



Sustainability disclosure practices as seen through the lens of the signaling theory: A study of companies listed on the Colombian Stock Exchange

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ABSTRACT

Companies have a particularly important role to play in achieving sustainable development, yet to do this they must transparently communicating their performance. The purpose of this study is to analyze the Sustainability Disclosure Practices of companies listed on the Colombian Stock Exchange by applying Signaling Theory dimensions - intent, necessity and camouflage - to the different economic sectors. A qualitative study was performed that involved examining the sustainability reports of 43 companies in 2018 by applying different content analysis techniques. The results show that industrial companies frequently 1) report their environmental practices, especially emissions management; 2) report economic practices exclusively in relation to their economic performance; and 3) report social practices that are focused on the development of their internal stakeholders. In this study, the most recurrently observed signal is intent, rather than necessity or camouflage. This research further contributes to extant literature by showing that camouflage signals can be categorized into two types: 1) those whereby organizations hide information and 2) those whereby organizations seek to highlight their attributes and achievements. The latter are not contemplated in Connelly's original proposal but were clearly found in this research.

1. Introduction

The sustainability question has been explored extensively at the global level (Ogreaan and Herciu, 2018) and it is clear that companies have a special role in achieving sustainable development (Annunziata et al., 2018). Hence, corporate sustainability has been recognized as a fundamental component of organizational strategies (Ashrafi et al., 2019) and is very relevant in developing countries worldwide (Lee, 2019); therefore, organizations are generally required to transparently disclose their financial performance, corporate management and sustainable development contributions (Albertini, 2019). However, of these three, the quality and disclosure of sustainability reports has received less attention (Ching and Gerab, 2017), a situation that is reflected in many developing countries, such as Colombia, where the analysis of the content of sustainability reports is still incipient.

This study's particular focus is on exploring the sustainability practices reported by companies listed on stock exchanges (Busu and Busu, 2019; Leigh et al., 2004), since they must typically comply with the

periodic presentation of their sustainability reports (Paun, 2018) and are a reference for other companies in the implementation of sustainability practices. This fact has been particularly true in Colombia since 2014, the year in which the Colombian Stock Exchange (*Bolsa de Valores de Colombia* - "BVC") joined the United Nations Sustainable Stock Exchange ("SSE") initiative. In 2018, 32 listed companies distinguished themselves in the context of the BVC's sustainability program for having the best reporting standards in Colombia. Of this group of companies, 27 report their sustainable actions under the Global Reporting Initiative ("GRI") (GRI and BVC, 2020). These 27 reports seek to illustrate the companies' best practices and to encourage other firms in the country.

Corporate disclosure proponents believe that sustainability reports promote organizations' responsibility and transparency regarding their operations' impacts in social and environmental matters. Detractors of sustainability reporting, however, hold that companies use these reports mainly as marketing tools to improve their public image (Cho et al., 2018). Since this is practical research, it is necessary to delve deeply into the comprehension of sustainable practices. In this regard, the Signaling

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Theory perspective is helpful (Cho et al., 2015; Hahn and Kühnen, 2013) and although previous studies have explained companies' sustainable practice reporting dynamics using the Signaling Theory (Albertini, 2019; Legendre and Coderre, 2013; Moratis, 2016, 2018), there is nevertheless a theoretical gap that some authors claim can be closed by expanding and extending the use of this theory when implementing the disclosure exercise using corporate sustainability reports (Ching and Gerab, 2017; Cho et al., 2015).

This study therefore seeks to contribute to the aforementioned research gap in Sustainability Disclosure Practices in developing countries by studying exchange-listed companies. In particular, it builds on prior literature (Bae et al., 2018; Hassan et al., 2020; Karaman et al., 2020; Simoni et al., 2020) to expand the knowledge of sustainability practices and the signal types used in companies' sustainability reports. We used the three signals proposed by Connelly et al. (2011) but unlike previous research adopted an additional original perspective by introducing a qualitative approach that is particularly suited to enriching the understanding and awareness of emerging phenomena (Talbot and Boiral, 2018). Our research concentrated on 43 BVC-listed companies' Sustainability Disclosure Practices as seen through the lens of Signaling Theory by describing their environmental, economic and social sustainable practices.

The paper is structured as follows: first, we develop the theoretical framework that presents the conceptual foundations of this study; then, we present our methodological strategy, and close with the results, discussions and conclusions according to the specific goals of the research. The study also sets forth its limitations and suggestions as to future lines of research.

2. Conceptual framework

2.1. Sustainability and its disclosure practices

According to the Brundtland Report of the United Nations (World Commission on Environment and Development, 1987: 27), the purpose of sustainable development is to "guarantee the needs of the present without compromising the needs of future generations." Companies currently endeavour to articulate their fulfilment of the Sustainable Development Goals ("SDG") of the 2030 Agenda (Annunziata et al., 2018). Sustainability is therefore perceived as a multidimensional concept characterized by environmental, economic and social development that shapes the so-called Triple Bottom Line ("TBL") framework (Braccini and Margherita, 2019).

Sustainability is now viewed as fundamental for companies' performance. To illustrate this, the corporate sustainability concept refers to how companies integrate and deploy the perspectives of the TBL results (Savitz and Weber, 2014), in addition to balancing them (Henry et al., 2019) and creating long-term value with them (Ashrafi et al., 2019). Corporate sustainability can be perceived as a process that begins by recognizing stakeholders' expectations and configuring company-oriented strategic solutions in external and internal contexts (Rezaee, 2017). As a result, corporate sustainability practices are understood to be the environmental, economic and social organizational activities that satisfy stakeholders' needs without compromising future generations' quality of life (Carroll and Buchholtz, 2014).

Organizations commit to reporting their contributions to sustainable development through different tools, one of which is the sustainability report - a voluntary form (Popa et al., 2009) of communicating TBL performance using quantitative and qualitative organizational data (Kolk et al., 2002). These reports seek to provide an integrated view of an organization's sustainability efforts (Corbett et al., 2018) and contribute to achieving organizational competitive advantages (D'Adamo et al., 2020). Several initiatives, frameworks and rules have been developed for the preparation of sustainability reports (see Appendix A). The initiatives feature different approaches and incorporate broad-ranging sustainability criteria (Ranängen et al., 2018); the

frameworks encompass varied organizational principles and guidelines that support the disclosure process and the rules explain how to achieve organizational sustainability by applying certain sets of specifications (Siew, 2015).

In the business world, GRI criteria based on the TBL framework are widely recognized and their implementation has increased significantly over recent years (Thijssens et al., 2016). Each criterion is expressed in indicators that effectively monitor variables of organizational interest and facilitate the planning of actions to improve performance. GRI is part of the sustainability disclosure report that is a communication form that mitigates adverse regulatory pressure and provides companies a favorable position to benefit from future investment opportunities (Chiu and Wang, 2015).

