GOVERNANCE STRUCTURES AND CORPORATE ENVIRONMENTAL REPORTING POLICY: AN INTERNATIONAL ANALYSIS

Abstract
Institutional contexts where firms are domiciled differ among countries and, consequently, environmental reporting policies of firms will depend on the institutional factors where companies operate. Investor protection, ownership dispersion and market-oriented financial systems, among others, are institutional features that determine the corporate governance of countries, varying the environmental disclosure of firms. Thus, the aim of this paper is to examine how these three institutional factors impact environmental reporting policies of firms in different countries. Institutional theory argues that companies localized in the same institutional setting tend to behave in similar ways and, therefore, the stakeholders' attitudes toward environmental reporting will be similar. The findings report that companies operating in countries with high ownership dispersion and where the most important capital providers are capital markets are most likely to disclose environmental issues, while firms domiciled in countries with strong investor protection are not associated with environmental disclosure policies.

Key words: Environmental reporting policy, corporate governance structures, investor protection, ownership dispersion, market-oriented financial system.

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1. Introduction

Firms are currently more engaged with corporate environmental issues as a result of the growing attention that society and stakeholders are paying to them. In this sense, stakeholders pressure companies to make significant corporate social responsibility (CSR) efforts (Brammer et al., 2007), such as environmental reporting, through which corporations disclose information concerning their public image, activities and aspirations associated with the environment. Thus, firms will be interested in being legitimized by society in general, and stakeholders in particular and, as a result, they will be expected to report environmental information.

Kolk and Pinkse's (2010) paper, based on a description of the organization Ethical Investment Research Services, states that corporate governance is a mechanism that leads to interaction between firms' managers, boards, shareholders and stakeholders. Good firm governance becomes a guarantee for shareholders in the sense of achieving fair profitability for their investments, and for stakeholders in becoming confident that firms are positively involved with environmental and social matters. Thus, corporate governance structures affect corporate environmental reporting policies of firms.

However, corporate governance models are not the same in all countries, since they employ different mechanisms to supervise and run firms. In line with Fernández-Sánchez et al. (2011) and Thomsen and Coyon (2012), we can differentiate between the Anglo-American corporate governance model, where countries are mainly based on a common law legal system, and the European model, where countries are based on a civil law legal system. The most relevant features of Anglo-American corporate governance structures are high ownership dispersion, a financial system oriented towards markets, strong investor protection (common law legal system), shareholder orientation and the scarce presence of dominant owners in firms, while European structures demonstrate high ownership concentration, weak investor protection (civil law legal system), a financial system oriented toward the banks, stakeholder orientation and the presence of a small number of controlling shareholders in companies, among others. Li et al. (2008) find that some corporate governance attributes such as ownership structure (concentration or dispersion) and type (institutions, individual or families), board composition and audit committee size and activity affect intellectual capital disclosure. This argument can be extended to environmental reporting policies of countries

whose businesses operate in different corporate governance structures. These differences may determine the way in which firms govern and do business, as well as the social and environmental orientation and attitude of shareholders and managers and, therefore, the decision-making process of firms and their behavior respecting environmental disclosure may be influenced.

The analysis of the association between corporate governance and alternative forms of firm disclosing has received growing attention in empirical research (e.g., Ben-Amar and McIlkenny, 2015; Helfaya and Moussa, 2017; Jizi, 2017). However, there is scarce evidence as to which corporate governance characteristics, of either the Anglo-American or European model, tend to endorse companies' voluntary reporting (e.g., Jensen and Berg, 2012; Fasan et al., 2016), particularly with regards to environmental matters. Thus, in this research we aim to examine which corporate governance features of countries of both models (Anglo-American and European) – namely, investor protection, ownership structure and financial system – are more likely to encourage environmental disclosure. In this way, we try to fill this gap in prior literature from an international perspective. Given the benefits that environmental reporting might provide to all stakeholders, such as reducing information asymmetries and the cost of capital (Lev, 1992; Leuz and Verrecchia, 2000), the investigation of this topic merits our interest.

Our findings report that firms domiciled in countries with higher ownership dispersion and higher market orientation are more involved with environmental disclosure policy – that is, firms of these countries tend to report environmental information voluntarily, while countries with strong investor protection do not engage with environmental reporting. Thus, we contribute to previous research in several ways. Firstly, this evidence suggests that corporate governance characteristics such as ownership dispersion and market orientation are positively associated with environmental disclosure policy. These two features are more common in the Anglo-American corporate governance system and, consequently, nations that adopt this governance model will tend to report more environmental matters than countries with high ownership concentration and bank-oriented characteristics of European corporate governance models. Secondly, investor protection in countries is not a factor to take into account when firms of nations decide whether to report environmental issues. Thus, environmental reporting policy, among countries with different corporate governance models, does not depend on the legal system that regulates the level of investor protection of the country. Secondly, our results seem to show that the corporate governance model adopted by a country, particularly some governance characteristics, positively impact the environmental

disclosure strategies of firms, while other features do not. Finally, we have used 69 variables for measuring environmental reporting of firms, using statistical techniques that have allowed us to obtain a numerical value for each of the environmental issues of companies that we include in our research. At the same time, it is important to highlight that this environmental reporting is adapted to the international standards of the Global Reporting Initiative (GRI, 2016), a consolidated set of GRI sustainability reporting standards that will take effect by 2018. These standards provide support for our research, in the sense that firms comply with standards that are more established around the world.

