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CSR committees and their effect on green practices

Ngoc Bao Vuong[1]

Abstract

This paper explores the relationship between the presence of corporate social responsibility (CSR) committees and the implementation of corporate green practices. Using data from 445 non-financial Japanese firms from 2010 to 2021, we find a positive impact of such sustainability committees on both integrated and three individual aspects of green initiatives, including internal pollution prevention, green supply chain management, and green product innovation. In addition, our evidence demonstrates a variation in the CSR committees—green practices nexus across diverse groups of firms, based on their exposures to environmental risks. Finally, we claim that CSR-linked compensation and CSR strategy can explain how CSR committees affect firms' eco-friendly practices. Generally, our study confirms the crucial role of a governance mechanism—CSR committees—that business organisations and policymakers can exploit to promote sustainable behaviours.

Keywords

- CSR committees
- green practices
- environmentally sensitive sectors
- CSR-linked compensation
- CSR strategy

JEL codes: G34, M14.

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Introduction

In the last few decades, as many reform initiatives on sustainable development have been implemented globally, the demand for companies to endorse the corporate social responsibility (CSR) concept in their business activities has increased. CSR is a self-regulated practice that incorporates sustainable development into business strategy. The goal of CSR is to establish positive public relations and strong ethical standards to diminish risks and enhance shareholder trust, promoting corporate long-term competitiveness and resilience (Han et al., 2016). A company's CSR effort is reflected by its environmental, social, and corporate governance (ESG) activities. The environmental aspect refers to a firm's initiatives to reduce its influence on the environment. The social aspect reflects how well a company maintains its stakeholders' relationships, including employees, customers, suppliers, and communities. Meanwhile, the governance aspect includes practices in leadership, internal control, executive pay, and shareholder rights. Overall, the ESG framework provides specific criteria that can be used to assess a company's commitment to the environment and society.

Alongside this context, discussions and studies on corporate governance to detect which governance mechanisms positively impact firm CSR behaviours have also attracted numerous scholars, practitioners, and policymakers. A literature stream has recently emerged to explore the role of board sustainability committees in CSR-related outcomes (Bifulco et al., 2023; García Martín & Herrero, 2020; Konadu, 2017; Radu & Smaili, 2022). CSR committees are specialised governance mechanisms, voluntarily established by the board of directors to instruct and oversee the information contained in sustainability reports and ensure the proper operation of the organisation's CSR systems and policies (Liao et al., 2015).

However, compared to the comprehensive literature on corporate governance and sustainability or ESG performance, such studies are scarce and demonstrate heterogeneous results. On the one hand, Bifulco et al. (2023), Kend (2015), and Rodrigue et al. (2013) state that the presence of sustainability committees does not play any significant role in enhancing corporate environmental and social outcomes. Other studies, in contrast, provide evidence that such committees positively impact CSR disclosures and performance (Biswas et al., 2018; Córdova et al., 2018; Orazalin, 2020; Román et al., 2021). These inconclusive results lay the foundations for our research, as we wonder whether the concerns of the board of directors on sustainability issues, reflected by the creation of CSR committees, can convert into effective CSR initiatives that promote sustainability performance.

More specifically, in this study, we investigate how the presence of CSR committees in the governance system affects corporate green behaviours.

A few prior studies, for example, García Martín and Herrero (2020), Rodrigue et al. (2013), and Walls et al. (2012) mention the relationship between sustainability committees, as a part of their research on environmental governance mechanisms, and firm green initiatives. Nevertheless, these studies do not draw any unambiguous conclusions.

Besides, Velte and Stawinoga (2020) claim that industry effects, for example environmentally sensitive industries, can lead to mixed results on the relationship between CSR committees and CSR-related outcomes. They also address the lack of studies on the mediator factors in this relationship. As a result, we further explore the variation in the CSR committees—green practices nexus across industrial sectors and potential channels that explain the effect of CSR committees on firms' eco-friendly practices.

To address these purposes, we first self-construct our green practices indices, based on data from 445 non-financial Japanese firms between 2010 and 2021. The relationship between CSR committees and corporate green practices is examined by applying pooled ordinary least squares with industry-fixed and year-fixed effects. We then verify these baseline results with two different regression techniques. In addition, we employ seemingly unrelated regressions and Chow tests to assess the variation in the CSR committees—green practices nexus across business sectors. Lastly, the potential mediating impact of CSR-linked compensation and CSR strategy on the CSR committees—green practices nexus is investigated, following Baron and Kenny's (1986) approach.

Generally, our study makes several contributions to the literature. Firstly, it broadens the literature on the impact of CSR committees. Most of these studies emphasise the relationship between CSR committees and CSR reporting, assurance, and overall performance (Biswas et al., 2018; Burke et al., 2019; Orazalin, 2020). Our paper, distinctive from previous works, examines the association between the CSR committee and corporate green practices. Secondly, we extend the literature on the determinants of green practices. Prior research explores the role of technological, organisational, and environmental factors in adopting green initiatives (Aboelmaged, 2018; Hwang et al., 2016; Qin et al., 2022; Zhu et al., 2008). We investigate whether the existence of sustainability committees could be a driving factor in promoting a company's environmentally friendly behaviours. Finally, as the first study concentrates solely on the CSR committees-green practices nexus, we provide comprehensive evidence of the impact of CSR committees on various aspects of corporate green behaviours, including internal pollution intervention, green supply chain management, and green product innovation. More importantly, we demonstrate that our analysed relationship varies across business sectors, based on their different exposure to environmental risks, and such a relationship is mediated by firms' CSR-linked compensation and CSR strategy.

The remainder of this paper proceeds as follows: Section 1 reviews the related literature and develops a hypothesis; Section 2 describes our sample, variables, and methods; Section 3 presents the empirical results; and the last section discusses and summarises our findings.

1. Literature review and hypothesis development

The CSR committee is a specialised governance mechanism established by the board of directors to address issues on sustainability, health and safety, ethics, and the environment. According to Dixon-Fowler et al. (2017), members of the CSR committee are expected to provide instructions and recommendations to the board of directors in creating tactical CSR strategies and ensure ESG criteria are incorporated into business activities and reporting. Hence, the CSR committee plays a vital role in overseeing and implementing quality CSR practices (Radu & Smaili, 2022).

