





RESEARCH ARTICLE

The drivers of the integration of the sustainable development goals into the non-financial information system: Individual and joint analysis of their influence

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Abstract

In response to recent calls about the need to improve the current understanding of what drives SDG reporting, this paper analyzes the individual and joint effect of a broad array of factors on the integration of the sustainable development goals (SDGs) into the non-financial information system. Using a sample made up of 1535 international companies for the period 2015–2017, we examine the extent to which both external and internal factors affect SDG reporting as well as the role played by two influential actors in corporate decision-making (i.e., the CEO and the board of directors) in promoting this disclosure strategy. The results indicate that institutional pressures at the country level, firm size and incentives associated with the monitoring of financial analysts and the demands of investors, together with the specialisation and size of the board of directors are, in this order, drive the level of integration of the SDGs into the non-financial information system. In the absence of these factors, the training of the CEO in sustainability issues is the main determinant of SDG reporting.

KEYWORDS

institutional theory, non-financial reporting, SDG Compass, SDG reporting, sustainable development goals

1 | INTRODUCTION

The sustainable development goals (SDGs) are part of the 2030 Agenda for Sustainable Development, which defines the road map agreed by the United Nations (UN) “to shift the world towards more sustainable and resilient pathways” (Caiado et al., 2018, p. 1276). Larger companies in particular must take an active role in achieving the 2030 Agenda, pioneering the introduction of good business practices that can be implemented by other companies and organisations

(Rosati & Faria, 2019a, 2019b). The need to create and implement a sustainable business model based on the integration of the SDGs into business strategies has been highlighted (Bebbington & Unerman, 2018).

SDG engagement and reporting has received increasing research attention, and is an emerging research area (Tsalis et al., 2020). Nevertheless, studies on the factors that drive firms to engage with the SDGs and to integrate them into their reports are still scarce (Pizzi et al., 2021; van der Waal & Thijssens, 2020) and, therefore, more

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studies are needed to improve the current understanding of what drives SDG reporting (Izzo et al., 2020; Tsalis et al., 2020).

This paper intends to fill this research gap by considering a broad array of factors able to affect SDG reporting. It aims to determine the driving factors behind the integration of the SDGs into the non-financial information system. We develop a theoretical framework based on institutional theory that jointly considers the interplay between external factors (i.e., institutional pressures at the sector and the country level) and internal factors (firm characteristics and incentives), as well as the role played by two influential actors in corporate decision-making (the chief executive officer -CEO- and the board of directors).

This research contributes to the literature in several ways. Firstly, it enriches the corporate social responsibility (CSR) literature by extending and developing the limited available empirical evidence regarding the determinants of SDG reporting. We identify new drivers of SDG reporting, the effect of which has not been previously studied, and extend prior findings regarding the effects of other factors. Our research differs from previous studies in that, in addition to analysing the individual effects of potential drivers of SDG reporting, we assume that they will have a different effect on companies which carry out actions in this area, and so we try to determine their relative importance. To the best of our knowledge, this research is the first to analyse the joint effect of different potential explanatory factors of the integration of the SDGs into the non-financial information system. Secondly, we contribute to institutional theory from a theoretical viewpoint by extending empirical evidence about the role played by institutional pressures on firms to adopt this new framework for sustainability reporting. The uniqueness of our research resides in its analysis of the interplay between institutional pressures and firm characteristics and incentives, along with the role played by two influential actors in corporate decision-making.

The rest of the paper proceeds as follows: the next section presents the theoretical framework developed to analyse the drivers of CSR reporting. The third section sets out the empirical framework. The fourth section summarises the main results along with their discussion. Finally, the last section presents the main conclusions and implications of our study as well as its limitations.

2 | BACKGROUND AND LITERATURE REVIEW

2.1 | Integration of the SDGs into the non-financial information system: The role of the SDG Compass

In order to facilitate corporate engagement with SDGs, the United Nations Global Compact (UNGC), the Global Reporting Initiative (GRI) and the World Business Council for Sustainable Development (WBCSD) issued a guide—the SDG Compass—which explains how the SDGs can be integrated into a corporate social responsibility (CSR) strategy, and helps companies to effectively integrate the SDGs into their reporting policies. The framework of the SDG Compass sees

reports of the progress made towards meeting the SDGs as an effective communication strategy, aimed at satisfying the needs of stakeholders (Balcerzak & Pelikánová, 2020; GRI, 2015; Kapucu & Beaudet, 2020).

Four criteria define an effective disclosure strategy in relation to the SDGs (GRI, 2018): (a) sustainability reports must be concise, focusing on the provision of material information; (b) reports must be consistent, recommending the use of international disclosure frameworks and highlighting the link between the SDGs and the GRI; (c) reports must use non-financial performance indicators to allow stakeholders to estimate future performance; and (d) reports should be comparable.

2.2 | Determinants of the integration of the SDGs into the non-financial information system

The decision to integrate the SDGs into a company's non-financial information system is a voluntary choice that is probably influenced by both institutional factors and internal factors that go beyond specific business incentives. Both groups of factors are significant determinants of the voluntary disclosure of sustainability information (García-Sánchez, 2020; García-Sánchez, 2021) and represent “the existing influences and constraints” that affect the behaviour of social actors (Farooq & de Villiers, 2018).

