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Corporate social responsibility disclosure and market valuation: evidence from Spanish listed firms

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Abstract Using a sample of listed Spanish companies pertaining to the IBEX35 index for the period 2007–2011, this paper examines whether those firms with higher CSR disclosure ratings are more valued by market participants. This study also complements the literature addressing the value relevance of CSR disclosure by further analyzing not only the direct effects of CSR reporting on stock prices but also its indirect effects through its interaction with main accounting variables (i.e., earnings and book value of equity). CSR reports can also affect stock price indirectly because the sustainability report may be perceived by investors to be a source of further and complementary information regarding the nature, composition and trends of the traditional value-relevant accounting variables. Finally, this study also analyzes whether CSR disclosure by firms operating in environmentally-sensitive industries is assessed differently by market participants than CSR disclosure by companies operating in other industries. By using a modified Ohlson (Contemp Account Res 1:661–687, 1995) model, it is found that CSR disclosure do have both a direct and indirect effect on stock prices by modifying the value-relevance of earnings and book value of equity. Moreover, CSR disclosure by companies operating in environmentally-sensitive industries is associated with higher market valuations than CSR disclosure by companies operating in nonsensitive industries. This may be due to the fact that CSR disclosures provide information that allow investors to make better assessments of the increased risk related to potential litigation and future environmental liabilities, thereby reducing information asymmetries and the risk of adverse selection.

Keywords Firm value · Corporate social responsibility · Value relevance · Environmentally-sensitive sectors · Spain

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1 Introduction

The recent progress of the socially responsible investment movement worldwide reveals that the marketplace is developing both social and environmental criteria to supplement the traditional financial information used to make investment decisions. Corporate social responsibility (hereafter, CSR) is understood to be the way companies integrate social, environmental and economic concerns into their values, culture, strategy, decision making and operations in a transparent and accountable manner. There is a growing consensus about the potential link between CSR and business success. The *World Business Council for Sustainable Development* (WBCSB 2002) has noted that a coherent CSR strategy based on integrity, sound values and a long-term approach offers clear business benefits to companies and contributes to the well-being of society. In this context, companies have been increasingly urged to become accountable to a wider audience than shareholder and creditor groups. As a matter of fact, public awareness and interest in environmental and social issues and increased attention in mass media have resulted in more social disclosures from corporations in the last two decades (Deegan and Gordon 1996; Gray et al. 1995; Hooghiemstra 2000; Kolk 2003).

According to the Global Reporting Initiative (GRI 2011), the social dimension of sustainable development deals with the impact that the organization may have on social systems in which it operates, while the economic dimension of sustainable development refers to impacts that the organization may have on the economic conditions of its stakeholders and on economic systems at local, national, and global level. At the same time as firms are becoming increasingly committed to issuing sustainability reports, a number of national and international bodies have developed frameworks so as to provide them with guidance on disclosing CSR information. Some examples of these guidelines can be found in the *GRI Guidelines* (GRI 2011), the *World Business Council for Sustainable Development Guidelines* (WBCSB 2002) and the *Institute of Social and Ethical Accountability Guidelines* (AA1000 2008). Disclosure of alternative non-financial information such as CSR reporting has generated, however, heated debates about whether such information is useful for stakeholders and whether disclosure along CSR dimensions should be mandated by regulation. Although the literature on the relationship between financial and environmental/social performance is growing, there is limited evidence regarding whether investors value more those firms more engaged in CSR reporting transparency.

In this context, my study has four main contributions. First, it provides evidence on the value relevance of CSR reporting for investors in a context other than the traditional US and UK institutional settings. My paper focuses on Spain, one of the leading countries in CSR reporting at an international level. The '*State of Play in Sustainability Reporting in the EU*' study (2011) outlines that Spain, out of all European countries, is the leading country with 22.6 % of all European GRI reports

in 2009. This leadership of Spain in CSR reporting at the European level is also confirmed by the more recent report '*Sustainability Reporting Examiner*'. Based on the 2,268 sustainability reports submitted to GRI in 2012, Spain is the leading country in Europe (115 reports), followed by Germany (111) and Sweden (94). In the *GRI Sustainability Reporting Statistics 2011*, Spain attains 2nd place worldwide in the percentage of registered 2011 GRI reports with an 8 %, only preceded by the US with an 11 %, despite Spain having a remarkably lower GDP than US (see Table 1 below). Unlike the US and the UK that are common-law jurisdictions with more developed stock markets, Spain is a code or civil-law country (based on comprehensive and continuously updated legal codes) with a less developed stock market. However, in comparison with other European stock markets, the Spanish one is the seventh in terms of the value of the market capitalization-to-GDP ratio, even higher than that of France and Germany (Worldbank 2012). This study is aimed at analyzing whether the value relevance of CSR reporting for common-law countries with more developed stock markets found in previous studies might also be extrapolated to code-law regimes with less developed capital markets.[1]

Second, this paper enriches the literature on the value relevance of non-financial variables (Barth and McNichols 1994; Amir and Lev 1996; Hirschey et al. 2001; Choi and Jungh 2008; Pae and Choi 2011). The general conclusion emerging from research in this area is that the value relevance of traditional financial information has decreased over recent decades, mainly as a consequence of the increasing importance of unreported intangible resources in the value creation process. In this context, investors are increasingly aware of the importance of company information that is not directly reflected in financial statements, thereby suggesting the consideration of the potential value relevance of non-financial information such as environmental and social information.

Third, my study complements the literature addressing the value relevance of CSR, analyzing not only the direct effects of CSR reporting on stock prices but also its indirect effects on stock prices through its moderating effect on the value relevance of earnings and book value of equity. CSR reports can also affect stock prices indirectly because the provision of CSR information leads to lower economic uncertainty, more predictible earnings and lower risk for investors. This suggests that the disclosure of CSR information affects the market's ability to anticipate future earnings changes (Hussainey and Salama 2010), increases the level of a firm's future cash flow estimation or reduces the perceived variability of its cash flows (Robinson et al. 2011).

Finally, in the event of some firms operating in specific sectors, their CSR performance may have a relatively high impact on their future cash flows, such as the case for companies in environmentally-sensitive industries (i.e., oil, mining and chemicals). As a result, firms in these industries have an increased risk related to

[1] As the value relevance studies rely on the basic assumption of stock market efficiency, i.e., that stock prices pick up the effects of all relevant information, their inferences may be misleading if the stock market under analysis is not efficient. In this respect, the study by Kristoufek and Vosvrda (2014) compare the efficiency of 41 stock indices worldwide based on the correlation structure of the returns (long-term and short-term memory) and local herding behavior (fractal dimension). Their results show that Spain attains 12th place out of the 41 indices in the efficiency index.