The remainder of the paper is organized as follows. In the next section, the theoretical framework and the hypotheses are described. The third section provides the methodology and the variables used. The fourth section analyzes the results and, finally, in the fifth section, the conclusions and implications of our findings are drawn.

2. Theoretical framework and hypotheses

Stakeholder theory is one of the most widely accepted approaches for analyzing firms' corporate disclosure, such as environmental reporting (e.g., Huang and Kung, 2010; Montiel and Delgado-Ceballos, 2014). Stakeholder theory is based on the expectations of a firm's stakeholders and, as a result, companies' responsibilities go beyond the shareholders, since firms not only consider shareholders, but also all stakeholders. Thus, stakeholders will expect firms to voluntarily disclose CSR matters such as environmental information, because it helps them mitigate information asymmetries and capital cost, among others, and assess how companies engage with social responsibility behaviors – for instance, if firms are involved, or not, with environment and pollution issues. In cases where this engagement is not perceived, stakeholders have the power to commit firms to environmental issues (Brammer et al., 2007). Hence, the pressure of companies' stakeholders becomes a relevant tool in driving management teams to disclose environmental matters. Furthermore, companies can gain legitimacy, identity and a better reputation when reporting environmental issues (Hooghiemstra, 2000).

Furthermore, institutional theory focuses on the deeper aspects of social structures. According to this theory, structures that include routines, norms, schemas and rules are established as authoritative guidelines for social behavior. These structures are socially acceptable and legitimate within their organizational fields (Scott, 1995), regardless of their actual effectiveness. This process, known as "isomorphism," according to DiMaggio and Powell (1983), suggests that companies operating under the same institutional setting are

pressured to behave in a similar way. This leads firms within a particular context to become homogeneous and, thus, all these companies will adopt, for instance, the same corporate governance model. Jensen and Berg (2012) argue that national institutional characteristics may institutionalize firms' processes as a legitimacy mechanism. Conformity with any minimum disclosure policies encourages legitimacy, since stakeholders do not participate in the management of the company and they give importance to environmental information and risk management practices. This explains why companies adopt several procedures and policies, such as voluntarily disclosing environmental information, in order to enhance their perceived legitimacy rather than to improve their operations (DiMaggio and Powell, 1983; Scott, 1995). Accordingly, their activities are less likely to be questioned and the company has greater access to external resources for survival, since there is less perceived risk associated with the company. However, social, economic, cultural and legal variables, among others, differ among countries, which might vary stakeholders' pressure concerning environmental disclosure policies. In this sense, Fasan et al. (2016), who also focus on institutional theory, contend that the pressure exerted by stakeholders depends on the different institutional factors of the environment where firms operate, such as financial, political or educational factors, among others. Hence, companies operating in regions or countries with similar institutional characteristics will tend to behave in the same way and, accordingly, the stakeholders' attitude toward CSR practices, such as environmental reporting, will be similar, according to these institutional features. These ideas are supported by Matten and Moon (2008), who developed a theoretical framework based on an institutional approach, describing how dissimilar institutional settings lead to different CSR practices. Jensen and Berg (2012) and Fasan et al. (2016) also demonstrate that a country's institutional features drive integrated reporting and its quality. Consequently, and following Jensen and Berg (2012) and Fasan et al. (2016), we analyze how three institutional factors in different countries, particularly institutional protection, ownership dispersion and a market-oriented financial system, affect environmental disclosure within these countries.

Investor protection

Laws on investor protection differ across countries, since rights of investors, such as voting power or legal protection against expropriation by management, are dissimilar. Thus, being a shareholder in one country does not give the same rights as in another country and, therefore, there are some countries with high investor protection and others with weak protection. Jensen and Berg (2012) and Fasan et al. (2016) argue that those countries with

high investor protection attend to shareholders demands and needs. As a result, as Jackson and Apostolakou (2010) show, companies substitute for high investor protection by implementing stronger CSR mechanisms involved with social and environmental matters, such as their reporting. Given that the role of investors is highly institutionalized, companies might counterbalance this investor orientation by adopting more extensive activities engaged with the environmental and social dimensions of CSR, for instance, disclosing more environmental and social issues, in order to provide a correlate role for other social collectives or employees (Jackson and Apostolakou, 2010).

