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What companies do not disclose about their environmental policy and what institutional pressures may do to respect

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Abstract

The information contained in corporate social responsibility (CSR) reports is a controversial issue, and it has generated an important debate among academics regarding company disclosure strategies. Environmental matters are especially relevant given their impact on sustainable development. The present study has two objectives. The first is to determine which Global Reporting Initiative (GRI) environmental indicators are reported less frequently. The second is to predict the evolution of these indicators in light of the institutional pressures that companies try to resist. Specifically, the study of the environmental dimension of the GRI focusses on an analysis of the following: materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport, environmental assessment, and environmental grievance mechanisms. A content analysis of CSR reports from some of the world's largest companies reveals that the indicators least disclosed by companies relate to the environmental aspects of biodiversity. The dissemination of environmental indicators is influenced by normative, mimetic, and (to a lesser extent) coercive pressures. In addition, we observe that mimetic institutional pressures under a national and industrial vision influence the dissemination of environmental information. In terms of cultural dimensions, companies located in long-term, feminine, and collectivist countries tend to disseminate environmental information accordingly.

KEYWORDS

corporate social responsibility, stakeholder engagement, sustainability development, environmental policy, corporate social report, institutional theory, biplot

1 | INTRODUCTION

The demand for more sustainable business behaviour and greater information transparency has boosted corporate social responsibility (CSR) practices and business interest in showing their commitment to social and environmental aspects in CSR reports or other reports (Fernandez-Feijoo, Romero, & Ruiz-Blanco, 2014; Gutiérrez, García, & Canizares, 2013; Kolk, 2010; Prado-Lorenzo, García-Sánchez, & Blázquez-Zaballos, 2013). This demand for business information has also aroused the interest of the scientific community and has generated a deep interest in both the content and the quality of these reports (Jairo, 2013; Kuzey & Uyar, 2017; Manetti, 2011; Mio, 2010; Sun, Zhao, & Cho, 2019).

The CSR strategy allows companies, in collaboration with their stakeholders (Martínez-Ferrero, Suárez-Fernández, & García-Sánchez, 2019; Tolmie, Lehnert, & Zhao, 2019), to reconcile economic, social, and environmental aspects (Comisión Europea, 2001) thus allowing sustainable business behaviour (Cinquini, Passetti, Tenucci, & Frey,

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2012; Engle, 2007; Girella, Zambon, & Rossi, 2019). Additionally, the adoption of informative practices enhances the reputation and image of companies (Bear, Rahman, & Post, 2010; Heikkurinen & Ketola, 2012; Hur, Kim, & Woo, 2014; Lii & Lee, 2012; Minor, 2013), allows access to new financial markets (Cheng, Ioannou, & Serafeim, 2014; García-Sánchez, Hussain, Martínez-Ferrero, & Ruiz-Barbadillo, 2019; Jiraporn, Jiraporn, Boeprasert, & Chang, 2014), and creates a scenario of value and leadership for society (Cuadrado-Ballesteros, García-Sánchez, & Martínez Ferrero, 2016; Dhaliwal, Li, Tsang, & Yang, 2014; I. M. García-Sánchez & Noguera-Gámez, 2017a, 2017b; Martínez-Ferrero, Ruiz-Cano, & García-Sánchez, 2016; Stanaland, Lwin, & Murphy, 2011; Tata & Prasad, 2015).

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However, the preparation and dissemination of the CSR report entails a huge cost for companies (Boria-Reverter, García-Gonzalez, Vizuete-Luciano, Gil-Lafuente, & Crespi-Vallbona, 2013; Braam, de Weerd, Hauck, & Huijbregts, 2016; Matsumura, Prakash, & Vera-Muñoz, 2013) that decide to disclose this information for internal or external reasons or factors.

Regarding internal factors, many authors have shown that the "size of the company" has a great explanatory capacity for environmental disclosure in CSR (Brammer & Pavelin, 2008; Henri & Journeault, 2008: Kolk & Fortanier. 2013: Liu & Anbumozhi. 2009: Minutolo. Kristjanpoller, & Stakeley, 2019; Rupley, Brown, & Marshall, 2012; Suttipun & Stanton, 2012; Wegener, Elavan, Felton, & Li, 2013). "Age" is another aspect to take into account, because companies that have very old fixed assets are thought to be environmentally less sensitive and, consequently, tend to reduce the emission of environmental information (Borghei-Ghomi & Leung, 2013; Cormier & Gordon, 2001; Cormier, Magnan, & Van Velthoven, 2005) and vice versa. In the same way, the "degree of influence" in the company's environment suggests a certain disposition in environmental disclosure (Borghei-Ghomi & Leung, 2013; Liesen, Hoepner, Patten, & Figge, 2004; Rankin, Windsor, & Wahyuni, 2011). Studies also indicate that the presence of external or nonexecutive directors in the composition of the "board of directors" validates the positive relationship with environmental disclosure (Brammer & Pavelin, 2008; García-Sánchez & Martínez-Ferrero, 2018; Helfaya & Moussa, 2017; Ienciu, Popa, & Ienciu, 2012) and defends the link between corporate CSR "committees" and the disclosure of environmental information (García-Sánchez, 2019; Rankin et al., 2011; Rupley et al., 2012). Furthermore, García-Sánchez and Martínez-Ferrero (2019) reveal the beneficial role the CEO can play in CSR strategies; García-Sánchez, Oliveira, and Martínez-Ferrero (2019) and Amorelli and García-Sánchez (2019) suggest that women directors have a positive influence on voluntary disclosure around gender issues. Additionally, publicly owned companies (Cormier & Gordon, 2001; Suttipun & Stanton, 2012) or those with a presence of "foreign capital" (da Silva Monteiro & Aibar-Guzmán, 2010) favour the dissemination of the corporate environmental dimension. Similarly, researchers have provided evidence of a link between company profitability and the disclosure of environmental information (Bae Choi, Lee, & Psaros, 2013; Brammer & Pavelin, 2008) and a relationship between CSR disclosure and earnings quality (Siueia & Wang, 2019).

