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# Integrated information and the cost of capital

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### ABSTRACT

The growing requirements for corporate transparency have encouraged companies to report their performance to shareholders, investors and society in general from the economic, social and environmental points of view. However, many reports involve difficulties at the moment of analysing the information. To help minimize this problem, the integrated report has arisen. This document integrates all the financial, social and environmental information, jointly disclosing the key performance statistics.

Previous research has revealed that disclosing financial information gives important economic advantages to companies. This work aims to extend the existing empirical evidence, analysing the effect that the disclosure of integrated information has on the cost of capital. Accordingly, we used a sample of 995 companies in 27 countries and 3294 observations. The period in which the sample was taken was from 2009 to 2013. The results, after applying the panel data methodology, confirmed that a negative relationship exists between the cost of capital and the disclosure of an integrated report. The reduction of the cost of capital as a result of the disclosure of an integrated report is especially relevant to those companies that need to increase their basic funding. They have considerable problems with asymmetric information or they operate in markets with limited protection for investors.

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## 1. Introduction

Multinational companies have a significant influence on the planet: the decisions that their board members make affect populations and sometimes even countries. Society has started to demand greater transparency from corporations regarding their method of operation and the impact that their performance has on the triple point of view, that is, economic, social and environmental.

In this context, some companies aim principally to disclose information that minimizes these social tensions. This voluntary practice has benefits like the reduction of political costs relating to legal requirements, taxes, rates and so on (Rodríguez Domínguez, Gallego Álvarez, & García Sánchez, 2008); at the same time, it allows companies to minimize the problem of asymmetric information and the costs of funding (Baiman & Verrecchia, 1996) and of capital (Easley & O'hara, 2004a, 2004b) as a result of the credibility and trust gained from investors and the liquidity of securities (Healy, Hutton, & Palepu, 1999). However, it may also

bring costs related to the use of this information by actual and potential competitors or the possibility that this information could be used in lawsuits against the companies (Prado-Lorenzo & García-Sánchez, 2010). In this sense, the board members need to appraise the advantages and the adverse effects associated with corporate transparency.

The cost of capital occupies a very important place when making management and investment decisions. It reflects the problems of asymmetric information. It motivates academic researchers to orient their work towards analysing the role of the voluntary disclosure of information in the reduction of the cost of capital to mitigate this agency problem. For example, Elliot and Jacobson (1994) argued that a large volume of disclosed information would help to reduce the capital cost. It would contribute to investors and creditors having a better understanding of the economic risk of the investment that they have made already or are planning to make. In other words, the information disclosed by companies affects the perception that the investors could have of the actual situation in the company and of the future expectations. These perceptions could affect key variables like the capital cost.

Nowadays, corporate management has the opportunity to disclose voluntary non-financial information through several

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reports, such as sustainability, intellectual capital and corporate governance reports. However, the existence of this important number of statements including different kinds of information has caused the development of a large amount of difficulties in analysing the issued information and making decisions about the company behaviour. To help ease these problems, some companies have begun to integrate all their information into a single document as an integrated report for a sustainable strategy (Eccles & Kruz, 2010). This statement provides, in a composite, organized and cohesive form, information on the company's strategy, corporate governance, performance and prospects in such a way as to reflect the commercial, social and environmental contexts in which it operates. Thus, a clear and concise statement is provided of how the organization operates and how it creates and maintains value (International Integrated Reporting Committee, IIRC, 2011).

The purpose of this research is to analyse the effect of the voluntary disclosure of integrated information on the cost of capital. To assess this relation, we used 3294 observations corresponding to 995 companies in 27 countries in the period of 2009–2013.

The results show that companies that disclose an integrated report have a lower cost of capital, confirming the use of integrated information in decision making. This effect is especially important to companies that increase their basic funding or experience more problems related to asymmetric information. Furthermore, this typology of information is more valued by investors operating in capital markets with less protection for them.

