
$FEMEMP_{i,t}$	Continuous variable that represents the ratio of female labor representatives compared to the total number of board members (0-1) (Source: hand collection from annual reports).
$FIN_{i,t}$	*FIN* is measured as the sale of common and preferred shares minus the purchase of common and preferred shares plus the long-term debt issuance minus the long-term debt reduction (Richardson, Teoh, & Wysocki (2004) (Source: Compustat).
$GLOBAL_{i,t}$	Indicator variable that equals 1 if a firm reports foreign income, and 0 otherwise (Source: Compustat).
$GENDIV_{i,t}$	Continuous variable that represents the proportion of women on board of directors (0-1) (Source: ASSET 4 database and hand collection from annual reports).
$GENDIV_SQ_{i,t}$	Quadratic value of $GENDIV_{i,t}$
$LABOR_{i,t}$	Indicator variable that equals 1 if a firm has at least one-third labor representation on supervisory board, and 0 if the board does not include any labor representatives (Source: Hand collected from annual reports).
$LEVERAGE_{i,t}$	We define *LEVERAGE* as the ratio of total debt divided by total assets. (Source: Compustat).
$LITIGATION_{i,t}$	Indicator variable that equals 1 if a firm operates in a high-litigation industry (SIC codes of 2833– 2836, 3570–3577, 3600–3674, 5200–5961, and 7370), and 0 otherwise (Francis et al., 1994; Matsumoto, 2002) (Source: Compustat).
$LIQUIDITY_{i,t}$	Our liquidity measure, LIQUIDITY, is the ratio of the number of shares traded in the year to the total shares outstanding at the year-end (Source: Compustat).
$MIN3FEM_{i,t}$	Indicator variable that equals 1 if a firm has three or more women on the supervisory board, and 0 otherwise; Number of Women = *GENDIV* * board size (Source: Asset 4).
$MSCI_CSR_{i,t}$	The alphabetical scores of MSCI ESG are uniformly transformed to an integer scale ranging from 1 (Score C) to 7 (Score AAA) and are interpreted as a metric variable. MSCI ranks firms' CSR performance in Environmental, Social And Governance (ESG) factors (Source: MSC ESG).
$MSCI_ENV_{i,t}$	The environmental pillar scores are integer scale ranging from 0 to 1 and are interpreted as a metric variable. (Source: MSC ESG).
$ROA_{i,t}$	Return on assets (ROA), computed as income before extraordinary items scaled by total assets at the beginning of each year (Source: Compustat).
$SIZE_{i,t}$	Natural logarithm of the market value of common equity at the beginning of each year. (Source: Compustat).
$TIME_{i,t;}$ $STATE_{i,t}$ $INDUSTRY_{i,t;}$	In all specifications, we include time (either quarterly or yearly), industry and country indicators to control for potential time, industry and country effects
$TREATED_{i,t}$	Indicator variable equal to 1 in the pre-period, which are two years before and the post-period, which are three years after a firm's gender diversity score exceeds the 60 percent threshold as provided by the Asset 4 database.

$TOBINQ_{i,t}$	*TOBINQ* is Tobin's Q, defined as the market value of common equity plus the book value of preferred stock, book value of long-term debt and current liabilities, scaled by the book value of total assets (Source: Compustat).

Variables are sorted alphabetically.

Table 3: Descriptive statistics

Panel A: firm-quarter observations	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	N	mean	sd	min	p25	p50	p75	max
Dependent variables								
$A4_CSR_{i,t}$	22,485	0.63	0.28	0.04	0.42	0.73	0.88	0.96
$A4_ENV_{i,t}$	22,485	0.66	0.28	0.09	0.41	0.78	0.91	0.97
$MSCI_CSR_{i,t}$	22,485	4.44	1.61	1.00	3.00	4.00	6.00	7.00
$MSCI_ENV_{i,t}$	22,485	2.31	1.88	1.1	1.4	1.60	1.70	10.00
Variables of interest								
$GENDIV_{i,t}$	22,485	0.09	0.11	0.00	0.00	0.07	0.17	0.43
$MIN3FEM_{i,t}$ (>=3)	22,485	0.15	0.35	0.00	0.00	0.00	0.00	1.00
$LABOR_{i,t}$	22,485	0.10	0.30	0.00	0.00	0.00	0.00	1.00
$FEMEMP_{i,t}$	22,485	0.01	0.03	0.00	0.00	0.00	0.00	0.19
Control variables								
$LIQUIDITY_{i,t}$	22,485	7.59	1.75	-0.16	7.20	8.02	8.58	10.00
$ROA_{i,t}$	22,485	0.01	0.02	-0.07	0.00	0.01	0.02	0.10
$TOBINQ_{i,t}$	22,485	1.03	1.99	0.06	0.38	0.52	0.67	10.00
$LEVERAGE_{i,t}$	22,485	0.57	0.22	0.03	0.43	0.58	0.72	1.00
$SIZE_{i,t}$	22,485	23.36	2.80	18.52	21.23	22.59	25.49	30.99
$LITIGATION_{i,t}$	22,485	0.18	0.39	0.00	0.00	0.00	0.00	1.00
$FIN_{i,t}$	22,485	0.17	0.80	-2.79	-0.00	0.00	0.54	4.77
$GLOBAL_{i,t}$	22,485	0.50	0.50	0.00	0.00	0.00	1.00	1.00
$ABS_EM_{i,t}$	22,485	0.00	0.07	-0.29	-0.02	0.00	0.02	0.30
$COMPETITION_{i,t}$	22,485	-0.28	0.26	-1.00	-0.35	-0.17	-0.11	0.00
$CORPGOV_{i,t}$	22,485	2.97	2.52	0.00	1.40	1.60	5.00	10.00
Panel B: matched sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	N	mean	sd	min	p25	p50	p75	max
Dependent variables								
$A4_CSR_{i,t}$	242	0.83	0.22	0.05	0.58	0.83	0.90	0.97
$A4_ENV_{i,t}$	242	0.78	0.22	0.71	0.71	0.88	0.92	0.97
$MSCI_CSR_{i,t}$	242	4.93	1.34	1.00	4.00	5.00	6.00	7.00
$MSCI_ENV_{i,t}$	242	2.23	1.72	0.08	1.50	1.60	1.70	10.00
Variables of interest								
$GENDIV_{i,t}$	242	0.08	0.11	0.00	0.00	0.00	0.14	0.43
$MIN3FEM_{i,t}$ (>=3)	242	0.28	0.45	0.00	0.00	0.00	1.00	1.00
$LABOR_{i,t}$	242	0.50	0.50	0.00	0.00	0.50	1.00	1.00
$FEMEMP_{i,t}$	242	0.03	0.05	0.00	0.00	0.00	0.06	0.19
Control variables								
$LIQUIDITY_{i,t}$	242	7.78	1.65	-0.16	7.61	8.13	8.68	10.00
$ROA_{i,t}$	242	0.01	0.02	-0.07	0.00	0.01	0.02	0.06
$TOBINQ_{i,t}$	242	0.72	1.22	0.06	0.42	0.53	0.66	10.00
$LEVERAGE_{i,t}$	242	0.65	0.16	0.03	0.53	0.66	0.76	1.00
$SIZE_{i,t}$	242	23.08	2.19	18.52	21.77	22.82	24.39	30.99
$LITIGATION_{i,t}$	242	0.16	0.36	0.00	0.00	0.00	0.00	1.00
$FIN_{i,t}$	242	0.33	1.00	-1.40	-0.00	0.05	0.54	4.77
$GLOBAL_{i,t}$	242	0.34	0.47	0.00	0.00	0.00	1.00	1.00
$ABS_EM_{i,t}$	242	-0.01	0.06	-0.23	-0.03	-0.01	0.02	0.30
$COMPETITION_{i,t}$	242	-0.25	0.24	-1.00	-0.31	-0.16	-0.10	0.00
$CORPGOV_{i,t}$	242	2.77	2.23	0.00	1.50	1.60	4.00	10.00
Panel C: Distribution of differences in matched propensity scores (P-scores								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	N	mean	sd	min	p25	median	p75	max
Satisfied P-score (matched sample)	347	0.12	0.05	0.04	0.08	0.11	0.15	0.28