In relation to external factors, the literature is more limited, because the studies focus on determining the influence that institutional pressures have on all the information contained in sustainability reports (Frías-Aceituno, Rodríguez-Ariza, & García-Sánchez, 2013; García-Sánchez, Cuadrado-Ballesteros, & Frías-Aceituno, 2016; García-Sánchez, Prado-Lorenzo, & Frías-Aceituno, 2013; García-Sánchez, Rodríguez-Ariza, & Frías-Aceituno, 2013; García-Sánchez, Rodríguez-Ariza, & Frías-Aceituno, 2013; Martínez-Ferrero & García-Sánchez, 2017). This leads to a lack of knowledge about what environmental information is not disclosed by companies and how different institutional pressures influence the dissemination of certain environmental indicators.

Consequently, the objective of this work is to understand the role of institutional pressures from the company's country of origin in relation to the Global Reporting Initiative (GRI) environmental indicators that companies report less frequently in their CSR reports. Specifically, the study of the environmental dimension of the GRI focusses on the analysis of the following aspects: materials, energy, water, biodiversity, emissions, effluents and waste, products and services, compliance, transport, overall, supplier environmental assessment, and environmental grievance mechanisms.

On the basis of institutional theory, organizations co-evolve in the organizational field (Hoffman, 1999) so that they adjust to the institutional influences of their context. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), Claessens and Fan (2002), and Campbell (2007) agree that organizations that exercise their operations in countries with similar institutional structures will adopt homogeneous forms of behaviour. The institutionalization process is based on three basic pillars, cognitive, normative, and regulatory (Scott, 1995), which give rise to "coercive," "normative," and "mimetic pressures" (DiMaggio & Powell, 1983). These institutional pressures to which companies are subjected give rise to the process known as "isomorphism' (DiMaggio & Powell, 1983). Although "normative isomorphism" derives from the cultural values that surround the business environment, "coercive isomorphism" is based on respecting and complying with the laws and regulations that define the corporate legal framework, and "mimetic isomorphism" refers to the process of imitating the leading or normally successful companies (Perez-Batres, Miller, & Pisani, 2011).

Empirically, based on the content of the CSR reports of the largest companies worldwide, we apply the new "Elastic Net" HJ-Biplot methodology that allows us to analyse the influence of institutional pressures on environmental dissemination practices and simultaneously represent the countries where the companies operate, the environmental indicators, and the different institutional forces.

The results of this study determined that normative and mimetic pressures influence the dissemination of environmental information, unlike coercive pressures that do not seem to be determinants of this behaviour.

This article is structured as follows. After the introduction, in Section, 2 we describe the theoretical framework that supports the institutional theory and its relevance in social responsibility practices that are evidenced through the normative, coercive, and mimetic pressures cited by previous studies. The third section describes our research method in terms of the sample and the analysis techniques used. The empirical results obtained are presented in the fourth section, and finally, the discussion of the results and the main conclusions are presented in the last section.

2 | ENVIRONMENTAL INFORMATION AND ISOMORPHISM

If we question why environmental concerns are important for companies, we will have many answers. Citizen awareness, the content of laws, etc., are some of the factors that must increase a firm's level of commitment to environmental responsibility. However, on the basis of externalities like those that occurred in the Gulf of Mexico, it cannot be said that the strategies or measures to avoid environmental impact are sufficient. Actions on which key problems such as greenhouse gas emissions or environmental disasters caused by oil leaks or toxic spills depend.

Companies are the main pollutants of the planet, so the requirement to carry out sustainable practices or processes are more than necessary. However, these depend very much on the country in which they are located. In this way, indirectly their environmental responsibility is a national issue. In this sense, adopting the proposal of the institutional theory of Campbell (2007) for any action considered within the CSR strategy, companies build their environmental strategies in response to the intensity and coherence of the external pressures they face, adopting isomorphic behaviour patterns derived from the normative, coercive, and mimetic pressures they support (Amor-Esteban, Galindo-Villardón, & García-Sánchez, 2018a, 2018b; Amor-Esteban, García-Sánchez, & Galindo-Villardón, 2018).