Our results contribute to the literature in several aspects. First of all, unlike previous studies, we use a proxy of disclosure accuracy, not a proxy of disclosure quantity. Secondly, we consider jointly the effect all of typologies of financial and non-financial information, presented in an integrated form. Results show that it is the accuracy of integrated information disclosure, not the quantity of information disclosed in different reports, that reduces the cost of capital.

In addition, we have observed that the effect of voluntary disclosure of integrated reports on cost of capital is determined by firm incentives, as well as on the institutional environment. In this sense, firms that have greater information asymmetries and higher cost of capital, and that use long-term financial funds are the main beneficiaries of this relationship. From a macro-country perspective, weaker institutions in relation to stock-market development and investor-protection rules foment the benefits associated with accurate information disclosure.

Methodologically, this paper improves on the previous literature by analysing simultaneous equations for panel data, based on the Generalised Method of Moments (GMM) estimator proposed by Arellano and Bond (1991), to correct for problems of endogeneity, taking lags of integrated reports and the cost of capital as instruments of these independent variables. GMM is more consistent than other estimators (de Miguel, Pindado, & de la Torre, 2005) because it not only corrects endogeneity but also controls for the unobservable heterogeneity which arises because an integrated information disclosure decision is taken by specific individuals within a firm, thus generating a particular behaviour pattern. These individual characteristics usually remain constant over time but are unobservable to the researcher (Chi, 2005).

This article is structured in five sections following this introduction. The first part consists of the theoretical background and a preview of the empirical investigation; the second part provides a description of the dependent variable and the control variable as well as the sample and methodology; the third part describes the results of the analyses; and the fourth section presents the complementary results and finally the conclusions that are most relevant to the research.

## 2. Theoretical background

### 2.1. Voluntary disclosure and integrated information

With the purpose of facilitating the decision making of investors and other interested groups, companies are issuing integrated reports that offer an easy, clear and complete view of the company. The information that they contain concerns the company strategies, corporate governance, social responsibility and finance and it can all be found in one document.

The publication of an integrated report does not mean that a company will not publish other, more specific, information or data aimed at particular users. In fact, it involves the production of information comprising financial and non-financial aspects that can be utilized by all types of users (Eccles & Kruz, 2010). However, the integrated report will become the company's primary report and will replace rather than add to the existing requirements, ensuring that only information that is regarded as relevant to the creation of value in the short, medium and long term will be disclosed (Deloitte, 2012).

Previous research has focused on analysing the disclosure of the typology of this report, specifically Frías-Aceituno, Rodríguez-Ariza, and García-Sánchez (2014). Taking into account the postulates of the four principle theories of information disclosure – agency theory, the theory of signals, the theory of the political cost and the theory of the property cost – they observed that the companies that operate in a concentrated sector are less likely to publish integrate reports, with the aim of preserving their abnormal benefits. Another study conducted by the same authors, Frías-Aceituno, Rodríguez-Ariza, and García-Sánchez (2013), focused the analysis on the role of the disclosure in the size, activity, independence and diversity of the administrative council, which are related to the growth of this voluntary new kind of report. The results show that the level of transparency and integration of the corporate information is a priority to large companies and ones with considerable opportunities for growth. This process is also affected by the characteristics of the council. Regarding this, size and gender diversity are the most influential factors in the decision to extend and improve the process of reporting accounts.

Adopting an institutional approach, Frías-Aceituno, Rodríguez-Ariza, and García-Sánchez (2013) concentrated their research on examining the influence of the legal system on the development of integrated reports. These authors demonstrated that companies located in countries with civil law and with major development of law and order are more likely to issue integrated reports that favour decision making. Furthermore, García-Sánchez, Rodríguez-Ariza, and Frías-Aceituno (2013) evaluated the impact of the cultural system on the development of the integrated report as a document linked to corporate development, highlighting that companies located in societies with collectivist values and strong feminism are in the vanguard of the integration of the information.

In this research, we adopt a new approach to the analysis and disclosure of integrated reports, the interest lying in evaluating the effect that the disclosure of the document has on the corporate cost of capital; in the following paragraph, we present our work theory.