Panel A shows the descriptive statistics in the full sample (panel variable = quarter). Panel B represents descriptive statistics in the matched sample (panel variable = year). Panel C provides the distribution of the propensity (P-Score) that is used to create a matched sample. Variables are defined in Table 2.

Table 4: Univariate statistics

Panel A: one-tier board system	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	N	mean	sd	min	p25	p50	p75	max
Dependent variables								
$A4_CSR_{i,t}$	20,584	0.63	0.28	0.04	0.42	0.73	0.88	0.96
$A4_ENV_{i,t}$	20,584	0.65	0.29	0.09	0.40	0.77	0.91	0.98
$MSCI_CSR_{i,t}$	20,584	4.33	1.64	1.00	3.00	4.00	6.00	7.00
$MSCI_ENV_{i,t}$	20,584	2.31	1.89	1.10	1.40	1.50	1.70	10.00
Variable of interest								
$GENDIV_{i,t}$	20,584	0.09	0.11	0.00	0.00	0.06	0.15	0.43
$MIN3FEM_{i,t}$ (>=3)	20,584	0.13	0.34	0.00	0.00	0.00	0.00	1.00
$LABOR_{i,t}$	20,584	0.03	0.17	0.00	0.00	0.00	0.00	1.00
$FEMEMP_{i,t}$	20,584	0.00	0.02	0.00	0.00	0.00	0.00	0.09
Panel B: two-tier board system	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	N	mean	sd	min	p25	p50	p75	max
Dependent variables								
$A4_CSR_{i,t}$	1,901	0.70	0.26	0.04	0.54	0.81	0.89	0.96
$A4_ENV_{i,t}$	1,901	0.77	0.24	0.09	0.67	0.90	0.93	0.97
$MSCI_CSR_{i,t}$	1,901	4.83	1.50	1.00	4.00	5.00	6.00	7.00
$MSCI_ENV_{i,t}$	1,901	2.63	2.16	1.10	1.50	1.60	1.90	10.00
Variables of interest								
$GENDIV_{i,t}$	1,901	0.13	0.11	0.00	0.05	0.11	0.20	0.43
$MIN3FEM_{i,t}$ (>=3)	1,901	0.32	0.47	0.00	0.00	0.00	1.00	1.00
$LABOR_{i,t}$	1,901	0.85	0.35	0.00	1.00	1.00	1.00	1.00
$FEMEMP_{i,t}$	1,901	0.06	0.07	0.00	0.00	0.05	1.00	0.18

Panel A shows the descriptive statistics of dependent variables and variables of interest in the subsample that consist of firms that are operating in one-tier board system (only one board of directors or management board). Panel B provides the descriptive statistics for firms operating in a two-tier board system (management and supervisory board). Variables are defined in Table 2.

Table 5: Pearson correlation

Panel A: Full sample for linear regressions

Variable name		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)	$A4_CSR_{i,t+1}$	1,00																	
(2)	$A4_ENV_{i,t+1}$	0,74*	1,00																
(3)	$MSCI_CSR_{i,t+1}$	0,45*	0,42*	1,00															
(4)	$MSCI_ENV_{i,t+1}$	0,10*	0,09*	0,13*	1,00														
(5)	$GENDIV_{i,t}$	0,30*	0,10*	0,18*	0,11*	1,00													
(6)	$LABOR_{i,t}$	0,09*	0,14*	0,12*	0,04*	0,19*	1,00												
(7)	$FEMEMP_{i,t}$	0,10*	0,09*	0,12*	0,07*	0,31*	0,71*	1,00											
(8)	$ROA_{i,t}$	0,04*	-0,03*	0,03*	0,01	0,05*	-0,02*	-0,01	1,00										
(9)	$LEVERAGE_{i,t}$	0,21*	0,19*	0,12*	0,03*	0,07*	0,06*	0,05*	0,02	1,00									
(10)	$SIZE_{i,t}$	-0,01	0,26*	0,07*	0,03*	-0,20*	-0,04*	-0.04*	-0,04*	-0,07*	1,00								
(11)	$TOBINQ_{i,t}$	-0,12*	-0,19*	-0,09*	-0,02	0,01	-0,04*	-0,03	0,08*	0,08*	-0,21*	1,00							
(12)	$LITIGATION_{i,t}$	-0,03*	-0,02*	0,02	-0,02*	0,04*	-0,04*	0,01	0,02*	-0,08*	0,04*	0,02*	1,00						
(13)	$FIN_{i,t}$	-0,08*	-0,04*	-0,07*	-0,03*	-0,07	0,02	0,00	-0,02*	-0,05*	-0,06*	0,16*	0,00	1,00					
(14)	$GLOBAL_{i,t}$	-0,35*	-0,32*	-0,22*	-0,04*	-0,14*	-0,12*	-0,12*	-0,01	-0,06*	-0,21*	0,14*	-0,03*	0,02*	1,00				
(15)	$ABS_EM_{i,t}$	-0,02*	0,00	0,00	0,00	-0,02*	-0,02	-0,06*	0,04*	-0,05	0,03*	-0,03*	0,01	0,00	0,00	1,00			
(16)	$COMPETITION_{i,t}$	0,01	-0,03*	-0,03*	-0,02*	-0,04*	0,01	0,00	0,03	-0,02	-0,06*	0,01	-0,10*	0,04*	-0,03*	0,00	1,00		
(17)	$LIQUIDITY_{i,t}$	-0,09*	-0,03*	-0,04*	-0,06*	-0,15*	-0,03*	0,00	-0,04*	-0,02*	0,07*	0,00	0,01	0,01	0,07*	0,00*	0,03	1,00	
(18)	$CORPGOV_{i,t}$	0.04*	0,05*	0,02	0,04*	0,04*	-0,01	0,02	0,03	-0,15*	0,03	0,01	0,01	-0,01	0,01	0,01	-0,15*	0,01	1,00