According to Deephouse (1996), isomorphism entails regulatory improvement and public support, and it influences the processes and decision-making of organizations (Hoskisson, Eden, Lau, & Wright, 2000). Also, it exerts pressure for the voluntary dissemination of sustainability reports (Martínez-Ferrero & García-Sánchez, 2017) and becomes a scenario that encourages socially responsible behaviour (Martínez & Fernández, 2018). In the opinion of Cruz-Suárez, Prado-Román, and Díez-Martín (2014), the organizations that survive the longest are those that best fit the pressures of the environment; otherwise, they do not survive (Zaheer, 1995) or are questioned in their environment (Hannan & Freeman, 1977).

In this sense, we consider that the companies that bear the highest regulatory, coercive, and mimetic pressures will be the ones most likely to disclose in the future the least-reported environmental information indicators. The role that different pressures can play in this regard is determined in the following subheadings.

2.1 | Normative isomorphism

Normative isomorphism is the result of business professionalization (DiMaggio & Powell, 1983) with special reference to particularities of a specific job or activity (Deephouse & Suchman, 2008; DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Oliver, 1991; Tolbert & Zucker, 1983), with which organizations converge in form and behaviour (Teodoro, 2014). In this context, Scott (2008) argues that cultural systems are similar to normative forces because they meet the prescriptive, evaluative, and mandatory dimensions of social life.

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At the business level, normative pressures arise from differences in cultural values (Bustamante, 2011), with which they suppose a strong impact in the behaviour of the CSR (Beekun, Hamdy, Westerman, & HassabElnaby, 2008; Haxhi & Van Ees, 2010; Ioannou & Serafeim, 2012; Maignan, 2001; Parboteeah, Addae, & Cullen, 2012; Prado-Lorenzo et al., 2013; Ringov & Zollo, 2007; Su, 2006).

Robbins (2004) states that the cultural dimensions of Hofstede (2001) are a frame of reference for differentiating national cultures. This reference is originally integrated into four dimensions (individualism/collectivism, masculinity/femininity, tolerance/evasion of uncertainty, and power distance); and from there, it becomes a model of culture (Hofstede, 2011; Hofstede & Hofstede, 2005) widely used in the field of CSR (Christie, Kwon, Stoeberl, & Baumhart, 2003; Cubilla-Montilla, Nieto-Librero, Galindo-Villardón, Vicente Galindo, & García-Sánchez, 2019; Gallego-Álvarez & Ortas, 2017; I. M. García-Sánchez et al., 2013; Ho, Wang, & Vitell, 2012; Husted, 2005; Newson & Deegan, 2002; Orij, 2010; Park, Russell, & Lee, 2007; Peng, Dashdeleg, & Chih, 2014; Vachon, 2010; Van der Laan Smith, Adhikari, & Tondkar, 2005; Vitell, Paolillo, & Thomas, 2003; Waldman et al., 2006).

In the present context, normative isomorphism can be analysed in terms of cultural dimensions (Hofstede, 2001). The dimension of collectivism is associated with societies consisting of citizens whose decisions and actions are based more on their membership of a group than on their status as individuals, with the result that they show a strong commitment to the public good. This leads us to believe that countries with higher collectivist values will be more committed to the environment. The dimension of femininity refers to the role of women and is associated with societies oriented towards the guality of life and thus environmental concerns. The dimension of uncertainty tolerance is associated with lower levels of aversion to the unknown and the need for rules determining coexistence. Therefore, more tolerant societies will be more likely to exert regulatory pressures on companies on environmental issues. In contrast, the dimension of power distance shows power to be vertically stratified, and individuals with less power expect and accept its unequal distribution. This leads to less interest in environmental issues. The dimension of short-term orientation describes societies that value tradition; they are focussed on obtaining fast results and have little interest in saving for the future or in caring for the environment.

We hypothesized that firms located in societies with high values of collectivism, femininity, and uncertainty tolerance can therefore be expected to show a greater commitment to the environment. These normative pressures mean that they will tend to follow practices that promote greater transparency, such as releasing higher volumes of environmental information. The opposite is expected in countries where hierarchical distance and short-term orientation are the norm. Coercive isomorphism refers to the force of laws and regulations regarding CSR and the dissemination of information. Thus, the higher institutions exert pressures on companies by using coercive mechanisms. Thus, legal provisions at the country level should be considered as key factors (Boiral & Gendron, 2011). Under this concept, Vargas-Sánchez and Riquel-Ligero (2012) argue that strength and fear prevail. This leads organizations to comply with rules and regulations to avoid sanctions (Hart, 1997; Wood, 1991). The scope of the legal provisions in the disclosure of information has been previously evidenced (Francis, Khurana, Martin, & Pereira, 2011; García-Sánchez et al., 2016; Martínez-Ferrero & García-Sánchez, 2017; Zhou, Simnett, & Green, 2013).

The traditional classification of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) distinguishes legal systems into two categories: civil law and common law. Using this categorization, the researchers show that companies that operate in civil law-based countries are usually more interested in issuing information about CSR than those that operate in common law countries (Amor-Esteban et al., 2017; Ball, Kothari, & Robin, 2000; García-Sánchez et al., 2013; Martínez-Ferrero & García-Sánchez, 2017; Simnett, Vanstraelen, & Chua, 2009). Similarly, companies located in civil law countries disclose environmental reports with better quality than those in common law countries (Kolk & Perego, 2010; Ortas, Álvarez, Jaussaud, & Garayar, 2015; Van der Laan Smith et al., 2005). On the other hand, Gallego-Álvarez, Ortas, Vicente-Villardón, and Álvarez Etxeberria (2017) emphasize that companies that operate in countries with civil law tend to mostly focus on water and emissions issues in their sustainability reports.