2.2. Signaling Theory

Organizations frequently send out signals that reduce information asymmetry among them and stakeholders and enable them to communicate their organizational image, intentions, behavior and performance; this is referred to as Signaling Theory (Karaman et al., 2020). Signaling Theory is related to companies' need to communicate their information to the stakeholders and the market by emitting signals about their commitment to society (Bae et al., 2018).

The main actors of the Signaling Theory are the signaler, the receiver and the signal itself. The signal is hitherto private positive or negative information that signalers decide to communicate or not to receivers (Connelly et al., 2011). Signalers are insiders (e.g., CEOs, executives and managers) who have access to individual, product and organizational information that is not available to receivers (or outsiders) (Taj, 2016).

Signals emitted by organizations can be organized into three groups: 1) signals of intent, which relate with the future actions; 2) signals of camouflage, which are conceived to hide a possible organizational liability and seek to divert attention from a potential vulnerability that could arise from a corporate action, and 3) signals of necessity that communicate organizational requirements (Connelly et al., 2011).

Signaling Theory holds a prominent position in the field of strategic management (Basdeo et al., 2006), human resource management (Leahy, 2007), finance (Francis et al., 2010), corporate governance (Trevis, 2003) and marketing (Zerbini, 2017). Furthermore, it has been used to analyze organizations that are listed on the stock exchange (Mantari and Nuryasman, 2017). It has only been in the last decade that Signaling Theory has gained relevance in the analysis of sustainability practices; however, there is plenty of room for this approach to expand and to achieve a better description of the signals that companies emit.

2.3. Sustainability Disclosure Practices and Signaling Theory

In the field of corporate sustainability, Signaling Theory indicates that managers use sustainability reports to inform stakeholders about their firms' long-term sustainability management policy (Hassan et al., 2020). These Sustainable Disclosure Practices report on transparency, financial stability and environmental and social concerns (Bae et al., 2018). The problem with this practice is that stakeholders find it difficult to determine which companies are performing well because, among other factors, sustainability disclosure reports are not mandatory (Mahoney et al., 2013).

To date, sustainability reporting has been relatively limited (Ching and Gerab, 2017). Legendre and Coderre (2013) point out that the Signaling Theory has been used to explain some aspects of the sustainability reporting practices of companies, such as GRI adoption and GRI performance indicators. Marquis and Quian (2014) have studied the signaling quality in corporate social responsibility ("CSR") reporting while, most recently, Hassan et al. (2020) have employed the Signaling Theory as a substantive sign of concern for society and the environment sent out by companies in Bangladesh. Karaman et al. (2020) studied the association between sustainability reporting and green logistics

performance using the Signaling Theory. Finally, [Simoni et al. \(2020\)](#) found that a company's decision to always publish its sustainability reports is motivated by the willingness to signal its sustainability performance and the need to maintain good relations with its stakeholders.

Despite the various studies, extant literature on the Signaling Theory has yet to produce firm evidence regarding the interpretation of the type of signal that an organization is emitting. For example, current research does not examine whether camouflage is a signal that dominates intent and/or necessity. Our study will contribute towards filling this gap. Besides, exhaustive discussion about the interpretation of signals is especially needed today when organizations apply diverse methods to certify their practices. Given the limited number of studies that link the Signaling Theory and its impact on corporate sustainability, this article will analyze the TBL disclosure practices of a group of BVC-listed companies and their correspondence to the dimensions of their intent, camouflage and necessity signals.

3. Method

3.1. Research design

According to [Boiral and Heras-Saizarbitoria \(2020\)](#) the studying of sustainability reports is based primarily on the quantitative description of their content and rarely about what they seek to communicate and signify. Our study, on the other hand, should be considered within the realm of qualitative research. [Denzin and Lincoln \(2016\)](#) argue that qualitative research involves interpretive practices that make the world more visible and simultaneously impact it. Therefore, qualitative researchers study social phenomena from a natural perspective; they try to specify the feelings people have about these phenomena and thus understand them better. We contribute by providing a new way of analyzing sustainability using the Signaling Theory.

3.2. Data sources

For this study we examined the 2018 annual sustainability reports of BVC-listed organizations. Previous work in this field has also used the one-year fiscal period for studying sustainability reports ([Boiral and Henri, 2017](#); [Hassan et al., 2020](#); [Talbot and Barbat, 2019](#); [Saber and Weber, 2019](#)) including use of the Signaling Theory ([Legendre and Coderre, 2013](#)).

Authors such as [Boiral and Henri \(2017\)](#) justify the analysis of a single fiscal year because of the characteristics of qualitative research (i. e., data extraction, categorization, coding and analysis). Given the volume of information analyzed, the data extraction, categorization and analysis took nearly 2 years. Evaluating reports of a single year also has to do with the fact that there is a time gap between the data analyzed by the report and the data that the company possesses when the report is actually released. This time lag can affect the analysis, particularly when the report's methodology varies from year to year. For this reason, taking into account a single year means that the findings of the study are more reliable. In this sense, the reports' underlying information must be based on equal or similar versions of the reporting framework and in the case of Colombia, companies indeed employed the same prevalent framework. Finally, to resolve the challenge of the sheer volume of information, as [Boiral and Henri \(2017\)](#) suggested, the research team was better able to maneuver data from a single year.

The sample that we took from the year 2018 consisted of 43 corporate reports out of a total of 176 listed companies, of which only 68 were using a sustainability report framework. The 43 reports out of these 68 firms were found on their websites. For additional information on the 43 companies please visit: <https://padlet.com/sustainabilityresearch036/pscirgikt7x6c6so>.

3.3. Data analysis strategy

This study was conducted using the qualitative content analysis technique, which contributes to the interpretation of the data as well as the coding and identifying of topic clusters within the data ([Hsieh and Shannon, 2005](#)). Qualitative content analysis is acknowledged as a powerful tool for analyzing documentary information ([Seuring and Gold, 2012](#)). [Hsieh and Shannon \(2005\)](#) suggest an oriented approach - where the initial codes come from prior theories or research - as one way to analyze qualitative content. This approach was chosen because classifying information using categories established in already-recognized theories grants a certain degree of reliability ([Beattie and Thomson, 2007](#)). Thematic content analysis was also used to interpret the data referenced in Section 3.2., since it provides an ideal analysis of topics within the data ([Braun and Clarke, 2006](#)). The following phases ([Table 1](#)) were subsequently considered for the coding process ([Anthony et al., 2019](#); [Braun and Clarke, 2006](#); [Braga et al., 2009](#); [Cho and Lee, 2014](#); [Fernandes et al., 2019](#)) and Nvivo 12 Plus® statistical and qualitative data analysis was used to support our research work.