### 2.2. Financial and non-financial information disclosure and the cost of capital

Information asymmetry theory assumes that at least one party to a transaction has relevant information, whereas the others do not. According to Kim and Verrecchia (1994), this allows us to talk about the existence of buyers and sellers in the market with different skills in information processing. According to Akerlof (1970), the asymmetric distribution of information among market participants creates a barrier to the smooth exchange of assets at

efficient prices with low transaction costs. Information asymmetry among investors creates trading frictions by introducing adverse selection, leading to lower levels of stock liquidity and higher expected returns (Leuz & Verrecchia, 2000), which increase a firm's cost of capital (Brennan & Subrahmanyam, 1996). This is possible since the opportunity of transacting with counterparts that are more informed requires investors to seek higher returns, causing future expected payoffs to be discounted at a higher rate (Easley & O'hara, 2004a, 2004b), as the information asymmetry component of the cost of capital is the difference in the cost of capital with and without the presence of adverse selection risk (Verrecchia, 2001).

If the existence of information asymmetry is assumed to result in the misallocation of resources, it is important to understand which factors could potentially mitigate such asymmetry. Diamond and Verrecchia (1991) indicated that a lack of disclosure can create incentives for some investors to acquire information privately, thereby increasing the information asymmetry. By increasing their disclosure, firms can combat these market frictions, fomenting the best function of an efficient capital market (Healy and Palepu, 2001). 'Public information makes traders' beliefs more homogeneous and reduces the magnitude of speculative positions which informed traders take' (Diamond, 1985, p. 1073). This argument is based on the pioneering research by Akerlof (1970), who supported the idea that information disclosure reduces the opportunity to obtain private information from investors, and therefore to acquire asymmetric information, because the information has a dual role: it monitors the actions of the management and provides information about the value of the firm that affects the market price in the context of the efficient market hypothesis (Ronen & Yaari, 1993). But, nowadays, there is an ongoing debate about whether better information decreases the cost of capital.

Previous research has analysed how voluntary information disclosure – financial or non-financial – decreases information asymmetry problems in capital markets. In relation to financial information, the financial report shows the economic and financial situation of the company with regard to informing managers and shareholders, and is of crucial importance in decision-making when the interests of both shareholders and creditors must be taken into account (American Accounting Association, 1977). In this sense, some authors argued that high-quality financial information reduces information asymmetries and affects the cost of capital (Easley & O'hara, 2004a, 2004b), but in the empirical literature the results are mixed. While Sengupta (1998), Botosan and Plumlee (2002), Bhattacharya, Daouk, and Welker (2003), Botosan, Plumlee, and Xie (2004) and Francis, Nanda, and Olsson (2008) find a negative relation between financial information quality and cost of capital, others such as Botosan (1997), Core, Guay, and Verdi (2008) or McInnis (2010) fail to find any relation.

In this sense, it is necessary to take into account that the financial report has a weakness in that it does not provide information about certain questions that currently cause great concern; namely the social, environmental and other aspects of company activities. To overcome this limitation, companies disclose non-financial information that determine their corporate governance, intellectual capital and sustainability practices. Empirically, Yoo and Semenenko (2012), Saini and Herrmann (2013) and Blanco, García Lara, and Tribo (2015) agreed that there is a negative relationship between the cost of capital and the quality of the segmented information disclosed. In contrast, Richardson and Welker (2001a, 2001b) observed a positive relationship between the disclosure of social information and the cost of capital; an effect mitigated by the enlargement of the financial results. Following the same approach, Dhaliwal, Li, Tsang, and Yang (2011) examined the benefits associated with the

disclosure of information on corporate social responsibility and the cost of capital. They found that those companies that started to disclose sustainability information experienced a reduction in the cost of capital, even though it did not happen in the following exercises. Likewise, Martínez-Ferrero, Ruiz-Cano, and García-Sánchez (2015a) concluded that the decrease in the cost of capital is a consequence of the strategy of transparency regarding sustainability, especially for those companies located in countries that are more preoccupied with the rights of stakeholders.