La Porta et al. (2002) also show that firms domiciled in countries with strong investor protection are positively assessed by capital markets, given that agents who trade with stocks do not want to pay more for them. Thus, companies operating in countries with better laws protecting and defending shareholders' rights and interests will be highly valued by capital markets and, as a consequence, management teams will have fewer incentives to obtain private benefits and expropriate shareholders' wealth, since capital markets may detect these behaviors. In this vein, these firms will be more likely to disclose environment matters in order to be evaluated highly by capital markets.

Hence, based on the above arguments, we posit the following hypothesis:

Hypothesis 1: Firms domiciled in countries with strong investor protection are positively associated with environmental reporting policies.

Ownership dispersion

Ownership structure impacts the owners' monitoring role of the management team, since shareholders have the power to impose their will, thus impacting the extent of voluntary reporting (Li et al., 2008; Samaha and Dahawy, 2011). So, a higher ownership concentration will imply that controlling shareholders will have more power to influence firms, which is in contrast with ownership dispersion, whereby owners do not have so much power. In this sense, companies with ownership dispersion do not widely supervise managers and, therefore, it is presumed that managers are more accountable to owners, leading to more voluntary reporting, such as that on environmental issues (Khan et al., 2013a).

Furthermore, while controlling shareholders do not depend on information disclosed by companies, because they can directly access it from firms, shareholders in companies with dispersed ownership are less likely to have direct access to any kind of information. This means that dominant shareholders will not be interested in reporting voluntary information such as environmental issues, because they do not need additional reporting (Fasan et al.,

2016), which is in contrast to dispersed owners, who will be more engaged with social and environmental information; thereby, many owners holding small stakes of stocks will have a higher need for firms' voluntary disclosure.

This view is supported by past research (e.g., Adams and Hardwick, 1998; Cox et al., 2004), which suggests that ownership dispersion leads to an increase in managers' sensitivity to environmental and social issues, since the decision-making process of firms is influenced by several diverse investors, such as owners with ethical, social and environmental concerns. According to Simerly and Bass (1998), ownership structure determines the environmental and social perspective of corporate governance, since each investor has his/her own environmental and social orientation. Thus, the stake of shares held by shareholders will influence a firm's attitude toward environmental and social issues. This leads us to expect that ownership structure may affect environmental reporting policies of firms.

Authors such as Hossain et al. (1994) and Chau and Gray (2002) show that dispersed firms are more likely to report information voluntarily – for instance, on environmental issues. In dispersed companies, it is less common to find dominant or controlling shareholders, who may expropriate minority owners disclosing fewer voluntary matters to them. Thus, the lack of these dominant shareholders in companies with ownership dispersion will encourage environmental reporting policies. In the same line, Brammer and Pavelin (2006) and Khan et al. (2013b) also find that dispersed ownership companies are more likely to disclose environmental and CSR issues voluntarily.

Therefore, according to the above views, we posit the following hypothesis:

Hypothesis 2: Firms domiciled in countries with high ownership dispersion are positively associated with environmental reporting policies.

Market-oriented financial system

Among the different classifications used for distinguishing countries from one another, we focus on the distinction between market- and bank-based financial systems (Demirguc-Kunt and Levine, 1999). Jensen and Berg (2012) and Fasan et al. (2016), among others, also employ this categorization. In bank-oriented financial systems, banks perform a crucial role in allocating capital to firms, while in market-based structures, this role is played by capital markets. Thus, in countries with market-oriented financial systems, stakeholders – particularly minority shareholders, which form the most common ownership structure in countries with strong investor protection – do not usually have direct access to a firm's information, which they need for taking decisions such as allocating funds to firms by buying

shares. In these countries, companies have to get financial support from stakeholders, since they cannot depend on bank funding and, consequently, companies will have to report not only compulsory information such as financial statements, but also further information focused on social and environmental matters, among others. In contrast, in countries with bank-based structures, companies and other financial entities maintain business relations and, therefore, banks can easily obtain a firm's data, such as social and environmental information, without the need for additional reporting by the firm (e.g., Ali and Hwang, 2000).

Hence, it is expected that stakeholders will demand more environmental information in market-based systems than in bank-based systems. This hypothesis is supported by past literature (e.g., Belz and Schmidt-Riediger, 2010; Jansson, 2011), which suggests that market-oriented firms may take into account environmental matters as an opportunity to meet stakeholders' demands, such as those of customers. Fasan et al. (2016) also find that there is an increase in the quality of integrated reporting disclosure across the market-oriented countries, concluding that these countries exert higher institutional pressure on firms, which leads to a better level of integrated reporting quality.

This evidence shows that for economies in market-oriented structures, where the role of all stakeholders is essential as commented above, the diversity of stakeholders will press companies to implement different strategies, including voluntary disclosure. This implies engagement with CSR activities and can be employed as a company strategy in improving reputation and in satisfying stakeholders' demands (e.g., Gelb and Strawser, 2001), and firms will thus consider it as a key management strategy to fulfill stakeholder's information demands (Buysese and Verbeke, 2003).