*This table represents Pearson correlations between all variables. * indicate coefficients are significantly related at the 1 percent level.*

Table 6: Regression results

VARIABLES	(1) $A4_CSR_{i,t+1}$	(2) $A4_ENV_{i,t+1}$	(3) $A4_CSR_{i,t+1}$	(4) $A4_ENV_{i,t+1}$	(5) $A4_CSR_{i,t+1}$	(6) $A4_ENV_{i,t+1}$
$\boldsymbol{LABOR_{i,t}}$	0.095***	0.087***			0.088***	0.081***
	(0.016)	(0.016)			(0.016)	(0.016)
$\boldsymbol{GENDIV_{i,t}}$			0.409***	0.358***	0.004***	0.004***
			(0.018)	(0.019)	(0.000)	(0.000)
$ROA_{i,t}$	0.271***	-0.172**	0.242***	-0.199***	0.242***	-0.200***
	(0.069)	(0.074)	(0.068)	(0.074)	(0.068)	(0.073)
$LEVERAGE_{i,t}$	0.174***	0.181***	0.170***	0.178***	0.167***	0.176***
	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)
$SIZE_{i,t}$	0.015***	0.017***	0.014***	0.016***	0.014***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$TOBINQ_{i,t}$	-0.012***	-0.012***	-0.011***	-0.012***	-0.011***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$LITIGATION_{i,t}$	0.020***	0.009*	0.017***	0.007	0.018***	0.008
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
$FIN_{i,t}$	-0.008***	0.001	-0.005**	0.004*	-0.005**	0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$GLOBAL_{i,t}$	-0.159***	-0.125***	-0.152***	-0.119***	-0.152***	-0.119***
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
$ABS_EM_{i,t}$	0.003	0.002	0.007	0.005	0.009	0.006
	(0.023)	(0.025)	(0.022)	(0.024)	(0.022)	(0.024)
$COMPETITION_{i,t}$	-0.002	-0.014**	-0.007	-0.017***	-0.006	-0.017***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
$LIQUIDITY_{i,t}$	0.000	-0.000	0.001	-0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$CORPGOV_{i,t}$	0.004***	0.004***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TIME FE	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,484	21,283	22,484	21,283	22,484	21,283
Adj. R-squared	0.378	0.371	0.044	0.392	0.393	0.382

These results are obtained when we employ a linear regression model as presented in Equation (1), where the dependent variable and independent variables are lagged over one ***quarter****. The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table 7: Main model including an interaction term

VARIABLES	(1) $A4_CSR_{it+1}$	(2) $A4_ENV_{it+1}$	(3) $MSCI_CSR_{it+1}$	(4) $MSCI_ENV_{it+1}$
$\boldsymbol{LABOR_{i,t}}$	0.095***	0.110***	0.659***	0.226
	(0.017)	(0.016)	(0.108)	(0.151)
$\boldsymbol{GENIV_{i,t}}$	0.004***	0.004***	0.021***	0.013***
	(0.000)	(0.000)	(0.001)	(0.002)
$\boldsymbol{LABOR_GENDIV_{i,t}}$	-0.001	-0.002***	-0.005	0.007
	(0.000)	(0.001)	(0.003)	(0.006)
$ROA_{i,t}$	0.243***	-0.196***	1.882***	0.106
	(0.068)	(0.074)	(0.457)	(0.538)
$LEVERAGE_{i,t}$	0.167***	0.174***	0.433***	-0.103
	(0.008)	(0.009)	(0.055)	(0.068)
$SIZE_{i,t}$	0.014***	0.016***	0.044***	0.030***
	(0.001)	(0.001)	(0.005)	(0.007)
$TOBINQ_{i,t}$	-0.011***	-0.012***	-0.027***	-0.006
	(0.001)	(0.001)	(0.005)	(0.006)
$LITIGATION_{i,t}$	0.018***	0.008	0.331***	-0.117***
	(0.005)	(0.005)	(0.035)	(0.042)
$FIN_{i,t}$	-0.005**	0.004*	-0.058***	-0.017
	(0.002)	(0.002)	(0.014)	(0.014)
$GLOBAL_{i,t}$	-0.152***	-0.120***	-0.466***	-0.129***
	(0.003)	(0.004)	(0.023)	(0.028)
$ABS_EM_{i,t}$	0.007	0.002	0.214	-0.004
	(0.022)	(0.024)	(0.148)	(0.182)
$COMPETITION_{i,t}$	-0.006	-0.018***	-0.061	0.162***
	(0.006)	(0.006)	(0.044)	(0.056)
$LIQUIDITY_{i,t}$	0.001	0.000	-0.006	-0.023***
	(0.001)	(0.001)	(0.006)	(0.009)
$CORPGOV_{i,t}$	0.003***	0.003***	0.048***	0.011*
	(0.001)	(0.001)	(0.004)	(0.006)
TIME FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	22,484	21,282	21,282	21,282
Adj. R-squared	0.393	0.383	0.163	0.047