According to institutional theory, firms are ruled by institutions that define the actions and practices that are considered socially appropriated, moulding corporate behaviour (DiMaggio & Powell, 1983; Jamali et al., 2020). Studies have found that sustainability reporting is an organisational response to institutional pressures (Frias-Aceituno et al., 2013; López-Arceiz et al., 2020), which may explain why firms adopt socially responsible behaviours and practices and how these differ in different countries. To the extent that the SDGs represent “a global imperative” (Tsalis et al., 2020, p. 1618), engagement with SDGs and SDG reporting will also be influenced by the institutional pressures that organisations face in this regard at the sector and the country level (Rosati & Faria, 2019b; van der Waal & Thijssens, 2020; van Zanten & van Tulder, 2018).

Organisations do not play a passive role, but, on the contrary, may use their resources and skills to influence institutions in line with their objectives (Farooq & de Villiers, 2018). In other words, firm characteristics and incentives may moderate the effect of institutional pressures on corporate behaviour, explaining why, in the face of similar pressures, there is high variability in the adoption of CSR practices (García-Sánchez & Noguera-Gámez, 2018). Among such firm characteristics and incentives, firm size, firm age, business performance, financial constraints, asymmetric information problems, cost of capital, and analyst coverage have been identified as influential drivers of sustainability reporting and corporate transparency (García-Sánchez et al., 2020a, 2020b; Martínez-Ferrero & García-Sánchez, 2017a; Melloni et al., 2020; Rosati & Faria, 2019a).

At the same time, the new institutionalism gives human action an important role in the creation of institutions, considering that social

actors can use agency to serve their own interests (Scott, 2008). Given their influence on corporate strategic decisions, a company's CEO and board of directors are key actors who can use their power and skills to promote/discourage institutions in line with their interests. An increasing stream of literature has focused on the role played by these actors with regard to CSR policies and strategies. Several demographic characteristics (such as gender and education/training) as regards the CEO have been identified as important determinants of CSR (Lewis et al., 2014; Yuan et al., 2017; Zaman et al., 2020). A CEO's willingness to adopt socially responsible practices may also be affected through the insertion of sustainability-related targets in CEO compensation contracts (Al-Shaer & Zaman, 2019), as well as by the fact that they are the chairpersons of the board of directors (Lewis et al., 2014). The composition (e.g., size, independence, diversity, and specialisation) and activity of the board of directors affect how it acts with regard to a firm's sustainability strategy and stakeholder engagement (García-Sánchez et al., 2020c, 2021a; Parra-Domínguez et al., 2021; Pizzi et al., 2021).

The following model (Figure 1) is proposed as depicting the determinants of the integration of SDGs into the non-financial information system.

3 | METHODS

3.1 | Sample

In line with previous research (García-Sánchez et al., 2016; van der Waal & Thijssens, 2020), our sample consists of the largest listed firms worldwide according to Forbes, because these firms tend to be more proactive in sustainability reporting than smaller companies (García-Sánchez et al., 2021b; Izzo et al., 2020; Monteiro et al., 2021; Rosati & Faria, 2019a), and they are thus more likely to disclose information regarding the SDGs in their sustainability reports (KPMG, 2018). The fact that the sample is composed of only the largest listed companies may bias our findings and conclusions, however, and this limitation will be discussed in depth later.

The sample is conditioned by the ability to obtain the sustainability and financial information necessary for the estimation of Equation (1) in the GRI and Thomson Reuters databases, respectively. The sample thus includes 1535 companies belonging to 53 countries and operating in 10 sectors of activity for the period 2015–2017, which enables a data panel of 4346 observations.

3.2 | Empirical models and variables

We designed the model set out in Equation (1) to analyse the effects that institutional pressures, firm characteristics and incentives, and the efforts of social actors have on the integration of the SDG into the non-financial information system.

$$\begin{aligned} \text{SDG_Compass}_{it} = & \gamma_0 + \gamma_1 \text{IA}_{it} + \gamma_2 \text{Analysts}_{it} + \gamma_3 \text{KZ}_{it} + \gamma_4 \text{COC}_{it} \\ & + \gamma_5 \text{Age}_{it} + \gamma_6 \text{Size}_{it} + \gamma_7 \text{ROA}_{it} + \gamma_8 \text{Duality}_{it} \\ & + \gamma_9 \text{CEO_Women}_{it} + \gamma_{10} \text{CEO_Compensation}_{it} \\ & + \gamma_{11} \text{CEO_Training}_{it} + \gamma_{12} \text{BoardAct}_{it} \\ & + \gamma_{13} \text{BoardSize}_{it} + \gamma_{14} \text{BoardIndep}_{it} \\ & + \gamma_{15} \text{BoardWom}_{it} + \gamma_{16} \text{CSRCommittee}_{it} \\ & + \gamma_{17} \text{Culture}_{it} + \gamma_{18} \text{NCSR}_{it} + \gamma_{19} \text{ICSRPI}_{it} \\ & + \gamma_{20} \text{Year}_{it} + \mu_{it} + \eta_i \end{aligned} \quad (1)$$

where i identifies the firm and t the year, γ represents the coefficients to be estimated, η reflects the unobservable heterogeneity, and μ represents the error term. Year is a numerical variable that identifies the years in the sample.