Table 1 Top 10 reporting countries 2011

Country	% of registered 2011 GRI reports	% Global 500 HQs[a]	GDP (IMF data in US$ billions)[b]
USA	11	27	15,094.025
Spain	8	2	1,493.513
Sweden	6	1	538.237
Brazil	6	1	2,492.908
China	5	12	7,298.147
Netherlands	4	2	840.433
Germany	4	7	3,577.031
Australia	4	2	1,488.221
Switzerland	3	3	636.059
Canada	3	2	1,736.869

Source: GRI Sustainability Reporting Statistics 2011

[a] Global 500 data from 2011, retrieved on 20 April 2012 from CNN Money (http://money.cnn.com)

[b] 2011 GDP data retrieved on 20 April 2012 from the International Monetary Fund's World Economic Outlook Database

potential litigation and future environmental liabilities and are thus exposed to higher levels of public concern (Cho and Patten 2007; Cormier and Magnan 2007; De Villiers et al. 2011). In this respect, CSR disclosures provide information that allow investors to make better assessments of these risks thereby reducing information asymmetries and the risk of adverse selection. Hence, I also examine whether CSR disclosure by firms operating in environmentally-sensitive industries is assessed differently by market participants than CSR disclosure by companies operating in other industries.

In order to measure the level of CSR disclosure, I use the rating of a company's CSR reporting practices elaborated by the *Observatory on Corporate Social Responsibility* (OCSR). This rating is based on an exhaustive content analysis of sustainability reports based on the amount of information disclosed by a particular company related to more than 500 indicators/requirements. As this disclosure rating also considers social issues, I extend previous literature that focuses only on the value relevance of environmental reporting. Moreover, unlike previous studies that focus on whether investors value more those companies that disclose a CSR report based on GRI guidelines (Schadewitz and Niskala 2010) or on whether investors do assign value to firms publishing separately a sustainability report (Berthelot et al. 2012), my main interest is in the value relevance of CSR information reported by firms as proxied by a rating based on the disclosure of a large number of CSR-related items.

The rest of the paper is organized as follows. Section 2 reviews the literature regarding the value relevance of CSR disclosure practices and outlines the main hypotheses to be tested. Section 3 describes the research methodology, presenting detail of the data and the empirical models. Section 4 reports the results. Finally, I present the discussion and conclusions of the study.

2 Literature review and hypotheses development

2.1 Literature review

In addition to financial accounting information, CSR disclosure may also play an important role in shareholders' investment decisions (Hassel et al. 2005; Cormier and Magnan 2007; Dhaliwal et al. 2011) raising the question whether such disclosures create value for investors in the capital markets. Despite much research on the topic (see Griffin and Mahon 1997; Orlitzky 2001; Orlitzky et al. 2003; Margolis and Walsh 2003; Margolis et al. 2007 for reviews of the literature), few sound conclusions can be drawn, except that the literature is divided. These mixed results can arise from two main reasons. First, the underlying theories (e.g., economic vs. socio-political theories) have different implications about the impact of CSR disclosure on stock prices. While the economic agency theory suggests that disclosures are value-relevant (assuming that it is costly to copy such activities and disclosures), the legitimacy theory entails that CSR disclosures may be irrelevant or even negatively associated with stock market prices. Second, previous literature has suggested that actual CSR performance may deviate from disclosed CSR performance (Al-Tuwaijri et al. 2004; Clarkson et al. 2013).[2] While some studies find evidence of a positive association between CSR performance and CSR disclosure (Al-Tuwaijri et al. 2004; Clarkson et al. 2008), others provide evidence of a negative association between CSR performance and CSR disclosure. That is, firms with poor CSR performance are found to provide more CSR disclosure (Rockness 1985; Hughes et al. 2001; Patten 2002).

In the literature related to corporate sustainability, the majority of studies applying value relevance[3] methodology pertain to environmental issues (Al-Tuwaijri et al. 2004; Hassel et al. 2005; Cormier and Magnan 2007; Moneva and Cuellar 2009; Clarkson et al. 2013). Some studies focus on environmental performance and accountability (as measured by relatively independent institutions such as DJSI or KLD) while others focus on environmental disclosure by companies.

[2] Prior research has not found a consistently significant association between environmental performance and environmental disclosure. As pointed out by Al-Tuwaijri et al. (2004), if we assume that good environmental performance reduces the firm's exposure to future environmental costs, then disclosure of this information should be perceived as good news by investors. Therefore, firms with good environmental performance should disclose more environmental information (in quantity and quality) than should firms with poorer environmental performance. On the other hand, if greater disclosure provides information that may be used in litigation against the disclosing firm (presumably by third parties with political or social agendas), good environmental performers might elect to minimize such disclosure (Li et al. 1997).

[3] The underlying assumption of a value-relevance study is that the information used by investors when valuing a share will be incorporated into the firm's share price (Barth et al. 2001). Value relevance could thus be measured in terms of the levels of equity prices (i.e., *price-levels models*) or in terms of changes in share prices (i.e., *returns models*). The objective when using a return approach is to evaluate what is reflected in share price changes during a particular period, whereas the objective when using a price levels approach is to evaluate what is reflected in stock price at a specific time (Barth 2006). Both types of value relevance studies inform us of the value relevance of information although the research question when using share returns instead of share prices may also be related to the information timeliness (Barth 2006).

Al-Tuwaijri et al. (2004) study the relationship between environmental disclosure, environmental performance, and economic performance focusing on chemical or polluting industries. They use the ratio of toxic waste recycled to total toxic waste generated to proxy for environmental performance and self-assign a score to environmental disclosure using content analysis on annual reports and Form 10Ks. Their results show that firms' annual returns are positively associated with firms' environmental performance, which is interpreted as a signal that investors consider environmental information in their decision-making investment process.

Hassel et al. (2005) find published information regarding environmental performance to be incrementally value relevant beyond financial accounting information, although it is associated with a decrease in market value of equity for Swedish companies. Their findings supported the cost-concerned perspective, which attributes a decrease in market value to increased costs associated with the increase in disclosure.

Using a multi-country analysis, Cormier and Magan (2007) investigate the impact of environmental reporting on the relationship between a firm's earnings and its stock market value. To assess how country-specific contexts may affect the impact of environmental reporting, they focus on three countries that employ different reporting and governance regimes such as Canada, France and Germany. Results suggest that decisions to report environmental information have a moderating impact on the stock market valuation of a German firm's earnings. In contrast, environmental reporting does not significantly influence the stock market valuation of Canadian and French firms earnings.