4. Results

The purpose of this study is to analyze the environmental, economic and social dimensions of the Sustainability Disclosure Practices of exchange-listed companies, based on the Signaling Theory. We conducted a qualitative analysis of the sustainability reports of 43 companies, of which, according to the BVC classification, 20 belong to the industrial sector and 23 to the services sector. The reports we analyzed included general annual, management, built-in, sustainability and CSR reports, following the indications of [Cho et al. \(2018\)](#). [Table 2](#) below presents this information.

After classifying them into the industrial and services sectors, our analysis of these companies' environmental practices reports indicates that most of the reported practices are associated with emission controls produced by their operations. A comparative analysis ([Table 3](#)) shows that the industrial sector has more references related to emission controls.

Our findings coincide with the emissions from companies' operations and are associated with: 1) reports on the reduction of carbon emission levels; 2) strategy implementation, such as shared means of transportation and teleworking; 3) participation in compensation actions, such as tree-planting; and 4) decisions concerning materials that diminish the impacts on atmospheric conditions. Similar results can be observed in other research work:

Table 1
Step-by-step thematic content analysis.

Step	Description
Step 1	Collection and preparation of the information (Sustainability reports).
Step 2	Defining the unit of analysis (Sentence or set of sentences)
Step 3	Generating the initial codes - Dictionary of codes: List of GRI indicators -environmental, economic, and social- (Global Reporting Initiative -GRI-, 2013) and the types of signals -intent, camouflage, and necessity- (Connelly et al., 2011). See this Dictionary at: https://padlet.com/sustainabilityresearch036/pscirgikt7x6c6so
Step 4	Performing the coding process (this process was performed independently by the researchers and it involved two coding cycles)
Step 5	Defining the themes
Step 6	Reviewing the themes - Emerging themes (meeting and consultation between researchers)
Step 7	Prepare a research report - Results obtained

Table 2
Types of reports (Authors).

Name	Quantity
Sustainability reports	12
Management reports	11
Built-in reports	7
Annual reports	6
Annual management reports	2
Others: Individual Colombia, Corporate Social Responsibility, Management and Sustainability Reports, Sustainability Management Built-in Report, Built-in management report	5

Table 3
Environmental dimension by economic sector (Authors using Nvivo 12 Plus® software).

Environmental dimension	Industrial sector	Services sector	Total references
Water and effluents	32	12	44
Biodiversity	21	22	43
Regulatory compliance	7	2	9
Effluents and waste	16	26	42
Emissions	54	30	84
Energy	28	24	52
Environmental assessment of suppliers	15	12	27
General	3	14	17
Materials	43	4	47
Environmental claim mechanisms	0	4	4
Products and services	27	2	29
Transportation	11	7	18

“A reduction of 72% in CO₂ emissions, equivalent to taking 11,300 cars off the streets.” (29, this number represents the numbering of the companies in the Nvivo 12 Plus® software files).

“We strengthened the Try My Ride application in Bogotá and Medellín that allows employees to share routes in means of transportation such as bicycle, carpooling, walking or corporate van.” (10)

“Around 80 active employees in teleworking strategy in Medellín and Bogotá with which we reduced the number of trips and therefore the pollution emissions into the atmosphere.” (3)

“To attack climate change, we are moving to use as little fossil fuels as are economically feasible with lower production of CO₂ and closing cycles to create circularity in our production process.” (15)

“We also implemented complementary conservation actions such as the planting of 50,000 trees in the Resguardo del Agua Negra indigenous community in alliance with the Coffee Growers Committee in the area of influence of the Salvajina hydroelectric power plant.” (17)

Table 4 shows the economic practices reported by the companies we analyzed. We found that most of the information disclosed was related to economic performance. A comparative analysis shows that the services sector has more references alluding to economic practices.

In these results, economic performance is associated with the

Table 4
Economic dimension by economic sector (Authors using Nvivo 12 Plus® software).

Economic dimension	Industrial sector	Services sector	Total references
Indirect economic consequences	10	37	47
Economic performance	30	43	73
Purchasing practices	2	11	13
Presence in the market	4	0	4

financial indicators of the companies we analyzed. Other authors found similar issues:

“The year 2018 was a year of good financial, operational and social results for the group. We achieved the goals and purposes that we established. We registered an operating income of COP 4 billion with a growth of 12% compared to 2017, while our net profits increased by 13.5% to over COP 1.7 billion.” (35)

“The year 2018 closed with total operating income of COP 8.457 million which is an increase of COP 777 million over the previous year, percentage-wise it represents 10.1%.” (30)

“Earnings Before Interest and Taxes (EBIT), which basically indicates the company ability to generate profits, has shown sustained growth over recent years, keeping its value with hardly any modification for the year 2018 showing an increase of COP 55 million.” (19)

Table 5 presents the social practices reported by the analyzed companies. We found that most disclosed information relates to labor and decent work practices. Comparative analysis indicates that the service sector has more references related to social practices.

In the field of labor and decent work practices, most of the references are associated with 1) training processes; 2) workers’ well-being (this became an emergent code, as the GRI indicators do not directly consider the actions that organizations implement to achieve employees’ well-being); and 3) health and security at work. For example:

“We defined the talent development process aligned with the preparation of the future leaders of the company. Our vice presidents and directors assigned the development programs according to each career plan. 195 programs were assigned of which 114 were executed in 2018.” (4)

“The company gives additional days off for the maternity and paternity leave. In Colombia, the mother is given the opportunity, once she returns to work, to have two additional months when she can work remotely part-time during the breastfeeding period.” (34)

“Health campaigns were held throughout the year 2018 with the participation of nearly 400 employees. These campaigns were designed to promote health and prevent illnesses and we would highlight periodic occupational health tests, optometry assessments, dentistry, breast screening, cardiovascular and healthy bones as well as relaxation activities encouraging a healthier life, where professionals gave yoga and Ergo Kinect classes.” (26)

Table 6 summarizes the sustainability practice reports of the analyzed companies. They refer mostly to social practices, which are primarily reported by the services sector, followed by environmental practices primarily reported by the industrial sector, and economic practices primarily referenced by the services sector.

Table 7 shows the type of signals the analyzed companies use in their sustainability reporting. We find that from the coding performed, the signals of intent were mostly identified, which refer to companies’ future actions.

Signals of intent were mostly identified in the social dimension, where the analyzed organizations face challenges in developing internal and external interest groups. Here we found similar findings:

Table 5
Social dimension by economic sector (Authors using Nvivo 12 Plus® software).

Social dimension	Industrial sector	Services sector	Total references
Human rights	70	49	119
Labor and decent work practices	230	307	537
Product responsibility	20	95	115
Society	145	199	344

Table 6
Dimensions VS Sectors (Authors using Nvivo 12 Plus® software).

Sustainability dimensions	Industrial sector	Services sector	Total references
Environmental dimension	206	120	326
Economic dimension	46	89	135
Social dimension	433	594	1027

Table 7
Sustainability dimensions vs. types of signals (Authors using Nvivo 12 Plus® software).