The dependent variable represents the integration of the SDG Compass into the firm's non-financial information system. It was constructed in accordance with the proposal of García-Sánchez et al. (2020b) and takes values between 0 and 4 depending on the extent to which a firm adopts the SDG Compass strategy in its CSR reports. This variable reflects the extent to which the indicators incorporated in a firm's reports are related to those mapped in the SDG Compass, as well as their scope of disclosure. Where a firm discloses SDG Compass indicators but they are not linked to the SDGs, the variable takes the value 0; if a firm discloses indicators associated with the relevant SDGs but they are not those proposed by the SDG Compass strategy, the variable takes the value 1; when a firm discloses SDG Compass indicators according to the “in accordance-core” level of the GRI G4 guide, the variable takes the value 2; where a firm that discloses SDG Compass indicators according to the “in accordance-comprehensive” level of the GRI G4 guide, the variable takes the value of 3; and if a firm issues a report following the SDG Compass strategy (i.e., the SDG Compass is fully integrated into its non-financial information system), the variable takes the maximum value of 4. In order to compute its value, the information obtained from the GRI database was complemented with a manual search in the firms' reports available in the institutional repository of this organisation.

According to the model depicted in Figure 1, the explanatory variables in Equation (1) include firm characteristics and incentives (firm

FIGURE 1 Conceptual framework

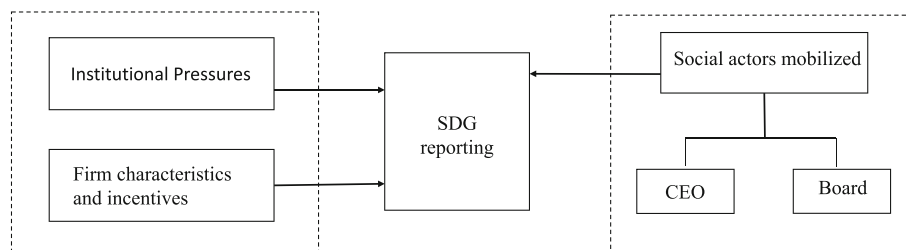


TABLE 1 Description of independent variables

Variable	Acronym	Definition	Studies	Expected sign
Panel A. Firm characteristics and incentives				
Firm size	Size	Natural logarithm of total assets	Martínez-Ferrero and García-Meca (2020); Pizzi et al. (2021)	+
Firm age	Age	Age of the firm	García-Sánchez (2020); Melloni et al. (2020)	+
Performance	ROA	Economic profitability measured by the return-on-assets ratio	García-Sánchez et al. (2020a, 2020b); Martínez-Ferrero and García-Meca (2020)	+
Financial constraints	KZ	KZ index from Kaplan and Zingales (1997)	García-Sánchez (2020); García-Sánchez et al. (2020a)	+
Cost of capital	COC	PEG ratio, price-earnings-growth	García-Sánchez (2020); Martínez-Ferrero and García-Sánchez (2017a)	+
Asymmetric information problems	IA	Error in predicting future earnings by analysts	García-Sánchez (2020); García-Sánchez et al. (2020a)	+
Analyst coverage	Analysts	The number of analysts following the company	García-Sánchez et al. (2020a, 2020b); Melloni et al. (2020)	+
Panel B. CEO's demographic characteristics, values, and cognitive styles				
Gender	CEO_Women	Dummy that takes a value of 1 if the CEO is a woman	García-Sánchez (2020)	+
Training and educational background	CEO_Training	Dummy that takes a value of 1 if CEO compensation is linked to CSR performance	García-Sánchez (2020)	+
Insertion of sustainability-related targets into CEO compensation contracts	CEO_Compensation	Dummy that takes a value of 1 if the CEO has CSR training	Al-Shaer and Zaman (2019); García-Sánchez (2020)	+
CEO duality	Duality	Dummy that takes a value of 1 if the CEO also is the Chairman	García-Sánchez et al. (2020a, 2020b); Martínez-Ferrero and García-Meca (2020)	+
Panel C. Board of directors' composition and activity				
Board size	BoardSize	Number of directors on the board	García-Sánchez et al. (2020b); Pizzi et al. (2021)	+
Board activity	BoardActv	Number of meetings of the board per financial year	Martínez-Ferrero and García-Meca (2020); Pizzi et al. (2021)	+
Board independence	BoardIndep	Percentage of independent directors on the board	Martínez-Ferrero and García-Meca (2020); Pizzi et al. (2021);	+
Board diversity	BoardWom	Percentage of female directors on the board	Pizzi et al. (2021); Rosati and Faria (2019a)	+
Existence of a CSR committee	CSR_Comm	Dummy that takes the value 1 if there is a CSR committee on the board of directors, and 0 otherwise	Martínez-Ferrero and García-Meca (2020); Melloni et al. (2020); Pizzi et al. (2021);	+
Panel D. Institutional pressures				
National culture's dimensions	Culture	Dummy that takes a value of 1 if the national cultural values of the firm's origin country are stakeholder oriented	García-Sánchez (2020)	+
Institutional pressures at the country level	NCSRPI	Level of orientation towards the stakeholders of the firm's country of origin (Amor-Esteban et al., 2019a, 2019b)	Cubilla-Montilla et al. (2020); García-Sánchez (2020); García-Sánchez et al. (2020c)	
Institutional pressures at the sector level	ICSRPI	Aggregate indicator of institutional pressures at the sectoral level (Amor-Esteban et al., 2018)	Cubilla-Montilla et al. (2020); García-Sánchez (2020); García-Sánchez et al. (2020a, 2020b)	

