

“Sell” recommendations by analysts in response to business communication strategies concerning the Sustainable Development Goals and the SDG compass

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Abstract

This paper has two main aims: firstly, to examine the effect of pessimistic (*sell*) recommendations made by analysts to investors on the implementation of business communication strategies in accordance with the Sustainable Development Goals (SDGs), through the adoption of the SDG Compass. Secondly, it considers the possible corrective effect produced by these strategies on analysts' recommendations, i.e. modifying their perception of corporate social responsibility (CSR) as an agency cost. Based on a sample of 989 international companies which disclose CSR information, obtained by merging the Global Reporting Initiative (GRI) and Thomson Reuters

databases, our analysis of the results obtained shows that the companies receiving most *sell* recommendations were among the first to adopt the SDG Compass in a given year or in the year immediately following it. Nevertheless, this effect is limited, because the long-term implementation of CSR strategies has a relatively trivial impact on analysts' recommendations, since there is little likelihood of change in these strategies.

Keywords: Sustainable development goals; SDG compass; Corporate social responsibility; Sustainability reporting; Analysts' recommendations; Institutional logic

1 Introduction

The SDGs form a major part of the United Nations (UN) road map to achieve sustainable economic and social development by 2030. They represent a common agenda for all stakeholders, aimed at using resources ecologically, at defending human rights and at promoting the innovation needed to bring about radical change in our management of the planet (UN, 2015). Among these stakeholders, businesses have a vital role to play, and must be pro-active if the SDGs are to be attained (Schramade, 2017; Sullivan et al., 2018).

To facilitate the integration of the SDGs into business strategies, the UN Global Compact, the GRI and the World Business Council for Sustainable Development designed a guide, the SDG Compass, detailing the steps companies should take to align their strategy with the SDGs and to contribute to their achievement (GRI, 2015). The SDG Compass is conceived as a holistic approach to promote the formulation, implementation and communication of SDG-related business strategies.

In short, the business communication strategy recommended in the SDG Compass constitutes a means of strengthening a company's relationships with its stakeholders (Schramade, 2017), providing relevant information that will satisfy their interest in the contribution made by the company to achieving the SDGs. Moreover, it allows companies to differentiate themselves from their competitors (Rosati and Faria, 2019a); enabling a firm to position itself as a leader in the adoption of CSR practices and thus attract the attention and approval of stakeholders (Ioannou and Serafeim, 2019).

The SDGs have attracted the attention of investors concerned about whether the companies in which they invest are acting in a socially responsible way (Schramade, 2017). In response to this interest, rating agencies, such as RobercoSAM, have begun to include items related to the companies' contributions to the 2030 Agenda in their analyses. Thus, the disclosure of relevant information on the companies' performance regarding the SDGs can satisfy the interest of rating agencies and attract potential investors.

In addition, SDG information could be used by financial analysts who act as information intermediaries in capital markets. Their recommendations and forecasts constitute a useful source of information for investors, influencing their investment behaviour and, consequently, stock prices (Ioannou and Serafeim, 2015; Luo et al., 2015; García-Sánchez et al., 2019a). As a result, analysts' recommendations and requests have a strong influence on corporate decisions (Adhikari, 2016), such as the disclosure of CSR-related actions (Jo and

Harjoto, 2014; Zhang et al., 2015; García-Sánchez et al., 2019a), as one means by which companies might obtain favourable recommendations from analysts and hence financial gains.

Analysts' perceptions of CSR and their recommendations to investors regarding companies presenting high/low levels of CSR depend on the prevailing institutional logic at a given time (Ioannou and Serafeim, 2015). As noted by Adhikari (2016), under the agency logic prevailing in the US financial market in the early 1990s, CSR-related business initiatives were interpreted negatively by analysts, in the view that these policies were opportunistically motivated. In consequence, when companies obtained high scores in CSR ratings, analysts responded by issuing pessimistic (sell) recommendations. However, in a pioneer study, Ioannou and Serafeim (2015) empirically documented that this institutional agency logic weakened over time. This evolution, together with a stronger orientation towards stakeholders, changed analysts' perceptions of the significance of CSR in the mid-2000s and, led to the appearance of optimistic (buy) recommendations for the most proactive companies in this field (i.e. those scoring highly in the CSR ratings).

Taking into account the fundamental role played by analysts in the functioning of capital markets and the fact that analysts have now begun to take an interest in determining which companies are seriously addressing the 2030 Agenda, our paper examines the extent to which analysts' recommendations affect and are affected by the adoption of the SDG Compass. Specifically, we analyse the effect of *sell* recommendations on the adoption of the SDG Compass by a firm. We also examine the other side of the coin, namely the impact of this business communication strategy on analysts' opinions about the company, possibly modifying their perception of CSR as an agency cost.

In this analysis, we examine a sample of 989 international companies that disclosed CSR information for the period 2015–2017 (corresponding to an unbalanced data panel of 2615 observations). The results show that 30% of the companies that, on average, received most *sell* recommendations from analysts were those which first adopted the SDG Compass in that year or in the following year. These represent almost 60% of the 780 companies that have adopted this communication strategy. Nevertheless, this effect was limited to the short term, as the implementation of CSR strategies had a relatively trivial effect on analysts' recommendations when the company maintained the communication strategy over time (the likelihood of analysts changing their sell recommendations was only 0.181%).

Our research contributes to the literature in several ways. Firstly, it broadens the empirical evidence available on the extent to which analysts influence companies' adoption of CSR-related policies, and offers a novel approach to this question. On the one hand, while most previous studies in this area (Zhang et al., 2015; García-Sánchez et al., 2019a) focus on the relationship between CSR information disclosure and the degree of coverage by analysts or the accuracy of their predictions, our paper belongs to a smaller body of research that seeks to analyse the sign of analysts' predictions (Ioannou and Serafeim, 2015). On the other hand, to the best of our knowledge, this study is the first to link analysts' recommendations with the adoption of the communication strategy defined in the SDG Compass and to empirically analyse such a relationship.

Secondly, this paper contributes to institutional theory, by providing empirical evidence about the role played by analysts' recommendations as a source of institutional pressure on companies to adopt (or refrain from adopting) innovative measures with respect to CSR (i.e. the SDG Compass). Although some papers have used

institutional theory to analyse the institutional pressures that may spur organisations to adopt management models consistent with sustainable development (Marshall et al., 2005; Chatterji and Toffel, 2010; Ioannou and Serafeim, 2019), none have analysed the extent to which analysts' recommendations may influence business decisions in this respect. In addition, our results corroborate the hypothesis of Ioannou and Serafeim (2015) regarding the influence of the currently-prevalent institutional logic on analysts' recommendations. However, in our opinion, the main contribution and novelty of this study is the analysis of the possible existence of a two-way relationship between analysts' recommendations and the adoption of the SDG Compass by companies, viewing the latter as a driver of change in the prevailing institutional logic regarding CSR. In addition, compared to the aforementioned authors, our study reports more generalisable results, thanks to the use of an international database of 53 countries.