Sustainability dimensions	Signals of camouflage	Signals of intent	Signals of necessity
Environmental dimension	18	73	36
Economic dimension	2	24	58
Social dimension	33	91	70
Total	53	188	164

“For 2020, businesses will endeavour to keep themselves at the forefront in diversity and inclusion practices and will have to secure the incorporation of global talent, the strengthening of policies that promote genre equity, and greater participation of minorities in the labour force.” (36)

“... to continue implementing high-impact social and/or environmental projects that underpin our strategic pillars.” (4)

Signals of necessity referred to regulation compliance reports. These signals were mostly identified in the social dimension, primarily when referencing compliance, the guarantee and promotion of human rights, and the implementation of OHSAS 18001. For example:

“In 2018 we socialized the Occupational Health and Safety Regulations of Suppliers and Contractors among the Contract Managers as required by Decree 1072 of 2015, as well as the clarification of any doubts in this regard. The purchasing department also sent a statement to the suppliers and contractors formalizing the delivery of such regulations and the importance of compliance with same.” (14)

“No violations of the rights of the indigenous communities were identified during 2018. In cases of action for constitutional protection (amparo), this company strictly enforces the current regulations.” (27)

The camouflage signals were mostly identified in the social dimension. These signals are reported to divert attention from a potential vulnerability caused by a company. For example, when organizations assume State liabilities by investing in treasury bonds are unrelated to their core business, and then proceed to report these bonds as ‘sustainability’ bonds to hide the negative impacts they have generated on the business’s operating environment:

“We delivered school kits collected by the operational personnel to make a contribution to the children and teenagers of some of the village of the municipalities of the area of influence in order to motivate and encourage the importance of education as a fundamental basis for the growth and development of the population in general.” (24)

This is also visible when organizations highlight their attributes and achievements, referencing the acknowledgments obtained:

“We received a special acknowledgment from ARL Liberty Seguros for an extraordinary work accident-free term of 5 years during the execution of the Cerromatoso project in the loading and transport services.” (24)

5. Discussion

Results obtained during the development of this study are summarized and discussed considering the authors’ and institutions’

approaches to sustainability management that we examined.

Bearing in mind the commitments regarding CO₂ emissions, namely, the Kyoto Protocol and the Paris Climate Agreement (Leitao et al., 2021), and given the environmental practices reported by the analyzed companies, industrial sector organizations’ emissions levels should decrease. This condition is not possible if their energy sources are fossil fuels, which generate greenhouse effect gases (Xu and Lin, 2017). According to Wang et al. (2018), manufacturing companies have important environmental impacts, especially in developing countries where this type of organization is booming.

According to the *Inventario Nacional y Departamental de Gases Efecto Invernadero (2016)*, industrial activities associated with soil transformation and deforestation represent 33 % of the country’s CO₂ emissions, followed by the industrial farming, mining and energy, and manufacturing sectors with 22 %, 13 %, and 11 %, respectively. Twenty of the 43 companies analyzed belong to these specific sectors. In any event, Colombia’s adherence to the Paris Climate Agreement commits the organizations in the country to being concerned about the gas emissions of their operations.

As noted by Yaqoob et al. (2019), industrial companies tend to be more oriented towards the management of emissions reduction; however, this activity has been exercised in order to articulate with actions aimed at reducing their energy consumption. This indicator was the second most referenced in this study and is mentioned almost equally between the industrial and service sectors. Similarly, economic growth, energy consumption and CO₂ emissions in all countries enjoy long-term relationships (Chen et al., 2016).

Among the recurrent references to the identified reduction emissions, tree-planting initiatives are used to weigh emission level mitigations; however, the *Inventario Nacional y Departamental de Gases Efecto Invernadero (2016)* warns that the growth of forest plantations, renewal of native forests, and growth of representative crops contribute only 9 % to the absorption of pollutants. Hence, tree-planting should not be proposed as a central practice for CO₂ emission reduction.

According to Cucchiella et al. (2020), the implementation of renewable energy plants, and the adoption of recycling and reuse techniques in waste management are good examples of emission-reduction practices. According to several authors and as confirmed by the results of this research, therefore, we consider that industrial companies face the biggest environmental challenges (Mahsud et al., 2018). For their part, Caruso et al. (2020) found that the implementation of a more stringent environmental policy has positive direct effects on renewable energy consumption which can subsequently generate an increase in Gross Domestic Product (“GDP”) growth per capita.

Economic sustainability actions most frequently reported by the analyzed companies relate to their economic performance. Chiu and Wang (2015) revealed that sustainability disclosure reports can be used as a communication tool to gain the trust of interest groups. Similarly, Bae et al. (2018), revealed that these reports can positively affect companies’ reputations. Therefore, sustainability reports constitute an opportunity to show an organization’s good economic performance, hence promoting its image among its stakeholders.

However, only 13 references related to purchasing practice indicators were identified. These references refer to the percentage of expenditure that corresponds to local suppliers. Moreover, they indicate a potential challenge if corporate sustainability presupposes the expansion of economic activities and simultaneously contributes to improving the quality of life in the context of business operations (Cabral and Cunha, 2018).

Most social disclosures of the analyzed companies relate to labor and decent work practices. This finding indicates that the social sustainability dimension is oriented among the groups of analyzed companies towards the internal perspective since it mainly focuses on internal stakeholder development. This orientation is significant in Colombia, according *Organización Internacional del Trabajo* report (2019: 2), which

states that “In 2018, most of the 3.3 billion people employed in the world suffered deficits in material well-being, economic security and equal opportunities and they lacked sufficient margins of human development.” This panorama therefore confirms the challenges of labor welfare and the implementation of decent work practices in our country.

The coding process shows that the analyzed companies’ sustainability reports are more oriented towards the social dimension. However, from an internal perspective, most of the references in this dimension refer to labor and decent work practices, particularly in the services sector. This finding is significant if an inoperant welfare system can lead to occupational health problems that can negatively affect the quality of the services it offers (Angulo et al., 2014), making this condition a challenge for service organizations.

An analysis of the signals used by the studied companies in their sustainability reporting of environmental, economic and social practices shows that most signals identified are of intent. These signals refer to future sustainability disclosures. This finding is consistent with the idea emphasized by some authors that corporate sustainability leads to a desirable future for internal and external interest groups (Lin and Chang, 2019). As a result, sustainability reports also constitute a prospective organizational exercise that proposes a planning system for corporate resources, consistent with interest groups.

Signals of necessity refer to regulation compliance actions that control corporate actions. These signals were mostly identified in the social dimension, particularly related to compliance, the guarantee and promotion of human rights, and implementation of Occupational Health and Safety Assessment Series (“OHSAS”) 18001.