These results are obtained when we employ a linear regression model as presented in Equation (1), where the dependent variable and independent variables are lagged over one ***quarter****. Additionally, we include an interaction term between both of our variables of interest ($GENDIV_{i,t}$ and $LABOR_{i,t}$). The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table 8: Codetermination and female critical mass at board level

VARIABLES	(1) A4_ CSRit+1	(2) A4_ ENV$_i$t+1	(3) MSCI_ CSR$_i$t+1	(4) MSCI_ ENV$_i$t+1
LABOR$_{i,t}$	0.091***	0.083***	0.590***	0.315**
	(0.016)	(0.016)	(0.102)	(0.139)
MIN3FEM$_{i,t}$	0.027***	0.027***	0.219***	0.271***
	(0.004)	(0.005)	(0.033)	(0.048)
ROA$_{i,t}$	0.267***	-0.176**	1.961***	0.240
	(0.069)	(0.074)	(0.463)	(0.534)
LEVERAGE$_{i,t}$	0.173***	0.180***	0.466***	-0.102
	(0.008)	(0.009)	(0.055)	(0.067)
SIZE$_{i,t}$	0.014***	0.016***	0.047***	0.029***
	(0.001)	(0.001)	(0.005)	(0.007)
TOBINQ$_{i,t}$	-0.011***	-0.012***	-0.029***	-0.009
	(0.001)	(0.001)	(0.005)	(0.006)
LITIGATION$_{i,t}$	0.019***	0.008	0.329***	-0.124***
	(0.005)	(0.006)	(0.035)	(0.042)
FIN$_{i,t}$	-0.008***	0.001	-0.066***	-0.023*
	(0.002)	(0.002)	(0.014)	(0.014)
GLOBAL$_{i,t}$	-0.158***	-0.124***	-0.484***	-0.137***
	(0.003)	(0.004)	(0.023)	(0.028)
ABS_EM$_{i,t}$	0.003	0.001	0.159	-0.144
	(0.023)	(0.025)	(0.148)	(0.184)
COMPETITION$_{i,t}$	-0.002	-0.013**	-0.030	0.143**
	(0.006)	(0.006)	(0.044)	(0.056)
LIQUIDITY$_{i,t}$	0.001	-0.000	-0.006	-0.021**
	(0.001)	(0.001)	(0.006)	(0.009)
CORPGOV$_{i,t}$	-0.334***	-0.293***	3.794***	0.721**
	(0.045)	(0.041)	(0.244)	(0.317)
TIME FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	22,484	21,283	21,283	21,283
Adj. R-squared	0.379	0.372	0.154	0.046

*These results are obtained when we employ a linear regression model as presented in Equation (1), where the dependent variable and independent variables are lagged over one quarter in all columns. We substitute GENDIV$_{i,t}$ by dummy variables that are either one if the number of women on the board is three or above, and zero otherwise (MIN3FEM$_{i,t}$) or one if the number of women on the board is below three (MAX2FEM$_{i,t}$). The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table 9: Regression results when analyzing female employee representatives

VARIABLES	(1) $A4_CSR_{i,t+1}$	(2) $A4_ENV_{i,t+1}$	(3) $MSCI_CSR_{it+1}$	(4) $MSCI_ENV_{it+1}$
$\boldsymbol{FEMEMP_{i,t}}$	0.319***	0.212***	3.282***	3.715***
	(0.067)	(0.069)	(0.450)	(0.710)
$ROA_{i,t}$	0.263***	-0.178**	1.928***	0.216
	(0.069)	(0.075)	(0.466)	(0.534)
$LEVERAGE_{i,t}$	0.175***	0.182***	0.480***	-0.090
	(0.008)	(0.009)	(0.055)	(0.068)
$SIZE_{i,t}$	0.015***	0.017***	0.049***	0.031***
	(0.001)	(0.001)	(0.005)	(0.007)
$TOBINQ_{i,t}$	-0.012***	-0.012***	-0.030***	-0.011*
	(0.001)	(0.001)	(0.005)	(0.006)
$LITIGATION_{i,t}$	0.019***	0.009	0.330***	-0.122***
	(0.005)	(0.006)	(0.035)	(0.042)
$FIN_{i,t}$	-0.008***	0.001	-0.066***	-0.024*
	(0.002)	(0.002)	(0.014)	(0.014)
$GLOBAL_{i,t}$	-0.159***	-0.125***	-0.489***	-0.142***
	(0.003)	(0.004)	(0.023)	(0.028)
$ABS_EM_{i,t}$	0.003	0.002	0.161	-0.141
	(0.023)	(0.025)	(0.148)	(0.184)
$COMPETITION_{i,t}$	-0.003	-0.014**	-0.039	0.133**
	(0.006)	(0.006)	(0.044)	(0.056)
$LIQUIDITY_{i,t}$	0.000	-0.001	-0.011*	-0.027***
	(0.001)	(0.001)	(0.006)	(0.009)
$CORPGOV_{i,t}$	0.004***	0.004***	0.049***	0.015**
	(0.001)	(0.001)	(0.004)	(0.006)
TIME FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	22,484	21,283	21,283	21,283
Adj. R-squared	0.378	0.371	0.152	0.045

These results are obtained when we use $FEMEMP_{i,t}$ as our only variable of interest which represents the proportion of female employee representatives to the number of board members. Our dependent and control variables equal those presented in Equation (1) and are lagged over one ***quarter*** *in all models. The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table A1: Codetermination levels across OECD states[27]

Level	Scope of codetermination	OECD states
0	No labor representation or voting rights at the board level in the private sector.	Australia, Belgium, Canada, Estonia, Greece, Ireland, Iceland, Japan, Latvia, Lithuania, New Zealand, South Korea, Switzerland, United Kingdom, USA, Spain, Mexico, Chile, Israel, Italy, Portugal, France (until 2013), Turkey.
1	Employee representation with up to one-third of all board members including voting rights.	Finland, Poland, France (since 2013), Sweden, Hungary.
2	Obligatory employee representatives on (supervisory) boards with at least one-third voting rights in the private sector.	Czech Republic (until 2014), Austria, Netherlands, Slovak Republic, Norway, Denmark, Germany, Slovenia, Luxembourg.

Our own overview is based on the European Trade Union Institute's (ETUI, 2014) data and information provided by the German Hans-Böckler-Stiftung (2004), as well as Conchon et al. (2015), Höpner (2004, 2007) and Niedenhoff (2005). Codetermination rights are presented in Table A2.