In the Spanish context, Moneva and Cuellar (2009) find financial environmental disclosure to be associated with an increase in share price, but not for non-financial environmental information. They document that the combination of financial reporting with non-financial environmental measures does not improve the explanatory power of stock prices. Their results also suggest that market participants value non-financial environmental disclosure provided by companies in environmentally-sensitive industries more than they value environmental disclosure by companies operating in other industries.

Clarkson et al. (2013) provide evidence that voluntary environmental disclosure by US companies provides incremental value-relevant information beyond information about the historical environmental performance of a company (proxied by the Toxic Release Inventory—TRI), after controlling for the general inclination of a company to disclose environmental information.

Studies analyzing whether investors assign value relevance to either CSR performance or CSR disclosure are fewer (Murray et al. 2006; Moneva and Ortas 2008; Schadewitz and Niskala 2010; De Klerk and De Villiers 2012; Berthelot et al. 2012; Lourenço et al. 2012, 2014; Carnevale and Mazzuca 2014).

Focused on CSR performance, Moneva and Ortas (2008), using a sample of 142 European companies included in the DJSI Index, do not find a direct relationship between stock valuation and sustainability performance. More recently, Lourenço et al. (2012) shows that CSR performance has significant explanatory power for stock prices over the traditional summary accounting measures such as earnings and book value of equity. Lourenço et al. (2014), using the DJSI index as a proxy for

reputation for sustainability leadership, find that net income of firms with good sustainability reputation has a higher valuation by the market as compared to those with less sustainability reputation.

Among the studies focusing on CSR disclosure, it should be mentioned the paper by Murray et al. (2006) based on data from the CSEAR database of social and environmental disclosure by the top 100 UK companies. They do not provide direct evidence of a relationship between stock returns and CSR disclosure. However, the longitudinal data revealed a convincing relationship between consistently high (low) returns and the predilection to high (low) disclosure. No significant association between firm's share returns and sustainability reporting is also reported by Jones et al. (2007). However, they find evidence of a significant relationship between sustainability reporting and many measures of company financial performance.

Schadewitz and Niskala (2010) and De Klerk and De Villiers (2012) examine the value relevance of CSR disclosure more broadly by using disclosure measures based on the GRI guidelines. Schadewitz and Niskala (2010), in the context of the Ohlson model, include a GRI dummy variable based on whether the firm discloses a GRI-based sustainability report. They find that GRI is value relevant and represents an important explanatory factor for the firm's market value for Finnish firms. De Klerk and De Villiers (2012), using a KPMG dataset on the CSR of the top 100 South African companies, do find that CSR disclosure is positively and significantly associated with share prices for South African companies. For the Canadian setting, Berthelot et al. (2012), by including in the valuation model a dummy variable if the company discloses a sustainability report, find that investors positively value this type of reporting. In a similar way but applied to the banking sector, Cardamone et al. (2012) examines the value relevance of publishing a sustainability report for a sample of Italian listed companies. Their findings show a negative correlation between a firm's market value and the publication of a sustainability report. More recently, Carnevale and Mazzuca (2014), for a sample of European banks, provide evidence that publishing a sustainability report produces a positive effect on stock prices.

2.2 Theoretical framework and hypotheses development

2.2.1 Underlying theories for CSR disclosure

CSR disclosure has been explained by means of a multi-theoretical framework encompassing several alternative theories. Among them, the most referred ones are the agency theory, the legitimacy theory and the stakeholder theory. The first one is based on the perspective of capital markets whereas the last two theories are regarded as socio-political theories. Next, I briefly outline its main consequences on CSR disclosure.

Following its emergence as an explanatory model for corporate financial reporting (Watts and Zimmerman 1986), economic *agency theory* (or positive accounting theory) views the firm as a nexus of contracts between various economic agents who act opportunistically within efficient markets. In this context, social and environmental disclosure may prove useful in determining debt contractual

obligations, managerial compensation contracts, or implicit political costs. However, as indicated by Cormier et al. (2005), agency theory's focus on monetary or wealth considerations among agents who trade in informationally efficient markets does limit the scope of relevant social and environmental disclosure as well as its intended purpose, insofar as many potential users of this kind of information may not act in these markets at all (e.g., pressure groups such as Greenpeace).

In contrast to agency theory, the *legitimacy theory* provides a more comprehensive perspective on CSR disclosure as it explicitly recognizes that firms disclose information in order to appease important stakeholders or to prevent legislation. Legitimacy theory assumes that organizations continually seek to ensure that they operate within the bounds and norms of society (Patten 1991; Deegan and Gordon 1996). Suchman (1995) defines legitimacy as 'a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within societal constructed system of norms, values, beliefs, and definitions'. Gray et al. (1995) and Hooghiemstra (2000), among others, argue that most insights into CSR disclosure arise from the use of this theoretical framework which entails that social and environmental disclosure is a way to legitimize a firm's continued existence or operations to the society. Reinforcing the previous arguments, many prior studies on corporate disclosures have provided evidence that firms voluntarily disclose information in their annual reports as a strategy to manage their legitimacy (Patten 1991; Deegan and Rankin 1996; Nasi et al. 1997; Campbell 2000; Hutchings and Taylor 2000; Woodward et al. 2001).

Finally, the *stakeholder theory* posits that corporate disclosure is an instrument for managing the informational needs of the various powerful stakeholder groups (employees, shareholders, investors, consumers, public authorities and NGOs, etc.). Managers use information to manage or manipulate the most powerful stakeholders in order to gain their support which is required for survival (Gray et al. 1996). In relation to the overlap between legitimacy theory and stakeholder theory, Deegan (2002, p. 295) state that "both theories conceptualise the organisation as part of a broader social system wherein the organisation impacts, and is impacted by, other groups within society. Whilst legitimacy theory discusses the expectations of society in general (as encapsulated within the 'social contract'), stakeholder theory provides a more refined resolution by referring to particular groups within society (stakeholder groups). Essentially, stakeholder theory accepts that because different stakeholder groups will have different views about how an organisation should conduct its operations, there will be various social contracts 'negotiated' with different stakeholder groups, rather than one contract with society in general. Whilst implied within legitimacy theory, stakeholder theory explicitly refers to issues of stakeholder power, and how a stakeholder's relative power impacts their ability to 'coerce' the organisation into complying with the stakeholder's expectations".