size, firm age, business performance, financial constraints, asymmetric information problems, cost of capital, and analyst coverage), the CEO's demographic characteristics, values, and cognitive styles (i.e., gender, training/educational background, duality, and compensation), the attributes of the board of directors (size, independence, diversity, activity, and the existence of a CSR committee), and institutional factors (i.e., institutional pressures at the sector and the country level as well as the national culture's dimensions). Table 1 summarises the measurement and expected sign for each variable, and includes references to the previous studies that have used them.

Because the dependent variable (SDG_Compass) is censored, we use a Tobit model for panel data to estimate Equation (1), delaying the independent variables by one period in order to correct endogeneity problems. In order to assess the relative weight of each group of independent variables and determine which has the greatest explanatory power, following Martínez-Ferrero and García-Sánchez (2017b) and García-Sánchez (2020), we used the two-stage model used by Francis et al. (2011). This method is especially appropriate in our case as, in addition to measuring the effect of each independent variable in explaining the integration of the SDG_Compass in the non-financial information system, it allows us to determine which typology of factors has the greatest explanatory power through their individual predictive values instead of the individual variables.

As its name indicates, this method implies two steps. Initially, we estimated the effect of each typology of factors on the SDG_Compass separately, by using the coefficients obtained to estimate the predictive value of each model. In a second phase, each factor's previously predicted values were incorporated as independent variables into a second Tobit model to determine which has the greatest predictive power regarding the integration of the SDG_Compass into the non-financial information system. Accordingly, the predicted values of each observation in Equation (1) based on the firm characteristics and incentives, CEO's features, board attributes and institutional factors were renamed as F_Score, C_Score, B_Score, and I_Score, respectively, which represent the new explanatory variables. These scores were used in a second Tobit model, as depicted in Equation (2), to evaluate which group of factors has a greater predictive capacity regarding the integration of the SDG Compass:

$$\text{SDG_Compass}_{it} = \gamma_0 + \gamma_1 \text{F_Score}_{it} + \gamma_2 \text{C_Score}_{it} + \gamma_3 \text{B_Score}_{it} + \gamma_4 \text{I_Score}_{it} + \gamma_5 \text{Industry}_{it} + \gamma_6 \text{Year}_{it} + \mu_{it} + \eta_i \quad (2)$$

The Wald test was used to determine whether the significant coefficients are different, starting from the null hypothesis of equality. On the assumption that this test is significant, the null hypothesis can be rejected, and we therefore determine which group of factors acts differently to the remaining groups, and which has the greatest explanatory power.

4 | RESULTS AND DISCUSSION

4.1 | Descriptive statistics

Table 2 summarises the descriptive statistics for the numerical variables and the relative frequency of the dichotomous variables. As can be seen in Panel A, the integration of the SDG_Compass into the firm's non-financial information system is on average 1.36, within the interval ± 1.21 . In general, companies thus show a limited integration of the SDG Compass in their non-financial information systems. Complementing this average value with the frequencies by category, we

TABLE 2 Descriptive statistics

Panel A. Dependent variable		
Values SDG_Compass	Frequency relative	
0	35.76%	
1	15.51%	
2	29.18%	
3	16.31%	
4	3.24%	
SDG_Compass	Mean	Standard deviation
	1.36	1.21
Panel B. Independent variable (dummies)		
Variable	Frequency relative	
Duality	68.21%	
CEO_Women	4.12%	
CEO_Compensation	33.96%	
CEO_Training	62.43%	
CSR_Committee	60.80%	
Culture	58.47%	
Panel C. Independent variables (numerical)		
Variable	Mean	Standard deviation
IA	0.08	0.80
Analysts	15.58	9.28
COC	0.01	0.01
KZ	0.02	0.13
Age	45.13	35.31
Size	18.10	2.72
ROA	5.06	8.38
BoardSize	10.24	3.29
BoardActv	18.98	10.46
BoardIndep	46.41	30.70
BoardWom	15.58	13.08
ICSRPI	0.11	9.03
NCSRPI	0.49	3.03

can confirm that only 3.24% of the largest companies worldwide have integrated the SDG Compass into their non-financial information systems, although a very high percentage of companies have implemented indicators associated with the SDGs at different levels as a consequence of using the GRI guidelines in preparing their sustainability reports. These results partially correct the findings of Izzo et al. (2020) and van der Waal and Thijssens (2020), who observed that SDG reporting lacks substance and is mainly focused on intentions rather on actual progress in achieving the SDGs, concluding that companies use SDG reporting in a context of SDG washing or impression management (Yamane & Kaneko, 2021).