Studies on the impact of CSR committees on CSR-related activities can be categorised into two streams. One stream explores the relationship between CSR committees and CSR reporting. Pucheta-Martinez and Gallego-Alvarez (2019) examined the effect of board composition on CSR reporting and concluded that CSR board committees encourage the disclosure of CSR matters. Previously, Ruhnke and Gabriel (2013) found a positive impact of CSR committees on the assurance of CSR reports audited by external parties. Another stream investigates how the presence of sustainability committees affects CSR performance. Baraibar-Diez and Odriozola (2019), Biswas et al. (2018), and Orazalin (2020) found a positive relationship between board sustainability committees and overall ESG performance. Furthermore, the evidence from Córdova et al. (2018) and Román et al. (2021) indicated that the presence of a CSR committee reduces firms' carbon emission levels. Nevertheless, some researchers state that CSR committees do not significantly impact CSR reporting and performance (Burke et al., 2019; Kend, 2015). Al-Shaer and Zaman (2018) even found a negative association between sustainability committees and the credibility of sustainability reports.

Meanwhile, corporate green practices, also known as environmentally friendly or eco-friendly behaviours, refer to initiatives undertaken by companies to minimise their influence on the environment and promote sustainable development. Such practices, although diverse, depending on operating sectors and firm size, can be categorised into four main groups: pollution prevention, green supply chain management, green product innovation, and environmental management system standards. Pollution prevention practices are actions that businesses implement to reduce or improve certain environ-

mental performance, such as waste and toxic chemical reduction, air emission reduction, or water and energy efficiency. Green supply chain management includes initiatives to use environmental criteria to select materials and suppliers or to optimise transportation routes. Green product innovation practices refer to actions aiming to reduce the environmental effect of a product, like eco-friendly design. Finally, environmental management system standards indicate the adoption of voluntary standards, such as ISO 14001 into firm environmental management.

Many studies showed the positive impact of green behaviours on ESG and financial performance that can encourage companies to adopt environmentally friendly practices in their daily operations (Erauskin-Tolosa et al., 2020; King & Lenox, 2002; Lin et al., 2013). Others tried to detect drivers that affect the collaboration of green behaviours in corporate activities. These drivers can be classified into three categories: technological, organisational, and environmental factors. According to Hwang et al. (2016), technological factors refer to technological attributes relevant to innovation, organisational factors refer to the firm characteristics, and environmental factors refer to the arena in which a firm conducts its business including its industry, customers, competitors, and the government. The authors indicated that all three aspects influence green supply chain adoption in the semiconductor industry. Similarly, for small and medium enterprises, Alraja et al. (2022) found a strong positive relationship between technological factors and green innovation, organisational factors and green human resource management, and environmental factors and green marketing. Aboelmaged (2018) and Qin et al. (2022) revealed the vital role of management support, internal environment management, and the engagement of employees in green manufacturing practices. Zhu et al. (2008) demonstrated that large and medium-sized firms are more committed to going green than their smaller counterparts. Chege and Wang (2020) stated that technological innovation and firm performance are organisational characteristics that play a key role in the implementation of sustainable practices. However, organisational culture, government support, and employee training do not exhibit any significant links with such practices.

Focusing on environmental management, the resource dependence theory suggests that members of the CSR committee are more inclined to endorse their company's engagement with other eco-friendly enterprises. A collaboration of this type can result in better environmental strategies and performance through sharing environmental experience, skills, and resources between both organisations. Moreover, from the standpoint of stewardship theory, CSR committee members may recognise that their reputations are likely to link with the environmental performance of their companies (Dixon-Fowler et al., 2017). As a result, these directors would persuade other boards of directors to conduct effective environmental tac-

tics that will enhance performance and develop a better corporate social reputation (Konadu, 2017).

Despite being scarce and inconclusive, previous studies demonstrated the potential impact of board sustainability committees on environmental practices. Dixon-Fowler et al. (2017) and Walls et al. (2012) revealed that the environmental committee associates positively with firm environmental strengths, such as the development and marketing of green products and services, the use of pollution prevention approaches in production, recycling, and the use of alternative fuels. García Martín and Herrero (2020) also confirmed the positive relationship between the existence of a CSR committee and the implementation of environmental initiatives. In contrast, Rodrigue et al. (2013) argue that the presence of an environmental committee is not significantly associated with the presence of a pollution prevention policy. Based on these viewpoints and empirical results, we propose our hypothesis as follows: *The presence of the CSR committee is positively related to corporate green practices.*

2. Sample, variables, and methodology

The study is conducted based on a set of non-financial Japanese companies whose CSR and financial data are available in the LSEG Datastream database. The final sample consists of 445 companies from 2010 to 2021. Following Fan et al. (2023), we create a one-year lag for all corporate financial variables to partially mitigate the potential endogeneity in our regression models. Furthermore, all continuous variables are winsorised at 1 and 99th percentiles to alleviate the effect of outliers.

The dependent variables include three indices that represent three types of green practices: the internal pollution prevention index (GP_{IPP}), the green supply chain management index (GP_{GSCM}), and the green product innovation index (GP_{GPI}). These indices are constructed using underlying data points from resource uses, emission reduction, and product innovation categories of the environmental pillar of Datastream ESG data, following the methodology used by Miroshnychenko et al. (2017). Datastream is one of the largest and most popular CSR databases and most importantly, unlike other databases, it provides raw data to users, allowing them to create their own measurements (de Villiers et al., 2022). We also construct an aggregated green practice index (GP) from three individual ones.

The independent variable is the presence of a CSR committee (CSR_{COM}). It is a dummy variable that has a value of one if the company has a CSR committee, and zero otherwise (Baraibar-Diez & Odriozola, 2019; Biswas et al., 2018;

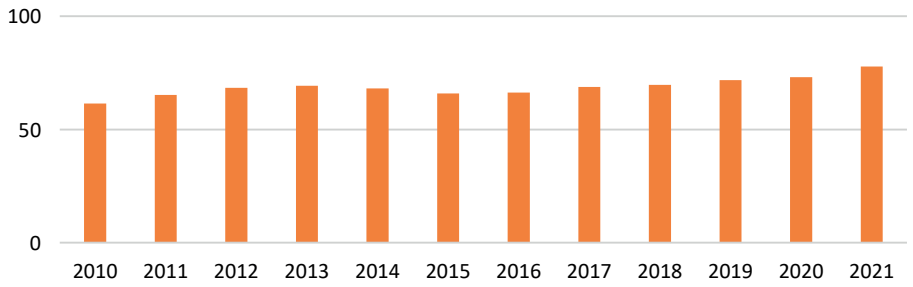

Figure 1. Percentage of Japanese firms with a CSR committee (2010–2021)

Source: own calculations.