While there are some similarities, the previous three alternative theories essentially differ on the basis of fundamental assumptions. Unlike the agency or positive accounting theory, legitimacy theory and stakeholder theory make no assumption of rational, wealth-maximising individuals operating within the environment of efficient capital markets. On the other hand, whilst Woodward et al. (1996) have shown that both legitimacy theory and stakeholder theory

consider an organisation to be part of the wider social system, legitimacy theory looks at society as a whole, whereas stakeholder theory recognises that some groups within the society are more powerful than others.

Even though disclosures may be driven by stakeholder and/or societal pressure, such disclosures are likely to reduce information asymmetries and, thus, be rewarded by investors with higher stock market valuations.

2.2.2 Value relevance of CSR

Information asymmetry between managers and shareholders is often argued to justify voluntary corporate disclosure (Healy and Palepu 2001). The well-known agency theory posits that information asymmetry exists where there is separation of ownership and control between shareholders and managers. In a widely held company, voluntary disclosure can act as a bonding and monitoring tool reducing agency conflicts between managers and shareholders (Jensen and Meckling 1976). Non-financial information can lessen the information asymmetries that exist between firms and their investors and reduce uncertainty about the future economic benefits and risks of the company (Healy and Palepu 2001). Investors can use the information to make better estimates of the company's value and the price they are willing to pay for the company's shares. Enhanced transparency and more accurate estimates of future earnings results in investors being able to determine a more accurate share price for the company (Cormier and Magnan 2007).

In the specific case of CSR reporting, it provides mainly non-financial information about social and environmental aspects of a company. This type of information has been provided in stand-alone reports or alongside the traditional financial information of the annual report (KPMG 2011). However, unlike the provision of financial information in the annual report, CSR is mainly a voluntary reporting practice. Given that voluntary nature, firms will disclose CSR information only if the benefits derived from it outweigh the costs of disclosing this information. By providing additional CSR disclosures, firms can reduce the information asymmetries between the company and its external shareholders (Myers and Majluf 1984). This benefits firms because it can lead to a reduced risk of adverse selection by investors and higher market valuations of firms' shares (Healy and Palepu 2001). If investors consider CSR along with the financial information in their investment decision-making process, then the two types of information together should better explain firms' market valuations.

Based on the above agency theory-based arguments, my first hypothesis is stated as follows:

H_1 CSR disclosure is positively and significantly associated with firms' share prices and provides incremental value-relevant information beyond that provided by financial accounting information (i.e., earnings and book value of equity).

Carnevale and Mazzuca (2014), Cardamone et al. (2012) and Lourenço et al. (2014) examine whether those firms with a high reputation for being socially responsible (i.e., via DJSI membership) are expected to present a higher market valuation of earnings and book value when compared to firms without such

reputation. That is, it is analyzed whether CSR has a 'moderating effect' by affecting the value relevance of both earnings and book value, i.e., its multiples. As stated by Lourenço et al. (2014), "the reputation for leadership in CSR leads to lower economic uncertainty, more predictible earnings and lower risk for investors (…) It is associated with better market's ability to anticipate future earnings change (Hussainey and Salama 2010) and can increase the value of a firm's future cash flows and/or reduce the variability of its cash flows (Robinson et al. 2011)". In the same vein and in the context of environmental reporting, Cormier and Magnan (2007) posit that by voluntarily reporting on environmental issues, a firm does improve its perceived transparency toward investors and allows them to derive more precise estimates of its future earnings. Cormier and Magnan (2007) point out that the impact of environmental reporting on the relationship between a firm's earnings and its stock market value can be assessed from two contrasting perspectives. On the one hand, environmental reporting comprises mostly information of a proprietary nature (i.e., environmentally-related capital expenditures and operating costs, estimates of site remediation and reclamation costs, budgeted environmental investments, environmental management strategies and environmental liabilities or commitments), whose disclosure is likely to take out much uncertainty from a firm's reported net earnings, thus enhancing their credibility and, ultimately, their stock market valuation. On the other hand, the content and meaning of certain aspects of environmental reporting may replicate information that is potentially negative but which is already in the public domain either through the legal and regulatory systems (e.g., litigations, lawsuits, regulatory proceedings, pollutant emissions) or through media headlines (e.g., oil spills). The disclosure of high levels of pollutant emissions may explicitly signal to investors that some costly environmental obligations are not explicitly recognized in the firm's liabilities (Hughes 2000; Clarkson et al. 2004). However, under these conditions, management may rely on voluntary environmental reporting to gain support among its various stakeholders. Furthermore, by voluntarily reporting on these environmental issues, a firm does improve its perceived transparency toward investors and allows them to derive more precise estimates of its future earnings. Hence, it is expected that even such disclosure enhances the relationship between a firm's earnings and its stock market valuation. As Cormier and Magan (2007) conclude, "overall, irrespective of the nature or sign of the information being reported about, we expect that it enhances the relationship between a firm's earnings and its stock market valuation".[4]

The previous studies, thus, do consider that CSR disclosure can affect stock price not only directly but also indirectly through its influence on the relevance of main accounting variables (i.e., earnings and book value of equity). This is because CSR reporting is perceived by investors to be a source of further and *complementary* information regarding the nature, composition and trends of the traditional value-

[4] It could be the case that the information on the future cash flows of the firm provided by CSR information may be negative if the firm needs considerable investments in order to retain the 'license to operate'. In addition, previous literature (Kallapur and Kwan 2004) has indicated that managers may adjust their voluntary disclosures due to incentive schemes or as an 'excuse' for having missed the earnings benchmark. When the reliability of earnings declines, the market may place less reliance on earnings and look for other sources of information, such as book value.

relevant accounting variables. According to the guidelines proposed by GRI and by other associations, the CSR report must provide information not only on a company's past and present commitments to CSR but also on its future policy. As a consequence, the CSR report must contain information regarding future projects and initiatives that may result from different choices in the allocation of financial and economic resources. As this type of forward-looking information is not necessarily included in the financial statements, this may explain the complementary nature of the information contained in the sustainability report.

In the context of the Ohlson (1995) valuation model used in the present study, and consistent with viewing the firm as a going concern, Ohlson (1995) and Penman (1992) argue that book value proxies for expected future normal earnings. As pointed out by Schmelzer (2013), as CSR reporting might reveal information about the persistence of earnings, the prediction is that the value relevance of both earnings and book value increases when a variable for CSR reporting is added to the model.