On the other hand, Panel B and Panel C show that, on average, each company is monitored by 16 analysts, and the board of directors consists of 10 directors, who meet an average of 19 times a year, and of whom 46% are independent and 16% are women. In 68% of the firms, the CEO is also the chair of the board, and 61% have a board

committee specialised in CSR. More than 60% of CEOs have training in CSR issues, although only 34% of companies have linked CEO compensation to sustainability performance. There is a very limited presence of women as CEOs (4.12%).

The bivariate correlations are shown in Table 3. As can be seen, the coefficients are not high, indicating that there are no multicollinearity problems in the estimated models.

4.2 | Main results

Table 4 presents the results obtained for Equation (1), considering the different factors individually but grouped into sub-models, which allows us to calculate the score that will be used to estimate Equation (2). Table 4 shows the estimated coefficient and the error standard associated with each coefficient for each explanatory variable.

TABLE 3 Bivariate correlations

	SDG_ Compass	1	2	3	4	5	6	7	8	9	
1	IA	-0.03									
2	Analysts	0.12	0.05								
3	COC	0.00	0.02	-0.17							
4	KZ	0.09	0.00	0.02	-0.05						
5	Age	0.02	-0.03	-0.07	0.06	0.01					
6	Size	0.16	-0.01	0.25	-0.40	0.32	0.04				
7	ROA	0.00	-0.01	0.11	0.01	0.00	0.03	-0.10			
8	Duality	0.01	0.03	-0.07	0.04	0.03	-0.06	0.00	0.00		
9	CEO_Women	0.01	-0.01	0.03	0.02	-0.02	0.05	-0.03	0.07	0.01	
10	CEO_Compensation	-0.11	0.05	0.05	0.20	-0.08	0.08	-0.30	0.07	-0.05	0.12
11	CEO_Training	0.13	0.03	0.07	-0.03	0.03	0.00	0.05	0.02	0.04	-0.07
12	BoardSize	0.12	-0.04	0.14	-0.09	0.00	0.02	0.11	-0.02	-0.13	0.00
13	BoardAct	0.07	0.03	-0.15	0.07	-0.01	0.05	0.06	-0.06	0.29	-0.05
14	BoardIndep	-0.08	0.04	0.01	-0.01	-0.05	0.03	-0.19	0.04	-0.21	0.04
15	BoardWomen	0.02	-0.01	0.05	0.06	-0.06	0.03	-0.16	0.08	-0.05	0.10
16	CSRCommittee	0.19	0.03	0.03	-0.02	-0.06	-0.01	0.07	0.00	0.06	-0.02
17	NCSRPI	0.09	0.04	-0.22	0.30	-0.09	-0.01	-0.29	-0.08	0.18	-0.01
18	ICSRPI	0.02	-0.02	-0.16	0.09	0.00	0.04	-0.04	-0.08	-0.07	0.05
19	Culture	-0.04	0.03	0.19	0.19	0.00	0.06	-0.47	0.12	-0.06	0.10
		10	11	12	13	14	15	16	17	18	
11	CEO_Compensation	0.00									
12	CEO_Training	-0.02	0.29								
13	BoardSize	-0.09	0.25	-0.09							
14	BoardAct	0.28	-0.18	-0.09	-0.37						
15	BoardIndep	0.12	0.23	0.18	-0.01	0.16					
16	BoardWomen	0.02	0.45	0.30	0.21	-0.11	0.21				
17	CSRCommittee	-0.07	0.05	-0.04	0.28	-0.12	0.10	0.04			
18	NCSRPI	0.04	-0.01	0.05	0.07	0.02	0.02	0.01	0.06		
19	ICSRPI	0.46	0.06	-0.03	-0.14	0.26	0.27	-0.01	-0.01	0.06	

TABLE 4 Results for Equation (1): Analysis sub-models for the construction of scores

	Equation (1)			
	Equation (1.a) Coeff. (Std. error)	Equation (1.b) Coeff. (Std. error)	Equation (1.c) Coeff. (Std. error)	Equation (1.d) Coeff. (Std. error)
IA	0.00814 (0.0283)			
Analysts	0.0169*** (0.00386)			
COC	6.633*** (2.386)			
KZ	0.155 (0.245)			
Age	0.00109 (0.000940)			
Size	0.0322* (0.0165)			
ROA	-0.00571 (0.00456)			
Duality		0.0470 (0.0443)		
CEO_Women		-0.0139 (0.124)		
CEO_Compensation		-0.199*** (0.0513)		
CEO_Training		0.215*** (0.0418)		
BoardSize			0.0229*** (0.00857)	
BoardActv			0.00277 (0.00255)	
BoardIndep			-0.00181* (0.000956)	
BoardWomen			-0.00166 (0.00202)	
CSRCommittee			0.212*** (0.0536)	
NCSRPI				0.0150*** (0.00244)
ICSRPI				0.0127* (0.00716)
Culture				-0.0705 (0.0457)
Constant	0.494* (0.297)	1.584*** (0.0495)	1.135*** (0.273)	1.379*** (0.0363)
Log-likelihood	-2818.88	-3948.97	-3021.74	-6408.62
Wald chi-square	48.94***	44.09***	43.65***	40.92***

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

As regards institutional pressures at the sector level, although studies have noted that SDG reporting varies significantly across industries, supporting the assumption that the industry to which a company belongs affects its decision to disclose information about its contribution to SDGs, and, specifically, that companies belonging to industries characterised by negative externalities and/or higher environmental sensitivity show a greater level of SDG engagement and SDG reporting, our findings indicate that institutional pressures at the sectoral level have only a marginal effect (ICSRPI: coef. 0.0127; $p < .010$). This result challenges prior empirical evidence that industry affiliation substantively affects SDG reporting practices through mimicry (Izzo et al., 2020; Melloni et al., 2020; Pizzi et al., 2021; van Zanten & van Tulder, 2018).