Thirdly, our findings indirectly reflect the effectiveness of using SDG-related communication strategies to meet the information needs of analysts concerning the companies' contributions to achieving the SDGs. Thus, our results are also of real practical value, providing an initial test of how effectively a company makes use of the SDG Compass to optimise relationships with its stakeholders. In view of the considerable influence of analysts on investors (Luo et al., 2015), managers must carefully weigh up how to interact with analysts in order to obtain a favourable judgment (Fieseler, 2011). In this sense, our results concerning the effects of the adoption of the SDG Compass on analysts' subsequent recommendations provide managers with a more complete view of the extent to which the integration of the SDGs into business strategies is, in fact, appreciated by the financial markets.

This paper contains six sections. After this introduction, the main characteristics of the SDG Compass are summarised. Section three presents the theoretical framework on the basis of which our research hypotheses are formulated. The fourth section sets out the empirical framework of the study, after which we present and discuss the results. Finally, in section six, the main conclusions are drawn, the implications of our findings are discussed and the limitations of this study are acknowledged.

2 The sustainable development goals and the SDG Compass

As observed above, the SDG Compass provides companies with the means to understand the extent to which the SDGs impact on business management, facilitating their integration into day-to-day strategies (GRI, 2015). Moreover, it guides companies' approach to communication, helping them structure sustainability reports, organise information and determine the aspects to be included and prioritised, and highlighting the need to use non-financial information expressed via a set of key performance indicators (KPIs). In this regard, the SDG Compass emphasises the close relation existing between the SDGs and the GRI, and observes that the GRI indicators can be used not only to reflect management performance but also to disclose information to stakeholders (GRI, 2015).

The SDG Compass promotes the incorporation of the SDGs into sustainability reports, urging companies to provide credible, material information on their CSR performance and on their progress towards meeting the SDGs. In the SDG Compass framework, therefore, the sustainability report is considered "significantly more than simply a piece of communication to key stakeholders" (GRI, 2015: 26). Instead, it is viewed as "a

strategic tool” that fosters the creation of sustainable value and helps integrate sustainability concerns into decision making processes and performance evaluation at all levels, throughout the value chain.

3 Theoretical framework

3.1 Analysts’ recommendations as a source of institutional pressure

Institutional theory addresses the pressures exerted on organisations to adjust their structures and behaviour in accordance with those considered appropriate in their institutional environment and their responses to such pressures (DiMaggio and Powell, 1983; Scapens, 1994). Institutional pressures not only affect behaviour but also influence the introduction of innovations (DiMaggio and Powell, 1983). The pressures associated with the need for legitimacy may encourage or obstruct the adoption of new practices, depending on the extent to which they conform to the values and expectations prevalent in the institutional environment. However, with the passage of time, innovations may weaken the prevailing institutional logic and give rise to a new one based on other values and expectations about what is appropriate or legitimate (Scapens, 1994).

Due to their strong influence on investors, analysts play a prominent role in the legitimisation process, directly or indirectly exerting pressure on companies (Benner and Ranganathan, 2012). Benner and Ranganathan (2012) used institutional theory to analyse analysts' reactions to the change produced by investment in new technologies and the subsequent effect of these reactions on the investing company. They concluded that analysts' recommendations constitute a source of institutional pressure to which companies react by adopting strategies considered legitimate. In other words, there is a causal relationship between analysts' recommendations and companies' subsequent reactions (Ioannou and Serafeim, 2019). However, Benner and Ranganathan (2012) also recognised the possibility that, instead of adjusting their strategies to analysts' expectations, companies might react to institutional pressures by attempting to alleviate them, via a paradigm change towards a new one in line with the firm's outlook.

3.2 Analysts’ recommendations and business disclosure strategies: research hypothesis

It has been suggested that investment in CSR is not always oriented towards maximising firm value, but may arise from opportunistic decisions by managers, who prioritise the satisfaction of their own interests over the company's financial performance and the shareholders' interests (Adhikari, 2016). From this perspective, CSR is considered an agency cost (Cheng et al., 2014; Ioannou and Serafeim, 2015). Therefore, analysts may consider that CSR actions do not generate financial value for the company and, accordingly, do not benefit the investors' interests, and may even harm them. Consequently, they will react unfavourably by issuing negative recommendations. In response, companies would seek to demonstrate that their CSR-related actions do contribute to their future profitability and, therefore, to their shareholders' wealth. Thus, firms would seek to modify analysts' perceptions of their CSR actions and, thereby, change the sign of their recommendations to investors (Ioannou and Serafeim, 2015).

As observed above, the SDG Compass can help companies strengthen their information disclosure policies, increase information transparency and improve the quality and credibility of their CSR reports (GRI, 2015; Rosati and Faria, 2019b). Thus, stakeholders, and, in particular, analysts, would be reassured that the firm's

CSR-related actions are not merely symbolic (Ioannou and Serafeim, 2015) or the outcome of opportunistic motives, but demonstrate a real commitment to sustainable development and constitute a core component of the company's strategic approach, creating sustainable value for shareholders (GRI, 2015; Schramade, 2017). Therefore, we suggest that analysts' pessimistic recommendations will pressure companies to align their CSR actions with “the analysts' beliefs about the drivers of value” (Benner and Ranganathan, 2012: 215) by adopting the SDG Compass.

Furthermore, by providing analysts with regular, transparent information on the company's sustainability performance, this new communication strategy would enable them to understand the link between CSR performance and the creation of value for shareholders (Fieseler, 2011; García-Sánchez et al., 2019a). Therefore, by adopting the SDG Compass, companies could modify analysts' perceptions about the motives underlying CSR policies and their consequences for investors' interests (Ioannou and Serafeim, 2015). If analysts were thus persuaded, their recommendations could become more optimistic (Luo et al., 2015).