To verify whether CSR provides investors with complementary information, and may therefore exert a moderating effect on the relevance of both earnings and book value, the following hypothesis is tested:

H_2 CSR disclosure indirectly influences firms' share prices by moderating the value relevance of earnings and book value of equity.

Finally, based upon the legitimacy theory (Patten 2002; Cho and Patten 2007), previous research in the CSR field reveals that industry plays a crucial role in explaining the content and extent of social and environmental disclosures (Gray et al. 1995; Adams et al. 1998). Legitimacy theory posits that the extent of a firm's disclosures is also a product of the firm's exposure to public pressure from stakeholder groups in the social, political, and regulatory environment. The results from these studies show that corporations from industries whose manufacturing process have a negative influence on the environment (referred to as 'environmentally-sensitive' industries) disclose and report considerably more information than firms from other sectors. Such industries are typically distinguished by the extent of pollution resulting from their operations, waste creation, the predominant use or extraction of natural resources, or the manufacturing of environmentally harsh products. The characteristics associated with these industries increase the market's tolerance of bad environmental news, but decrease the tolerance of non-disclosure (Li et al. 1997).

In general, corporations from the paper and pulp, metals, power generation, water, mining, oil and chemical industries emphasise information regarding environmental, health and safety issues (Clarke and Gibson-Sweet 1999; Hoffman 1999; Bowen 2000; Line et al. 2002; Jenkins and Yakovleva 2006). As a result, firms in these industries have an increased risk related to potential litigation and future environmental liabilities and are thus exposed to higher levels of public concern (Cho and Patten 2007; Cormier and Magnan 2007; De Villiers et al. 2011). In this respect, CSR disclosures provide information that allow investors to make better assessments of these risks. More extensive disclosures can further reduce information asymmetries and the risk of adverse selection for investors in

companies operating in environmentally-sensitive industries. Thus, it is expected that firms' market values will be incrementally higher when a higher level of CSR is disclosed by firms that operate in environmentally-sensitive industries. Reinforcing this argument, Reverte (2012) documents, for the case of Spanish firms, that the beneficial effect of CSR disclosure on the reduction of the cost of equity capital -one of the main determinants of a firm's share price- is more pronounced for those firms operating in environmentally-sensitive industries.

Based on the previous arguments, the third hypothesis is stated as follows:

H_3 Higher levels of CSR disclosure ratings by firms operating in environmentally-sensitive industries are associated with higher share prices relative to CSR disclosure ratings provided by firms operating in other industries.

3 Research methodology

3.1 Sample data

Data related to CSR disclosure come from the reports issued by the OCSR in the period 2007–2011. The OCSR provides a CSR disclosure rating for those firms listed on the Madrid Stock Exchange and included in the IBEX35 index, which comprises the 35 largest firms in terms of market capitalization. As is common in this type of studies, I have excluded financial firms (mainly banks and insurance companies) because of the particular characteristics of their accounting system.

Based on a content analysis of annual reports as well as sustainaibility and corporate governance reports, the OCSR issues each year a very exhaustive and detailed report on CSR disclosures by Spanish listed firms whereby each of the covered firms is assigned a numerical rating (ranging from 0 to 4 in a continuous scale) based on the amount of information disclosed regarding the following principles or guidelines[5]:

(a) *Global Reporting Initiative* (GRI)'s *Guidelines* (G2 and G3) (especially in the fields of environmental performance, human rights, labor practices and decent work, society and product responsibility);
(b) *United Nations Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with Regard to Human Rights* (2003);
(c) *AA1000 Accountability Principles* (issued by the Institute of Social and Ethical AccountAbility);
(d) *New Economics Foundation* (NEF) *Principles* and
(e) *Corporate Governance recommendations* issued by the Spanish stock market regulator and, in the case of US cross-listed firms, the Sarbanes–Oxley Law.

[5] CSR ratings usually employed in this literature (such as the KLD *Strenghts and Concerns* or the ASSET4 ratings) are intended to measure CSR performance (not CSR disclosure). The rating used in my study developed by the OCSR is more similar in spirit to others based on content analysis to evaluate CSR disclosure (e.g., Al-Tuwaijri et al. 2004).

More than 500 indicators/requirements are taken into consideration in the computation of the CSR disclosure rating elaborated by the OCSR. "Appendix" provides a more detailed information about how the CSR disclosure rating is computed.

3.2 Empirical models

Following the conventional approach in market-based accounting research (Devalle et al. 2010; Alfaraih and Alanezi 2011; De Klerk and De Villiers 2012; Shamki and Raman 2012), I use the following modified Ohlson (1995) model that relates market capitalization to book value and earnings as basis to evaluate the value relevance of accounting information (Barth and Clinch 2009):

$$MV_{it} = \alpha_0 BV_{it} + \alpha_1 EARN_{it} + \varepsilon_{i,t} \quad (1)$$

where $MV_{i,t}$ is the market value of equity of firm i at time t, $BV_{i,t}$ equals book value of equity of firm i at time t, $EARN_{i,t}$ is earnings of firm i for period t and ε is the regression error.

In this study, a share price specification of the above model is used in order to mitigate the potential of incorrect inferences based on size differences (the so called 'scale effect', Easton and Sommers 2003; Barth and Clinch 2009). Barth and Clinch (2009) find the undeflated specification (also referred to as the market value of equity specification) of the modified Ohlson (1995) model to be less effective than scaling with number of shares but more effective than scaling with book value, opening share price, or market value of equity. The regression model is thus as follows:

$$P_{it} = \beta_0 + \beta_1 BVPS_{it} + \beta_2 EPS_{it} + \varepsilon_{it} \quad (2)$$

where $P_{i,t}$ is the share price of firm i at time t,[6] $BVPS_{i,t}$ equals book value of equity per share of firm i at time t and $EPS_{i,t}$ is earnings per share of firm i for period t.

My overall objective is to evaluate the value relevance of CSR disclosure by Spanish companies. I also examine whether the combined effect of financial accounting information with CSR disclosure explains market value better than an exclusive focus on financial accounting information. To this end, I add CSR disclosure to represent other non-accounting value-relevant information in the Ohlson (1995) model (see model 3).

$$P_{it} = \gamma_0 + \gamma_1 BVPS_{it} + \gamma_2 EPS_{it} + \gamma_3 CSR_{it} + \varepsilon_{it} \quad (3)$$

where, apart from the variables previously defined, $CSR_{i,t}$ represents the CSR disclosure rating corresponding to firm i and period t. CSR rating is not deflated as—by its own construction- it is independent of company size.