Hence, based on all these perspectives, we posit the following hypothesis:

Hypothesis 3: Firms domiciled in countries with market-oriented financial systems are positively associated with environmental reporting policies.

3. Research methods

3.1. Sample description

Of the initial sample comprising 5,405 international companies, whose information was obtained from the Thomson Reuters Eikon database, we eliminated 112 companies, since it was not possible to find information on one of the independent variables: investor protection. Thus, the final sample of companies is 5,293, corresponding to the year 2015.

Table 1 shows the number of companies by country and Table 2 shows the number of companies by sector of activity, according to the Global Industry Classification Standard (GICS). In total, the sample comprised 39 countries and 10 sectors of activity.

INSERT TABLE 1 HERE

Table 1 shows that the United States is the country with the largest number of companies in the sample, at 3,456, while other countries such as Argentina and Sweden only present four observations each. In Table 2, the maximum number of companies corresponds to the Information Technology sector, with 908 companies. This sector includes companies dedicated to software, services, technology, hardware and equipment. Secondly, there are 786 companies in the Materials sector, comprising mining, metals and chemicals. The Real Estate sector is the one with the least number of companies present in the sample.

INSERT TABLE 2 HERE

3.2. Dependent variable

The dependent variable in the present research study is environmental reporting, which we represent by "ER." The way to obtain and measure this type of information has varied considerably over the years. In the first investigations, it was achieved by perusing annual reports to obtain the number of pages, words or phrases containing environmental information (Deegan and Gordon, 1996; Al-Tuwaijri et al., 2004). Other investigations have assigned binary variables (1, 0) to indicate the presence or absence of environmental information in companies' sustainability reports (Dangelico and Pontrandolfo, 2010). Subsequent research (e.g., Meng et al., 2013) has broken down such information in a more detailed way, by assigning values from 0 to 3, specifying whether the information is described in monetary form, in general, or not at all.

Although these techniques have been very useful, we consider that it may be of great interest to use a different technique that can better represent the environmental reporting of a large number of companies from different countries around the world (Boyce et al., 2016). To do so, we use statistical techniques such as categorical principal component analysis (CATPCA) and partial triadic analysis (PTA), which allow us to obtain a numerical value for each of the environmental issues of companies that we include in our research. From this analysis, we obtain 69 variables that indicate environmental reporting. At the same time, we analyze whether this environmental reporting is adapted to the international standards of the Global Reporting Initiative (GRI, 2016) – specifically, the consolidated set of GRI sustainability reporting standards that will take effect by 2018. To verify this relation, we performed between-groups analysis (BGA) for the same matrix with the 5,293 companies and

the 69 indicators that reflect the environmental reporting of the companies obtained in the previous analysis. This analysis revealed that the eight groups of environmental indicators proposed by the GRI (2016) to be implemented in 2018 correspond to the 69 indicators presented in the environmental reporting of the companies under study, as shown in Table 3.

INSERT TABLE 3 HERE

3.3. Independent variables

We use specific variables that condition the structure of companies' corporate governance as independent variables in the present study: investor protection, ownership dispersion and market-oriented financial system.

Investor protection is measured by an index with values defined between 0 and 10, and the higher the value of the index, the greater the investor protection. This index is denoted by INVPRO. INVPRO is computed by the International Finance Corporation and the World Bank (IFC and World Bank, 2016). Authors such as Jackson and Apostolakou (2010) and Choi and Wong (2007) consider that in countries with high investor protection it is crucial to meet the needs of shareholders and, therefore, in those countries, reporting on environmental activities is important. Common law countries (e.g., UK, Canada, United States) have the greatest investor protection and, as a result, the companies in these countries are the most likely to make their environmental reporting known.

Ownership structure is an important element of the institutional context, as it indicates how owners, workers, and management interact (Aguilera and Jackson, 2003). In addition, according to Samaha and Dahawy (2011), the ownership structure of a company determines the level of monitoring and, thus, affects the extent of voluntary disclosures. In this vein, ownership concentration impedes market strength and strongly influences managerial performance, leading to a stock market and corporate control that are almost non-existent (Weimer and Pape, 1999). Majority shareholders have control of the company, and there are close personal relationships of trust between them, management and board members, such that companies with a structure of ownership concentration may have less voluntary corporate disclosure. By contrast, ownership dispersion refers to many shareholders who have a small proportion of shares (La Porta et al., 1999), and this structure is present in organizations in developed economies such as the United States and the United Kingdom. In fact, authors such as Tagesson et al. (2009) found a negative effect of ownership concentration on social and environmental information disclosed on corporate websites. To determine which countries have ownership dispersion, we use the classification made by Hall and Gingerich (2004), the

Organization for Economic Cooperation and Development (OECD, 2017) and Jensen and Berg (2012). This independent variable is represented as OWNEDISP.