Accordingly, we hypothesise there exists a two-way relationship between analysts' recommendations and a company's adoption of the SDG Compass. This relationship would have two main outcomes: on the one hand, the fear of analysts' *sell* recommendations to investors would encourage firms to adopt the SDG Compass, in order to demonstrate that their CSR strategy is aligned with the SDGs and does not correspond to a merely opportunistic decision; and, on the other, given that the SDG Compass promotes a communication strategy more closely aligned with analysts' interests and information demands, the adoption of this strategy would modify their perceptions regarding the firm's CSR-related actions (i.e., such actions would no longer be considered an agency cost). Consequently, the analysts' recommendations would be revised from pessimistic to optimistic. In other words, the adoption of the SDG Compass would have a corrective effect on the analysts' pessimistic recommendations. Accordingly, we propose the following hypotheses:

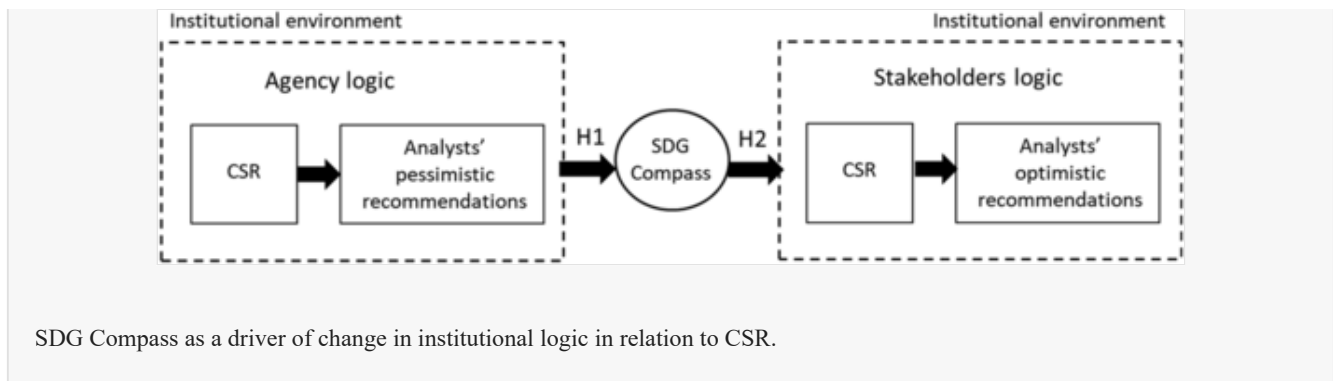
H1 When analysts make pessimistic recommendations to investors, this motivates the company concerned to adopt the SDG Compass.

H2 When a company adopts the SDG Compass, this has a positive effect on analysts' recommendations, modifying them from pessimistic to optimistic.

Thus, a company's response to the institutional pressures arising from analysts' pessimistic reaction to its CSR activities, namely its adoption of the SDG Compass, will produce a change in the prevailing institutional logic, by which CSR is reinterpreted as “a legitimate part of corporate strategy” (Ioannou and Serafeim, 2015: 1058). This, in turn, will affect analysts' own reactions to CSR, leading them to issue more optimistic recommendations. Fig. 1 illustrates this process, in which the SDG Compass drives a change in institutional logic in relation to CSR.

alt-text: Fig. 1

Fig. 1



4 Method

4.1 Sample

The sample used for the analysis consists of 989 companies which provided data for the period 2015–2017 (2013–2017 for financial information), corresponding to an unbalanced data panel of 2615 observations. The information regarding the adoption of the SGD Compass was extracted from the GRI database, while everything related to the economic-financial variables was obtained from the Thomson Reuters Compustat database and the data on analysts and their recommendations, from Thomson Reuters I/B/E/S.

Table 1 shows the sample's structure. By activity sector, the most prominently represented sectors are those of industrial, financial and real estate companies. Geographically, there is a very large presence of US companies. These biases were corrected in our analysis by including control variables for the firms' country of origin and activity sector.

alt-text: Table 1

Table 1

i The presentation of Tables and the formatting of text in the online proof do not match the final output, though the data is the same. To preview the actual presentation, view the Proof.

Distribution of the sample.

Panel A. Geographic distribution

Country	%	Country	%
ARGENTINA	0.73	MALAYSIA	1.49
AUSTRALIA	2.94	MEXICO	1.38
AUSTRIA	0.57	MOROCCO	0.04
BELGIUM	1.03	NETHERLANDS	1.34
BRAZIL	2.83	NEW ZEALAND	0.31

CANADA	3.90	NORWAY	0.61
CHILE	0.80	OMAN	0.04
CHINA	3.82	PERU	0.46
COLOMBIA	0.80	PHILIPPINES	0.69
CZECH REPUBLIC	0.04	POLAND	0.73
DENMARK	0.23	PORTUGAL	0.31
EGYPT	0.04	QATAR	0.11
FINLAND	1.64	RUSSIA	1.03
FRANCE	3.14	SAUDI ARABIA	0.08
GERMANY	3.63	SINGAPORE	1.22
GREECE	0.61	SOUTH AFRICA	3.86
HONG KONG	2.83	SPAIN	2.41
HUNGARY	0.15	SRI LANKA	0.08
INDIA	2.79	SWEDEN	3.48
INDONESIA	0.80	SWITZERLAND	2.18
IRELAND	0.11	TAIWAN	7.69
ISRAEL	0.31	THAILAND	2.29
ITALY	1.68	TURKEY	0.57
JAPAN	7.72	UNITED ARAB EMIRATES	0.04
JORDAN	0.11	UNITED KINGDOM	3.90
KOREA (SOUTH)	3.71	UNITED STATES	16.63
KUWAIT	0.04		

Panel B. Activity sector distribution

	%
Oil and Gas	6.69
Basic materials	12.54
Industrial	20.38
Consumer goods	11.74
Health care	3.44
Consumer services	8.99

Telecommunications	3.63
Public services	5.77
Financial and real estate	20.46
Technology	6.35

4.2 Model and analysis techniques

Equations [1] and [2] are designed to test our study hypotheses. Equation [1] represents an empirical model in which the implementation of the SGS Compass is reflected in the analysts' recommendations in the current year and in the preceding year. Various control variables are included to correct possible biases. Equation [1] also incorporates η to control the unobservable heterogeneity that may underlie business decision making and μ , a disturbance factor. The company and the time period are identified by the subscripts i and t , respectively. ϕ is the parameter to be obtained.

$$SDG_{i,t} = \phi_0 + \phi_1 \mathbf{Recomm}_{i,t} + \phi_2 \mathbf{Recomm}_{i,t-1} + \phi_3 \mathbf{Recomm}_{i,t} * \mathbf{Recomm}_{i,t-1} + \phi_4 \mathbf{Analysts}_{i,t} + \phi_5 \mathbf{Size}_{i,t} + \phi_6 \Delta \mathbf{Sales}_{i,t}$$

[1]

The dependent variable is the adoption of the SDG Compass to communicate the firm's contribution to the SDGs. This is a dummy variable that takes the value 1 if the company has implemented this strategy, and the value 0 otherwise (Rosati and Faria, 2019a). The independent variable “**Recomm**” corresponds to the analysts' annual consensus recommendation for each company Benner and Ranganathan (2012); Ioannou and Serafeim (2015). The values were obtained from the I/B/E/S database and are ranked according to a five-point scale, on which a value of 1 indicates a strong *buy* recommendation (optimistic or positive) and a value of 5, a strong *sell* recommendation (pessimistic or negative). As the business decision-making margin can mean that analysts' negative recommendations take effect in the year in question, or in the one immediately following, or in both, the variable “**Recomm**” is included with a lag, such that the interaction of this variable at t and at $t-1$ is included. In addition, the control variable “**Analysts**” is included to represent the effect produced on companies' disclosure strategies by the presence of these financial agents (García-Sánchez, 2019a).