However, Dhaliwal et al. (2014) have indicated that these classifications are insufficient in terms of explaining disclosure practices. It is necessary to identify those countries that have laws requiring firms to report their environmental and social policies and activities. These laws reflect higher stakeholder expectations of CSR performance. Therefore, we argue that in countries with CSR-related disclosure laws and the most stringent environmental laws, firms face greater coercive pressures to disclose more information about their environmental policies. In contrast, companies in countries that are characterized by financial opacity are less likely to disclose corporate information and thus fewer environmental indicators.

2.3 | Mimetic isomorphism

Mimetic isomorphism comes from the uncertainty perceived by organizations in the business environment. According to DiMaggio and Powell (1983), uncertainty is an element that causes imitation. Burt (1987) suggests that mimetic pressures are exerted on companies, if they are structurally equivalent, share similar objectives, and compete for the same customers. Thus, by perceiving the success of other organizations, companies conform to these practices, imitating and adopting their behavioural models (Carvalho, Falcão Vieira, & Goulart Silva, 2012; P. J. DiMaggio & Powell, 1991; P. DiMaggio & Powell, 1983; Hodson, Connolly, & Younes, 2008). CUBILLA-MONTILLA ET AL.

Research indicates that mimetic institutional pressures explain companies' interest in sustainable development (Bansal, 2005) and in the issuance of environmental information (Aerts, Cormier, & Magnan, 2006). From the sector of the industrial activity, institutional pressures arise that cause a mimicry in the practices of CSR (Clark, Frijters, & Shields, 2008; Cormier et al., 2005; Cormier & Magnan, 1999; Simnett et al., 2009; Venanzi & Fidanza, 2006) because companies that belong to the same sector of activity face common interests (Amor-Esteban, Galindo-Villardón, & García-Sánchez, 2018b; Amor-Esteban, Galindo-Villardón, & García-Sánchez, 2019: Amor-Esteban, Galindo-Villardón, García-Sánchez, & David, 2019). In contrast, studies show that sustainability practices vary between companies operating in different industries as a result of the pressure exerted by stakeholders (Bayoud, Kavanagh, & Slaughter, 2012; Branco & Rodrigues, 2008; Newson & Deegan, 2002: Parsa & Deng, 2008: Wanderley, Lucian, Farache, & de Sousa Filho, 2008; Weber, 2014; Young & Marais, 2012). In more recent work, it has been shown that the type of industry puts pressure on companies to adopt similar CSR standards (Amor-Esteban, García-Sánchez, & Galindo-Villardón, 2018; Fernandez-Feijoo et al., 2014; Martínez-Ferrero & García-Sánchez, 2017). They need to adopt similar behaviours to those of leading firms in their respective countries to benefit from the economic advantages associated with these practices.

Thus, we hypothesized that there will be two types of mimetic isomorphism: at industry level, where companies mimic the environmental outreach strategies of those operating in the same sector because of the common challenges they face; and at country level, where they attempt to replicate the success of companies that are operating in other sectors.

3 | METHODOLOGY

3.1 | Population and sample

The empirical analysis was designed to target the world's 500 largest companies in 2015 according to the Fortune Global 500¹ (http://fortune.com/global500). The selection of the largest companies internationally was a consequence of the fact that they have different corporate characteristics, and they are more profitable and are more exposed to public opinion. In addition, institutional pressures are more influential in large companies, because they have greater visibility (García-Sánchez et al., 2016).

The sample corresponds to 201 companies from 15 countries that prepare and disseminate their CSR reports in accordance with the GRI model version G4. This guide standardizes the contents of sustainability reports in order to increase the relevance of this reporting by ensuring greater credibility and comparability of the information disclosed.

The final sample is shown in Table 1. The largest contributions were from the United States and Japan, with 32.34% and 14.93%,

¹The Fortune Global 500, also known as Global 500, is an annual ranking of the top 500 corporations worldwide as measured by revenue and the list is compiled and published annually by Fortune magazine

TABLE 1 Sample distribution by countries

	Companie	Companies per country		
Country	N°	Percentage		
Australia	8	3.98		
Canada	10	4.98		
Switzerland	9	4.48		
Germany	18	8.96		
Spain	6	2.99		
France	14	6.97		
United Kingdom	7	3.48		
India	3	1.49		
Italy	5	2.49		
Japan	30	14.93		
South Korea	14	6.97		
Netherlands	9	4.48		
Sweden	2	1.00		
Thailand	1	0.50		
USA	65	32.34		

respectively. The economic development of these countries has been such that they contain the greatest number of large firms. In contrast, Thailand, Sweden, and India have the fewest, with a frequency of 1, 2, and 3, respectively. The remainder of the countries present a frequency higher than 5. However, the geographical distribution of the sample is in line with the composition of the Global 500.