Another of the independent variables to be tested is how companies finance themselves. According to Freeman et al. (2007), capital providers are important stakeholders for organizations, since they are the ones that finance their operations, through two mechanisms: the market-based financial system (e.g. the United States) and the financial system based on bank credit (e.g. France, Germany) (Whitley, 1999). As regards the role of financial markets, capital providers are important actors for organizations, since they finance commercial operations (Freeman et al., 2007), as well as investment and, therefore, condition the evolution and survival of companies. In some countries, such as the United States, the stock market is the central financial resource of companies, because they obtain their capital in the stock market and shares are relatively dispersed among the shareholders. As a consequence, companies have to provide a high degree of transparency and accountability to their investors, and social and environmental reporting falls within this type of transparency. However, when the companies are financed by bank credit, the companies themselves provide the financial entities with information directly and, consequently, less information is disclosed, whether financial or social and environmental (Ali and Hwang, 2000; Mayer, 1990). To represent market-oriented financial systems, we use the variable MKORFINSYS.

3.4. Control variables

Regarding the control variables, we use the variable SIZE to represent firm size. Many studies have previously found that size positively influences organizational reporting (Al-Tuwaijri et al., 2004; Brammer and Pavelin, 2008; Haddock-Fraser and Fraser, 2008; Stanny and Ely, 2008; Tagesson et al., 2009), arguing that large firms often attract greater attention to their environmental performance than smaller firms and, therefore, face greater pressure to disclose more environmental information than smaller companies.

With the LEVERAGE variable, companies evaluate financial risk and the availability of financial resources within a company (Meng et al., 2013), so that a company with high indebtedness could be closer to a breach of its debt pacts and may have higher capital and risk costs (Karim et al., 2006). Environmental reporting may be affected by indebtedness, since companies with excessive debt may not have the necessary funds for communication practices with interested parties, such as the presentation of environmental information. A relationship between these two variables has not been found unanimously in previous studies, and authors

such as Freedman and Jaggi (2005), who suggest that leverage is not a determining factor for the disclosure of environmental reporting of companies, can be highlighted.

ROA (return on assets) is a variable that measures business profitability. The most profitable companies are thought to be the ones that will disclose more information on environmental issues, since the less profitable companies will give greater importance to other issues that affect business profits more directly (Roberts, 1992). Regarding previous research, some authors (Ismail and Chandler, 2005) have found a positive relationship, arguing that if managers have the capacity to make companies profitable, they will also have the ability to disclose all the social and environmental aspects related to the company. However, other authors, such as Clarkson et al. (2008), conclude in their research that there is no relationship between environmental reporting and profitability and, for Wallace and Naser (1995), the relationship between these variables is negative.

The activity sector of the company is measured by the variable SECTORS. This is also a variable that can influence the disclosure of environmental reporting. Several authors (e.g., Campbell, 2003; Boyer and Kiumar, 2007; Cho and Patten, 2007; De Villiers and Marques, 2016) show that companies in more sensitive sectors may disclose more environmental information to show their legitimacy as they face more stringent government oversight. Jenkins and Yakovleva (2006) also find that firms in certain sectors such as the oil, chemical, and mining industries are more likely to report on environmental issues, while financial sector firms generally focus on philanthropic and social needs.

3.5. Econometric model

Starting from the baseline model, several models are used to test the hypotheses:

Environmental Reporting = f (investor protection, ownership dispersion, market-oriented financial system, size, leverage, ROA, activity sectors)

Model 1 can be empirically estimated using the following equation.

$$\mathbf{ER_i = \beta_0 + \beta_1 INVPRO_i + \beta_2\ SIZE_i + \beta_3 LEVERAGE_i + \beta_4 ROA_i}$$
$$\mathbf{+\beta_5 SECTORS_i + \varepsilon \quad (1)}$$

Model 2 can be empirically estimated using the following equation:

$$\mathbf{ER_i = \beta_0 + \beta_1 OWNEDISP_i + \beta_2\ SIZE_i + \beta_3 LEVERAGE_i + \beta_4 ROA_i}$$
$$\mathbf{+\beta_5 SECTORS_i + \varepsilon \quad (2)}$$

Model 3 can be empirically estimated using the following equation:

$$\mathbf{ER_i = \beta_0 + \beta_1 MKORFINSYS_i + \beta_2\ SIZE_i + \beta_3 LEVERAGE_i + \beta_4 ROA_i}$$
$$\mathbf{+\beta_5 SECTORS_i + \varepsilon \quad (3)}$$

Where:

ER_i is the index of disclosure of environmental reporting of a company obtained from the Thomson Reuters Eikon database, as shown in Table 3; $INVPRO_i$ is an index that ranges from 0 to 10, so that the higher the value, the greater the investor protection; $OWNEDISP_i$ is a dummy variable equal to 1 when the company belongs to a country characterized by ownership dispersion and 0, otherwise; $MKORFINSYS_i$ is a dummy variable equal to 1 when the company belongs to a country with a market-oriented financial system and 0, otherwise; $SIZE_i$ is the firm size measured by the log of total assets of the company; $LEVERAGE_i$ is the leverage ratio of a company computed as the ratio between its total debt and stockholders' equity; ROA_i is the return on assets of a company measured as the ratio between operating income and total assets; $SECTORS_{ik}$ is a dummy variable that takes the value 1 if the company belongs to the sector k and 0, otherwise. Ten sectors are considered in this study: consumer discretionary, consumer staples, energy, healthcare, industrials, information technology, materials, real estate, telecommunications services and utilities.