Finally, in line with previous studies (García-Sánchez et al., 2019a, 2019b and 2019c; Rosati and Faria, 2019a and 2019b), several control variables, related to the company, the board of directors and the environment, are included in order to eliminate bias from the results. The control variables associated with the business characteristics are “**Size**”, represented by the natural logarithm of the company's assets; “**ΔSales**”, which identifies growth opportunities as represented by the variation in sales with respect to the previous year; “**ROA**”, the economic profitability associated with the performance of business assets; “**Leverage**”, the ratio of the company's debt in relation to its own resources; “**CFO**”, the standard deviation of cash flow from operations performed during the period from $t-2$ to t ; and “**Dividend**”, the dividend paid per share. The following control variables associated with the characteristics of the board of directors are included:

“**BoardSize**”, the size of the company board, represented by the number of board members (Michelon and Parbonetti, 2012); “**BoardActivity**”, the level of board activity according to the number of meetings held annually (García-Sánchez et al., 2013); “**BoardFemale**”, the proportion of women on the board of directors (García-Sánchez et al., 2019b); “**BoardIndep**”, the proportion of independent directors on the board (García-Sánchez and Martínez-Ferrero, 2018); “**Duality**”, a dummy variable that takes the value 1 for companies whose CEO is also the chairman of the board of directors and 0, otherwise; and “**CSR_committee**”, another dummy variable that takes the value 1 if the company has a CSR committee, and the value 0 otherwise (Helfaya and Moussa, 2017).

The impact of institutional pressures, by country and industry sector, in relation to sustainability is identified through the composite indexes **NCSRPI** and **ICSRPI** proposed by Amor-Esteban et al. (2018a and 2018b). Reflecting the role played by institutional pressures on corporate transparency (García-Sánchez et al., 2016), these aggregate composite indexes of sustainability, nationwide and according to industry sectors, describe the effect of institutional factors on the level of CSR commitment. Thus, the indicator score obtained indicates the appropriateness of the institutional context, at the country and sector level, for CSR practices. Hence, the higher the index score, the higher the level of CSR observed. Finally, **Country**, **Industry** and **Year** are numerical variables that identify the company's country of origin, the activity sector in which it operates and the year analysed, respectively.

Given the dichotomous nature of the SDG dependent variable, Equation [1] is estimated by means of a logit regression with random effects for panel data. This approach improves the explanatory power of the model by increasing the time horizon considered, thus enhancing consistency, controlling for unobservable heterogeneity and strengthening the estimation of parameters (e.g., by offering data that are more informative and present less collinearity between variables). The Hausman test for the logit panel data model offered a $\text{prob} > \chi^2$ higher than 0.05, which is why estimations of random effects were made; in this approach, changes in the behaviour of individual explanatory variables are not considered because the behaviour of each individual does not influence these variables.

Equation [2] is a variant of Equation [1] in which analysts' recommendations are explained by the implementation of the SDG Compass in the current year and in the preceding year. Furthermore, “**DLoss**”, “**AI**” and “**KZ_index**” are included as control variables to reflect the losses obtained in the year, the existence of asymmetric information problems and the level of financial restrictions, respectively (García-Sánchez et al., 2019d). We must also take into account the possible existence of asymmetric information, i.e. a situation in which varying amounts of information are available to different stakeholders. In this case, investors will demand higher returns for their investments. The disclosure of more and higher quality corporate information can alleviate frictions of this kind, thus enhancing the efficiency of the capital market. In this respect, Martínez-Ferrero et al. (2016) and Cuadrado-Ballesteros et al. (2017) reported evidence of a bidirectional relationship between information asymmetries and the quality of CSR reporting, with feedback between them. To examine the effect on information asymmetries, and following these authors, we use as a proxy the accuracy of profit forecasts, calculated as the absolute value of real earnings per share, minus the median expected earnings per share, adjusted by the share price. Another source of friction in the capital market is the existence of financial constraints, which may prevent a company from undertaking investment projects due to

the impossibility of obtaining the necessary funds. In this respect, [García-Sánchez et al. \(2019d\)](#) highlighted the advantages of disclosing reliable CSR information. Taking these considerations into account, therefore, we measured financial restrictions using the KZ index proposed by Kaplan and Zingales (1997). Moreover, these arguments could be extrapolated to firms that were loss making in previous years. Thus:

$$\text{Recomm}_{i,t} = \alpha_0 + \alpha_1 \text{SDG}_{i,t} + \alpha_2 \text{SDG}_{i,t-1} + \alpha_3 \text{SDG}_{i,t} * \text{SDG}_{i,t-1} + \alpha_4 \text{Analysts}_{i,t} + \alpha_5 \text{Size}_{i,t} + \alpha_6 \Delta \text{Sales}_{i,t} + \alpha_7 \text{ROA}_{i,t} -$$

[2]

Given the nature of the dependent variable “**Recomm**”, which takes values ranging from 1 to 5, equation [2] is estimated by means of a probit model with random effects for panel data. Under this technique, the errors μ_{it} and η_i are assumed to be normally distributed and are estimated by maximum likelihood.


5 Results

5.1 Descriptive statistics

[Table 2](#) shows the descriptive statistics obtained for the proposed variables in our analysis of the study hypotheses. In this regard, 30% of the companies included in the sample had implemented the SDG Compass. This value is significantly higher than the 16% reported by [Rosati and Faria \(2019a\)](#) in their analysis of the sustainability reports published in 2016 by a sample of 408 organisations, which confirms the trend pointed out by [Bebbington and Unerman \(2018\)](#) concerning the rapid incorporation of SDG information into corporate sustainability reports.

alt-text: Table 2

Table 2

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Descriptive statistics.