Our approach is that this lack of consensus results from the fact that information differences across investors affect a firm's cost of capital through information precision, and not information asymmetry per se, associated with a lower volume of information. Once one controls for information precision, information asymmetries have no effect on the cost of capital. In this sense, the provision of accurate information is the key element for predicting and estimating a firm's risk, which leads to better investment decisions (Lambert, Leuz, & Verrecchia, 2007; Lambert, Leuz, & Verrecchia, 2008). Given that integrated information disaggregates in key performance indicators, including the whole activity of the firm and providing details of different business or geographical lines, risks, strategy plans, etc. in which the firm is involved, this type of information is crucial for investors and analysts. So, we consider that the availability of voluntary integrated financial and non-financial information allows a better understanding of investors' and creditors' economic risk, and thus reduces the cost of capital for the company (Glosten & Milgrom, 1985; Lev, 1992; Holland, 1998; Mazumdar & Sengupta, 2005). This leads to our hypothesis:

**Hypothesis.** Firms providing integrated information are expected to be rewarded with a lower cost of capital.

All of these findings in the previous literature suggest a link between the cost of capital and the existence of non-financial reporting, or the quantity of this type of information disclosed. However, we should not only consider the quantity, but also the accuracy of the disclosures. The quantity of non-financial disclosure only captures the degree of diversification and not the quality of the disclosure itself. That is, the quantity of non-financial disclosure is not a good indicator of investors being able to estimate the firm's cash flow more accurately. Conversely, a measure of integrated disclosure, based on the existence of available key performance indicators (that provide global and integrated data about the company's past and present behaviour and about its future), would capture whether the firm provides more information than expected. Such a measure of disclosure would be a good indicator of an investor's capability to estimate a firm's cash flow. This increased investor capability to estimate a firm's cash flow is expected to reduce estimation risk and, as a consequence, the cost of capital.

### 3. Methodology

#### 3.1. Sample

The sample used to test our hypotheses comprises 995 international companies listed for the years 2009 to 2013. The sample is unbalanced and consists of a total of 3294 observations obtained from 27 countries (Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Luxembourg, Malaysia, Mexico, the Netherlands, Norway, Singapore, Spain, Switzerland, Thailand, the United Kingdom and the United States of America).

The sample is divided into industry groups, which are classified by the Compustat economic activity code. It comprises companies engaged in (1) materials (building materials, chemicals, gases and

raw materials), (2) consumer discretionary (car manufacturers, builders, hotels, casinos, shops and appliance companies), (3) consumer staples (food and drug retail and brewers), (4) health care (health care and pharmaceuticals), (5) energy (oil and gas companies), (6) industrial (conglomerates, construction, aerospace and defence, heavy equipment, airlines and shipping companies, truck, rail and business services and supplies), (7) financial and assurance companies, (8) information technology (telecommunications, information technology, software, electronics and semi-conductors), (9) utilities (electricity, gas, water and shipping companies) and, finally, (0) others.

This sample was obtained from the fusion of information available from four databases: Compustat for accounting and financial data, the Ethical Investment Research Service (EIRIS) and Spencer & Stuart Board Index (SSBI) for data on corporate governance and hand collection of integrated information reporting on the websites of each company. The financial information corresponds to the consolidated data of the analysed companies.

Initially, we considered like populations all the worldwide public companies available in the Compustat database. From this list, we then eliminated the companies which did not have the necessary financial and market information in order to define our dependent and control variable. Later, we fused this information with the data available in the EIRIS and SSBI databases, that is necessary to determine the transparency about sustainability and corporate governance issues. Our final sample of 995 companies (3294 observations) belongs to 27 specific countries that are important in this fusion process. In this regard, we hand-collected and analysed the integrated reports available on the websites of each company during the years 2009–2013.