These signals signify a challenge to the incorporation of the perspective of human rights in organizations. This finding is based on the UN Guiding Principles on Business and Human Rights (2011:15), which states that “The responsibility to respect human rights constitutes a worldwide code of conduct applicable to all companies, wherever they operate ... it is an additional responsibility to compliance with existing laws and regulations for the protection of human rights.” Therefore, the main task for promoters of human rights extends beyond the regulations’ provisions and refers to practices that transcend the regulatory perspective of the analyzed organizations.

Health and security at work tends to be managed from the limited perspective of occupational health (Gimeno et al., 2013; Gómez, 2007). According to López-Santamaría (2016), implementing a healthy comprehensive organization model and subscribing to corporate social responsibility activities that constitute sustainability strategies is required to transcend the regulation perspective of organizations’ health management.

The camouflage signals divert the attention of a potential vulnerability caused by a company’s operations. This research demonstrates that camouflage signals can be categorized into two types: 1) those where organizations hide information and 2) those where organizations seek to highlight their attributes and achievements. The latter constitutes a contribution of this study, since it has not been directly considered in the Connelly et al. (2011) proposal. For the first type, Corbett et al. (2018) found that sustainability reports can often omit information and prevent the acknowledgment of the real evolution of organizational sustainability initiatives. For the second type, Chiu and Wang (2015) found that sustainability reports can be a communication tool that serves to mitigate regulatory pressure and offers the company a favorable position where it can benefit from future investment opportunities.

6. Conclusions

This research applied a new approach to the analysis of the environmental, economic and social dimensions of the Sustainability Disclosure Practices of BVC-listed companies based on Signaling Theory. To begin, we identified the TBL sustainability practices disclosed by various Colombian companies.

We found that the disclosure of environmental practices was prevalent in the industrial sector. This result is significant when one considers the risk of environmental impacts caused by industrial companies in developing countries. Moreover, one of the actions reported as a mitigation measure is tree-planting. Thus, this practice is perceived as an action that is complementary to higher-impact practices, such as the use of less polluting materials, flexible work practices and shared transportation.

The economic sustainability actions most frequently reported by the analyzed companies relate to their economic performance, which is something that prevails in the services sector. This finding is significant since the dissemination of sustainability reports can be viewed as an opportunity to gain stakeholders’ confidence. Nevertheless, there is a potential challenge to procurement practice indicators because few actions were identified that report alliances with local suppliers, even though corporate sustainability presupposes the expansion of economic activity and simultaneously contributing to improving the quality of life in the context of business operations.

Most of the social disclosures of the analyzed companies relate to labor and decent work practices. Therefore, an internal perspective focusing on internal stakeholder development prevails in the social dimension. This result shows that Colombia’s corporate sustainability faces important challenges to the well-being of the work force. This issue requires prioritizing actions aimed at external stakeholders, especially in the services sector, where the issue is largely identified.

The foregoing would lead us to conclude that despite the fact that listed companies should act as a benchmark for other companies, in the matter of disclosing sustainability practices these companies face challenges to improving their performance in this area.

From the qualitative research perspective, we also identified and interpreted the types of signals emitted by the companies studied in the disclosure of TBL sustainability practices. The analysis of the signals sent by the analyzed companies when preparing their sustainability reports indicates that those of intent were the ones most identified. These signals collaborate with corporate sustainability to project strategies as they are viewed by internal and external stakeholders. The signals of necessity were mostly identified in the social dimension, particularly concerning the fulfilment, guarantee and promotion of human rights and implementation of OHSAS 18001. The main task in the field of human rights and health and safety management at work involves extending effects beyond the provisions of the standard and refers to practices that transcend the normative perspective in the analyzed organizations.

At the same time, our study showed that camouflage signals can be categorized into two types: 1) those behind which organizations hide information and 2) those where organizations seek to highlight their attributes and achievements. This categorization suggests to us that sustainability reports are not only aimed at reducing information asymmetry between companies and stakeholders but also at impacting organizational reputations by advertising attributes and achievements. With this finding, we expand Connelly’s proposal regarding camouflage signals.

A major limitation of the study is the use of reports of just one year. We would therefore encourage the development in future research of longitudinal studies to identify environmental practice compliance within the framework of the signals of intent. The study of a sample of exchange-listed companies in other countries would also be advisable. Nevertheless, the possibility of generalizing the results of this study is limited by their qualitative and exploratory nature. According to various authors, one of the disadvantages of qualitative content analysis is the impossibility of eliminating subjectivity in the interpretation of data. We employed validation mechanisms such as double-coding procedures and confirming the understanding of the categories to mitigate this subjectivity. Future research is needed to incorporate the two types of camouflage signals identified in this study to continue validating their recurrence in companies’ Sustainability Disclosure Practices.

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 B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2021.128416>.

Appendix A

Sustainability initiatives, frameworks, and regulations (Prepared with modifications from Lee, 2007; Ranängen et al., 2018).

Initiatives, frameworks, and regulations	Description
The ILO Declaration on Fundamental Principles and Rights at Work	Contains four principles: the freedom of association and right to collective bargaining, abolition of all forms of forced labor, child labor abolition and elimination employment discrimination
Universal Declaration of Human Rights of the UN	Has 30 fundamental human rights that are universally protected.
The Children's Rights and Business Principles	Provides examples of how companies can apply each of the children's principles to practice.
The UN Convention against Corruption	Is an anti-corruption instrument for subscribed countries.
The Measurement Framework of Green Growth of the OECD	Organizes indicators along with the environmental productivity and resource, economic, and environmental assets, quality of environmental life, economic opportunities, political answers.
Sustainable Development Goals -SDG-	"A set of global objectives to eradicate poverty, to protect the planet and to ensure prosperity for everyone as part of a new agenda of sustainable development. Each objective has specific goals that must be achieved in the next 15 years" (https://bit.ly/2Vgx5Mq).
Triple bottom line framework	Is a reference sustainability framework that demands companies to consider not only financial profits but also their operations' social and environmental impacts.
Global Reporting Initiative (GRI)	Is an organization that helps companies, governments, and other organizations to understand and communicate the impact of companies on critical sustainability matters.
Global Compact	"Is an international initiative that promotes implementing ten universally accepted principles to promote sustainable development in areas of human rights and companies, labour regulations, environment and the fight against corruption in the activities and the business strategies of the companies" (https://bit.ly/37PoyQm).
SS 854000: 2014 Management system for sustainability in communities-Guideline	Provides orientation on organizations' socially responsible operation, that is, to maintain ethical and transparent practices that contribute to society's health and well-being.
ISO 1400 2015: Environmental Management Systems	Provides a framework for environmental protection and changing environmental conditions in balance with the socio-economical necessities. It specifies the requirements to achieve the results expected that are established for your EMS.
OHSAS 18001: 2007 Occupational Health and Safety Management Certification	Specifies the requirements for a security and occupational health management system to allow an organization to control its SSO risks and improve its development.
ISO 90012015: Quality Management Systems	Is an organizational strategic decision that helps improve general performance and provides a solid base for sustainable development initiatives.