Variable	Type and content	Frequency	
		Absolute	Relative
SDG	Dummy variable that takes the value 1 if the company has implemented the SDG Compass, and the value 0 otherwise.	780	29.83
Duality	Dummy variable that takes the value 1 for companies whose CEO is also the chairman of the board of directors and 0, otherwise.	1.390	53.15
CSR_committee	Dummy variable that takes the value 1 if the company has a CSR committee, and the value 0 otherwise.	1.198	45.81

DLoss	Dummy variable that takes the value 1 if the company reports negative earnings in a year, and the value 0 otherwise.	181	0.069
<i>Variable</i>	<i>Type and content</i>	<i>Mean</i>	<i>Std. Dev.</i>
Recomm	Ordinal variable according to a five-point scale that identifies analysts' annual consensus recommendation. 1 indicates a strong buy recommendation (optimistic or positive) and a value of 5, a strong sell recommendation (pessimistic or negative).	2.40	0.57
Analysts	Numerical variable that represents the number of analysts following the firm.	10.17	8.79
Size	Numerical variable that represents firm size, measured by the natural logarithm of the company's assets.	15.74	3.02
ΔSales	Numerical variable that identifies growth opportunities as represented by the variation in sales with respect to the previous year.	32.03	5.39
ROA	Numerical variable that represents the firm's economic profitability measured by the ratio return of assets.	4.27	8.16
Leverage	Numerical variable that identifies the financial situations of the firm by the ratio of debt in relation to its own resources.	12.84	8.77
CFO	Numerical variable that represents the available financial resources according to the standard deviation of cash flow from operations performed during the period from t-2 to t.	4.55	1.53
Dividend	Numerical variable that represents the dividend paid per share.	45.77	6.35
BoardSize	Numerical variable that identifies the size of the board of directors, represented by the number of board members.	10.24	3.65
BoardActivity	Numerical variable that represents the level of board activity, proxied by the number of meetings held annually.		
BoardFemale	Numerical variable that identifies the level of board gender diversity, measured by the proportion of women on the board of directors.	11.42	11.48
BoardIndep	Numerical variable that represents the degree of board independence, measured by the proportion of independent directors on the board.	51.39	30.19
ICSRPI	Ordinal variable that represents the institutional pressures exerted, on the industry.	0.039	3.02
NCSRPI	Ordinal variable that identifies the institutional pressures exerted, at the national level.	-1.82	8.95
IA	Numerical variable that identifies information asymmetries, proxied by the accuracy of future benefit forecasts.	0.107	1.533
KZ_index	Numerical variable that represents financial constraints, using the KZ index proposed by Kaplan and Zingales (1997).	0.007	0.060

On average, the companies received analysts' recommendations of 2.50 (SD: +0.57), representative of recommendations that are not very pessimistic, but with a moderate "sell" pattern. On average, each company was considered by ten analysts, had a board composed of ten directors who met 18 times a year, and of whom 51% were independent and 11% were women. In 51% of the companies, the chair of the board played a dual role, and 46% had a specialised CSR committee.

Table 3 shows the bivariate correlations between the dependent, independent and control variables. The coefficients are not high, and, therefore, do not indicate multicollinearity.

alt-text: Table 3

Table 3

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Bivariate correlations.

		1	2	3	4	5	6	7	8
1	Recomm	1							
2	Analysts	0.047***	1						
3	Size	0.129***	0.337***	1					
4	ΔSales	-0.005	-0.010***	0.007**	1				
5	ROA	-0.003	0.018***	0.026***	0.001	1			
6	Leverage	0.012***	-0.004	-0.003	0.000	0.000	1		
7	CFO	-0.020***	0.047***	0.075***	0.001	0.003	0.000	1	
8	Dividend	-0.024***	0.015***	0.144***	0.001	0.002	0.000	0.122***	1
9	BoardSize	0.032***	0.090***	0.162***	0.003	0.008	0.002	-0.002	-0.021***
10	BoardActivity	0.032***	-0.029***	0.037***	0.004	-0.010*	-0.005	0.005	0.007
11	BoardFemale	0.027***	0.064***	-0.090***	-0.006	0.004	0.001	-0.025***	-0.041***
12	BoardIndep	-0.051***	0.037***	-0.183***	-0.002	-0.006	0.005	-0.017***	-0.035***
13	Duality	0.016***	-0.037***	0.001	0.000	-0.008	-0.004	0.012**	0.006
14	CSRCommittee	0.029***	0.108***	0.100***	-0.002	-0.005	-0.005	0.014***	-0.002
15	ICSRPI	-0.049**	0.004	-0.065***	0.002	0.000	-0.003	0.018***	-0.011***
16	NCSRPI	0.104***	0.014***	-0.015***	0.001	0.011***	0.006*	-0.015***	0.019***
		9	10	11	12	13	14	15	16

9	BoardSize	1							
10	BoardActivity	-0.118***	1						
11	BoardFemale	0.050***	-0.016***	1					
12	BoardIndep	-0.134***	-0.285***	0.268***	1				
13	Duality	-0.063***	0.297***	0.008*	-0.161***	1			
14	CSRCommittee	0.155***	0.180***	0.146***	-0.011**	0.053***	1		
15	ICSRPI	-0.033***	0.042***	-0.054***	-0.009**	-0.009**	0.053***	1	
16	NCSRPI	-0.036***	0.220***	0.002	-0.104***	0.134***	0.054***	0.039***	1

5.2 Results for the dependency analysis model

Table 4 shows the results obtained for Equations [1] and [2] using the logit and probit panel data method. These results enable us to determine whether there exists a two-way relationship between the analysts' recommendations and business disclosure strategies on companies' contributions to meeting the SDGs. These models have an explanatory capacity of 52.67% and 93.49%, respectively (see Table 5).

alt-text: Table 4

Table 4

i The presentation of Tables and the formatting of text in the online proof do not match the final output, though the data is the same. To preview the actual presentation, view the Proof.

Effect of recommendations on the adoption of the SGD Compass.

Equation [1]		Equation [2]	
Dependent variable:	SDG _t	Dependent variable:	Recomm _t
Explanatory variables	Coefficient (Std.Error)	Explanatory variables	Coefficient (Std.Error)
Recomm _t	2.572* (1.464)	SDG _t	0.050 (0.030)
Recomm _{t-1}	3.218** (1.545)	SDG _{t-1}	0.00726 (0.0565)
Recomm _t * Recomm _{t-1}	-1.096* (0.564)	SDG _t * SDG _{t-1}	-0.181** (0.0711)