In relation to the effect of institutional factors at the country level, the results indicate that there is greater integration of the SDG Compass into the non-financial information system in those firms located in countries with more developed legal systems and where regulatory and coercive institutional pressures are higher, which entails high isomorphism with regard to the CSR practices that they carry out (NCSRPI: coef. 0.0150; $p < .001$). Our findings thus seem to indicate that there are institutional pressures regarding sustainability and sustainability reporting at the country level, favouring the integration of the SDG Compass into the non-financial information systems of companies located in such countries. These findings contrast with the results obtained by Rosati and Faria (2019b), however, who did not find empirical evidence allowing them to confirm or reject the influence of stronger country-level institutions on SDG reporting. They found that, on average, companies located in civil law countries, countries with stronger employment and environmental protection, and economically developed countries do not disclose more information on SDGs than companies located in other countries.

We also observed that cultural values at the national level, as a whole, do not have an effect on the development of an information system aimed at reporting on a business's contribution to the 2030 Agenda. This reinforces the findings of Cubilla-Montilla et al. (2019, 2020), in the sense that the effect of national cultural values is not enough to promote the implementation of GRI indicators that report on less general and more precise social and environmental issues of business performance. Specifically, the influence that the cultural values in a firm's country of origin have on the level of SDG reporting is not clear, and, national cultures do not always affect SDG reporting and disclosure quality in the same direction (Melloni et al., 2020). Rosati and Faria (2019b) found that companies reporting on SDGs are located in countries with lower levels of power distance, and in countries characterised by individualistic and short-term oriented cultures. These findings were only partially supported by Melloni et al. (2020), who also found that the country's level of power distance is negatively associated with SDG reporting, but contrary to Rosati and Faria (2019b), found that companies from collective societies tend to disclose more SDG information and in greater detail than companies located in individualistic societies.

We obtained evidence of a positive and significant impact, at 99%, of the pressures exerted by the number of analysts who monitor

a company and the cost of the capital it bears (coef. 0.0169 and $p < .01$; 6.633 and $p < .001$, respectively). Companies that bear higher capital costs and are monitored by more financial analysts are thus those more likely to integrate indicators of their contribution to the SDGs in their non-financial information system. The significant effect of analyst coverage on SDG reporting is in line with evidence obtained by García-Sánchez et al. (2020a), who found that the sell recommendations of analysts pushed companies to disclose SDG information through the adoption of the SDG Compass, and Melloni et al. (2020), who also identified analyst coverage as a key driver of SDG reporting. In line with Dhaliwal et al. (2011), our findings also indicate that the possibility of reducing the cost of capital is an incentive for companies to improve their sustainability reporting practices by including SDG information, and confirms the positive effect that the integration of the SDG Compass into the non-financial information system entails for companies due to the favourable reaction of institutional investors documented by García-Sánchez et al. (2020b).

Firm size also has a positive and significant effect, at 90%, on the integration of the SDG Compass into a firm's non-financial information system (coef. 0.0322 and $p < .010$). According to our findings, larger firms are thus more likely to integrate the SDG Compass into their non-financial information system. This confirms the results obtained by Melloni et al. (2020), Rosati and Faria (2019a), and Van der Waal and Thijssens (2020), and can be explained by the fact that larger firms draw greater stakeholder attention, and, given the increasing stakeholder awareness of the SDGs (Yamane & Kaneko, 2021), they may feel pressured to report on them to satisfy stakeholder expectations (Izzo et al., 2020). Furthermore, although Melloni et al. (2020) found that firm age is a key determining factor in SDG reporting, our findings do not suggest a significant effect of firm age on the integration of the SDG Compass into the non-financial information system.

The role played by the CEO has only been observed to have a positive effect where the CEO has training in CSR issues. It has a positive and 99% significant effect on the level of integration of the SDG Compass into a firm's non-financial information system (coef. 0.215; $p < .001$). This suggests that education and training in CSR issues make CEOs more concerned about sustainability challenges and favour their awareness of, and engagement with, the SDGs. Conversely, the integration of sustainability-related targets in CEO compensation has a negative effect on the level of integration of the SDG Compass into a firm's non-financial information system (coef. -0.199 ; $p < .001$), which suggests that, at present, the motivating role of remuneration systems linked to financial performance is not directly transferable to the sustainable dimensions of business behaviour. Moreover, although Martínez-Ferrero and García-Meca (2020) showed that CEO duality is negatively related to the disclosure of the SDGs in sustainability reports, our findings do not indicate a significant effect of the fact that the CEO is the chairperson of the board of directors on the integration of the SDG Compass into the non-financial information system.