The models (1, 2 and 3) were tested empirically using a linear regression estimated by ordinary least squares. As explained above, the dependent variable was obtained from the environmental information contained in the Thomson Reuters Eikon database. The independent variables were obtained from different sources of information, and the control variables were obtained from the economic-financial data available on the Thomson Reuters Eikon database.

4. Results

4.1. Descriptive analysis

Table 4 shows the most relevant descriptive statistics. The dependent variable ER shows an average value of 0.016 and a standard deviation of 0.896. With respect to the variable that represents investor protection, the average value is 6.614, being within the 0–10 limits by which the index is measured, and thus the countries where the firms in the study are domiciled have an above-average value for investor protection. With regard to OWNEDISP, the average value of 0.837 indicates that companies in the sample belong to corporate environments where there is high ownership dispersion. In the case of MKORFINSYS, with a mean value of 0.864, the sample companies are shown to be in contexts with a primarily market-oriented financial system. As for the other variables, the average value of ROA is negative, indicating that companies in the sample for the target period of the study show a negative average performance, although the high standard deviation means that there is

variability in the companies with respect to their results. That is, some companies provide high positive results while, in contrast, other companies provide high negative results.

It can be deduced from the correlation matrix[1] that, among the variables studied, the control variable SIZE is the one showing the highest correlation with the dependent variable, ER, at 0.3222. The independent variables are the ones showing the highest correlation: OWNEDISP and INVPRO have a correlation of 0.3229, OWNEDISP and MKORFINSYS have a correlation of 0.3984, and MKORFINSYS and OWNEDISP have the highest correlation, at 0.7869 (none of these correlations is higher than 0.8, and thus there are no problems of multicollinearity).

INSERT TABLE 4 HERE

4.2. Multivariate analysis

Table 5 shows the results obtained for the three models proposed for testing our hypotheses.

INSERT TABLE 5 HERE

Model 1, in which the independent variable is INVPRO, has an explanatory power (R-squared) of 12.50% for a confidence level of 99% (p-value <0.01).

Considering each of the variables individually, INVPRO is not statistically significant and, therefore, investor protection does not affect the environmental reporting of companies and H1 is not accepted. This means that investor protection makes no difference as to whether companies disclose environmental reporting or not. This result reveals evidence against what we had posited: that in countries with high investor protection it is crucial to meet the needs of shareholders and in those countries the reporting of environmental activities is important.

In Model 2, we test how OWNEDISP affects the environmental reporting of companies, and in this case the model has an explanatory power (R-squared) of 13.06% for a confidence level of 99% (p-value <0.01). The independent variable OWNEDISP is positive and statistically significant for a confidence level of 99% (p-value <0.01); we therefore accept hypothesis H2. Thus, ownership structure indeed influences the environmental reporting carried out by companies. In fact, the companies with ownership dispersion are the ones that tend to publish environmental information.

Model 3 has an explanatory power (R-squared) of 12.92% for a confidence level of 99% (p-value <0.01). The independent variable MKORFINSYS is positive and statistically significant for a confidence level of 99% (p-value <0.01); therefore, we accept hypothesis H3. This evidence reveals that the way companies finance themselves does indeed influence their environmental reporting. Specifically, when companies are financed in the capital market,

they need to provide more informative transparency, and in this sense, environmental issues come within this kind of transparency.

Regarding the control variables, they all behave the same in the three models. SIZE shows a positive and statistically significant relationship with a significance level of 99% (p-value <0.01), LEVERAGE does not show any statistical significance in our model, whereas the company's profitability as measured by ROA does in fact affect the dependent variable, with a statistical significance of 99% (p-value <0.01). However, it must be noted that the significance is negative, which indicates that the higher the ROA, the less companies will disclose on their environmental issues. In relation to the variable that represents the different types of industries (SECTORS), except for utilities, all are positive and statistically significant, from which it can be deduced that the different activities of companies do indeed influence corporate environmental reporting. The significance is greater for sectors such as materials, at 99% (p-value <0.01); this sector includes mining, metals and chemical activities that are very sensitive to environmental issues.