Analysts	0.0338	Analysts	-0.00321**
	(0.0206)		(0.00138)
Size	0.325***	Size	-0.00251
	(0.0953)		(0.00955)
ΔSales	0.209	ΔSales	-0.545***
	(0.316)		(0.0692)
ROA	0.00831	ROA	-0.00199**
	(0.0167)		(0.000943)
Leverage	-4.66e-05	Leverage	0.000151**
	(0.000245)		(6.62e-05)
CFO	2.48e-10	CFO	0.001***
	(1.64e-10)		0.000
Dividend	2.56e-05	Dividend	-2.50e-05*
	(0.000301)		(1.41e-05)
		DLoss	-0.0145
			(0.0708)
		IA	-0.267
			-1.023
		KZ_index	-0.269***
			(0.0706)
BoardSize	-0.0170	BoardSize	-0.00148
	(0.0545)		(0.00374)
BoardActivity	-0.00328	BoardActivity	-0.00769***
	(0.0180)		(0.00137)
BoardFemale	0.0183	BoardFemale	0.00206**
	(0.0137)		(0.00103)
BoardIndep	-0.00570	BoardIndep	-0.00348***
	(0.00629)		(0.000476)
Duality	0.334	Duality	-0.0378
	(0.349)		(0.0249)

CSRCommittee	0.437	CSRCommittee	-0.0510**
	(0.352)		(0.0257)
ICSRPI	0.144*	ICSRPI	0.0294***
	(0.0856)		(0.00494)
NCSRPI	0.0594***	NCSRPI	0.0124***
	(0.0222)		(0.00127)
<i>Controlled by Industry, Country and Year</i>			
Constant	-4575***	Constant	41.50
	(768.4)		(63.14)
Log-likelihood	-539.880	Log-likelihood	-164.462
Chi	52.67	Rho	93.49
p-value	0.000	p-value	0.000

In Equation [1], the *Recomm* variables at *t* and *t-1* have a positive effect, which is significant at 90% and 95% respectively, in the adoption of the *SDG Compass* ($\mathbf{Recomm}_t : \phi_1 = 2.572; p = 0.079$ and $\mathbf{Recomm}_{t-1} : \phi_2 = 3.2182; p = 0.037$). Thus, companies which receive a more pessimistic recommendation at *t-1* are more likely to implement the *SDG Compass*. Specifically, the natural logarithm of the probability of their implementing the *SDG Compass* increases by 3.218% for each extra point awarded in the analysts' recommendations during the previous year. This probability is 2.572% for the recommendations made in year *t*. In the case of companies that receive pessimistic recommendations both in the previous year and in the current one, the probability of their implementing the *SDG Compass* is lower than the sum of the individual effects, since it is corrected by -1.096 ($\mathbf{Recomm}_t * \mathbf{Recomm}_{t-1} : \phi_3 = -1.096; p = 0.052$). Specifically, a one-point increase in the *sell* recommendations for a company in year *t* and in *t-1* produces a 5% increase in the probability that *SDG*-related management systems and business performance disclosure will be implemented ($\mathbf{Recomm}_t + \mathbf{Recomm}_{t-1} + \mathbf{Recomm}_t * \mathbf{Recomm}_{t-1} = \phi_1 + \phi_2 + \phi_3 = 2.572 + 3.218 - 1.096$).

In view of the above results, we accept hypothesis *H1*. This outcome is in line with the conclusions of [García-Sánchez et al. \(2019a\)](#), who provided empirical evidence of the positive influence of the demands of analysts on companies' adoption of the *GRI-IFC* disclosure strategy. Our results are also consistent with those obtained by [Chatterji and Toffel \(2010\)](#) and [Cheng et al. \(2014\)](#), who demonstrated that negative judgments of rating agencies regarding companies' environment-related performance generated a reaction by which these firms sought to improve their performance and thus protect or enhance their reputational capital ([Zhang et al., 2015](#)). Therefore, our results confirm previous evidence regarding the role played by analysts in fostering the adoption of *CSR* actions ([Jo and Harjoto, 2014](#); [García-Sánchez et al., 2019a](#)).

In relation to the control variables, in contrast to [García-Sánchez et al. \(2019a\)](#) with respect to companies' adoption of the *GRI-IFC* strategy, we found that the number of analysts who monitored company performance

had no effect on the adoption of the SGD Compass. The leading companies in the implementation of this strategy tended to be the largest ones, those located in countries with greatest institutional pressure of a coercive and normative nature, and those operating in sectors that experience significant mimetic forces with respect to CSR issues. These results confirm the evidence of [Rosati and Faria \(2019a\)](#) on these strategies and those of [García-Sánchez et al. \(2016\)](#) on the dissemination of CSR information that is more comparable and useful as a result of following the GRI guidelines, among other research findings in this area.

The results obtained for Equation [2] show that information disclosure on the corporate contribution to the SDGs in the previous or in the current year has no impact on analysts' recommendations ($\text{SDG}_t : \alpha_1 = 0.050; p = 0.091$ and $\text{SDG}_{t-1} : \alpha_2 = 0.00726; p = 0.898$), except when this information is reported in both years ($\text{SDG}_t * \text{SDG}_{t-1} : \alpha_3 = -0.181; p = 0.011$). Specifically, for the companies that implemented the SGD Compass in two consecutive years, there was a 0.181% probability of the analysts' *sell* recommendations decreasing by one point.

Accordingly, our second hypothesis is accepted in part. In this respect, our findings are in line with those obtained by [Luo et al. \(2015\)](#), who observed that when a company discloses CSR information, this significantly influences analysts' recommendations. We also corroborate [Ioannou and Serafeim \(2010\)](#), who reported finding a positive relationship between US companies' disclosure of CSR information and subsequent *buy* recommendations by analysts. These results are also consistent with those obtained by [García-Sánchez et al. \(2019a\)](#) on the fact that adopting the GRI-IFC disclosure strategy is an effective means of attracting analysts' attention, thus increasing the coverage granted to the firm. This strategy would be adopted, therefore, with the ultimate aim of favourably influencing analysts' opinions. This outcome is corroborated by our results, in that a favourable effect on analysts' recommendations is achieved when companies adopt a strategy of disclosing non-financial information on CSR issues in line with analysts' information demands.

Regarding the control variables, we concur with [García-Sánchez et al. \(2019a\)](#) that when more analysts follow the company's performance, this reduces the number of *sell* recommendations made, probably due to the greater exhaustiveness in monitoring the company's performance and the risks it faces. More *buy* recommendations are made with respect to companies that are more profitable, which distribute a larger volume of dividends, which have more growth opportunities and whose boards of directors are more active, independent and specialised.

5.3 Robust analyses

In order to obtain robust results, we estimated the two models with different measures for the dependent and independent variables, i.e. instead of **SDG** we used the variable **DisclosureSDG**, taking values between 0 and 4 to represent the type of GRI-SDG Compass strategy applied. Thus, a score of 0 was assigned to companies that disclosed GRI indicators related to the SDGs but whose activities were not aligned with these goals. A score of 1 was assigned to firms that published an autonomous SDG report that did not comply with the GRI-SDG Compass strategy. Scores of 2 or 3 were assigned to firms that had adopted the SDG Compass and whose GRI indicators corresponded to “in-accordance-core” or “in-accordance-comprehensive”, respectively. A score of 4 was assigned to firms that issued a report that was fully in accordance with the SDG Compass strategy. The **Recomm** measures were obtained as the difference between the value for the firm and the standard

deviation of the analysts' annual consensus recommendation for companies, **StdRecomm**. The greater the difference, the stronger the *buy* (optimistic or positive) or *sell* (pessimistic or negative) recommendation made.