[27] For further information we refer to Conchon et al. (2015) and (ETUI, 2014).

Table A2: Codetermination levels across OECD states

No rules (level 0)	**Codetermination rights up to one-third; Rules under development or voluntary codetermination (level 1)**	**Rules in the public and private sector (level 2)**
In **Belgium**, only state-owned companies have two union representatives represented on the board. In **Estonia**, there is a two-tier system with a supervisory and management board for public limited companies and for larger private limited companies; otherwise companies can choose between the one or two-tier system. There is no right to have employee representatives at the board level in either system. In **Greece**, there is a one-tier board system but employee representation at the board level only exists in few state-owned companies. There is a one-tier board system in **Ireland** but employee representation at the board level only exists in some state-owned companies. In **Latvia** firms have a two-tier structure with a supervisory board and a management board. Employees have no right to board-level representation. In **Lithuania** firms can choose between a two-tier system, with both a supervisory and a management board, and a one-tier system, with just a management board. Employees have no right to board-level representation in either system. In **Malta,** there is no right to employee representation at the board level in the single tier system. In the past, some state-owned companies had board level representation, normally only a single director, but this is no longer the case. In Spain, firms have a one-tier structure with a management board. In the private sector employees have no right to board-level representation. In some large state-owned companies and local savings banks, there are	In **Finland**, most companies have a one-tier system with a single management board. A two-tier system with a supervisory board that oversees the management board is an option for the largest companies, but is rarely chosen. Codetermination applies to companies with more than 150 employees where employees want it; the extent and method of representation should be fixed by agreement. If there is no agreement, employees are entitled to 25% of the seats up to a maximum of four. If the employees cannot agree how their representatives should be chosen, the law provides for an election procedure. In **Poland,** public limited firms must have a two-tier structure, with both a supervisory and management board, but smaller limited companies can choose a one-tier structure. Employees have no general right to be represented at the board level in the private sector. There are employee representatives on the supervisory boards of companies in the process of privatization, including those where the state is a minority shareholder. The government plans to remove the right of employees to be represented on supervisory boards. In **France**, there was no codetermination legislation for the private sector until May 2013. In May 2013, a new codetermination act was adopted in France, with all firms with a minimum of 10,000 employees	In **Czech Republic**, in both private and state-owned firms with a two-tier system, employee representatives serve on the supervisory board, to which the management board reports. Proposals are underway that could remove or reduce these rights. Since 2014 one-third participation for listed companies with a minimum of 50 employees is no longer mandatory. In **Austria**, labor representation rights on supervisory boards exist on a one-third level in firms with a workforce of over 300. In a large number of companies with a two-tier system, labor representatives serve on the supervisory board, which oversees the actions of the management board. In the **Netherlands**, large firms with at least 100 employees and share capital of at least EUR 13 million are required to have a two-tier system with a supervisory and a management board. In these companies, there is one-third labor representation on the supervisory board, although the members cannot be employees of the company or of the union dealing with the company. In the **Slovak Republic**, public limited companies have a two-tier structure with both a supervisory board and a management board. In private firms with a minimum of 50 employees, there is one-third participation for labor representatives on supervisory boards provided certain criteria are fulfilled. In **Norway** companies with more than 200 employees have a corporate assembly as well as a board. That corporate assembly has a general supervisory role and may take decisions on large-scale investments or restructuring. The corporate assembly must have at least twelve members, with two thirds elected by the shareholders and one third elected by employees from a pool of employees. In **Denmark,** a large number of companies have employee

employee representatives on the board.

In **Spain**, in some state-owned companies the two national union confederations have one seat each on the board. In local savings banks, they have between 5% and 15% of the seats.

Firms in the **United Kingdom** follow the one-tier system with a management board. Employees have no right to representation at the board level.

In **Italy**, public limited firms can choose between the two-tier system, with both a supervisory and a management board, and the one-tier system, with just a management board. Most companies have the one-tier system. Limited companies have a one-tier system. Employees have no voting rights in either system.

Most firms in **Portugal** have a one-tier system with a management board and an audit committee but a small number make use of the right to have a two-tier structure with a management and a general council that oversees management. Employees have no right to be represented at the board level in the private sector.

worldwide or a minimum of 5,000 domestic employees have to introduce codetermination at the board level. This rule applies to both systems (one and two-tier). Firms that do not meet the criteria for mandatory labor representation on boards can introduce labor representatives to the board voluntarily.

In **Sweden**, companies with more than 25 employees and a collective agreement with a union must have two board members chosen by the unions. This rises to three in companies with 1,000 or more employees. Employee members can never have a majority on the board.

In **Hungary**, firms with more than 200 employees the supervisory board must have one-third labor representatives. In a two-tier structure, the supervisory board receives reports from the management board. After new legislation was introduced in 2006, in firms with a single-tier structure board level representation is subject to agreement between the employer and the works council.

representatives at the board level. There is a two-tier system for public limited companies and a choice between a one-tier or two-tier system for private limited companies. Specifically, firms with 35 employees or more have to provide employees at least with one-third participation rights at the board level.

In **Germany,** a two-tier board system applies, with a separate management board and supervisory board. Firms with between 500 and 1,999 domestic employees have to provide labor representatives with one-third participation right. Once the workforce rises beyond 2,000, parity codetermination applies (50 percent labor representatives on supervisory boards). Additionally, parity codetermination rights apply in German firms in the iron, coal and steel industries provided the domestic workforce is larger than 1,000.

In **Luxembourg**, in private companies with 1,000 or more employees, one-third of board members are elected by employee representatives.

In **Slovenia,** the works council can appoint between one third and half the members. In companies where employees hold half the seats, the chair always represents the shareholders and has the casting vote.

This table is our own overview, prepared on the basis of data from the European Trade Union Institute (ETUI, 2014). For further information, refer to Conchon et al. (2015).