References

- Albertini, E., 2019. Integrated reporting: an exploratory study of French companies. *J. Manag. Govern.* 23 (2), 513–535. <https://doi.org/10.1007/s10997-018-9428-6>.
- Angulo, R., Bayona, J., Esparza, M., 2014. Estrés laboral en el sector servicios. *Rev. Lebrét.* 6, 351–366. <http://revistas.ustabuca.edu.co/index.php/LEBRET/article/view/1461>.
- Annunziata, E., Pucci, T., Frey, M., Zanni, L., 2018. The role of organizational capabilities in attaining corporate sustainability practices and economic performance: evidence from the Italian wine industry. *J. Clean. Prod.* 171, 1300–1311. <https://doi.org/10.1016/j.jclepro.2017.10.035>.
- Anthony, J., Abdul Majid, M., Romli, A., 2019. Green information technology adoption towards a sustainability policy agenda for government-based institutions: an administrative perspective. *J. Sci. Technol. Policy. Manag.* 10 (2), 274–300. <https://doi.org/10.1108/JSTPM-11-2017-0056>.
- Ashrafi, M., Acciaro, M., Walker, T.R., Magnan, G.M., Adams, M., 2019. Corporate sustainability in Canadian and US maritime ports. *J. Clean. Prod.* 220, 386–397. <https://doi.org/10.1016/j.jclepro.2019.02.098>.
- Bae, S.M., Masud, M., Kim, J., 2018. A cross-country investigation of corporate governance and corporate sustainability disclosure: a Signaling Theory perspective. *Sustainability* 10 (8), 2–16. <https://doi.org/10.3390/su10082611>.
- Basdeo, D.K., Smith, K.G., Grimm, C.M., Rindova, V.P., Derfus, P.J., 2006. The impact of market actions on firm reputation. *Strat. Manag. J.* 27 (12), 1205–1219. <https://doi.org/10.1002/smj.556>.
- Beattie, V., Thomson, S.J., 2007. Lifting the lid on the use of content analysis to investigate intellectual capital disclosures. *Account. Forum* 31, 129–163. <https://doi.org/10.1016/j.acfor.2007.02.001>.
- Braccini, A.M., Margherita, E.G., 2019. Exploring organizational sustainability of industry 4.0 under the triple bottom line: the case of a manufacturing company. *Sustainability* 11, 36–53. <https://doi.org/10.3390/su11010036>.
- Braga, J.P., Oliveira, J.R.S., Salotti, B.M., 2009. Determinantes do nível de divulgação ambiental nas demonstrações contábeis de empresas brasileiras. *R. Cont. Ufba.* 3 (3), 81–95. <https://periodicos.ufba.br/index.php/rcontabilidade/article/view/3819/2790>.
- Braun, V., Clarke, V., 2006. Using thematic analysis in Psychology. *Qual. Res. Psychol.* 3 (2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>.
- Boiral, O., Heras-Saizarbitoria, I., 2020. Sustainability reporting assurance. Creating stakeholder accountability through hyperreality. *J. Clean. Prod.* 243, 1–17. <https://doi.org/10.1016/j.jclepro.2019.118596>.
- Boiral, O., Henri, J.F., 2017. Is sustainability performance comparable? A study of GRI reports of mining organizations. *Bus. Soc.* 56 (2), 283–317. <https://doi.org/10.1177/0007650315576134>.
- Busu, C., Busu, M., 2019. Modeling the predictive power of the singular value decomposition-based entropy. Empirical evidence from the Dow Jones Global Titans 50 Index. *Physica A. Stat. Mech. Appl.* 534, 120819. <https://doi.org/10.1016/j.physa.2019.04.055>.
- Cabral, M.F., Cunha, A.A., 2018. Relações entre características organizacionais e nível de sustentabilidade corporativa: um estudo nas empresas do setor sucroalcooleiro do estado de Pernambuco. *Sist. Gest.* 13 (3), 402–412. <https://doi.org/10.20985/1980-5160.2018.v13n3.1427>.
- Carroll, A.B., Buchholtz, A.K., 2014. *Business and Society: Ethics, Sustainability, and Stakeholder Management*, ninth ed. Cengage Learning, Stamford, CT.
- Caruso, G., Colantonio, E., Gattone, S.A., 2020. Relationships between renewable energy consumption, social factors, and health: a panel vector auto regression analysis of a cluster of 12 EU countries. *Sustainability* 12 (7), 2–16. <https://doi.org/10.3390/su12072915>.
- Chen, P.Y., Chen, S.T., Hsu, C.S., Chen, C.C., 2016. Modeling the global relationships among economic growth, energy consumption and CO2 emissions. *Renew. Sustain. Energy Rev.* 65, 420–431. <https://doi.org/10.1016/j.rser.2016.06.074>.