Table 1 shows how observations are distributed according to the country, industry and year of each of the 995 companies analysed in our sample. Focusing on the activity and the temporal period, consumer discretionary (with 1041 observations) is the industry group with the most companies in the sample during 2011 and 2012. The USA, with 678 observations of 3294, is the most represented country in the sample, closely followed by Japan (with 412 observations) and the United Kingdom (204 observations). The

**Table 1**  
Sampling distribution by country, sector and time period.

Country	Frequency	Percentage	Sector	Frequency	Percentage
Argentina	9	0.27	0	224	6.80
Austria	39	1.18	1	354	10.75
Australia	138	4.19	2	1041	31.60
Belgium	61	1.85	3	447	13.57
Brazil	119	3.61	4	411	12.48
Canada	140	4.25	5	214	6.50
China	110	3.34	6	402	12.20
Denmark	48	1.46	7	123	3.73
Finland	138	4.19	8	40	1.21
France	144	4.37	9	38	1.15
Germany	161	4.89	Total	3294	
Hong Kong	57	1.73			
India	99	3.01			
Indonesia	4	0.12			
Italy	181	5.49	Period	Frequency	Percentage
Japan	412	12.51	2009	425	12.90
Luxembourg	10	0.30	2010	652	19.79
Malaysia	22	0.67	2011	884	26.84
Mexico	33	1.00	2012	884	26.84
Netherlands	99	3.01	2013	449	13.63
Norway	42	1.28	Total	3294	
Singapore	41	1.24			
Spain	179	5.43			
Switzerland	80	2.43			
Thailand	46	1.40			
UK	204	6.19			
USA	678	20.58			
Total	3294				

strong presence of the USA, Japan and the UK is common to previous studies that analysed corporate transparency for an international sample, because these countries have a larger number of public companies (i.e. Frías-Aceituno et al., 2013a, 2013b, 2014; García-Sánchez et al., 2013; García-Sánchez, Cuadrado-Ballesteros, & Frías-Aceituno, 2016; Martínez-Ferrero, Cuadrado-Ballesteros, & García-Sánchez, 2016b).

### 3.2. Variables

#### 3.2.1. Dependent variable: cost of capital (COC)

Following Botosan and Plumlee (2005), El Ghouli, Guedhami, Kwok, and Mishra (2011) and Blanco et al. (2015), we use the PEG ratio based on the Easton model (2004) to determine our dependent variable, COC. It is based on the previous price-earnings-growth of Ohlson and Juettner-Nauroth (2005) but is more useful, since it isolates the effect of the growth and cash flow (Hail and Leuz, 2006). The  $r_{PEG}$  ratio is calculated as follows:

$$r_{PEG} = \sqrt{\frac{eps_5 - eps_4}{P_0}}$$

where  $eps_t$  are the earnings per share in year  $t$  and  $P_0$  is the market price of the firm's stock. Like Blanco et al. (2015), we use the five-year long-term growth rates from I/B/E/S and the Compustat database to calculate these earnings per share forecasts in years 4 and 5. The model requires positive one-year-ahead and two-year-ahead earnings forecasts as well as a positive change in the earnings forecast.

#### 3.2.2. Independent variable: integrated report

In this work, the integrated variable report, IR, is a variable dummy; the value is one when the company discloses an integrated report and zero in the opposite case. This information was hand-collected. In particular, we analysed the websites of the 995 companies selected and observed whether each firm disclosed independent reports, such as financial accounts, sustainability memory and corporate governance statements or, on the contrary, whether all of these statements were integrated into a single document; the integrated report. However, although several companies grouped these documents into an integrated report, they were clearly separate statements. In other words, the information was not presented in a holistic form. So, we examined whether or not the integrated report in each case corresponded to a single document, defined as one based on financial and management commentary, governance and remuneration information and sustainability reporting, in a way that reflected their interdependence. Moreover, in order to determine whether companies provided integrated reporting, it was necessary to observe whether the statement published contained a set of key performance indicators (Schaltegger & Wagner, 2006a, 2006b). In this sense, the recommendations of the IIRC (2011) and AECA (2011) were followed. Table 2 identifies the minimum items required for the document published by a company to be considered an integrated statement.