Table A3: Sensitivity analyses using MSCI data

VARIABLES	(1) $MSCI_CSR_{i,t+1}$	(2) $MSCI_ENV_{i,t+1}$	(3) $MSCI_CSR_{i,t+1}$	(4) $MSCI_ENV_{i,t+1}$	(5) $MSCI_CSR_{i,t+1}$	(6) $MSCI_ENV_{i,t+1}$
$\boldsymbol{LABOR_{i,t}}$	0.620***	0.351**			0.587***	0.329**
	(0.103)	(0.141)			(0.102)	(0.140)
$\boldsymbol{GENDIV_{i,t}}$			2.019***	1.308***	0.020***	0.013***
			(0.123)	(0.169)	(0.001)	(0.002)
$ROA_{i,t}$	1.993***	0.280	1.837***	0.180	1.836***	0.176
	(0.465)	(0.535)	(0.461)	(0.535)	(0.461)	(0.535)
LEVERAGEi,t	0.474***	-0.093	0.459***	-0.103	0.443***	-0.113*
	(0.055)	(0.068)	(0.055)	(0.068)	(0.055)	(0.067)
$SIZE_{i,t}$	0.049***	0.031***	0.045***	0.029***	0.045***	0.028***
	(0.005)	(0.007)	(0.005)	(0.007)	(0.005)	(0.007)
$TOBINQ_{i,t}$	-0.030***	-0.011*	-0.029***	-0.010	-0.028***	-0.009
	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)
$LITIGATION_{i,t}$	0.337***	-0.113***	0.322***	-0.123***	0.331***	-0.118***
	(0.035)	(0.042)	(0.035)	(0.042)	(0.035)	(0.042)
$FIN_{i,t}$	-0.068***	-0.025*	-0.052***	-0.014	-0.054***	-0.016
	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.014)
$GLOBAL_{i,t}$	-0.496***	-0.152***	-0.464***	-0.130***	-0.463***	-0.130***
	(0.023)	(0.028)	(0.023)	(0.028)	(0.023)	(0.028)
$ABS_EM_{i,t}$	0.164	-0.139	0.178	-0.130	0.189	-0.122
	(0.148)	(0.185)	(0.147)	(0.184)	(0.147)	(0.184)
$COMPETITION_{i,t}$	-0.031	0.141**	-0.052	0.128**	-0.050	0.129**
	(0.044)	(0.056)	(0.044)	(0.056)	(0.044)	(0.056)
$LIQUIDITY_{i,t}$	-0.009	-0.025***	-0.008	-0.025***	-0.006	-0.023***
	(0.006)	(0.009)	(0.006)	(0.009)	(0.006)	(0.009)
$CORPGOV_{i,t}$	0.050***	0.016**	0.047***	0.014**	0.048***	0.014**
	(0.004)	(0.006)	(0.004)	(0.006)	(0.004)	(0.006)
TIME FE	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,283	21,283	21,283	21,283	21,283	21,283
Adj. R-squared	0.152	0.044	0.161	0.047	0.162	0.047

*These results are obtained when we employ a linear regression model as presented in Equation (1) but use MSCI data for the dependent variables. All columns include firm-quarter observations. The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table A4: Further sensitivity analyses

Panel A: Excluding Sweden, U.S., Japan				
	(1)	(2)	(3)	(4)
VARIABLES	$A4_CSR_{i,t+1}$	$A4_ENV_{i,t+1}$	$MSCI_CSR_{i,t+1}$	$MSCI_ENV_{i,t+1}$
$\boldsymbol{LABOR_{i,t}}$	0.100***	0.097***	0.634***	0.425***
	(0.015)	(0.015)	(0.104)	(0.141)
$\boldsymbol{GENDIV_{i,t}}$	0.004***	0.004***	0.026***	0.014***
	(0.000)	(0.000)	(0.001)	(0.002)
Time FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	16,630	15,787	15,787	15,787
Adj. R-squared	0.379	0.410	0.195	0.057
Panel B: Firms without codetermination (*LABOR* = 0)				
	(1)	(2)	(3)	(4)
VARIABLES	$A4_CSR_{i,t+1}$	$A4_ENV_{i,t+1}$	$MSCI_CSR_{i,t+1}$	$MSCI_ENV_{i,t+1}$
$\boldsymbol{GENDIV_{i,t}}$	0.006***	0.003***	0.024***	0.013***
	(0.000)	(0.000)	(0.001)	(0.002)
Constant	0.516***	0.014	3.868***	1.714***
	(0.063)	(0.036)	(0.197)	(0.211)
Time FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	20,220	19,116	19,116	19,116
Adj. R-squared	0.276	0.325	0.117	0.043
Panel C: Number of women at board level (*GENDIV* = 0)				
	(1)	(2)	(3)	(4)
VARIABLES	$A4_CSR_{i,t+1}$	$A4_ENV_{i,t+1}$	$MSCI_CSR_{i,t+1}$	$MSCI_ENV_{i,t+1}$
$\boldsymbol{LABOR_{i,t}}$	0.125***	0.070***	0.436**	0.382**
	(0.027)	(0.026)	(0.189)	(0.183)
Time FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	10,511	9,970	9,970	9,970
Adj. R-squared	0.323	0.395	0.124	0.027
Panel D: Excluding the financial crisis years (year = 2007, year = 2008)				
	(1)	(2)	(3)	(4)
VARIABLES	$A4_CSR_{i,t+1}$	$A4_ENV_{i,t+1}$	$MSCI_CSR_{i,t+1}$	$MSCI_ENV_{i,t+1}$
$\boldsymbol{LABOR_{i,t}}$	0.079***	0.068***	0.637***	0.246
	(0.017)	(0.016)	(0.108)	(0.163)
$\boldsymbol{GENDIV_{i,t}}$	0.004***	0.004***	0.020***	0.014***
	(0.000)	(0.000)	(0.001)	(0.002)
Time FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	18,977	17,814	17,814	17,814
Adj. R-squared	0.400	0.393	0.156	0.054

*These results are obtained when we employ Equation (1) with identical variables but create subsamples. The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table A5: Sample split between one-tier and two-tier board systems