[6] Disclosure of CSR reports tends to lag the provision of annual financial statements. For the case of Spanish listed firms, annual accounts are usually disclosed within 2 months after fiscal year-end (i.e., around mid or end of February). However, CSR reports are usually disclosed within 3–6 months after fiscal year-end (depending on the company). Therefore, I have decided to take share prices corresponding to 6 months after the fiscal year-end in order to ensure that CSR reporting was available to investors.

Based on H_1, I expect γ_3, the coefficient for CSR disclosure in (3), to be positively and significantly associated with share price.

To test the 'moderating effect' of CSR on the value relevance of BVPS and EPS (hypothesis 2), I add interaction terms between the CSR score and both BVPS and EPS. The specification of the model through the introduction of these interaction terms allows us to highlight the effect that CSR produces on the value relevance that investors assign to BVPS and EPS by either increasing or decreasing their significance. Thus, in order to test H_2, I expand model (3) as follows:

$$P_{it} = \gamma_0 + \gamma_1 BVPS_{it} + \gamma_2 EPS_{it} + \gamma_3 CSR_{it} + \gamma_4 BVPS_{it} * CSR_{it} + \gamma_5 EPS_{it} * CSR_{it} + \varepsilon_{it} \quad (4)$$

The significance of the indirect effects are measured in model (4) by the coefficients γ_4-for the case of book value of equity- and γ_5-for the case of earnings-.

Finally, for testing H_3, I test model (4) for both environmentally-sensitive industries and non-sensitive industries and then a *t* test is used to investigate whether the estimates for the key variables (BVPS, EPS, CSR and interaction effects) are different across industries. Based on prior literature, the following 'more sensitive' sectors are identified: mining, oil and gas, chemicals, forestry and paper, steel and other metals, electricity, gas distribution and water (utilities). All others are considered as 'less sensitive'.

The OLS basic specification assumes that the standard errors are independent from each other. However, as disclosure practices are quite stable over the years, the previous assumption is unlikely to be held. To mitigate this problem, I base the significance tests on the Petersen (2009) procedure, which estimates clustered-robust standard errors that are robust to heteroskedasticity, serial and cross-sectional correlation with a two dimensional cluster at the firm and year level in all the regression models. Moreover, in order to control for industry and year-specific effects, models (2), (3) and (4) are estimated using industry[7] and year dummies.

4 Results

Table 2 reports the descriptive statistics of the dependent and independent variables. The table indicates that there is a high variability in CSR disclosure practices across Spanish listed firms, as the total CSR disclosure rating varies from 0.280 to 2.180.

Table 3 reports the correlation coefficients among the regressors. It can be seen that some correlations are statistically significant at a 1 % level, such as that between EPS and BVPS ($\rho = 0.677$). However, none of the variance inflation factors (VIFs)—not reported—exceed the critical value of 10 (Hair et al. 2010). Thus, it can be said that multicollinearity is not a serious problem in this study.

[7] Based on the SIC classification, we consider the following sectors: mining, oil and gas extraction (SIC1), manufacturing (SIC2 and 3), utilities (SIC4), commercial (SIC5) and services (SIC 7 and 8). Financial sector (SIC 6) is excluded from my sample.

Table 2 Descriptive statistics

	P_t	$BVPS_t$	EPS_t	CSR_t
Mean	24.124	15.125	3.566	1.360
Median	18.434	7.830	2.688	1.380
SD	25.711	20.376	3.505	0.452
Maximum	216.850	101.810	26.400	2.180
Minimum	4.390	1.180	0.180	0.280

P_t share price at time t, $BVPS_t$ book value of equity per share at time t, EPS_t earnings per share for period t, CSR_t CSR disclosure rating for time t

Table 3 Correlation coefficients among the explanatory variables

	$BVPS_t$	EPS_t	CSR_t
$BVPS_t$	1.000	0.677***	0.115
EPS_t		1.000	0.188
CSR_t			1.000

$BVPS_t$ book value of equity per share at time t, EPS_t earnings per share for period t, CSR_t CSR disclosure rating for time t

*** Significance at the 1 % level

The results from the estimation of models (2) to (4) are presented in Tables 4, 5 and 6. As expected, the coefficients for BVPS and EPS are positively and significantly associated with share prices. The adjusted R^2 for model (2), based only on financial accounting information, is 0.559 (see Table 4); together, EPS and BVPS explain 55.9 % of the variance of the Spanish firms' share prices. These results are close in terms of explanatory power to those found in recent studies by Devalle et al. (2010) ($R^2 = 0.539$, for the Spanish sample), Alfaraih and Alanezi (2011) ($R^2 = 0.570$) and Shamki and Raman (2012) ($R^2 = 0.489$).

The adjusted R^2 increases when the CSR disclosure rating is added to the regression model in Eq. (3) from 0.559 to 0.609. The CSR disclosure variable is significant at the 1 % level in model (3) (coeff. = 0.275, t stat. = 3.998). Overall, the results provide evidence that CSR disclosure provides incremental value-relevant information to shareholders beyond that provided by financial accounting information alone, thereby supporting H1. These results are in line with those obtained by Berthelot et al. (2012) in the Canadian context, Schadewitz and Niskala (2010) in the Finnish context and De Klerk and De Villiers (2012) for South African companies.

Table 5 presents the results from the estimation of model (4); the table indicates that CSR disclosures modify the value relevance of EPS and BVPS. The significance of the indirect effects are measured by the coefficients γ_4-for the case of BVPS- and γ_5-for the case of EPS. It can be seen that both coefficients are positive and statistically significant (0.059 and 0.225, respectively), supporting the idea that CSR affects indirectly and positively the value relevance of EPS and

Table 4 Results from the estimation of models (2) and (3)

	Model (2)	Model (3)
Intercept	9.738	8.757
	(2.855)**	(1.755)*
$BVPS_t$	0.644	0.629
	(3.887)**	(3.499)**
EPS_t	1.265	1.536
	(4.001)**	(4.016)**
CSR_t		0.275
		(3.998)**
Adjusted R^2	0.559	0.609
$N = 130$		

This table reports the regression results from the following models

$P_{it} = \beta_0 + \beta_1 BVPS_{it} + \beta_2 EPS_{it} + \varepsilon_{it}$ (mod.2)

$P_{it} = \gamma_0 + \gamma_1 BVPS_{it} + \gamma_2 EPS_{it} + \gamma_3 CSR_{it} + \varepsilon_{it}$ (mod.3)

Variables are defined in Table 2

t statistics for the regression coefficients are reported in parentheses. Following Petersen (2009), I estimate clustered-robust standard errors that are robust to heteroskedasticity, serial and cross-sectional correlation with a two dimensional cluster at the firm and year level

Industry and year dummies are included to control for industry and year-specific effects

*, ** Significance at the 10, and 1 % level, respectively

BVPS. The adjusted R^2 of model (4) versus model (3) increases from 0.609 to 0.637. Overall, these results seem to support the idea that accounting variables become better 'interpretable' when CSR information is provided.