Radu & Smaili, 2022). The annual ratios of Japanese companies with a CSR committee among the total sample from 2010 to 2021 are shown in Figure 1. In 2010, the CSR committee existed in approximately 61% of Japanese firms. This ratio increases to about 78% in 2021.

Table 1. Definition of variables

Variable	Description and calculation
Panel A. Dependent variables	
GP_{IPP}	Internal pollution prevention index
GP_{GSCM}	Green supply chain management index
GP_{GPI}	Green product innovation index
GP	Green practice index
Panel B. Independent variable	
CSR_{COM}	A dummy variable equals 1 if the given company has a CSR committee and 0 otherwise
Panel C. Control variables	
B_{SIZE}	Total number of board members
B_{FED}	The percentage of female board members
B_{IND}	The percentage of independent board members
B_{NED}	The percentage of non-executive board members
$SIZE$	Natural logarithm of total assets
ROA	Return on assets; Net profit divided by total assets
LEV	Total debt divided by total assets

Note: The detailed measurements of green practices indices are presented in Appendix.

Source: own elaboration.

Finally, in conjunction with previous studies by Orazalin (2020), Shaukat et al. (2016), and Walls et al. (2012), we employ several control variables that might affect the relationship being analysed. These are firm size ($SIZE$), leverage (LEV), profitability (ROA), board size (B_{SIZE}), board independence (B_{IND}), board diversity (B_{FED}), and non-executive board (B_{NED}). The definition and measurement of our main variables are summarised in Table 1.

To examine how the presence of a CSR committee affects a company's green practices, we first apply pooled ordinary least square (POLS) regressions using industry-fixed and year-fixed effects with Huber-White standard errors. The baseline model is as follows:

$$GP_{it} = \alpha_i + \beta_1 CSR_{COMit} + \sum_{k=1}^{7} \beta_{k+1} CV_{kit} + \varepsilon_{it} \quad (1)$$

where GP_{it} represents the overall green practice index as well as its three dimensions: GP_{IPP}, GP_{GSCM}, and GP_{GPI} of the company i at time t; CSR_{COMit} indicates whether the company i does or does not have a CSR committee at time t; CV_{kit} is the vector of control variables k of the company i at time t; ε_{it} includes an independent idiosyncratic error term u_{it} and unobserved corporate characteristics c_{it}.

Furthermore, two other estimations, propensity score matching (PSM) and generalised method of moments (GMM) are implemented to verify the relationship between CSR committees and green practices. We apply PSM to reduce selection bias in our analyses by aligning firm characteristics between companies with and without CSR committees. Meanwhile, according to Aslam et al. (2021), the GMM estimator is considered one of the most suitable tools to mitigate heterogeneity, endogeneity, and estimation bias issues.

3. Results

Panel A of Table 2 presents the descriptive statistics for the full sample. The mean of CSR_{COM} is 0.691, indicating that on average, nearly 70% of Japanese firms have a CSR committee throughout the period examined. Meanwhile, the mean of GP is 7.323, lower than the neutral score (8.5), implying that such organisations do not perform well in adopting green practices. Furthermore, with a standard deviation of 4.382, the level of adoption of green practices in business activities appears to differ among the organisations being studied. The results from three individual dimensions of green practices lead to a similar conclusion. Regarding corporate governance characteristics, the average board size is 11, with independent and non-executive directors accounting

Table 2. Descriptive statistics

Panel A. Full sample					
	Mean	**Min**	**Max**	**S.D.**	***N***
GP_{IPP}	3.943	0	9	2.382	4,445
GP_{GSCM}	1.789	0	4	1.434	4,445
GP_{GPI}	1.590	0	3	1.169	4,445
GP	7.323	0	15	4.382	4,445
CSR_{COM}	0.691	0	1	0.462	4,491
B_{SIZE}	11.451	1	30	3.859	4,455
B_{FED}	5.170	0	57.14	7.001	4,453
B_{IND}	22.684	0	87.5	16.240	4,451
B_{NED}	33.608	0	100	18.349	4,455
$SIZE$	20.276	16.692	23.533	1.268	5,289
ROA	4.193	–12.65	22	4.645	5,268
LEV	22.349	0	72.241	18.058	5,289

Panel B. Sub-samples								
	Firms without a CSR committee			**Firms with a CSR committee**			**Differences**	
	Mean	**Median**	***N***	**Mean**	**Median**	***N***	***t*-stat.**	***z*-stat.**
GP_{IPP}	1.803	1	1,379	4.906	5	3,066	–50.342***	–38.688***
GP_{GSCM}	0.540	0	1,379	2.351	3	3,066	–48.038***	–38.021***
GP_{GPI}	0.830	0	1,379	1.932	2	3,066	–32.312***	–27.546***
GP	3.172	2	1,379	9.189	10	3,066	–54.835***	–40.195***
B_{SIZE}	11.137	11	1,377	11.595	11	3,075	–3.662***	–4.379***
B_{FED}	3.745	0	1,376	5.810	0	3,074	–9.178***	–9.620***
B_{IND}	19.463	17.65	1,373	24.106	22.22	3,075	–8.889***	–10.244***
B_{NED}	32.808	30	1,377	33.952	33.33	3,075	–1.924**	–2.937**
$SIZE$	19.819	19.729	1,388	20.799	20.673	3,103	–28.401***	–26.247***
ROA	5.115	3.84	1,383	3.698	3.55	3,101	9.830***	6.486***
LEV	19.365	13.056	1,388	23.490	21.312	3,103	–7.262***	–10.600***

Note: Variables are described in Table 1. The last two columns in Panel B show the results of the t-test and Wilcoxon rank-sum test to compare the differences in means and medians between the companies with and without a CSR committee. **, and *** indicate significant levels at 5% and 1%, respectively.

Source: own calculations.

for 22.68% and 33.61% of board seats, respectively. In addition, it should be noted that the average ratio of female directors is only 5.17%, demonstrating the predominance of male leadership in Japanese companies.