#### 3.2.3. Control variables

To avoid biased results, it is necessary to control the effect of other factors that affect the cost of capital: the quality of financial information (FRQ), the relevance of sustainable data (GRI), the company size (SIZE), leverage (LEVERAGE), profitability (ROA), growth opportunities (MTB), working capital (WC), analysts (ANALYST), sector (INDUSTRY) and geographic distribution (REGION).

3.2.3.1. *FRQ*. As a proxy for financial reporting quality, we create the FRQ variable based on the accruals quality model proposed by Ball and Shivakumar (2006). These authors suggested that non-linear accrual models that incorporate the timely recognition of losses perform better than linear models. Hence, they consider a current-year cash flow dummy and its interaction with the level of previous, current and future cash flows.

$$\Delta W C_{i t} = \beta_0 + \beta_1 O C F_{i t-1} + \beta_2 O C F_{i t} + \beta_3 O C F_{i t+1} + \beta_4 \Delta R E V_{i t} + \beta_5 P P E_{i t} + \beta_6 D O C F_{i t} + \beta_7 O C F \times D O C F_{i t} + \varepsilon_t$$

where the change in working capital accruals from year  $t - 1$  to  $t$  is  $\Delta W C = \Delta$ Accounts Receivable +  $\Delta$ Inventory –  $\Delta$ Accounts Payable –  $\Delta$ Taxes Payable +  $\Delta$ Other Assets; OCF is the operating cash flow;  $\Delta R V E$  is the change in revenues; PPE represents plan, property and equipment; and DOCF is an indicator variable for negative cash flows. It takes the value one if there are negative OCFs and zero otherwise. In addition,  $i$  indicates the company and  $t$  refers to the time period. All the variables are scaled by the total assets.

We use the inverse of the absolute value of the residuals from this model as a proxy for FRQ: the higher the degree of this proxy, the higher the degree of FRQ. We expect a negative relationship between FRQ and the cost of capital.

3.2.3.2. *GRI*. So, dependent variable representative of the degree of voluntary disclosure of information is defined as GRI, ordinal variable that takes values between 0 and 100 (0, 25, 50, 75 and 100) as is shown in Table 3. These values are assigned based on the level of standardization of CSR disclosures. To create this variable, we have examined the reports of all companies included in the sample and have been assigned to the GRI values varies according to the classifications A, B or C of the GRI guidelines. The information available in the EIRIS database was supplemented with reports on CSR or sustainability reports of the websites of each company.

3.2.3.3. *Corporate size (SIZE)*. Several researchers have included this variable to explain companies' level of disclosure of information. This is in general an important factor in corporate transparency. It is known that large companies are obligated to disclose more information, with the purpose of informing the funding providers and projecting a market image of transparency (Rodríguez Domínguez et al., 2008). Furthermore, the theory of agency shows that large companies need external funding and this will increase the possibility of conflicts of interest among holders, creditors and the board. The information would serve as a mechanism to restrict those conflicts to reduce the information asymmetry.

Empirically, studies like the ones by Richardson and Welker (2001a, 2001b), Botosan et al. (2004), Plumlee, Brown, Hayes, and Marshall (2010), Dhaliwal et al. (2011) and Blanco et al. (2015) have observed that in the relationship between the disclosure of information and the capital cost, the variable size has significant results. Additionally, the research that has evaluated the importance of integrated reports, specifically Frías-Aceituno et al. (2013a, 2013b, 2014) and García-Sánchez et al. (2013), has noticed that the variable size has a positive and significant relationship.