Finally, with regard to the attributes of the board of directors, a greater board size (coef. 0.0229; $p < .001$) and specialisation through

TABLE 5 Results for equation (2): Score model and Wald test

	Equation (2) Coeff. (Std. error)		Wald test Chi-square
F_Score	1.136*** (0.233)	F_Score = C_Score	28.72***
C_Score	0.506 (0.310)	F_Score = B_Score	40.63***
B_Score	1.016*** (0.267)	F_Score = I_Score	27.83***
I_Score	1.162*** (0.339)	C_Score = B_Score	27.31***
Year	-0.361*** (0.0406)	C_Score = I_Score	16.34***
Constant	723.4*** (81.92)	B_Score = I_Score	28.06***
Log-likelihood	-1.222.289		
Wald Chi-square	146.5***		

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

a CSR committee (coef. 0.212; $p < .001$) positively affect the integration of the SDG indicators into the non-financial information system, guaranteeing the adequate treatment of the complexity of CSR disclosure and the accuracy and credibility of the disclosed information. Our findings slightly differ from those obtained by Pizzi et al. (2021) as regards board size, as they reported board size as having a different effect on SDG reporting depending on whether the company belongs to the financial sector or not. Our evidence that the creation of a CSR committee has a positive effect on SDG reporting, is in line with the results obtained by Melloni et al. (2020), although Pizzi et al. (2021) did not find empirical evidence that allowed them to confirm or reject an association between the existence of a CSR committee and SDG reporting.

We also found that the presence of independent directors only has a marginally negative effect on the integration of the SDG Compass into the non-financial information system (coef. -0.00181 ; $p < .010$), which contradicts the evidence obtained by Martínez-Ferrero and García-Meca (2020), who found that firms with greater board independence are significantly more likely to disclose SDG information in their sustainability reports, and Pizzi et al. (2021), who showed that board independence improves SDG reporting quality. Although Rosati and Faria (2019a) showed that a higher percentage of female directors on the board is positively related to SDG reporting, like Pizzi et al. (2021) we did not find empirical evidence that allows us to confirm or reject the effect of board diversity on the integration of the SDG Compass into the non-financial information system.

Once the variables that individually exert a significant influence on the integration of the SDG Compass into the non-financial information system have been identified, the next step is to examine the predictive capacity of each factor using the two-stage model

proposed by Francis et al. (2011). Table 5 shows the results of Equation (2), as well as those obtained for the Wald test. The evidence indicates that all factors have a significant effect, except those linked to the CEO's characteristics. It can thus be observed that institutional factors (coef. 1.162; $p < .001$), firm characteristics and incentives (coef. 1.136; $p < .001$), and the attributes of the board of directors (coef. 1.016; $p < .001$) have a significant effect on the integration of the SDG Compass. The CEO's characteristics do not have a significant effect from an econometric point of view, however. This effect may be because it is other features of the top manager that promote this decision, or that the CEO only has to assume that role in the absence of the other factors considered having an effect.

A Wald test was run to confirm the observed effects, which allows us to check whether all the coefficients are equal. Given the significance of 99% of the tests that link all the factors considered, we can confirm that institutional pressures have a stronger effect than the other factors in explaining the integration level of the SDG Compass into the non-financial information system. Intra-factor differences were also observed. Comparing coefficients suggests that the factors associated with institutional pressures at the country level, followed by firm characteristics and incentives and the effectiveness of the board of directors, in this order, drive the integration of the SDGs in the non-financial information system, whereas the CEO's characteristics play a complementary role. The adoption of isomorphic behaviour patterns with regard to SDG reporting is thus mainly derived in our case from institutional pressures at the country level, demonstrating that CSR responsibility is a "national issue" (Cubilla-Montilla et al., 2020, p. 1183).

Combining the results of Equations (1) and (2), we can confirm that the drivers of the quality, comparability and relevance of the information that companies disclose regarding their contribution to the 2030 Agenda correspond to institutional pressures, as well as to the stakeholder pressures faced by larger firms (mainly from two financial agents, analysts and institutional investors) to adopt an institutionalised sustainability reporting practice (i.e., SDG reporting), as well as to the specialisation and size of the board of directors. In the absence of these drivers, the influence of the training and experience of the CEO would be unquestionable. Although the mobilisation of key actors (e.g., key managers and employees or directors) has been identified as a commonly used mechanism with which to influence the institutionalisation process (Farooq & de Villiers, 2018), we can assert that mobilising the CEO to promote SDG reporting would be secondary, as it only occurs when the remaining drivers do not operate.

5 | CONCLUSIONS

Companies have become increasingly involved in SDG reporting (Bebbington & Unerman, 2018; KPMG, 2018), which, in the words of Di Vaio and Varriale (2020), "plays a relevant role in allowing organisations to create the right link with all stakeholders and the entire community through an opened and clear external and internal communication process about their sustainable performance in

meeting the SDGs Agenda". In response to recent calls to improve the current understanding of what drives SDG reporting (Tsalis et al., 2020), this paper analysed the extent to which a broad array of factors affects the integration of the SDG Compass into the non-financial information system. As SDG reporting represents "an extension to, or evolution of, corporate responsibility reporting" (Izzo et al., 2020, p. 11), we considered four typologies of factors that have been found to be drivers of sustainability reporting and corporate transparency. Using a sample of 1535 international companies for the period 2015–2017, we examined the extent to which external and internal factors affect SDG reporting, as well as the role played by two influential social actors in corporate decision-making, in promoting this new reporting strategy.