VARIABLES	Subsample: One-tier board system				Subsample: Two-tier board system			
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
	A4_ $CSR_{i,t+1}$	*A4_ $ENV_{i,t+1}$*	*A4_ $CSR_{i,t+1}$*	*A4_ $ENV_{i,t+1}$*	*A4_ $CSR_{i,t+1}$*	*A4_ $ENV_{i,t+1}$*	*A4_ $CSR_{i,t+1}$*	*A4_ $ENV_{i,t+1}$*
$LABOR_{i,t}$	0.071***	0.138***			0.119***	0.086***		
	(0.019)	(0.022)			(0.023)	(0.024)		
$GENDIV_{i,t}$	0.004***	0.004***			0.005***	0.002***		
					-0.316	-1.007***		
$FEMEMP_{i,t}$			0.066	0.131			0.406***	0.273***
			(0.112)	(0.128)			(0.092)	(0.099)
$ROA_{i,t}$	0.266***	-0.157**	0.291***	-0.129*	-0.316	-1.007***	-0.221	-0.964**
	(0.070)	(0.075)	(0.071)	(0.076)	(0.372)	(0.387)	(0.369)	(0.380)
LEVERAGEi,t	0.167***	0.175***	0.174***	0.182***	0.149***	0.151***	0.141***	0.147***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.035)	(0.036)	(0.036)	(0.036)
$SIZE_{i,t}$	0.013***	0.016***	0.014***	0.017***	0.018***	0.011***	0.020***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)
$TOBINQ_{i,t}$	-0.012***	-0.013***	-0.012***	-0.013***	0.010**	0.008	0.010**	0.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.005)	(0.005)	(0.005)
$LITIGATION_{i,t}$	0.034***	0.022***	0.035***	0.024***	-0.085***	-0.092***	-0.095***	-0.099***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.018)	(0.017)	(0.019)	(0.018)
$FIN_{i,t}$	-0.006***	0.003	-0.009***	0.001	0.028	0.032	0.038*	0.040
	(0.002)	(0.002)	(0.002)	(0.002)	(0.019)	(0.024)	(0.020)	(0.025)
$GLOBAL_{i,t}$	-0.150***	-0.117***	-0.157***	-0.123***	-0.159***	-0.126***	-0.165***	-0.129***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.015)	(0.014)	(0.015)	(0.015)
$ABS_EM_{i,t}$	0.008	0.004	0.002	0.000	0.028	0.115	0.008	0.103
	(0.023)	(0.025)	(0.024)	(0.026)	(0.079)	(0.081)	(0.077)	(0.080)
$COMPETITION_{i,t}$	-0.000	-0.013*	0.003	-0.010	-0.085***	-0.067***	-0.085***	-0.070***
	(0.006)	(0.007)	(0.006)	(0.007)	(0.019)	(0.017)	(0.020)	(0.017)
$LIQUIDITY_{i,t}$	0.003***	0.001	0.002**	0.001	-0.006***	-0.003**	-0.007***	-0.004**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
$CORPGOV_{i,t}$	0.003***	0.004***	0.003***	0.004***	0.003	-0.000	0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
TIME FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,584	19,472	20,584	19,472	1,900	1,810	1,900	1,810
Adj. R-squared	0.397	0.380	0.382	0.368	0.393	0.395	0.367	0.386

*These results are obtained when we employ a linear regression model as presented in Equation (1). In contrast to our main regressions, we split the sample between one-tier (Columns (1) to (4) and two-tier board systems (Columns (5) to (8). All columns include firm-quarter observations. The model's industry, state, and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table A6: Non-linear relationship

VARIABLES	(1) $A4_CSR_{i,t+1}$	(2) $A4_ENV_{i,t+1}$	(3) $MSCI_CSR_{i,t+1}$	(4) $MSCI_ENV_{i,t+1}$
LABOR$_{i,t}$	0.080***	0.076***	0.528***	0.293**
	(0.015)	(0.016)	(0.100)	(0.144)
GENDIV$_{i,t}$	0.010***	0.009***	0.052***	0.003
	(0.000)	(0.000)	(0.003)	(0.004)
GENDIV_SQ$_{i,t}$	-0.000***	-0.000***	-0.001***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
ROAi,t	0.245***	-0.185**	1.657***	0.390
	(0.068)	(0.073)	(0.459)	(0.532)
LEVERAGEi,t	0.163***	0.169***	0.406***	-0.102
	(0.008)	(0.009)	(0.055)	(0.067)
SIZEi,t	0.013***	0.015***	0.037***	0.033***
	(0.001)	(0.001)	(0.005)	(0.007)
TOBINQi,t	-0.011***	-0.012***	-0.027***	-0.009
	(0.001)	(0.001)	(0.005)	(0.006)
LITIGATIONi,t	0.018***	0.007	0.325***	-0.117***
	(0.005)	(0.005)	(0.035)	(0.042)
FINi,t	-0.005**	0.004*	-0.055***	-0.021
	(0.002)	(0.002)	(0.014)	(0.014)
GLOBALi,t	-0.149***	-0.116***	-0.448***	-0.132***
	(0.003)	(0.004)	(0.023)	(0.028)
ABS_EMi,t	0.006	0.004	0.050	-0.179
	(0.022)	(0.024)	(0.148)	(0.184)
COMPETITIONi,t	-0.007	-0.018***	-0.079*	0.132**
	(0.006)	(0.006)	(0.044)	(0.057)
LIQUIDITYi,t	0.001	-0.000	-0.007	-0.024***
	(0.001)	(0.001)	(0.006)	(0.009)
CORPGOVi,t	0.003***	0.003***	0.047***	0.008
	(0.001)	(0.001)	(0.004)	(0.006)
TIME FE	Yes	Yes	Yes	Yes
STATE FE	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes
Observations	22,484	21,282	21,282	21,282
Adj. R-squared	0.399	0.387	0.168	0.048

*These results are obtained when we employ a non-linear regression model and test for the effect of the squared proportion of female board members ($GENDER_SQ_{i,t}$). *, **, *** indicate that the estimated coefficient is statistically significant at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentiles and all columns include firm-quarter observations. Robust standard errors are presented in parentheses*