5. Discussion and conclusions

Voluntary reporting by firms, such as that of environmental matters, is receiving a lot of attention from companies and stakeholders. On the one hand, stakeholder theory claims that there are many economic agents interested in understanding firms' environmental behavior and, therefore they will demand information on the environmental impact of their activities (Huang and Kung, 2010; Montiel and Delgado-Ceballos, 2014). According to Hooghiemstra (2000), when firms disclose environmental information, they can achieve identity, legitimacy and an improved reputation. On the other hand, institutional theory also argues that firms voluntary report environmental information because adopting these policies improves their legitimacy, which is a relevant aspect of social structure as a guide for social behavior. This implies that companies domiciled in the same institutional context tend to behave similarly, pressured by the society of this particular setting, which may be different to other contexts. Accordingly, in this analysis we aim at examining how three institutional features in different countries, particularly institutional protection, ownership dispersion and market-oriented financial system, impact environmental reporting of these countries.

The results of our paper show that companies located in countries with higher ownership dispersion and higher market orientation are engaged with environmental reporting policy – that is, companies of these countries tend to disclose environmental issues voluntarily, while countries with strong investor protection are not associated with

environmental disclosure. Regarding ownership dispersion, our findings are in line with those obtained by Brammer and Pavelin (2006) and Khan et al. (2013b), who show that investors in dispersed companies are especially interested in showing their socially responsible behavior by reporting environmental or CSR matters, because their image and reputation are strongly linked to the ethical and responsible behavior of the firm in which they have invested and hold a directorship. Furthermore, stock markets are relevant actors for firms, since they provide financial support for commercial operations (Freeman et al., 2007) and investments, and thus they determine the evolution and survival of organizations. In some countries, the capital market is the main supplier of financial resources of firms, and this situation forces companies to provide their investors with higher transparency and accountability, with that being social and environmental disclosure within this type of transparency.

Our findings have several implications. Firstly, our measure of environmental reporting can be useful for all stakeholders, particularly companies, practitioners, shareholders and potential investors, because despite taking into account 69 variables, it is easy to construct. Hence, regulators may support an initiative that endorses firms to report environmental matters using easy environmental disclosure indexes in order to be better understood by all stakeholders. Furthermore, our evidence finds that the institutional setting in which companies operate, determines if a firm discloses environmental issues. Consequently, international regulatory bodies should reinforce their efforts with the purpose of harmonizing certain institutional factors among different countries. Secondly, our results may encourage further researchers to investigate other institutional features that might explain environmental disclosure policies of firms as well as other environmental reporting indexes. Thirdly, the measurement of environmental disclosure creates possibilities for researchers to analyze the relation of disclosure to other variables that are of interest to social scientists and policymakers, such as corporate governance and finance variables, voting behavior, and state environmental policies.

Likewise, the results obtained can be considered as a starting point for future research on the subject, since the method could be extended to consider a greater number of years and, at the same time, new variables in the corporate governance area.

Notes

[1] The matrix of correlations has been made but not presented in the paper for reasons of space; it can be requested from the authors, who will gladly provide it.

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Table 1
Number of companies by country

Country	Companies	Percentage	Country	Companies	Percentage
Argentina	4	0.08%	Netherlands	27	0.51%
Australia	73	1.38%	New Zealand	6	0.11%
Belgium	6	0.11%	Norway	32	0.60%
Canada	447	8.45%	Peru	25	0.47%
Chile	52	0.98%	Philippines	12	0.23%
China	217	4.10%	Puerto Rico	7	0.13%
Colombia	5	0.09%	Russia	18	0.34%
Cyprus	16	0.30%	Singapore	96	1.81%
Denmark	10	0.19%	South Africa	13	0.25%
Egypt	6	0.11%	South Korea	7	0.13%
France	7	0.13%	Sweden	4	0.08%
Germany	7	0.13%	Switzerland	28	0.53%
Greece	24	0.45%	Taiwan	14	0.26%
Hong Kong	111	2.10%	Ukraine	10	0.19%
India	6	0.11%	United Arab Emirate	10	0.19%
Indonesia	86	1.62%	United Kingdom	186	3.51%
Ireland	37	0.70%	United States	3456	65.29%
Israel	153	2.89%	Zimbabwe	42	0.79%
Luxembourg	16	0.30%	**Total**	**5,293**	**100,00%**
Malaysia	6	0.11%			
Mexico	11	0.21%			

Table 2
Number of companies by activity sector

GICS Industry group name	Number of companies	Percentage
Consumer Discretionary	712	13.45%
Consumer Staples	386	7.29%
Energy	750	14.17%
Healthcare	731	13.81%
Industrials	740	13.98%
Information Technology	908	17.15%
Materials	786	14.85%
Real State	16	0.30%
Telecommunications Services	98	1.85%
Utilities	166	3.14%
Total	**5,293**	**100.00%**

<div align="center">

Table 3
Environmental reporting disclosure

</div>

Materials-Consolidated GRI standards 301

1. Resource reduction policy
2. Policy sustainable packaging
3. Environmental materials sourcing
4. Environmental products
5. Eco-designs product
6. Hybrid vehicles
7. Product environmental responsible use
8. Agrochemical products
9. Noise renewable/clean energy products
10.Sustainable building products