Our findings show a limited integration of the SDG Compass into the non-financial information system, although a very high percentage of companies have implemented indicators associated with the SDGs at different levels. At the individual level, the results indicate that the institutional pressures that exist at country level and that promote isomorphism in terms of CSR have a significant positive effect, whereas the effect of institutional pressures at the sector level is only marginal. Our results show that companies that bear higher capital costs and are monitored by a higher number of financial analysts are more likely to disclose indicators of their contribution to the SDGs, and that firm size has a positive and significant impact. Similarly, our findings indicate that larger boards, and boards that have implemented a specialised committee for CSR, positively influence SDG reporting. Finally, the CEO's training in CSR issues is the only CEO characteristic that has a positive effect on SDG reporting.

In addition to measuring the individual effect of each factor, we also examined which typology of factors has the greatest explanatory power by using a two-stage logit model (Francis et al., 2011). The results when analysing the joint effect of all factors demonstrate the supremacy of external pressures over other drivers, followed, in this order, by the financial incentives of larger companies and certain characteristics of the board as the factors with a greater predictive capacity of the integration of the SDG Compass into the non-financial information system, whereas the CEO's characteristics play a complementary role. Our findings provide empirical support to the contention made by van Zanten and van Tulder (2018) that, although the institutional pressures of CSR that characterise the business environment are not the only determinant of SDG engagement, they are the most important drivers.

Our study contributes to the literature by exploring the joint effect of various factors of different types (namely, institutional-level, firm-level, governance-level, CEO-level), which allows us to determine their global relevance as well as the nature of the relationships that may exist among them. Our research thus differs from previous studies in that, in addition to analysing the individual influence of potential drivers of SDG reporting, we assume that they will exert a different effect on companies that carry out actions in this area, and, consequently, we tried to identify their relative relevance. Instead of focusing on a single country (Izzo et al., 2020; Pizzi et al., 2021) or a region (Martínez-Ferrero & García-Meca, 2020), we adopted an international

approach which encompassed 1535 of the largest listed companies worldwide, belonging to 53 countries and operating in 10 sectors of activity. Given that the SDG policies implemented by countries may vary depending on their national priorities (Forestier & Kim, 2020; Halisçelik & Soytaş, 2019; van Zanten & van Tulder, 2018), this approach allows us to assess the relative importance of the institutional pressures versus the other factors.

The results have important practical implications for regulators and companies in relation to strengthening non-financial information systems. From a managerial viewpoint, unlisted companies, which do not suffer pressure from the capital market, should foster the creation of specialised committees within their boards of directors to promote the quality, relevance and comparability of their CSR disclosures. These effects will be added to the pressures derived from isomorphism at the country level, which is evident in the behaviour of large multinationals. Furthermore, as our findings indicate that, in the absence of other drivers, a CEO's training in CSR issues has a positive effect on SDG reporting, a company's executive recruitment policy should value CSR training and experience to foster SDG engagement and reporting. Understanding the drivers of SDG reporting could assist policymakers in designing public policies aimed at promoting the use of the SDG Compass.

Finally, it should be noted that the results and conclusions of this study are subject to limitations. Firstly, our sample is composed of only the largest listed companies worldwide, according to Forbes. Although this sample has been used in previous research (García-Sánchez et al., 2016, 2021c; van der Waal & Thijssens, 2020), the particular characteristics of the sample companies may also bias our findings and conclusions. Furthermore, given the international nature of multinational operations, institutional pressures not only have a direct effect on SDG reporting policies, but may also affect them indirectly through their influence on stakeholder pressures in this regard, as well as their effect on the effectiveness of corporate governance mechanisms (La Porta et al., 2002). Although its international focus is one of the noteworthy contributions of our study, the use of such a sample creates interplay among the variables included, which does not allow their effect to be addressed in depth, given that the interdependent relationships between them generate feedback loops which may not be captured by the methodology adopted here. Many questions thus remain unanswered: does the host country's institutional environment moderate the effect of the remaining factors on the integration of the SDGs into a company's non-financial information system, or, on the contrary, can multinational enterprises actively influence the establishment of the SDG Agenda, forcing changes in the institutional environment of their host countries? Is there a complementary or substitutive relationship among the four typologies of variables in relation to their effect on SDG reporting? Future studies could use alternative samples or research designs to answer these questions. Secondly, the analysed factors may evolve, either as a result of their interaction or for other reasons, and consequently their individual and joint effect on SDG reporting would also change. This evolutionary dynamic should be addressed in the future. Finally, there are other important factors that have not been considered in this

study and may affect the conclusions drawn due to their effect on some of the analysed variables. For instance, given investor interest in knowing the efforts and progress of companies in complying with the SDGs (García-Sánchez et al., 2020d, 2021d; Schramade, 2017), future studies could analyse how the power dynamics between different types of institutional investors and management affect the role they play in relation to SDG reporting, and who is going to drive the integration of the SDGs into the company's non-information system.

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CONFLICT OF INTEREST


The authors declare no potential conflict of interest.

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