3.2.3.4. *Debt (LEVERAGE)*. This variable constitutes an important factor in the disclosure of voluntary corporate information. The relationship expected between the quantity of disclosure and indebtedness is positive. This is because the cost of agency is higher to those companies that use outside funding. The lenders can protect their interests with restrictive clauses that are included in the lending contracts (Martínez-Ferrero, 2014). Further, Giner (1997) considered that companies with higher debts disclose more information to contribute to reducing the agency costs between

**Table 3**  
Categories of GRI variable.

RSC_INF values	Type of CSR report
RSC_INF = 0	Companies that do not disclose CSR information
RSC_INF = 25	Companies that disclose CSR information which does not comply with GRI guidelines.
RSC_INF = 50	Companies that disclose CSR information following the C level of the GRI guidelines, i.e. their reports are very basic. More concretely, the report incorporates information on: <b>Profile Disclosures:</b> statements numbers 1.1; 2.1–2.10; 3.1–3.8; 3.10–3.12; 4.1–4.4; 4.14–4.15 (see GRI guidelines version 3) <b>Disclosures on management approach:</b> not required <b>Performance indicators and sector supplements performance indicators:</b> a minimum of any 10 performance indicators, including at least one from each of social, economic and environment. Performance Indicators may be selected from any finalised Sector Supplement, but 7 of the 10 must be from the original GRI Guidelines.
RSC_INF = 75	Companies that disclose CSR information following the B level of GRI guidelines, i.e. their reports are complete. Concretely, report contain information about: More concretely, the report incorporates information on: <b>Profile Disclosures:</b> statements numbers 1.1; 1.2; 2.1–2.10; 3.1–3.13; 4.1–4.17 (see GRI guidelines version 3). <b>Disclosures on management approach:</b> for each indicator category <b>Performance indicators and sector supplements performance indicators:</b> a minimum of any 20 performance indicators, including at least one from each of economic, environment, human rights, labour, society and product responsibility. Performance Indicators may be selected from any finalised Sector Supplement, but 14 of the 20 must be from the original GRI Guidelines.
RSC_INF = 100	Companies that disclose CSR information following the A level of GRI guidelines, i.e. their reports are very advanced. More concretely, the report incorporate information on: <b>Profile Disclosures:</b> 1.1; 1.2; 2.1–2.10; 3.1–3.13; 4.1–4.17 (see GRI guidelines version 3) <b>Disclosures on management approach:</b> for each indicator category <b>Performance indicators and sector supplements performance indicators:</b> Incorporate each core and sector supplement indicator.

Source: the authors.

shareholders and board directors as well as to take advantage of the funding. On the other hand, when the level of debt is high, the disclosure of information can be affected by the fear of an unfavourable prognosis and pressure from the creditors because of the high level of risk (Watson, Shrivs, & Marston, 2002).

The results from the empirical research are not conclusive; we can observe a negative relation (Giner, 1997; Watson et al., 2002) and a positive relation between debt and the quantity of information disclosed voluntarily. Likewise, Botosan (1997), Sengupta (1998), Richardson and Welker (2001a, 2001b), Botosan and Plumlee (2002) and Blanco et al. (2015) detected a positive relationship between the cost of capital and debt.

3.2.3.5. *Profitability (ROA)*. From the theoretical and practical points of view, there is a complex relationship between profitability, the cost of capital and the information disclosed. The principle theories of revelation are oriented towards a positive relationship. The theory of agency suggests that the board members from more profitable companies can use external information for personal purposes. The theory of signs shows that board members could be interested in broadcasting good news with the aim of having a favourable effect on the market and obtaining economic benefits. Meanwhile, the theory of political cost argues that companies with high profitability could be

**Table 2**

Integrated report.

**Business and organizational model**

Definition of corporate goals  
 Description of activities, markets, products and services  
 Identification of key factors (intellectual capital, environmental impact, etc.) and key stakeholders  
 Attitude towards risk

**Context, risks and opportunities**

Description of/reference to the commercial, social, environmental and regulatory contexts  
 Description of the key relations with internal and external stakeholders (needs and expectations)  
 Description of the main risks and opportunities

**Strategic goals and strategies**

Definition of the corporate outlook  
 Risk management regarding the key resources and their main relations  
 Definition/identification of the strategic goals  
 Relating strategies to other elements  
 Identification of strategies to achieve differentiation/competitive advantage