- Ching, H.Y., Gerab, F., 2017. Sustainability reports in Brazil through the lens of signaling, legitimacy and stakeholder theories. *Soc. Responsib. J.* 13, 95–110. <https://doi.org/10.1108/SRJ-10-2015-0147>.
- Chiu, T.K., Wang, Y.H., 2015. Determinants of social disclosure quality in Taiwan: an application of stakeholder theory. *J. Bus. Ethics* 129 (2), 379–398. <https://doi.org/10.1007/s10551-014-2160-5>.
- Cho, C.H., Laine, M., Roberts, R.W., Rodrigue, M., 2015. Organized hypocrisy, organizational facades, and sustainability reporting. *Account. Org. Soc.* 40, 78–94. <https://doi.org/10.1016/j.aos.2014.12.003>.
- Cho, C.H., Laine, M., Roberts, R.W., Rodrigue, M., 2018. The frontstage and backstage of corporate sustainability reporting: evidence from the arctic national wildlife refuge bill. *J. Bus. Ethics* 152 (3), 865–886. <https://doi.org/10.1007/s10551-016-3375-4>.
- Cho, J., Lee, E., 2014. Reducing confusion about grounded theory and qualitative content analysis: similarities and differences. *Qual. Rep.* 19 (32), 1–20. <https://nsuworks.nova.edu/tqr/vol19/iss32/2>.
- Connelly, B.L., Trevis, S., Ireland, R.D., Reutzel, C.R., 2011. Signaling theory: a review and assessment. *J. Manag.* 37, 39–67. <https://doi.org/10.1177/0149206310388419>.
- Corbett, J., Webster, J., Jenkin, T.A., 2018. Unmasking corporate sustainability at the project level: exploring the influence of institutional logics and individual agency. *J. Bus. Ethics* 147 (2), 261–286. <https://doi.org/10.1007/s10551-015-2945-1>.
- Cucchiella, F., D'Adamo, I., Gastaldi, M., Koh, S.C., Santibanez-Gonzalez, E.D., 2020. Assessment of GHG emissions in Europe: future estimates and policy implications. *Environ. Eng. Manag. J.* 19, 131–142. <http://www.eemj.eu/index.php/EEMJ/article/view/4039>.
- Denzin, N.M., Lincoln, Y.S., 2016. Introduction: the discipline and practice of qualitative research. In: Denzin, N.M., Lincoln, Y.S. (Eds.), *The SAGE Handbook of Qualitative Research*, fifth ed. SAGE Publications Ltd, Thousand Oaks, California, pp. 29–71.
- D'Adamo, I., Falcone, P.M., Martin, M., Rosa, P., 2020. A sustainable revolution: let's go sustainable to get our globe cleaner. *Sustainability* 12 (11), 4387. <https://doi.org/10.3390/su12114387>.
- Francis, B.B., Hasan, I., Lothian, J.R., Sun, X., 2010. The signaling hypothesis revisited: evidence from foreign IPOs. *J. Financ. Quant. Anal.* 45, 81–106. <https://www.jstor.org/stable/27801475>.
- Fernandes, S.M., Borna, A.C., Nakamura, L.R., 2019. The influence of boards of directors on environmental disclosure. *Manag. Decis.* 57 (9), 2358–2382. <https://doi.org/10.1108/MD-11-2017-1084>.
- Gimeno, M.Á., Grandío, A., Marqués, A.I., 2013. El cambiante mundo de las organizaciones: hacia una organización saludable. *RIO. Rev. Intern. Organ.* 10 (10), 41–53. <https://doi.org/10.17345/rio10.41-63>.
- Global Reporting Initiative -GRI-, 2013. G4 Sustainability Reporting Guidelines-Implementation Manual. Global Reporting Initiative, Amsterdam. <http://www.respect.international/g4-sustainability-reporting-guidelines-implementation-manual/>. (Accessed 20 January 2020).
- Gómez, I., 2007. Salud laboral: una revisión a la luz de las nuevas condiciones del trabajo. *Universitas Psychologica* 6, 105–114. <http://pepsic.bvsalud.org/pdf/up/v6n1/v6n1a11.pdf>.
- GRI-, BVC, 2020. Guía para la elaboración de informes ASG para emisores en Colombia. [https://bvcsostenible.bvc.com.co/ckfinder/userfiles/files/SUSTAINABILITY%20GUIDANCE%20-%2020GRI%20BVC\(1\).pdf](https://bvcsostenible.bvc.com.co/ckfinder/userfiles/files/SUSTAINABILITY%20GUIDANCE%20-%2020GRI%20BVC(1).pdf). (Accessed 20 January 2020).
- Guiding principles on business and human rights, 2011. Implementing the united Nations 'protect, respect and remedy' framework. https://www.ohchr.org/documents/publications/guidingprinciplesbusinesshr_en.pdf. (Accessed 20 January 2020).
- Hahn, R., Kühnen, M., 2013. Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research. *J. Clean. Prod.* 59, 5–21. <https://doi.org/10.1016/j.jclepro.2013.07.005>.
- Hassan, A., Elamer, A.A., Fletcher, M., Sobhan, N., 2020. Voluntary assurance of sustainability reporting: evidence from an emerging economy. *Account. Res. J.* 33 (2), 391–410. <https://doi.org/10.1108/ARJ-10-2018-0169>.
- Henry, L.A., Buyl, T., Jansen, R.J.G., 2019. Leading corporate sustainability: the role of top management team composition for triple bottom line performance. *Bus. Strat. Environ.* 28, 173–184. <https://doi.org/10.1002/bse.2247>.
- Hsieh, H.F., Shannon, S.E., 2005. Three approaches to qualitative content analysis. *Qual. Health Res.* 15 (9), 1277–1288. <https://doi.org/10.1177/1049732305276687>.
- Inventario Nacional y Departamental de Gases Efecto Invernadero, 2016. Tercera comunicación Nacional de cambio climático. IDEAM, PNUD, MADS, DNP, CANCELLERÍA, FMAM, Bogotá-Colombia. <http://documentacion.ideam.gov.co/openbiblio/bvirtual/023634/INGEL.pdf> (accessed 20 January 2020).
- Karaman, A.S., Kilic, M., Uyar, A., 2020. Green logistics performance and sustainability reporting practices of the logistics sector: the moderating effect of corporate governance. *J. Clean. Prod.* 258, 120718. <https://doi.org/10.1016/j.jclepro.2020.120718>.
- Kolk, A., Van der Veen, M.L., Hay, K., Wennink, D., 2002. International Survey of Corporate Sustainability Reporting 2002. Graduate Business School, Amsterdam. <https://dare.uva.nl/search?identifier=b74c942d-958b-4caf-8272-bc744660062f>.
- Leahey, E., 2007. Not by productivity alone: how visibility and specialization contribute to academic earnings. *Am. Socio. Rev.* 72 (4), 533–561. <https://doi.org/10.1177/000312240707200403>.
- Lee, K.M., 2007. So what is the 'triple bottom line'? *Int. J. Divers. Organ. Communities. Nations.* 6, 67–72. <https://doi.org/10.18848/1447-9532/CGP/v06i06/39283>.
- Lee, M.K.K., 2019. Effective Green Alliances: an analysis of how environmental nongovernmental organizations affect corporate sustainability programs. *Corp. Soc. Responsib. Environ. Manag.* 26, 227–237. <https://doi.org/10.1002/csr.1674>.
- Legendre, S., Coderre, F., 2013. Determinants of GRI G3 application levels: the case of the fortune global 500. *Corp. Soc. Responsib. Environ. Manag.* 20 (3), 182–192. <https://doi.org/10.1002/csr.1285>.
- Leigh, W., Modani, N., Hightower, R., 2004. A computational implementation of stock charting: abrupt volume increase as signal for movement in New York Stock Exchange Composite Index. *Decis. Support Syst.* 37 (4), 515–530. [https://doi.org/10.1016/s0167-9236\(03\)00084-8](https://doi.org/10.1016/s0167-9236(03)00084-8).