The analysed data were obtained from the information published in the sustainability reports that the companies had on their website. Through a content analysis, the presence or absence of each of the

TABLE 2 Environmental indicators (Global Reporting Initiative G4)

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environmental indicators established by the GRI G4 guide was established.

3.2 | Variables for analysis

3.2.1 | Environmental indicators

The GRI indicators related to the environmental dimension of CSR proposed in the G4 guide are grouped into 12 different aspects. They correspond to 34 indicators that cover impacts related to inputs (such as energy and water) and outputs (such as emissions, effluents, and waste). In addition, they cover biodiversity, transport, and product and service-related impacts, as well as environmental compliance and expenditures. Table 2 contains these indicators and their typologies.

3.2.2 | Institutional pressures

Regarding the institutional pressures that are exerted on environmental dissemination practices, we will analyse the normative, coercive, and mimetic forces (see Table 3).

The impact of the "normative pressures" that makes it possible to differentiate between countries is based on the cultural dimensions posed by Hofstede (2001): femininity, collectivism, power distance, uncertainty avoidance, and short-term orientation.

To characterize the "coercive pressures," we use three variables that measure the legal system of the countries in the sample: CSR_LAW, C_FINANCIAL (Dhaliwal et al., 2014), and ERRI (Esty & Porter, 2001). Mimetic pressures are analysed based on the Industrial Corporate Social Responsibility Practices Index and the National Corporate Social Responsibility Practices Index, which provide insight into the level of business mimicry with respect to CSR at the sector and

Environmental Aspects	Typology	Indicator Code
Materials	Resources utilized during the process and product recycling	EN1, EN2
Energy	Energy direct and indirect energy consumption, efficiency improvements	EN3, EN4, EN5, EN6, EN7
Water	Water source and withdrawal, water recycled and reused	EN8, EN9, EN10
Biodiversity	Biodiversity location, protected areas and habitat, managing impacts on biodiversity	EN11, EN12, EN13, EN14
Emissions	Direct and indirect greenhouse gas emissions, ozone-depleting substances, nitrogen oxides, sulphur oxides	EN15, EN16, EN17, EN18, EN19, EN20, EN21
Effluents and waste	Release of polluting substances into the environment: water discharge, waste, and spills	EN22, EN23, EN24, EN25, EN26
Products and services	Environmental impacts of products and services sold, packaging materials	EN27, EN28
Compliance	Compliance with laws and regulations, fines and nonmonetary sanctions for noncompliance	EN29
Transport	Environmental impacts of transporting products	EN30
Overall	Total environmental protection expenditures and investments by type	EN31
Supplier environmental assessment	New suppliers, current, and potential negative environmental impacts in the supply chain	EN32, EN33
Environmental grievance mechanisms	Complaints about environmental impacts filed, addressed, and resolved	EN34

country level (Amor-Esteban, Galindo-Villardón, & García-Sánchez, 2018b).

3.3 | Analysis technique

The information used in our analysis was organized in a binary data matrix $I \times J (X)$ in which rows (*I*) correspond to the 201 largest companies in the world and columns (*J*) correspond to 34 binary variables or indicators concerning to environmental aspects. All indicators are binary variables that take the value 1 when the characteristic is present (indicator disclosed) and 0 when it is absent (indicator not disclosed). From this matrix, another matrix was prepared that summarizes the percentage of dissemination of the indicator at the country level. In this way, the new matrix, object of our study, is summarized for 15 countries, and the 34 numerical indicators are expressed as a percentage of dissemination of each environmental aspect.

The ordering and nature of the data requires the use of two-way techniques that allow graphic representations that facilitate the visual analysis of the results with a strong statistical support that guarantees its adequate interpretation.

3.3.1 | HJ-biplot technique

In a multivariate analysis, in order to jointly represent individuals and variables, it is necessary to reduce the dimensionality of the data from a starting hyperspace to a subspace of reduced size.

Biplot (Gabriel, 1971; Galindo-Villardón, 1986) is a technique that seeks to find the best multivariate representation in a reduced dimension. The interpretation of the biplot is based on the following concepts: The similarity between countries is an inverse function of the distance between them; the lengths and angles of the vectors that represent the indicators are interpreted in terms of variability; the relationships between countries and indicators are interpreted in terms of the projections of the "row" points on the "column" vectors.

3.3.2 | Elastic net HJ-biplot technique

In the context of biplot, we have not found evidence to formulate alternative algorithms to penalize or contract the loads of the main components in order to improve the informational capacity provided by high-dimensional data. In this line of work, this document proposes a new alternative of biplot representation by adapting restrictions to zero charges on the main components based on the elastic net regularization theory.