Finally, Table 6 reports the results for the third hypothesis. It can be seen that the CSR coefficient is significantly higher for companies operating in environmentally-sensitive industries relative to those operating in non-sensitive sectors (0.551 vs. 0.272; *p* value of the *t* test = 0.016), thereby supporting my third hypothesis (i.e., a higher value relevance of CSR disclosure for environmentally-sensitive industries). Firms in environmentally-sensitive industries have an increased risk related to potential litigation and future environmental liabilities and are thus exposed to higher levels of public concern (Cho and Patten 2007; Cormier and Magnan 2007; De Villiers et al. 2011). CSR disclosures provide information that allow investors to make better assessments of these risks, thereby further reducing information asymmetries and the risk of adverse selection for investors in companies operating in environmentally-sensitive industries.

Table 6 also shows that, although CSR affects indirectly and positively the value relevance of EPS and BVPS in both environmentally-sensitive and non-sensitive industries, differences in the coefficients of the interaction effects (i.e., *BVPS* × *CSR* and *EPS* × *CSR*) are only significant at a 10 % level.

Table 5 Results from the estimation of model (4)

	Model (4)
Intercept	4.877
	(1.237)
$BVPS_t$	0.754
	(3.111)*
EPS_t	1.432
	(3.898)*
CSR_t	0.226
	(2.779)*
$BVPS \times CSR$	0.059
	(2.589)*
$EPS \times CSR$	0.225
	(3.119)*
Adjusted R^2	0.637
$N = 130$	

This table reports the regression results from model (4)

$P_{it} = \gamma_0 + \gamma_1 BVPS_{it} + \gamma_2 EPS_{it} + \gamma_3 CSR_{it} + \gamma_4 BVPS_{it} * CSR_{it} + \gamma_5 EPS_{it} * CSR_{it} + \varepsilon_{it}$

Variables are defined in Table 2

t statistics for the regression coefficients are reported in parentheses. Following Petersen (2009), I estimate clustered-robust standard errors that are robust to heteroskedasticity, serial and cross-sectional correlation with a two dimensional cluster at the firm and year level

Industry and year dummies are included to control for industry and year-specific effects

* Significance at the 1 % level

4.1 Sensitivity analysis

I have performed several robustness checks in order to ensure that the results are robust to alternative specifications. First, I control for the possibility that financial accounting information could have been anticipated by shareholders before the publication of the financial statements and factored into share price at the end of the financial year. Thus, I replace share prices corresponding to 6 months after the fiscal year-end by share prices at the year-end. Second, I add several control variables that previous value relevance studies (e.g., Barth et al. 2008) have found to be related to company's share prices, such as profitability (proxied by return on equity), leverage, size (natural logarithm of total assets) and international listing (dummy variable that assumes the value 1 if the firm is listed in a foreign stock exchange and 0 otherwise). Third, I use alternative deflators other than the number of shares outstanding such as total assets or opening book value of equity. Finally, instead of pooled OLS regressions I use panel data techniques such as fixed and random effects. In all cases, the main conclusions of the study remain unchanged with these alternative specifications.

Table 6 Differences across sectors in the estimates of the key variables in model (4)

Variable	Non-sensitive industries	Sensitive industries	*p* value of the *t* test of differences in the coefficients
BVPS	0.735	0.767	0.254
EPS	1.421	1.464	0.168
CSR	0.272	0.551	0.016
BVPS × *CSR*	0.054	0.063	0.089
EPS × *CSR*	0.218	0.229	0.091

This table reports the results from the estimation of model (4) for environmentally-sensitive industries and non-sensitive industries. Model 4 is

$$P_{it} = \gamma_0 + \gamma_1 BVPS_{it} + \gamma_2 EPS_{it} + \gamma_3 CSR_{it} + \gamma_4 BVPS_{it} * CSR_{it} + \gamma_5 EPS_{it} * CSR_{it} + \varepsilon_{it}$$

The last column shows the *p* value associated to the *t* test used to investigate whether the estimates for the key variables (BVPS, EPS, CSR and interaction effects) are different across industries. Based on prior literature, the following 'more sensitive' sectors are identified: mining, oil and gas, chemicals, forestry and paper, steel and other metals, electricity, gas distribution and water (utilities). All others are considered as 'non-sensitive'

5 Discussion and conclusions

For many decades the cornerstone of corporate reporting has been financial information that is presented in a company's annual reports whose objective is to provide a true and fair view of the firms' financial performance. These comprehensive financial reports have provided shareholders as well as other interested stakeholders with rather elaborate information on the company's operations and strategic activities during the past fiscal year. Disclosure of alternative non-financial information (i.e., environmental and social information) has generated, however, heated debates about whether such information is useful for stakeholders, whether disclosure along CSR dimensions should be mandated by regulation, and if so, what form such regulation should take.

In this context, this paper has examined the association between share prices and CSR disclosure ratings for a sample of Spanish listed companies included in the IBEX35 index. Unlike previous studies that focus on the signalling effect of the publication of a separate sustainability report (Berthelot et al. 2012) or the use of GRI as the reporting framework (Schadewitz and Niskala 2010), my study focuses on the value relevance of a CSR composite numerical disclosure rating developed by the OCSR, which considers more than 500 indicators/requirements in its computation.

By using a modified Ohlson (1995) model, I find that CSR disclosures are value-relevant: firms with higher CSR disclosures appear to have higher stock prices. CSR disclosures provide incremental value-relevant information to investors beyond financial accounting information (i.e., earnings and book value). This signals that responsibility reporting is a part of a firm's communication strategy in order to decrease information asymmetries between managers and investors (Myers and

Majluf 1984). CSR disclosure thus benefits firms because it can lead to a reduced risk of adverse selection by investors and higher market valuations of firms'shares (Healy and Palepu 2001). Therefore, my findings contribute to research on the intangible determinants of stock prices. The results of this paper are in line with earlier studies, which show a positive relationship between environmental/social information and market valuations. In addition, this paper suggests that the integration of non-financial CSR reporting into traditional financial investment analysis provides a richer understanding of the companies' long-term corporate performance. My results suggest that CSR reporting has the potential to link CSR performance to future financial performance, which is relevant for investor decision-making.