Table 4 shows the results obtained from the analysis of robustness, which are similar to those obtained for the basic models. We conclude from this that companies that were most frequently the object of *sell* recommendations were more likely to implement the SDG Compass strategy during that year or in the one immediately following. However, this strategy only affected analysts' recommendations when the policy of corporate transparency policy remained active over time.

5.4 Complementary descriptive analyses

Table 6 and Fig. 2 present numerical and visual descriptions of the two-way relationship between analysts' recommendations and companies' compliance with SDG Compass guidelines.

alt-text: Table 5

Table 5

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Robust analysis of the effect of recommendations on the adoption of the SDG Compass.

Panel A. Robust dependent variable

Equation [1]		Equation [2]	
Dependent variable:	DisclosureSDG _t	Dependent variable:	StdRecomm _t
Explanatory variables	Coefficient (Std.Error)	Explanatory variables	Coefficient (Std.Error)
Recomm _t	0.571** (0.290)	SDG _t	0.0410 (0.0266)
Recomm _{t-1}	1.050*** (0.308)	SDG _{t-1}	0.0135 (0.0472)
Recomm _t * Recomm _{t-1}	-0.305*** (0.110)	SDG _t * SDG _{t-1}	-0.193*** (0.0548)
Analysts	0.0338 (0.0206)	Analysts	-0.00303** (0.00141)

Panel B. Robust independent variables


Equation [1]		Equation [2]	
Dependent variable:	SDG _t	Dependent variable:	Recomm _t
Explanatory variables	<i>Coefficient</i>	Explanatory variables	<i>Coefficient</i>
	<i>(Std.Error)</i>		<i>(Std.Error)</i>
StdRecomm _t	1.970*	DisclosureSDG _t	-0.0286
	(1.170)		(0.0287)
StdRecomm _{t-1}	2.620**	DisclosureSDG _{t-1}	0.0599
	(1.251)		(0.0473)
StdRecomm _t * StdRecomm _{t-1}	-1.099*	DisclosureSDG _t * DisclosureSDG _{t-1}	-0.173***
	(0.565)		(0.0593)
Analysts	0.0170***	Analysts	-0.00251**
	(0.00408)		(0.00122)

Panel C. Robust dependent and independent variables

Equation [1]		Equation [2]	
Dependent variable:	DisclosureSDG _t	Dependent variable:	StdRecomm _t
Explanatory variables	<i>Coefficient</i>	Explanatory variables	<i>Coefficient</i>
	<i>(Std.Error)</i>		<i>(Std.Error)</i>
StdRecomm _t	0.403*	DisclosureSDG _t	-0.0190
	(0.234)		(0.0132)
StdRecomm _{t-1}	0.881***	DisclosureSDG _{t-1}	0.0462
	(0.252)		(0.0595)
StdRecomm _t * StdRecomm _{t-1}	-0.305***	DisclosureSDG _t * DisclosureSDG _{t-1}	-0.168***
	(0.110)		(0.0628)
Analysts	0.0170***	Analysts	-0.00336***
	(0.00408)		(0.00124)

alt-text: Table 6

Table 6

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Descriptive statistics of the two-way relation between the SDG Compass and analysts' recommendations.

Panel A. SDG Compass distribution according to pessimistic recommendations

Mean Recomm = 2.40

SDG _t	Under		Over	
	Total sample	Total Under	Total sample	Total Over
0	69.90%	40.49%	70.36%	59.51%
1	30.10%	41.02%	29.64%	58.97%
SDG _{t-1}	Total sample	Total Under	Total sample	Total Over
0	71.47%	40.80%	73.92%	59.20%
1	28.53%	43.81%	26.08%	56.19%
SDG _t *SDG _{t-1}	Total sample	Total Under	Total sample	Total Over
0	79.63%	40.34%	80.82%	59.66%
1	20.37%	42.16%	19.18%	57.84%

Panel B. Descriptive statistics for recommendations and CSR strategies

SDG_{t-1}

	0		1		Effect Size	
	Mean	Std.Dv.	Mean	Std.Dv.	Cohen's d	Hedges' g
Recomm	2.52	0.49	2.5	0.47	0.04	0.04

SDG_t

	0		1		Effect Size	
	Mean	Std.Dv.	Mean	Std.Dv.	Cohen's d	Hedges' g
Recomm	2.52	0.5	2.51	0.47	0.02	0.02

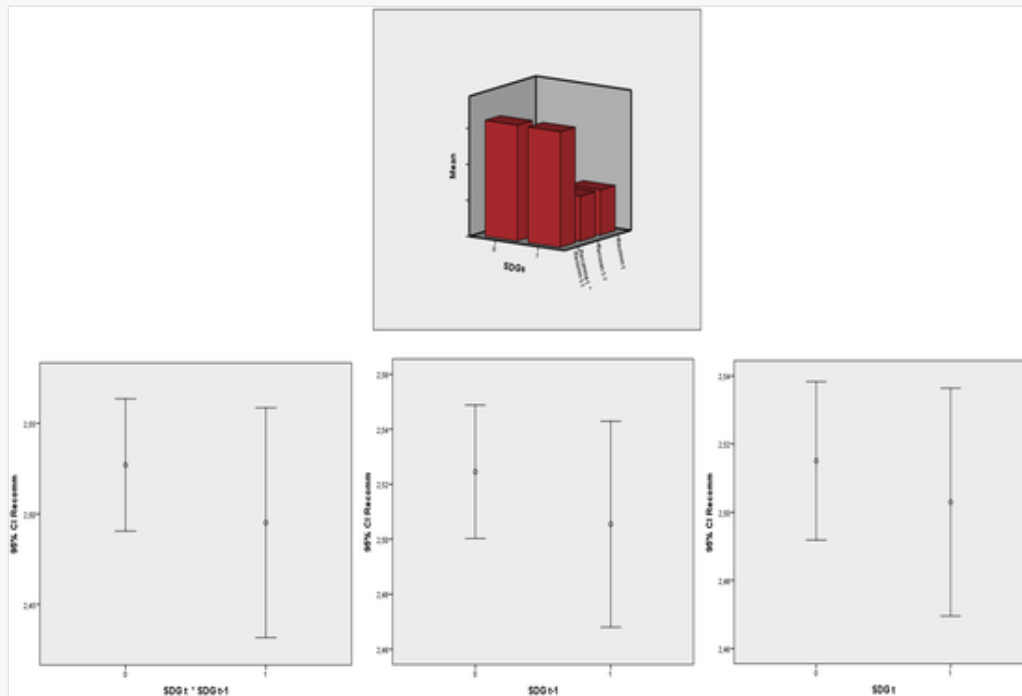
SDG_t *SDG_{t-1}

	0		1		Effect Size	
	Mean	Std.Dv.	Mean	Std.Dv.	Cohen's d	Hedges' g
Recomm	2.53	0.5	2.5	0.43	0.07	0.07

The formula for Cohen's d effect size is $d = M_1 - M_2 / s_{\text{pooled}}$.