In the regression analysis, Zou and Hastie (2005) propose a method that combines the penalization l_1 of LASSO and the regularization l_2 of Ridge, calling it elastic net, to penalize the size of the regression coefficients based on both norms l_1 y l_2 . From this approach, the analysis of main components can be transformed into a regression-type problem that is based on the elastic net regularization method. In this way, we can add the LASSO and Ridge penalty to the model and derive SPARSE components. Thus, from the elastic net modified loads for the biplot are derived, of the form

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TABLE 3 Institutional pressures

Institutional pressures		Description		
Normative	pressures Role played by feminine gender within society	Femininity		
	Collectivism	Tendency of society to reinforce collective well- being		
	Power distance	Society's perception of the distribution of power		
	Uncertainty tolerance	A measure of the level of tolerance that society has for unexpected or unknown situations		
Short-term	orientation	Describes societies that value traditional methods that are focused on obtaining fast results and with little interest in saving for the future		
Coercive	pressures	CSR LAW		
	A measure that captures the existence of disclosure laws related to CSR			
	C FINANCIAL	A measure of financial opacity at the country level		
ERRI	A measure that represents the quality of the environmental regulation system in a country			
Mimetic	pressures	Industrial Corporate Social Responsibility Practices Index		
	Difference between the average level of sustainability of the companies operating in the selected "industry" and the average level of sustainability of all companies included in the rating			
National	Corporate Social Responsibility Practices Index	Difference between the average level of sustainability of the companies operating in a selected "country" and the average level of sustainability of all the companies included in the rating		

Abbreviation: CSR, corporate social responsibility.

$$\widehat{\boldsymbol{V}}^{\textit{elasticnet}} = \text{argmin} \left\| \boldsymbol{X} - \boldsymbol{A} \boldsymbol{D}^{-1} \boldsymbol{B}^{\mathsf{T}} \right\|^{2} + \lambda_{2} \sum_{j=1}^{p} \boldsymbol{V}_{j}^{2} + \lambda_{1} \sum_{j=1}^{p} \left| \boldsymbol{V}_{j} \right|,$$

where $\lambda_1 > 0$ and $\lambda_2 > 0$ are both penalty parameters for contracting charges. The penalty is imposed on the charges of the main

TABLE 4 Descriptive statistics of environmental indicators

Category	Description	Code	Reported
Materials	Materials used by weight or volume Percentage of materials used that are recycled input materials	EN1 EN2	52.2 50.7
	Total average dimension materials		51.5
Energy	Energy consumption within the organization Energy consumption outside of the organization Energy intensity Reduction of energy consumption Reductions in energy requirements of products and services	EN3 EN4 EN5 EN6 EN7	87.6 49.8 70.1 79.1 62.7
	Total average dimension energy		69.9
Water	Total water withdrawal by source Water sources significantly affected by withdrawal of water Percentage and total volume of water recycled and reused	EN8 EN9 EN10	71.6 43.3 51.2
	Total average dimension water		55.4
Biodiversity	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas Habitats protected or restored Total number of IUCN red list species and national conservation list species with habitats in areas affected	EN11 EN12 EN13 EN14	42.8 50.7 45.8 29.9
	by operations		40.0
Emissions	Direct greenhouse gas emissions Energy indirect greenhouse gas emissions Other indirect greenhouse gas emissions Greenhouse gas emissions intensity Reduction of greenhouse gas emissions Emissions of ozone-depleting substances NO _x , SO _x , and other significant air emissions	EN15 EN16 EN17 EN18 EN19 EN20 EN21	42.3 87.1 85.1 72.1 73.6 78.6 45.3 56.2
	Total average dimension emissions		71.1
Effluents and waste	Total water discharge by quality and destination Total weight of waste by type and disposal method Total number and volume of significant spills Weight of transported, imported, exported, or treated waste deemed hazardous Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff	EN22 EN23 EN24 EN25 EN26	55.7 78.1 48.8 37.8 36.8
	Total average dimension effluents and waste		51.4
Products and services	Extent of impact mitigation of environmental impacts of products and services Percentage of products sold and their packaging materials that are reclaimed by category	EN27 EN28	68.7 37.8
	Total average dimension products and services		53.2
Compliance	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	EN29	55.0
	Total average dimension compliance		55.0
Transport	Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce	EN30	51.7
	Total average dimension transport		51.7
Overall	Total environmental protection expenditures and investments by type	EN31	52.2
	Total average dimension overall		52.2
Supplier environmental assessment	Percentage of new suppliers that were screened using environmental criteria Significant actual and potential negative environmental impacts in the supply chain and actions taken	EN32 EN33	54.7 48.3

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TABLE 4 (Continued)

Category	Description	Code	Reported
	Total average dimension supplier environmental assessment		51.5
Environmental grievance mechanisms	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	EN34	35.8
	Total average dimension environmental grievance mechanisms		35.8
	Total average—environmental		53.5

Abbreviation: IUCN, International Union for Conservation of Nature.

components. On the one hand, the term $\lambda_1 \sum_{j=1}^{p} |\beta_j|$ aims at sparse solutions (Ridge). On the other hand, the term $\lambda_2 \sum_{j=1}^{p} \beta_j^2$ (LASSO) promotes that highly correlated predictors have similar estimated coefficients.

4 | RESULTS

4.1 | Exploratory analysis

The results of the descriptive analysis of the environmental indicators are presented in Table 4. This table shows the relative frequency for each environmental indicator. This gives a first signal of which indicators are reported most frequently by the companies that constitute the sample and in turn which environmental categories are the most widely disclosed.

As you can see, on average, 53.50% of the companies studied regularly disclose all of the environmental indicators constituted in the G4 guide of the GRI. The percentage is higher on average for the indicators in the emissions, 71.1%, and energy categories, 69.9%.