This study also contributes to the CSR disclosure literature by providing evidence on the value relevance of CSR disclosure in a context other than the traditional US and UK institutional settings. The focus of this study is on Spain, one of the leading countries in CSR reporting at an international level. Moreover, unlike the US and the UK that are common-law jurisdictions with more developed stock markets, Spain is a code/civil-law country (based on comprehensive and continuously updated legal codes) with a less developed stock market. My results seem to suggest that the beneficial effects of CSR reporting for common-law countries with more developed stock markets found in previous studies can also be extrapolated to code-law regimes with less developed capital markets.

I further examine not only the direct effects of CSR on stock price but also its influence on the relevance of main accounting variables (i.e., earnings and book value of equity). CSR reports can also affect stock prices indirectly because the provision of CSR information leads to lower economic uncertainty, more predictible earnings and lower risk for investors. This suggests that the disclosure of CSR information affects the market's ability to anticipate future earnings changes (Hussainey and Salama 2010), increases the level of a firm's future cash flow estimation or reduces the perceived variability of its cash flows (Robinson et al. 2011). My results support the indirect effects of CSR reporting through its moderating effect on the value relevance of earnings and book value of equity.

Furthermore, my results provide evidence that CSR disclosure by companies operating in environmentally-sensitive industries is associated with higher share prices than CSR disclosure by companies operating in other industries. Firms in environmentally-sensitive industries have an increased risk related to potential litigation and future environmental liabilities and are thus exposed to higher levels of public concern (Cho and Patten 2007; Cormier and Magnan 2007; De Villiers et al. 2011). In this respect, CSR disclosures provide information that allow investors to make better assessments of these risks, which is reflected in higher market valuations of firms' shares.

We have to bear in mind that the publication of a CSR report requires companies to commit effort and financial resources to an initiative that is wholly voluntary in Spain and in other many countries worldwide. Since my results for

one of the leading countries in CSR reporting worldwide such as Spain confirm those obtained in other institutional environments regarding the value relevance of CSR reports, my findings may be useful to companies in making decisions of whether or not to engage in CSR reporting. In providing evidence that CSR disclosures are rewarded with increased valuations, I provide a justification for engagement in such a strategy. My findings do not imply at all that all companies should be required to provide this information. It may be the case that only the companies for which CSR information is relevant currently provide this type of information.

The main limitation of this study is that the CSR disclosure score used may be potentially subject to measurement error and, thus, my results should be interpreted with some caution. Potential extensions of this paper could be directed at exploring separately the effects of the individual components of CSR (e.g., environmental, social and governance) in order to investigate whether they are differently valued by investors. Other possible extension would be to test the differential value relevance of GRI disclosure application levels (named A, B and C) and also whether those companies with an external assurance of the GRI application level by a third party (named A+, B+, C+) are more valued by investors. An assured report can provide an organization's stakeholders with a greater sense of confidence in disclosures as it reflects the seriousness with which the company approaches sustainability reporting. As a matter of fact, investors, rating agencies and other analysts increasingly look for assurance when making investment and rating decisions.

Appendix: Methodology of the CSR disclosure score developed by the *Observatory on Corporate Social Responsibility* (OCSR)

The OCSR issues each year a very exhaustive report on CSR disclosures by Spanish listed firms included in the IBEX35 index, which comprises the largest 35 firms in terms of market capitalization. By means of an in-depth analysis of annual reports and sustainability and corporate governance reports, OCSR performs a content analysis by assigning each of the covered firms a numerical rating (ranging from 0 to 4 in a continuous scale) based on the reporting of more than 500 indicators/requirements included in the following guidelines/principles: (a) *Global Reporting Initiative* (GRI)'s *Guidelines* (G2 and G3) (especially in the fields of environmental performance, human rights, labor practices and decent work, society and product responsibility); (b) *United Nations Norms on the Responsibilities of Transnational Corporations and Other Business Enterprises with Regard to Human Rights*; (c) *AA1000 Accountability Principles* issued by the Institute of Social and Ethical Account Ability); (d) *New Economics Foundation* (NEF) *Principles* and (e) *Corporate Governance recommendations* issued by the Spanish stock market regulator and, in the case of US cross-listed firms, the Sarbanes–Oxley Law.

The table with the scoring for a given firm takes the following form:

Indicator	Scoring
Global reporting initiative (GRI)	
Index and GRI profile	
Strategy and analysis	
Organizational profile	
Governance, commitments to external initiatives and stakeholder engagement	
GRI content index	
GRI indicators	
Economic performance	
Environmental performance	
Social performance, including:	
Human rights	
Labor practices and decent work	
Society	
Product responsibility	
GRI principles	
Relevance/materiality	
Stakeholder inclusiveness	
Reliability/auditability	
Neutrality	
Sustainability context	
Accuracy	
Comparability	
Clarity	
Completeness	
Timeliness	
Transparency	
Corporate governance recommendations	
Good corporate governace practices	
Board	
Remunerations policy and disclosure	
Annual general meeting	
Board commissions	
United nations norms	
Non-discrimination (Norm 2)	
The right to security of persons (Norms 3–4)	
The rights of workers (Norms 5–9)	
The respect for national sovereignty and human rights (Norms 10–11), including the prohibition of corruption and fundamental rights to development (food and drinking water, housing, highest attainable physical and mental health standards etc.)	
Obligations with regard to consumers (Norm 13)	
Environmental protection (Norm 14)	

Indicator	Scoring
AA1000 accountability principles	
Completeness	
Materiality	
Regularity and timeliness	
Quality assurance	
Information quality	
Embeddedness	
Continuos improvement	
Accessibility	
New economics foundation (NEF) principles	
Inclusivity	
Completeness	
Comparability	
Embeddedness	
Disclosure	
External verification	
Continuous improvement	
Evolution	
Total mean score	

The scoring from 0 to 4 is assigned based on the following criteria:

Score	
0	Anecdotical information (at least 25 % of the aspects analyzed)
1	Scarce information (at least 50 % of the aspects analyzed)
2	Incomplete information (at least 75 % of the aspects analyzed)
3	Complete information on all aspects analyzed (but without much detail)
4	Exhaustive and detailed information on all aspects analyzed

The scoring by indicator and the total score for the firm are obtained by arithmetic means of their respective components.

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