Energy-Consolidated GRI standards 302

1. Policy energy efficiency
2. Energy use
3. Renewable energy use
4. Renewable energy supply
5. Energy use total
6. Energy purchased direct
7. Energy produced direct
8. Indirect energy use
9. Electricity purchased
10. Renewable energy purchased
11. Renewable energy produced
12. Renewable energy use

Water- Consolidated GRI standards 303

1. Policy water efficiency
2. Water use
3. Water withdrawal total
4. Fresh water withdrawal total
5. Water recycled
6. Discharge into water system
7. Water discharged
8. Water pollutant emissions
9. Water technologies

Biodiversity- Consolidated GRI standards 304

1. Biodiversity impact reduction

Emisions- Consolidated GRI standards 305

1. Toxic chemicals reduction
2. Policy emissions
3. Greenhouse gas emissions
4. CO_2 equivalents emission total
5. CO_2 equivalents emission direct
6. CO_2 equivalents emission indirect
7. CO_2 equivalent indirect emissions, scope 3
8. Emissions trading
9. NOx and SOx emissions reduction
10.NOx emissions
11.SOx emissions
12.VOC emissions reduction
13.Particulate matter emissions reduction
14.VOC emissions

Effluents and waste- Consolidated GRI standards 306

1. Total waste
2. Waste recycling ratio
3. Hazardous waste
4. Waste reduction
5. e-Waste reduction

Environmental compliance- Consolidated GRI standards 307

1. Environment management team
2. Environment management training
3. Land environmental impact reduction
4. Environmental controversies
5. Climate change commercial risks opportunities
6. EMS certified percent
7. Environmental investments initiatives
8. Environmental asset under management
9. ISO 14000 or EMS
10. Environmental expenditures
11. Equator principles
12. Environmental restoration initiatives

Supplier environmental assessment- Consolidated GRI standards 308

1. Policy environmental supply chain
2. Environmental supply chain management
3. Environmental supply chain monitoring
4. Environmental supply chain partnership termination
5. Environmental provisions
6. Environmental partnerships

Table 4
Descriptive analysis

Variable	Mean	Std. Dev.
ER	0.016	0.896
INVPRO	6.614	0.755
OWNEDISP	0.837	0.368
MKORFINSYS	0.864	0.341
SIZE	8.285	1.428
LEVERAGE	2.311	47.437
ROA	-108.842	3260.243
Consumer discretionary	0.268	9.789
Consumer staples	0.145	5.310
Energy	0.283	10.311
Health care	0.276	10.311
Industrials	0.279	10.050
Information technology	0.343	10.174
Materials	0.296	12.482
Real state	0.006	10.806
Telecommunication services	0.037	1.353
Utilities	0.062	2.287

Table 5
Multivariate analysis results

EMVIRONMENTAL REPORTING (EM)	MODEL 1 Coef. P>|t|	MODEL 2 Coef. P>|t|	MODEL 3 Coef. P>|t|
INVPRO	0.0013527		
	(0.954)		
OWNEDISP		0.1708375***	
		(0.001)	
MKORFINSYS			0.1576426***
			(0.003)
SIZE	0.2268189 ***	0.2353103***	0.233474***
	(0.000)	(0.000)	(0.000)
LEVERAGE	-0.0000189	-.00000591	-0.0000493
	(0.925)	(0.771)	(0.806)
ROA	-0.0000107***	-0.0000107***	-0.0000107***
	(0.000)	(0.000)	(0.000)
Consumer discretionary	0.1504435**	0.1748192**	0.1381624*
	(0.048)	(0.027)	(0.071)
Consumer staples	0.1836874***	0.1735665**	0.1623256**
	(0.009)	(0.019)	(0.027)
Energy	0.1861218***	0.1603074**	0.1622724***
	(0.003)	(0.010)	(0.008)
Health care	0.3535505***	0.3426244***	0.3384103***
	(0.000)	(0.000)	(0.000)
Industrials	0.1607046**	0.1658373**	0.1496259**
	(0.019)	(0.020)	(0.032)
Information technology	0.228861***	0.2213828***	0.2102448***
	(0.001)	(0.001)	(0.001)
Materials	0.4841437***	0.4493154***	0.4415662***
	(0.000)	(0.000)	(0.000)
Telecommunication services	0.4434009**	0.4249452**	0.4207446**
	(0.033)	(0.041)	(0.043)
Utilities	-0.0506186	-0.1044155	-0.1133137
	(0.695)	(0.443)	(0.411)
_cons	-1.966312***	-2.125489***	-2.103475***
	(0.000)	(0.000)	(0.000)
R-squared	12.50%	13.06%	12.92
F	12.34***	12.39***	12.39***

*p-value<0.1 **p-value<0.05 ***p-value<0.01