The sustainability reports of the companies analysed reflect that the most reported environmental indicators are the following: "Energy consumption within the organization,"-EN3- of the energy subcategory, with 87.6%; "Direct greenhouse gas emissions (scope 1)"-EN15-and "Energy indirect greenhouse gas emissions (scope 2)"-EN16-of the emissions subcategory with 87.1% and 85.1%, respectively.

The indicators "Total number of IUCN red list species and national conservation list species with habitats in areas affected by operations, by level of extinction risk" EN14 and belonging to the biodiversity subcategory, and "Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms" EN34, belonging to the environmental grievance mechanisms subcategory, are the least reported with 29.9% and 35.8% disclosure, respectively.

Figure 1 shows the disclosure percentages for each of the environmental indicators proposed in the G4 guide.



FIGURE 1 Frequency of disclosure of each environmental indicator [Colour figure can be viewed at wileyonlinelibrary.com]



FIGURE 2 Elastic net HJ-biplot representations of environmental indicators according to institutional pressures [Colour figure can be viewed at wileyonlinelibrary.com]

4.2 | Elastic net HJ-biplot technique

Then, through a new methodology called Elastic net HJ-biplot, we assess the effect that institutional pressures exert on the revelation of environmental indicators. In the biplot representation, the environmental indicators are shown as arrows (vectors) and countries as points. In this way, we have a convenient visualization of the structure of countries in relation to environmental indicators and the impact of institutional pressures through regulatory, coercive, and mimetic forces (see Figure 2).

Companies located in collectivist countries show greater interest in disseminating environmental information. Feminists disseminate a certain group of environmental indicators common to those that are disseminated from the collectivist perspective such as EN9, EN11, EN14, and EN29. Also, a small number of indicators—EN1, EN2, EN28, EN30, and EN31—are disclosed by companies located in countries with a long-term orientation. On the contrary, certain normative aspects such as hierarchical distance or tolerance to uncertainty do not seem to influence the dissemination of environmental indicators, being somewhat indifferent on the part of the companies under study. Regarding the coercive pressures CSR_LAW, ERRI, and C_FINANCIAL, the results of the study show that they exert little influence on the dissemination of environmental information. Finally, the effect of Industrial Corporate Social Responsibility Practices Index is that it puts pressure on the dissemination of environmental indicators such as EN9, EN11, EN14, EN25, EN29, and EN34. The National Corporate Social Responsibility Practices Index, has more effect on the following indicators: EN1, EN2, EN28, EN30, and EN31. This shows that the dissemination of environmental indicators varies according to the industrial sector to which the company belongs or according to the country where it is located.

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All the representations performed in the elastic net HJ-biplot analysis were implemented by the package SparseBiplots (https://cran.rproject.org/web/packages/SparseBiplots/index.html).

4.3 | Prediction of environmental indicators

Next, 20 environmental indicators representing those with a percentage of disclosure below 55% are analysed. Regions that predict "presence" are coloured green and identify companies located in countries that receive greater institutional pressure, therefore, should be



FIGURE 3 Regions of prediction of environmental indicators [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE 5 Percentage classification in relation to unreported environmental indicat	tors
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			Percentage of poorly classified			
Code Indicator	R ²	Percentage correct classification	Indicators disclosed in environments with low institutional pressure	Undisclosed indicators in environments with high institutional pressure		
Materials						
EN1	0.72	85.08	6.96	7.96		
EN2	0.79	89.05	2.99	7.96		
Water and energy						
EN4	0.42	73.13	11.95	14.92		
EN9	0.71	84.08	10.45	5.47		
EN10	0.77	85.57	3.98	10.45		
Biodiversity						
EN11	0.78	89.55	3.98	6.47		
EN12	0.70	82.09	6.96	10.95		
EN13	0.71	83.58	7.96	8.46		
EN14	0.84	92.04	6.47	1.49		
Emissions, effluents and waste						
EN20	0.68	86.57	4.47	8.96		
EN24	0.79	86.57	5.97	7.46		
EN25	0.69	85.57	7.96	6.47		
EN26	0.74	88.06	4.98	6.96		

(Continues)

Maximum

		Percentage of poorly classified		
<i>R</i> ²	Percentage correct classification	Indicators disclosed in environments with low institutional pressure	Undisclosed indicators in environments with high institutional pressure	
0.61	81.09	10.95	7.96	
0.56	76.12	8.96	14.92	
0.65	85.57	6.47	7.96	
0.52	75.12	10.95	13.93	
nent				
0.64	81.59	6.96	11.45	
0.65	82.59	8.95	8.46	
anism				
0.53	82.09	10.95	6.96	
	83.76	7.46	8.78	
	73.13	2.99	1.49	
	R ² 0.61 0.56 0.65 0.62 0.64 0.65 0.63 0.53	Percentage correct classification R ² 2000 0.61 81.09 0.56 76.12 0.65 85.57 0.65 75.12 0.64 81.59 0.65 82.59 anism 382.09 0.53 82.09 83.76 73.13	Percentage of poorly classifiedIndicators disclosed in winnents with low institutional pressureR2Percentage correct classification0.6181.090.6276.120.6385.570.646.470.5275.120.6382.590.6481.590.6582.590.6582.590.6582.590.6582.590.6582.590.527.120.5382.0910.950.5382.0910.950.5382.0910.950.5382.0910.950.547.4610.55	

92.04

associated with greater transparency. That is, these are companies located in countries where the analysed indicator should be disclosed. On the other hand, regions that predict "absence" are coloured in pink and identify companies located in countries with lower institutional pressures (see Figure 3). In these regions, there is less institutional pressure and that implies a certain weakness, so companies located in these countries do not report the indicator.