Table A7: Change analysis

VARIABLES	(1) $\Delta A4_CSR_{i,t+1}$	(2) $\Delta A4_ENV_{i,t+1}$	(3) $\Delta MSCI_CSR_{i,t+1}$	(4) $\Delta MSCI_ENV_{i,t+1}$	(5) $\Delta A4_CSR_{i,t+1}$	(6) $\Delta A4_ENV_{i,t+1}$
$\boldsymbol{\Delta LABOR_{i,t}}$	0.749**	0.332	0.331	0.683		
	(0.367)	(0.291)	(0.248)	(0.847)		
$\boldsymbol{\Delta GENDIV_{i,t}}$	0.010	0.028**	-0.016	0.130***		
	(0.017)	(0.014)	(0.012)	(0.040)		
$\boldsymbol{\Delta FEMEMP_{i,t}}$					0.060*	0.058
					(0.036)	(0.075)
$\Delta ROA_{i,t}$	0.000	-0.000**	0.000	0.000	0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta LEVERAGE_{i,t}$	0.005	0.006*	0.000	-0.006	0.005	0.006
	(0.004)	(0.003)	(0.003)	(0.009)	(0.006)	(0.005)
$\Delta SIZE_{i,t}$	0.380***	0.272***	0.149**	0.030	0.379***	0.272***
	(0.104)	(0.082)	(0.070)	(0.240)	(0.134)	(0.101)
$\Delta TOBINQ_{i,t}$	-0.003	0.001	0.000	0.003	-0.003*	0.001
	(0.002)	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)
$\Delta FIN_{i,t}$	0.000	0.000	-0.000	-0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta ABS_EM_{i,t}$	0.000	-0.000	0.000	0.000**	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta COMPETITION_{i,t}$	0.000	0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\Delta LIQUIDITY_{i,t}$	0.000	0.000	0.001	-0.003	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.000)
$\Delta CORPGOV_{i,t}$	0.006	0.009***	0.009***	0.018*	0.006	0.009**
	(0.004)	(0.003)	(0.003)	(0.010)	(0.004)	(0.004)
$LITIGATION_{i,t}$	0.014	-0.000	-0.012	0.037	0.014	-0.000
	(0.014)	(0.011)	(0.010)	(0.033)	(0.014)	(0.011)
$GLOBAL_{i,t}$	0.043***	0.008	0.012*	-0.052**	0.043***	0.008
	(0.010)	(0.008)	(0.006)	(0.022)	(0.010)	(0.008)
YEAR FE	YES	YES	YES	YES	YES	YES
INDUSTRY FE	YES	YES	YES	YES	YES	YES
STATE FE	YES	YES	YES	YES	YES	YES
Observations	6,593	6,593	6,593	6,593	6,593	6,593
Adj. R-squared	0.064	0.030	0.028	0.028	0.063	0.029

*These results are obtained when we employ a change analysis. *, **, *** indicate that the estimated coefficient is statistically significant at the 10%, 5% and 1% levels, respectively. All continuous variables are winsorized at the 1st and 99th percentiles and all columns include firm-quarter observations. Robust standard errors are presented in parentheses. All variables are defined in Table 2. Instead of level values, we employ all continuous variables as change (in percentage) variables (change from t-1 to t = $(Y_{i,t+1} - Y_{i,t})/_{Yi,t}$).*

Table A8: GMM estimation

VARIABLES	(1) A4_CSR$_{i,t+1}$	(2) A4_ENV$_{i,t+1}$
LABOR$_{i,t}$	0.129	0.358*
	(0.093)	(0.205)
GENDIV$_{i,t}$	0.002***	0.004***
	(0.001)	(0.001)
ROA$_{i,t}$	-0.098	-0.318
	(0.143)	(0.211)
TOBINQ$_{i,t}$	-0.007	-0.015***
	(0.004)	(0.005)
LEVERAGE$_{i,t}$	0.0734**	0.121**
	(0.036)	(0.053)
SIZE$_{i,t}$	0.001	0.001
	(0.003)	(0.006)
LITIGATION$_{i,t}$	0.039	-0.012
	(0.069)	(0.074)
FIN$_{i,t}$	-0.013	0.003
	(0.012)	(0.018)
GLOBAL$_{i,t}$	-0.215***	-0.161***
	(0.048)	(0.059)
ABS_EM$_{i,t}$	-0.013	-0.019
	(0.041)	(0.042)
LIQUIDITY$_{i,t}$	0.001	0.002
	(0.002)	(0.003)
COMPETITION$_{i,t}$	-0.009	-0.022
	(0.026)	(0.042)
CORPGOV$_{i,t}$	0.001	0.003
	(0.001)	(0.002)
TIME FE	Yes	Yes
STATE FE	Yes	Yes
INDUSTRY FE	Yes	Yes
Observations	6,593	6,230
Arellano-Bond AR (1)	0.000***	0.000***
Arellano-Bond AR (2)	0.261	0.064*
Arellano-Bond AR (3)	0.689	0.443
Hansen test	807.77	238.52
(p-value)	0.287	0.086*
Wald chi2	720.60***	497.26***

*These results are obtained when we employ the linear regression model as presented in Equation (1) using GMM estimates. The dependent variables are the CSR score (Column (1)) and environmental performance (Column (2)) of the subsequent year ($_{t+1}$). The model's industry, state and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*

Table A9: Matched sample

VARIABLES	(1) A4_CSR$_{i,t+1}$	(2) A4_ENV$_{i,t+1}$
LABOR$_{i,t}$ (ATET)	0.001***	0.001***
	(0.000)	(0.000)
LABOR$_{i,t}$ (ATE)	0.001**	0.001**
	(0.000)	(0.000)
GENDIV$_{i,t}$	0.002	-0.001
	(0.001)	(0.001)
ROA$_{i,t}$	0.003	-0.006
	(0.007)	(0.006)
TOBINQ$_{i,t}$	0.000	-0.000
	(0.000)	(0.000)
LEVERAGE$_{i,t}$	0.000	0.002**
	(0.001)	(0.001)
SIZE$_{i,t}$	-0.000	0.000***
	(0.000)	(0.000)
LITIGATION$_{i,t}$	0.000	0.001***
	(0.000)	(0.000)
FIN$_{i,t}$	0.000*	0.000***
	(0.000)	(0.000)
GLOBAL$_{i,t}$	-0.001***	-0.001***
	(0.000)	(0.000)
ABS_EM$_{i,t}$	-0.000	0.002
	(0.003)	(0.002)
LIQUIDITY$_{i,t}$	-0.000	-0.000
	(0.000)	(0.000)
COMPETITION$_{i,t}$	0.001	0.000
	(0.001)	(0.000)
CORPGOV$_{i,t}$	0.000	0.000
	(0.000)	(0.000)
TIME FE	Yes	Yes
STATE FE	Yes	Yes
INDUSTRY FE	Yes	Yes
Observations	242	242
Adj. R-squared	0.298	0.307

*These results are obtained when we employ the linear regression model as presented in Equation (1) in a matched sample with similar firms. The dependent variables are the CSR score (Column (1)) and the environmental performance (Column (2)) of the subsequent year ($_{t+1}$). The model's industry, state and time fixed-effect structure controls for the underlying main effects. Each of the continuous variables is winsorized at 1% and 99% to mitigate outliers. ***, **, * indicate coefficients are significant at the 1%, 5%, and 10% levels, respectively. Robust standard errors are in parentheses.*