Panel B of Table 2 presents the descriptive statistics when our sample is divided into two groups: firms without a CSR committee ($CSR_{COM} = 0$) and firms with a CSR committee ($CSR_{COM} = 1$). It also reports the results of *t*-tests and Wilcoxon *z*-tests to compare the differences in means and medians between such groups. Firms with a CSR committee score significantly higher in green practice indices, supporting our hypothesis preliminarily. A CSR committee is also associated with a larger board of directors, a board with more female, independent, and non-executive directors, a larger size, and a higher leverage ratio. Such considerable variances in control variables between our sub-samples might greatly affect our regression results. Consequently, it is necessary to control these variables to obtain more robust empirical evidence.

Table 3 presents the Pearson correlation matrix. As can be seen, the correlation coefficients between CSR_{COM} and all GP indices are significantly positive, indicating that having a CSR committee is correlated with organisations' green behaviours. Furthermore, except ROA, most firm characteristics ($SIZE$ and LEV) and corporate governance devices (B_{SIZE}, B_{FED}, B_{IND}, and B_{NED}) significantly and positively correlate with our dependent variables. Lastly, the correlation coefficients and variance inflation factors (VIFs)[2] between CSR_{COM} and all control variables are less than 0.7 and 3, respectively, signalling that our models do not suffer severe multicollinearity issues.

3.1. Baseline results

Table 4 reports the regression results for Equation (1). For each green practice index, columns (1) and (2) present the results for models without and with control variables, respectively. As can be seen in column (1), the coefficients of CSR_{COM} are positive and significant at the 1% level. When control variables are added to the regressions in column (2), its coefficient is still significantly positive. These results suggest that companies with a CSR committee tend to achieve higher scores in green practice indices, implying that a sustainability board can drive business organisations to act more environmentally responsible. Regarding control variables, larger firms with a more independent board are associated with higher levels of green adoption. In contrast, a board of directors with high percentages of female and non-executive directors, and a higher debt ratio, might negatively affect a firm's green behaviours.

[2] The VIFs' scores are not reported but are available upon request.

Table 3. Correlation matrix

	GP_{IPP}	GP_{GSCM}	GP_{GPI}	GP	CSR_{COM}	B_{SIZE}	B_{FED}	B_{IND}	B_{NED}	$SIZE$	ROA	LEV
GP_{IPP}	1.000											
GP_{GSCM}	0.702***	1.000										
GP_{GPI}	0.602***	0.583***	1.000									
GP	0.934***	0.865***	0.785***	1.000								
CSR_{COM}	0.603***	0.585***	0.436***	0.635***	1.000							
B_{SIZE}	0.060***	0.064***	0.118***	0.085***	0.055***	1.000						
B_{FED}	0.111***	0.115***	–0.044***	0.086***	0.136***	–0.110***	1.000					
B_{IND}	0.164***	0.193***	0.026*	0.159***	0.132***	–0.302***	0.386***	1.000				
B_{NED}	0.045***	0.088***	–0.058***	0.038**	0.029*	–0.220***	0.371***	0.750***	1.000			
$SIZE$	0.416***	0.366***	0.280***	0.421***	0.390***	0.315***	0.085***	0.061***	–0.011	1.000		
ROA	–0.090***	–0.096***	–0.137***	–0.117***	–0.145***	–0.130***	0.042***	0.077***	0.099***	–0.224***	1.000	
LEV	0.067***	0.080***	0.087***	0.086***	0.108***	0.210***	–0.041***	–0.085***	–0.108***	0.395***	–0.408***	1.000

Note: Variables are described in Table 1. *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively.

Source: own calculations.

Table 4. CSR committees and green practices – POLS regression

	GP_{IPP}		GP_{GSCM}		GP_{GPI}		GP	
	(1)	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
CSR_{COM}	0.588***	0.488***	0.575***	0.510***	0.424***	0.380***	0.621***	0.534***
	(0.013)	(0.015)	(0.012)	(0.014)	(0.014)	(0.017)	(0.012)	(0.014)
B_{SIZE}		–0.020		0.023*		0.044***		0.009
		(0.014)		(0.014)		(0.015)		(0.013)
B_{FED}		–0.014		–0.011		–0.081***		–0.033**
		(0.013)		(0.014)		(0.015)		(0.013)
B_{IND}		0.093***		0.134***		0.067***		0.112***
		(0.019)		(0.020)		(0.023)		(0.018)
B_{NED}		–0.061***		–0.008		–0.043**		–0.047***
		(0.018)		(0.019)		(0.021)		(0.018)
$SIZE$		0.230***		0.120***		0.139***		0.265***
		(0.016)		(0.017)		(0.019)		(0.015)
ROA		0.002		0.004		–0.056***		–0.013
		(0.013)		(0.013)		(0.015)		(0.013)
LEV		–0.085***		–0.035*		–0.092***		–0.082***
		(0.016)		(0.018)		(0.019)		(0.016)
Const.	0.101*	0.271***	–0.018	0.159***	0.199***	0.226***	0.102**	0.260***
	(0.054)	(0.052)	(0.058)	(0.056)	(0.056)	(0.057)	(0.050)	(0.048)
Obs.	4,445	4,058	4,445	4,058	4,455	4,058	4,445	4,058
R^2	0.3886	0.4436	0.3658	0.4130	0.2727	0.2981	0.4363	0.4871
F-stat.	141.57***	134.23***	155.62***	144.22***	91.08***	81.23***	188.36***	183.33***
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Variables are described in Table 1. Robust standard errors are in brackets. *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively.

Source: own calculations.

3.2. Robustness checks

Our preliminary findings imply that differences in firm-specific characteristics between treatment companies with a CSR committee ($CSR_{COM} = 1$) and control companies with no CSR committee ($CSR_{COM} = 0$) may influence companies' intentions to go green. Therefore, we align such characteristics of the two groups