For most environmental indicators, it can be noted that there is a high percentage of well-classified companies (green dots in the region shaded in green; pink dots in the region shaded in pink). In addition, depending on the indicator, there are several companies whose practice of disseminating the indicators would not be associated with their normative, coercive, or mimetic pressure (green dots in the pink region and pink dots in the green region). The green dots in the pink region refer to companies that report the indicator for reasons other than institutional pressures because in these countries the institutional pressures are moderate. The pink companies located in the green region are those that in the medium and long term will disclose these indicators mainly due to the normative and mimetic pressures they support.

In Table 5, we can see that the percentages of well-classified indicators are relatively high for all GRI environmental indicators that are least disclosed by companies. On average, approximately 84% of companies carry out practices for the dissemination of environmental information in accordance with the institutional pressures it supports.

This average is in a range between 92% for the indicator EN14 and 73.13% for the indicator EN4. Likewise, we identify that only 9% of companies (8.78%) will increase the information they issue in this regard as a result of the regulatory, coercive, and mimetic forces of their country of origin. Although, its effect is greater in those indicators that have less disclosure frequency (EN4, EN10, EN12, EN29, EN31, and EN32). On the other hand, it is evident that only 7.46% of companies are carrying out environmental dissemination practices not motivated by institutional pressures.

5 | DISCUSSION AND CONCLUSIONS

11.95

In this work, we have carried out a study of the environmental information reported in the CSR reports as established by the GRIstandardized framework of greater international diffusion. The study collects information from 34 environmental indicators corresponding to 201 companies from 15 countries.

Based on the empirical analysis of the GRI environmental indicators, the results indicate that 46% of large companies do not report the environmental indicators recommended in the G4 guide. The most widespread environmental indicators are those related to energy (70%) and emissions (71%). The indicators related to other aspects such as biodiversity (42%), materials (52%), and transport (52%) are the least disclosed by large companies. The deficiency found in the

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14.92

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dissemination of environmental information is in line with Cho and Patten (2007), who point out that companies publish environmental information that does not correspond to their actual performance.

In accordance with the neo-institutional approach, organizational archetypes originate from the common institutional environment and are disseminated through coercive, mimetic, and normative processes (Martínez-Ferrero & García-Sánchez, 2017). The results of this study determined that normative and mimetic pressures influence the dissemination of environmental information; unlike coercive pressures that do not appear to be determinants of this behaviour.

Regarding normative pressures, Hofstede (2001) dimensions have been widely used to study the relationship between cultural dimensions and environmental responsibility (Ioannou & Serafeim, 2012; Thanetsunthorn, 2015; Tsoy & Yonggiang, 2016). Our results reflect that companies located in collectivist countries tend to disseminate environmental information driven by this dimension of normative isomorphism. In addition, long-term orientation also seems to be a favourable element for the issuance of environmental information. In this sense, Gallego-Álvarez and Ortas (2017) argue that long-term orientation has a positive effect on social responsibility. In this same line of ideas, Graafland (2016), argues that the longer the company's time horizon, the more priority CSR will have. Cox, Friedman, and Tribunella (2011) and Peng et al. (2014) demonstrate the negative effect of the masculinity dimension on corporate environmental responsibility, a result that matches our findings. In relation to coercive pressures, our results coincide with Amran and Haniffa (2011) for whom the level of coercive isomorphism is not strong enough to encourage companies to disclose information in a meaningful way.

Finally, our study demonstrates that mimetic institutional pressures under a national and sectoral vision influence the practice of dissemination of environmental information. Therefore, we extend the empirical evidence prior to the effect that national, not only industrial, mimetic pressure has on corporate transparency. Previous studies only contrasted the effect of mimetic pressure at the sector level. Specifically, Amor-Esteban, Galindo-Villardón, and García-Sánchez (2018a) concluded that mimetic forces influence the obligation of companies in environmental terms. Jackson and Apostolakou (2010) are committed to similar regulations and general policies in industries to provoke a mimetic isomorphism. Martínez-Ferrero and García-Sánchez (2017) argue that companies that operate in industries interested in environmental issues are more likely to issue sustainability reports. Halkos and Skouloudis (2016) reinforce these arguments by stating that stakeholders have different areas of interest according to the industrial field. Therefore, the issuance of information depends precisely on the sector in which the company operates.

The results derived from this study have limitations. One of them is the transversal nature of the research. It would be convenient to conduct a longitudinal study in order to study the evolution of environmental dissemination practices and how companies' behaviour has changed over time, especially after the appearance of the GRI G4 guide and the integrated report that involves the union of financial and nonfinancial information.

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