- Leitao, J., Ferreira, J., Santibanez-Gonzalez, E., 2021. Green bonds, sustainable development and environmental policy in the European Union carbon market. *Bus. Strat. Environ.* 30 (4), 2077–2090. <https://doi.org/10.1002/bse.2733>.
- Lin, A.J., Chang, H.Y., 2019. Business sustainability performance evaluation for Taiwanese banks. A hybrid multiple-criteria decision-making approach. *Sustainability* 11 (8), 22–36. <https://doi.org/10.3390/su11082236>.
- López-Santamaría, M., 2016. Articulación entre la perspectiva de la salud y las acciones de responsabilidad social empresarial: análisis de las prácticas laborales de una organización saludable. In: Grueso, M.P. (Ed.), *Organizaciones saludables y procesos organizacionales e individuales. Comprensión y retos*. Editorial Universidad del Rosario, Bogotá, Colombia, pp. 97–127.
- Mahoney, L.S., Thorne, L., Cecil, L., LaGore, W., 2013. A research note on standalone corporate social responsibility reports: signaling or greenwashing? *Crit. Perspect. Account.* 24, 350–359. <https://doi.org/10.1016/j.cpa.2012.09.008>.
- Mahsud, R., Imanaka, J.L., Prussia, G.E., 2018. Authenticity in business sustainability. Overcoming limitations in strategic management constructs. *Sustain. Account. Manag. Policy J.* 9 (5), 666–684. <https://doi.org/10.1108/SAMPJ-02-2018-0036>.
- Mantari, J.S., Nuryasman, N., 2017. Moderation effect of exchange rate to signaling theory validity in Indonesia stock exchange. *Bus. Manag. Stud.* 3 (1), 80–89. <https://doi.org/10.11114/bms.v3i1.2259>.
- Marquis, C., Qian, C., 2014. Corporate social responsibility reporting in China: symbol or substance? *Organ. Sci.* 25, 127–148. <https://doi.org/10.1287/orsc.2013.0837>.
- Moratis, L., 2016. Out of the ordinary? Appraising ISO 26000's CSR definition. *Int. J. Law Manag.* 58, 26–47. <https://doi.org/10.1108/IJLMA-12-2014-0064>.
- Moratis, L., 2018. Signaling responsibility? Applying signaling theory to the ISO 26000 standard for social responsibility. *Sustainability* 10 (11), 41–72. <https://doi.org/10.3390/su10114172>.
- Ogrea, C., Herciu, M., 2018. Corporate sustainability-From a fuzzy concept to a coherent reality. *Stud. Bus. Econ.* 13, 112–127. <https://doi.org/10.2478/sbe-2018-0010>.
- Organización Internacional del Trabajo -OIT-, 2019. Perspectivas sociales y del empleo en el mundo. https://www.ilo.org/wcmsp5/groups/public/-dgreports/-dcom/-publ/documents/publication/wcms_670569.pdf. (Accessed 20 January 2020).
- Paun, D., 2018. Corporate sustainability reporting: an innovative tool for the greater good of all. *Bus. Horiz.* 61 (6), 925–935. <https://doi.org/10.1016/j.bushor.2018.07.012>.
- Popa, A., Blidid, R., Bogdan, V., 2009. Transparency and disclosure between theory and practice. A case study of Romania. In: Proceedings of the FIKUS'09 Symposium for Young Researchers, pp. 173–183. <https://econpapers.repec.org/bookchap/pkksfy09/173-183.htm>.
- Ranängen, H., Coster, M., Isaksson, R., Garvare, R., 2018. From global goals and planetary boundaries to public governance. A framework for prioritizing organizational sustainability activities. *Sustainability* 10 (8), 27–41. <https://doi.org/10.3390/su10082741>.
- Rezaee, Z., 2017. Corporate sustainability: theoretical and integrated strategic imperative and pragmatic approach. *J. Bus. Inq.* 16, 60–87. <https://srn.com/abstract=3148705>.
- Saber, M., Weber, A., 2019. How do supermarkets and discounters communicate about sustainability? A comparative analysis of sustainability reports and in-store communication. *Int. J. Retail Distrib. Manag.* 47 (11), 1181–1202. <https://doi.org/10.1108/IJRDM-08-2018-0156>.
- Savitz, A.W., Weber, K., 2014. *The Triple Bottom Line: How Today's Best Run-Companies Are Achieving Economic, Social and Environmental Success- and How You Can Too*, second ed. John Wiley & Sons, San Francisco, CA.
- Seuring, S., Gold, S., 2012. Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Manag.: Int. J.* 17 (5), 544–555. <https://doi.org/10.1108/1359541211258609>.
- Siew, R.Y.J., 2015. A review of corporate sustainability reporting tools (SRTs). *J. Environ. Manag.* 164, 180–195. <https://doi.org/10.1016/j.jenvman.2015.09.010>.
- Simoni, L., Bini, L., Bellucci, M., 2020. Effects of social, environmental, and institutional factors on sustainability report assurance: evidence from European countries. *Meditari Account. Res.* 28 (6), 1059–1087. <https://doi.org/10.1108/MEDAR-03-2019-0462>.
- Talbot, D., Boiral, O., 2018. GHG Reporting and impression management: an assessment of sustainability reports from the energy sector. *J. Bus. Ethics* 147, 367–383. <https://doi.org/10.1007/s10551-015-2979-4>.
- Talbot, D., Barbat, G., 2019. Water disclosure in the mining sector: an assessment of the credibility of sustainability reports. *Corp. Soc. Responsib. Environ. Manag.* 27 (3), 1241–1251. <https://doi.org/10.1002/csr.1880>.
- Taj, S.A., 2016. Application of Signaling Theory in management research: addressing major gaps in theory. *Eur. Manag. J.* 34 (4), 338–348. <https://doi.org/10.1016/j.emj.2016.02.001>.
- Thijssens, T., Bollen, L., Hassink, H., 2016. Managing sustainability reporting: many ways to publish exemplary reports. *J. Clean. Prod.* 136 (10), 86–101. <https://doi.org/10.1016/j.jclepro.2016.01.098>.
- Trevis, S., 2003. Influencing initial public offering investors with prestige: signaling with board structures. *Acad. Manag. Rev.* 28 (3), 432–446. <https://doi.org/10.5465/amr.2003.10196754>.
- Wang, Z., Jia, H., Xu, T., Xu, C., 2018. Manufacturing industrial structure and pollutant emission: an empirical study of China. *J. Clean. Prod.* 197, 462–471. <https://doi.org/10.1016/j.jclepro.2018.06.092>.

- World Commission on Environment and Development, 1987. Our common future. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>. (Accessed 30 June 2021) accessed.
- Xu, R., Lin, B., 2017. Why are there large regional differences in CO2 emissions? Evidence from China's manufacturing industry. *J. Clean. Prod.* 140 (3), 1330–1343. <https://doi.org/10.1016/j.jclepro.2016.10.019>.
- Yaqoob, M.E., Naser, H.A., Elkanzi, E.M., Janahi, E.M., 2019. Towards an effective environmental impact assessment (EIA) in the industrial sector of Bahrain. *Arabian Gulf. Arab. J. Basic Appl. Sci.* 26, 113–124. <https://doi.org/10.1080/25765299.2019.1570621>.
- Zerbini, F., 2017. CSR initiatives as market signals: a review and research agenda. *J. Bus. Ethics* 146, 1–23. <https://doi.org/10.1007/s10551-015-2922-8>.