Table 5. CSR committees and green practices – PSM estimation

	First-stage: $y = CSR_{COM}$		Second-stage: y = green practices			
	Logit regression	**Balance test**	GP_{IPP}	GP_{GSCM}	GP_{GPI}	GP
CSR_{COM}			0.503***	0.534***	0.389***	0.552***
			(0.017)	(0.017)	(0.019)	(0.017)
B_{SIZE}	–0.142***	0.011	–0.041*	–0.016	0.033	–0.019
	(0.046)	(0.056)	(0.022)	(0.021)	(0.024)	(0.021)
B_{FED}	0.272***	–0.071	0.020	–0.004	–0.104***	–0.018
	(0.048)	(0.059)	(0.023)	(0.025)	(0.026)	(0.023)
B_{IND}	0.536***	0.022	0.082***	0.072**	0.095***	0.093***
	(0.071)	(0.085)	(0.031)	(0.031)	(0.036)	(0.029)
B_{NED}	–0.325***	0.029	–0.089***	0.013	–0.089***	–0.068**
	(0.060)	(0.073)	(0.028)	(0.028)	(0.032)	(0.028)
$SIZE$	1.406***	–0.038	0.316***	0.164***	0.203***	0.280***
	(0.066)	(0.084)	(0.032)	(0.034)	(0.039)	(0.033)
ROA	–0.330***	0.001	0.012	0.002	–0.050**	–0.006
	(0.048)	(0.056)	(0.022)	(0.021)	(0.025)	(0.022)
LEV	–0.328***	0.067	–0.061**	–0.004	–0.102***	–0.062**
	(0.057)	(0.063)	(0.025)	(0.025)	(0.029)	(0.024)
Const.	1.892***	–0.177	0.199**	0.128	0.293***	0.228***
	(0.186)	(0.235)	(0.088)	(0.097)	(0.107)	(0.085)
Obs.	4,099	1,852	1,852	1,852	1,852	1,852
R^2	0.2084	0.0045	0.3636	0.3800	0.2471	0.4141
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Variables are described in Table 1. Robust standard errors are in brackets. *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively.

Source: own calculations.

using the PSM approach. We first implement logit regression for our full sample to estimate the propensity score for the treatment companies. The results are reported in the first column of Table 5. Then, we apply one-to-one matching without replacement and set the calliper distance at 0.01 to identify a control company for each treatment company. This procedure leads to 926 pairs of companies. The unmatched ones are removed from subsequent analyses.

We re-run the logit regression with the matched sample to check the covariance balance between treatment and control groups. The post-matching results in the second column of Table 5, where all coefficients of the covariances are insignificant, indicate that these two groups align closely. A similar implication can be drawn from Figure 2, which presents the Kernel density of propensity scores of treatment and control groups before and after PSM. As we can see, the Kernel densities are remarkably different between the two groups before matching. However, after matching, the Kernel densities are almost identical, implying that both groups' features become comparable.

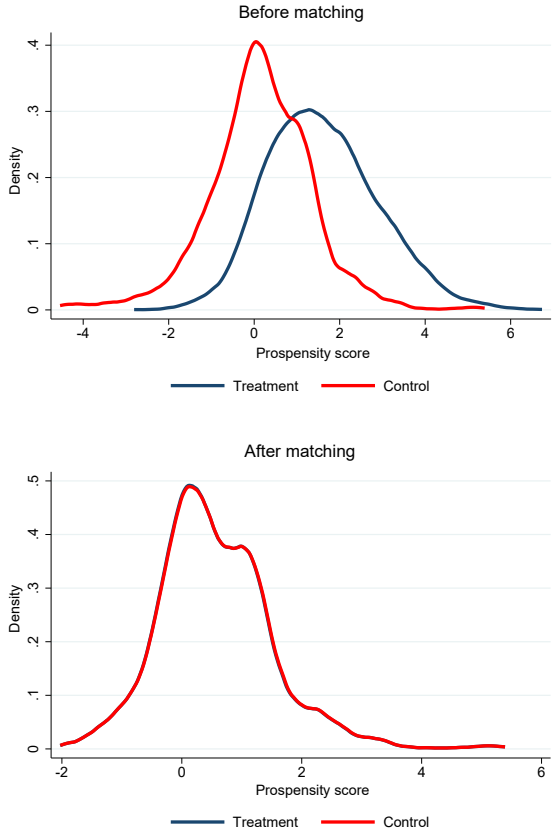

Figure 2. Kernel density of propensity scores before and after PSM

Source: own calculations.

Table 6. CSR committees and green practices – GMM estimation

	GP_{IPP}	GP_{GSCM}	GP_{GPI}	GP
L.GP_{IPP}	0.656***			
	(0.073)			
L.GP_{GSCM}		0.849***		
		(0.060)		
L.GP_{GP}			0.961***	
			(0.076)	
L.GP				0.728***
				(0.056)
CSR_{COM}	0.291***	0.168***	0.081*	0.248***
	(0.045)	(0.045)	(0.045)	(0.036)
B_{SIZE}	0.027	0.007	–0.023	0.013
	(0.065)	(0.058)	(0.058)	(0.052)
B_{FED}	0.079	0.013	–0.005	0.040
	(0.075)	(0.061)	(0.056)	(0.050)
B_{IND}	–0.092	0.039	–0.061	–0.039
	(0.097)	(0.077)	(0.089)	(0.069)
B_{NED}	0.165*	0.078	0.056	0.088
	(0.096)	(0.106)	(0.096)	(0.071)
SIZE	0.145*	0.028	–0.030	0.108
	(0.081)	(0.070)	(0.062)	(0.070)
ROA	–0.017	0.007	–0.013	–0.007
	(0.013)	(0.012)	(0.012)	(0.011)
LEV	–0.076**	–0.016	–0.006	–0.058**
	(0.038)	(0.038)	(0.031)	(0.029)
Const.	0.165	0.072	–0.061	0.247
	(0.180)	(0.226)	(0.186)	(0.179)
Obs.	3,929	3,929	3,929	3,929
No. of instruments	92	92	92	92
Wald-stat.	1,575.62***	1,205.09***	1,767.99***	2,093.77***
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
AR(2)	0.479	0.670	0.118	0.398
Hansen	0.874	0.486	0.692	0.979

Note: Robust standard errors are in brackets. *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively.

Source: own calculations.

Finally, we use the matched sample to re-estimate Equation (1). As is shown in the last four columns of Table 5, the coefficients of CSR_{COM} for the aggregate and three individual green practice indices are still positive and significant at the 1% level. These results indicate that the CSR committees—green practices nexus is robust after considering the impact of different characteristics between companies with and without a CSR committee. Besides, except for the coefficient of B_{FED} becoming insignificant, other control variables show similar results as in the baseline regressions.

Furthermore, endogeneity might be a potential problem when investigating the CSR committees—green practices nexus. As a result, for the second robustness test, we apply two-step GMM estimation to verify our results. The results for re-estimating Equation (1) using the GMM technique are shown in Table 6. Compared to the baseline results, the coefficients of CSR_{COM} are smaller, but still significantly positive, implying that our main findings still hold. In contrast, except for leverage, the impact of other control variables turns out to be statistically insignificant.