Where: M_1 is the mean value for the group $SDG_{t-1}/SDG_t/SDG_t * SDG_{t-1} = 0$ at t, t-1 and t*t-1. M_2 is the mean value for the group $SDG_{t-1}/SDG_t/SDG_t * SDG_{t-1} = 1$, and s_{pooled} represents the coordinated standard deviations for the two groups. The formula is: $\sqrt{[(s_1^2 + s_2^2)/2]}$.

Fig. 2



Two-way relation between analysts' recommendations and compliance with SDG Compass.

Regarding the adoption of the SDG Compass strategy by companies that receive pessimistic recommendations from analysts, Panel A of Table 6 shows that the SDG Compass was implemented by almost 30% of the companies that received a recommendation higher than the average of 2.40; moreover, these firms represented almost 60% of the 780 companies that had adopted this strategy. In other words, around 60% of the companies that had complied with the SDG Compass guidelines received moderate-to-strong *sell* recommendations by analysts, although they only represented 30% of the companies with less favourable recommendations.

Panel B of Table 6 shows that the adoption of the SDG Compass in the previous year, in the current year or in both is associated with an average reduction of 0.1–0.3 points in the analysts' recommendations; taking into account the corresponding standard deviations, this reduction can be viewed as representing 0.2, 0.3 and 0.7 points, respectively. According to the Cohen's *d* value, i.e. the size of the effect obtained from the standardised difference of the means, the values are relatively small, as a value < 0.2 although statistically significant is considered trivial.

Although the average effect of the SDG Compass strategy is small, Fig. 2 reflects the marked variability that occurs with its implementation, which produces significant differences in the lower interval of the pessimistic recommendations made.

6 Conclusions

The aim of this study was to analyse the impact of the *sell* recommendations made by analysts in response to companies' adoption of communication strategies regarding their SDG-related actions, and the possible corrective effect produced by these strategies on the recommendations, i.e. modifying analysts' perception of CSR as an agency cost. In other words, we examine whether there is a two-way relationship between analysts' recommendations and companies' implementation of a new communication strategy based on adopting the SDG Compass.

This analysis was conducted using a sample of 989 international companies that disclosed CSR information for the 2015–2017 period. The results show that the companies which were the object of more *sell* recommendations were those at the forefront of adopting the SDG Compass during that year or in the following year. Therefore, our results confirm previous evidence regarding the role played by analysts in improving business transparency (Jo and Harjoto, 2014; García-Sánchez et al., 2019a). However, although the adoption of the SDG Compass has a significant immediate effect on these analysts' recommendations, when the company maintains its CSR strategy over time, the long-term effect on the recommendations is trivial, since the likelihood of any change in analysts' *sell* recommendations is close to zero.

Our paper contributes to previous literature by extending the understanding of the role of analysts in fostering corporate transparency through their recommendations and how, in turn, they can be affected by the CSR information disclosed by firms. Thus, this study informs the institutional theory by providing empirical evidence about the role played by analysts' recommendations as a source of institutional pressure on companies to adopt innovative measures with respect to CSR (i.e. the SDG Compass).

Furthermore, the results obtained in this study present various practical and managerial implications. Regarding the disclosure of CSR-related non-financial information as an instrument for managing a company's relationships with its stakeholders, our evaluation of the relation between companies' adoption of the SDG Compass and analysts' recommendations indicates to managers how communication strategies should be addressed in order to achieve the optimum effect and to attract investment. As concerns the analysts, our results provide an indication of the effect produced by their recommendations on companies and highlight the conditions in which they are more likely to respond to these pressures. Finally, from the standpoint of regulators, we note that although growing numbers of companies are making sustainability reports (Bebbington and Unermann, 2018), the overall number of companies providing such information remains very small (Schramade, 2017). Our results may provide useful information to regulators on the measures that should be taken to promote the involvement of companies in the 2030 Agenda and to facilitate their contribution towards achieving the SDGs.

This study is subject to certain limitations, which also point the way for future research. Firstly, as the study's goal was to analyse the reciprocal influence of companies' adoption of the SDG Compass and analysts' recommendations, we have not considered other strategies that companies might adopt in response to pessimistic recommendations by analysts. Neither have we examined the pressures exerted by other key stakeholders (i.e. institutional investors or rating agencies) and their possible influence on the adoption of the SDG Compass. Future studies could usefully extend the scope of analysis to include other sources of institutional pressures, and/or companies' responses to such pressures.

Secondly, the recommendations considered were those issued by annual consensus among the analysts, expressed on a five-point scale. Although this measure is widely accepted (Benner and Ranganathan, 2012; Ioannou and Serafeim, 2015), it does not allow us to analyse the influence and characteristics of individual analysts. A future extension of this study should take this question into consideration.

Thirdly, following Rosati and Faria (2019a and 2019b), the data related to the adoption of the SDG Compass were obtained from the GRI database, which, to a certain extent, might bias our results. Future studies might examine the effect of analysts' recommendations on the adoption of the SDG Compass by companies that do not follow the GRI disclosure strategy. Finally, our analysis was focused on the two-way relationship between analysts' recommendations and companies' adoption of the SDG Compass. However, we have not analysed the performance of these companies in achieving the SDGs. Thus, the scope of future analysis might be expanded to address this question.

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Isabel-María García-Sánchez: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision. **Beatriz Aibar-Guzmán:** Conceptualization, Investigation, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Cristina Aibar-Guzmán:** Conceptualization, Investigation, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Lázaro Rodríguez-Ariza:** Conceptualization, Investigation, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2020.120194>.

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Highlights

- Analysts' recommendations affect and are affected by the adoption of the SDG Compass.
- Pessimistic recommendations of analysts fostered the adoption of the SDG Compass.
- The adoption of the SDG Compass has a short-term effect on analysts' recommendations.

Appendix A Supplementary data

The following is the supplementary data to this article:

[Multimedia Component 1](#)

Multimedia component 1

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