3.3. Additional analyses

According to legitimacy theory, the content and scale of CSR activities depend on the relationship between societal expectations, managers' attitudes to what they think are legitimate societal expectations, and business behaviours (Stratling, 2007). Lin et al. (2015) then argue that companies with higher environmental risks, i.e., having more effect on the environment, face more pressure on CSR requirements and expectations than others. As a result, environmentally sensitive firms typically disclose CSR information more frequently and perform better than their non-sensitive counterparts to satisfy and obtain legitimacy from their stakeholders (Brammer & Pavelin, 2008; Garcia et al., 2017; Kilian & Hennigs, 2014; Richardson & Welker, 2001).

Since previous studies demonstrate a possible influence of business sectors on CSR practices, we further investigate the CSR committees—green practices nexus for companies operating under different environmental risks. Following García-Meca and Martínez-Ferrero (2021), we consider firms active in the basic materials, energy, and utility sectors as highly environmentally sensitive firms. To compare the impact of CSR committees on green practices between such firms and low-sensitive firms, first, we re-estimate Equation (1) for each group, using POLS regressions with firm-fixed and year-fixed effects. Then we apply seemingly unrelated regressions and Chow tests to verify the differences in CSR_{COM}'s coefficients of these two groups. The results are presented in Table 7. Column (1) presents the results for the high-sensitive group, whereas column (0) presents the results for the low-sensitive group.

Table 7. CSR committees and green practices – High-sensitive vs. low-sensitive sectors

	GP_{IPP}		GP_{GSCM}		GP_{GPI}		GP	
	(1)	**(0)**	**(1)**	**(0)**	**(1)**	**(0)**	**(1)**	**(0)**
CSR_{COM}	0.391***	0.188***	0.251***	0.141***	0.200***	0.105***	0.348***	0.176***
	(0.050)	(0.019)	(0.052)	(0.020)	(0.048)	(0.020)	(0.039)	(0.017)
B_{SIZE}	–0.067*	0.001	–0.031	0.005	0.040	0.021	–0.036	0.008
	(0.038)	(0.014)	(0.032)	(0.014)	(0.028)	(0.016)	(0.027)	(0.012)
B_{FED}	0.054	0.014	–0.056*	0.027**	–0.001	–0.017	0.011	0.012
	(0.037)	(0.012)	(0.030)	(0.014)	(0.030)	(0.013)	(0.027)	(0.011)
B_{IND}	0.081	–0.034	0.153***	–0.051**	0.015	–0.077***	0.098**	–0.056***
	(0.062)	(0.023)	(0.056)	(0.023)	(0.050)	(0.024)	(0.046)	(0.021)
B_{NED}	–0.002	0.033**	–0.045	0.013	–0.021	0.026	–0.021	0.029**
	(0.057)	(0.017)	(0.052)	(0.017)	(0.043)	(0.019)	(0.042)	(0.015)
SIZE	0.372**	0.200***	0.244	0.394***	0.526***	0.202***	0.422***	0.292***
	(0.180)	(0.051)	(0.166)	(0.071)	(0.167)	(0.070)	(0.150)	(0.053)
ROA	–0.031	–0.001	0.038	–0.024**	0.049	–0.033***	0.008	–0.017*
	(0.038)	(0.010)	(0.035)	(0.012)	(0.032)	(0.011)	(0.031)	(0.010)

LEV	0.098	–0.002	–0.023	–0.021	0.027	0.011	0.053	–0.005
	(0.060)	(0.026)	(0.056)	(0.030)	(0.054)	(0.030)	(0.048)	(0.024)
Const.	0.833***	–0.569***	0.758***	–0.390**	1.227***	–0.927***	1.028***	–0.684***
	(0.167)	(0.191)	(0.148)	(0.184)	(0.138)	(0.178)	(0.132)	(0.136)
Obs.	649	3,409	649	3,409	649	3,409	649	3,409
R^2	0.7825	0.8528	0.7970	0.8449	0.7439	0.8315	0.8352	0.8938
F-stat.	29.09***	52.02***	31.66***	48.97***	23.68***	44.46***	40.56***	75.10***
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coefficient difference test for CSRCOM								
Difference	0.203***		0.110**		0.095**		0.172***	
Chi2_stat.	14.56***		3.85**		3.28*		16.16***	

Note: Variables are described in Table 1. Robust standard errors are in brackets. The differences between the coefficients of CSR_{COM} of the two groups are examined by the seemingly unrelated regressions and Chow tests. *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively.

Source: own calculations.

As can be seen, for GP and three individual indices, the coefficients of CSR_{COM} for highly environmentally sensitive firms are significantly larger than those of low-sensitive firms. These outcomes imply that the positive impact of sustainability committees on green practices comes out stronger for firms exposed to higher environmental risks.

In addition, Radu and Smaili (2022) argue that a CSR committee has both direct and indirect positive effects on firm environmental performance with CSR-linked compensation playing a mediating role. According to the authors, CSR committees and CSR-linked compensation are two vital governance mechanisms that the board of directors establishes to reflect their perceptions and commitments to CSR issues. The CSR committee monitors while CSR-linked compensation incentivises executives to align their interests with those of stakeholders. As the CSR committee is responsible for CSR-related decisions, implementing a CSR-linked executive compensation might be a part of these decisions to enhance CSR performance.

On the other hand, the empirical results from Orazalin (2020) suggest that the effectiveness of CSR strategy can explain the positive relationship between board sustainability committees and corporate environmental performance. Prior studies, such as Aragón-Correa et al. (2008), Helfaya and Moussa (2017), and Shaukat et al. (2016), have shown that companies with efficient and comprehensive CSR strategy are more likely to outperform their competitors in terms of environmental disclosure and performance, while the existence of CSR committees plays a key part in setting CSR strategy and monitoring its implementation in business activities (Mackenzie, 2007).

Such literature streams motivate us to explore the potential effect of CSR-linked compensation and CSR strategy on mediating the CSR committees—green practices nexus, following Baron and Kenny's (1986) approach. The authors suggest that a variable can be considered a valid mediator if it satisfies three critical conditions. First, there is a significant relationship between the independent and dependent variables. Second, there is a significant relationship between the independent and mediator variables. Finally, when both independent and mediator variables are included in one model, the impact of the mediator variable on the dependent variable must be significant and the effect of the independent variable on the dependent variable must be decreased. In our study, these conditions are assessed through 3-step estimations:

Step 1: Identifying the impact of the independent variable (CSR_{COM}) on dependent variables (GP and three individual indicators) via Equation (2.1):

$$GP_{it} = \alpha_i + \beta_1 CSR_{COMit} + \sum_{k=1}^{7} \beta_{k+1} CV_{kit} + \varepsilon_{it} \tag{2.1}$$

Table 8. Potential channels through CSR committees influence green practices

	GP	CSR_{COMPEN}	GP	CSR_{STRAT}	GP
	(Eq. 2.1)	**(Eq. 2.2a)**	**(Eq. 2.3a)**	**(Eq. 2.2b)**	**(Eq. 2.3b)**
CSR_{COMPEN}			0.040***		
			(0.009)		
CSR_{STRAT}					0.448***
					(0.016)
CSR_{COM}	0.534***	0.058***	0.531***	0.559***	0.283***
	(0.014)	(0.014)	(0.014)	(0.012)	(0.017)
B_{SIZE}	0.009	–0.024*	0.010	0.013	0.002
	(0.013)	(0.014)	(0.013)	(0.012)	(0.012)
B_{FED}	–0.033**	0.038	–0.034***	0.019	–0.040***
	(0.013)	(0.023)	(0.013)	(0.013)	(0.012)
B_{IND}	0.112***	0.106***	0.108***	0.094***	0.069***
	(0.018)	(0.027)	(0.018)	(0.018)	(0.016)
B_{NED}	–0.047***	–0.021	–0.047***	–0.024	–0.037**
	(0.018)	(0.022)	(0.018)	(0.016)	(0.015)
$SIZE$	0.265***	0.012	0.265***	0.283***	0.137***
	(0.015)	(0.023)	(0.015)	(0.015)	(0.014)
ROA	–0.013	–0.012	–0.012	0.009	–0.017
	(0.013)	(0.019)	(0.013)	(0.011)	(0.012)
LEV	–0.082***	0.045**	–0.084***	–0.027*	–0.072***
	(0.016)	(0.019)	(0.016)	(0.015)	(0.015)
Const.	0.260***	–0.119**	0.264***	0.177***	0.184***
	(0.048)	(0.050)	(0.048)	(0.050)	(0.044)
Obs.	4,058	4,098	4,058	4,099	4,058
R^2	0.4871	0.0644	0.4888	0.5187	0.5833
F-stat.	183.33***	5.54***	178.72***	310.29***	281.91***
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Note: Variables are described in Table 1. Robust standard errors are in brackets. *, **, and *** indicate significant levels at 10%, 5%, and 1%, respectively.

Source: own calculations.

Step 2: Identifying the impact of the independent variable (CSR_{COM}) on mediator variables (CSR_{COMPEN} and CSR_{STRAT}) via Equations (2.2a) and (2.2b):

$$CSR_{COMPENit} = \alpha_i + \beta_1 CSR_{COMit} + \sum_{k=1}^{7} \beta_{k+1} CV_{kit} + \varepsilon_{it} \quad (2.2a)$$

$$CSR_{STRATit} = \alpha_i + \beta_1 CSR_{COMit} + \sum_{k=1}^{7} \beta_{k+1} CV_{kit} + \varepsilon_{it} \quad (2.2b)$$

Step 3: Identifying the joint impact of the independent variable (CSR_{COM}) and mediator variables (CSR_{COMPEN} and CSR_{STRAT}) on dependent variables (GP and three individual indicators) via Equations (2.3a) and (2.3b). The impact of CSR_{COM} on GP must be weaker than in Step 1. Meanwhile, the effect of CSR_{COMPEN} and CSR_{STRAT} on GP must be statistically significant.

$$GP_{it} = \alpha_i + \beta_1 CSR_{COMPENit} + \beta_2 CSR_{COMit} + \sum_{k=1}^{7} \beta_{k+2} CV_{kit} + \varepsilon_{it} \quad (2.3a)$$

$$GP_{it} = \alpha_i + \beta_1 CSR_{STRATit} + \beta_2 CSR_{COMit} + \sum_{k=1}^{7} \beta_{k+2} CV_{kit} + \varepsilon_{it} \quad (2.3b)$$

in which: $CSR_{COMPENit}$ is a dummy variable that gets the value of one if the company i has a CSR-linked compensation policy at time t and zero otherwise. $CSR_{STRATit}$ is the CSR strategy score of the company i at time t obtained from the Datastream ESG database. The CSR strategy score indicates a company's efforts to incorporate economic, social, and environmental dimensions into its daily decision-making processes. Other variables are the same as in our previous analyses.

The results are presented in Table 8.[3] As can be seen from the table, both CSR-linked compensation and CSR strategy meet Baron and Kenny's requirements for a valid mediator variable. However, their effect on the CSR committees—green practices nexus is incomparable. Specifically, the coefficient of CSR_{COM} reduces slightly from 0.534 to 0.531 when CSR_{COMPEN} is added to the model. In contrast, there is a remarkable decrease in the magnitude of CSR_{COM}'s coefficient (from 0.534 to 0.283) with the inclusion of CSR_{STRAT}. These results suggest that the existence of sustainability committees can promote the integration of environmentally friendly practices in business activities through two channels: linking CEO compensation to CSR-related provisions and improving CSR strategy, with the improvement of CSR strategy demonstrating a stronger mediating effect.

[3] For brevity, we only present the results for the aggregate green practice index. The outcomes for three individual indices draw similar conclusions.

Conclusions

Using a sample of 445 Japanese companies between 2010 and 2021, the main objective of this research is to investigate the effect of CSR committees on the collaboration of green practices in business activities. We find that firms with a CSR committee are associated with higher scores in three environmentally friendly initiatives, including internal pollution intervention, green supply chain management, and green product development. These results are in tandem with the previous findings of Dixon-Fowler et al. (2017), García Martín and Herrero (2020), and Walls et al. (2012) and indicate the vital role of sustainability committees in promoting corporate green behaviours. Our findings still hold after considering the differences in firm-specific characteristics and corporate governance devices across companies and applying two additional methods, including PSM and GMM.

Furthermore, we claim that the positive impact of CSR committees on corporate green practices is stronger for firms operating in higher environmentally sensitive sectors. In our sample, the proportion of high-sensitive firms with a CSR committee is 79.78%, compared to 67.07% of their low-sensitive counterparts. Such a difference is expected as companies with higher environmental risks face more pressure on CSR requirements and expectations than others (Lin et al., 2015) and the board of directors in those companies can create CSR committees as one of the governance mechanisms to gain legitimacy from their stakeholders (Burke et al., 2019). Our results suggest that the presence of CSR committees in highly environmentally sensitive companies is not just a symbolic factor to control stakeholder perceptions favorably but truly enhances their environmental performance. This contrasts with Rodrigue et al. (2013), who argue that the environmental governance mechanisms in such companies are mostly part of a symbolic nature, having little substantial impact on organisations.

Finally, we suggest that the existence of CSR committees is associated with a CSR-linked compensation policy and an efficient CSR strategy. Furthermore, our results show that firms with CSR-linked compensation and a higher CSR strategy score perform better in green practice implementation. As a result, we assume that the presence of CSR-linked compensation and effective CSR strategy can explain the positive relationship between sustainability committees and firms' eco-friendly behaviours, supporting the results of studies by Aragón-Correa et al. (2008), Orazalin (2020), and Radu and Smaili (2022).

Overall, this study confirms the crucial role of a governance mechanism—CSR committees—that business organisations and policymakers can exploit to promote sustainable behaviours. It enriches the literature on the impact of CSR committees and the determinants of corporate green behaviours. More importantly, our research provides new insights into the CSR committees—green practices nexus, which has been investigated to a limited extent.

However, our findings should be generalised with caution. Firstly, there is no universal organisational arrangement regarding CSR committees. Their roles and responsibilities within different firms also vary. Secondly, the exposure and awareness of industries in the context of social and environmental responsibility are diverse. As shown in our study, CSR committees have a stronger impact on green practices for environmentally sensitive companies. Thirdly, country-specific characteristics might influence the relationship between CSR committees and CSR-related outcomes (Baraibar-Diez & Odriozola, 2019; Velte & Stawinoga, 2020). These matters can lead to heterogeneous results in the CSR committees—green practices nexus across companies, sectors, and countries. Moreover, this study is based on information about the presence or absence of sustainability committees in the corporate governance system. It would be important to consider the characteristics of such committees, for example, their size, composition, number of meetings, and so on. This information can help the board of directors create an effective CSR committee that eventually promotes CSR initiatives and performance. We will leave such issues for future research.

Appendix

Measurement of green practices indices

Variable	Measurement
Internal pollution prevention index (GP_{IPP})	The sum of the following emission and resource reduction underlying points: 1. Policy Emissions (ENERDP0051): Does the company describe, claim to have, or mention processes in place to improve emission reduction? – Yes = 1/No = 0. 2. Nitrogen Oxides (NOx) and Sulfur Oxides (SOx) Emissions Reduction (ENERDP033): Does the company report on initiatives to reduce, reuse, recycle, substitute, or phase out SOx or NOx emissions? – Yes = 1/No = 0. 3. Volatile Organic Compounds (VOC) Emissions Reduction (ENERDP036): Does the company report on initiatives to reduce, substitute, or phase out VOC? – Yes = 1/No = 0. 4. Particulate Matter Emissions Reduction (ENERDP037): Does the company report on initiatives to reduce, substitute, or phase out particulate matter less than ten microns in diameter (PM10)? – Yes = 1/No = 0. 5. Waste Reduction Initiatives (ENERDP062): Does the company report on initiatives to recycle, reduce, reuse, substitute, treat, or phase out total waste? – Yes = 1/No = 0. 6. e-Waste Reduction (ENERDP063): Does the company report on initiatives to recycle, reduce, reuse, substitute, treat, or phase out e-waste? – Yes = 1/No = 0.

Variable	Measurement
	7. Staff Transportation Impact Reduction (ENERDP081): Does the company report on initiatives to reduce the environmental impact of transportation used for its staff? – Yes = 1/No = 0. 8. Policy Water Efficiency (ENRRDP0121): Does the company describe, claim to have, or mention processes in place to improve its water efficiency? – Yes = 1/No = 0. 9. Policy Energy Efficiency (ENRRDP0122): Does the company describe, claim to have, or mention processes in place to improve its energy efficiency? – Yes = 1/No = 0. 10. Toxic Chemicals Reduction (ENRRDP031): Does the company report on initiatives to reduce, reuse, substitute, or phase out toxic chemicals or substances? – Yes = 1/No = 0. The GP_{IPP} index ranges from 0 (highest polluters) to 10 (lowest polluters).
Green supply chain management index (GP_{GSCM})	The sum of the following resource reduction underlying points: 1. Policy Environmental Supply Chain (ENRRDP0125): Does the company describe, claim to have, or mention processes in place to include its supply chain in the company's efforts to lessen its overall environmental impact? – Yes = 1/No = 0. 2. Environmental Materials Sourcing (ENRRDP029): Does the company claim to use environmental criteria (e.g., life cycle assessment) to source or eliminate materials? – Yes = 1/No = 0. 3. Environmental Supply Chain Management (ENRRDP058): Does the company use environmental criteria (ISO 14001, energy consumption, etc.) in the selection process of its suppliers or sourcing partners? – Yes = 1/No = 0. 4. Environmental Supply Chain Partnership Termination (ENRRDP059): Does the company report or show to be ready to end a partnership with a sourcing partner, if environmental criteria are not met? – Yes = 1/No = 0. The GP_{GSCM} index ranges from 0 (lowest GSCM practices) to 4 (highest GSCM practices).
Green product index (GP_{GP})	The sum of the following production innovation underlying points: 1. Environmental Products (ENPIDP019): Does the company report on at least one product line or service that is designed to have positive effects on the environment, or which is environmentally labeled and marketed? – Yes = 1/No = 0. 2. Product Environmental Responsible Use (ENPIDP048): Does the company report about product features and applications or services that will promote responsible, efficient, cost-effective, and environmentally preferable use? – Yes = 1/No = 0. 3. Eco-Design Products (ENPIDP069): Does the company report on specific products which are designed for reuse, recycling, or the reduction of environmental impacts? – Yes = 1/No = 0. The GP_{GP} index ranges from 0 (lowest green product practices) to 3 (highest green product practices).
Green practices index (GP)	The sum of the internal pollution prevention index, the green supply chain management index, and the green product index. GP index ranges from 0 (lowest green practices) to 17 (highest green practices).

Source: Datastream database and own elaboration.

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