**Corporate governance and remuneration policy**

Description of corporate governance  
 Influence of corporate governance on strategic decisions  
 Influence of corporate governance on executive remuneration

**Behaviour–performance and value creation: financial, social and environmental**

Identification of key quantitative indicators of performance and risk (KPIs, KRIs)  
 Identification of results (financial and non-financial)  
 Comparison of results with past data  
 Comparison of results with future data  
 Relation between KPIs and strategic goals

**Future outlook**

Definition/identification of future challenges and opportunities (scenarios)  
 Reference to the balance of short- and long-term interests/goals  
 Reference to future results/expectations

**Description of the analysed KPIs and KRIs***Economic efficiency*

Added value, debt, economic contribution to the community, employee benefits, financial expense, public administration expense, result, revenues, suppliers and shareholder retribution

*Environmental efficiency*

Energy efficiency (energy consumption and water consumption)  
 Pollution reduction (pollution emissions)  
 Waste reduction (waste generation and waste processed)

*Social efficiency*

Increase in human capital (absenteeism, accidents and diseases in the workplace, employees, employee turnover, employee training, gender diversity, job stability, seniority)  
 Increase in social capital (CSR certified suppliers, locally based suppliers, non-compliance with legal regulation concerning customers, payment period to suppliers)

Source: AECA (2011) and IIRC (2011).

interested in disclosing more information to justify their performance level.

The results from previous empirical research are not conclusive. There are studies in which the relationship is not statistically significant (Larrán & Giner, 2002; Marston & Polei, 2004; Oyeler, Lasward, & Fisher, 2003; Richardson & Welker, 2001a, 2001b; Rodríguez Domínguez & Noguera Gámez, 2014) or there is an inverse relationship between the profit and the disclosure of information (Giner, 1997; Gul & Leung, 2004; Prencipe, 2004; Rodríguez Domínguez et al., 2008; Rodríguez-Domínguez, Gallego Álvarez, & García Sánchez, 2011; Watson et al., 2002). In connection with work related to the cost of capital, the results are not significant (Saini and Herrmann, 2013). In addition, in some research related to the voluntary disclosure of integrated reports, it is observed that the profitability issue has a positive and significant effect (Frías-Aceituno et al., 2013b, 2014; García-Sánchez, Rodríguez-Ariza, & Frías-Aceituno, 2013).

3.2.3.6. *Growth opportunities (MTB)*. Companies with a considerable possibility of growth will disclose more information with the purpose of reducing the costs and problems associated with information asymmetry and agency; in that way, they will improve their efficiency in investments by decreasing the financial cost (Bushman & Smith, 2001). Most of the previous research that relates the opportunity to grow and the voluntary disclosure of information has suggested a positive relationship by stating that companies will disclose a greater volume of information with the aim of decreasing the problems of asymmetric information (Frías-Aceituno et al., 2014; Prado-Lorenzo & García-Sánchez, 2010; Prado-Lorenzo, Gallego-Álvarez, & García-Sánchez, 2009a; 2009b), because managers of companies with large opportunities to grow can be interested in disclosing preferential information about opportunities and perspectives of investment to other interested groups (Smith and Watts, 1992). Some researchers have analysed the relationship between the disclosure of information and the cost of capital, observing a positive and significant influence of this variable

**Table 4**  
Descriptive statistics.

	Frequency	Percentage
IR	414	12.57
	<i>Median</i>	<i>Std. Dv.</i>
COC	1.771	2.560
FRQ	0.03	0.64
GRI	42.75	23.00
SIZE	15.05	2.25
LEVERAGE	0.06	0.30
ROA	8.12	11.06
MTB	0.10	0.82
WC	204.10	1373.60
ANALYST	16.72	8.92

(Blanco et al., 2015; Botosan & Plumlee, 2005; Botosan et al., 2004; Saini & Herrmann, 2013).

**3.2.3.7. Working capital (WC).** This is defined as the difference between the current assets and the current liabilities and it reflects liquidity, that is, a company's ability to proceed normally with its activities in the short term. Companies with financial problems, which might be reflected as negative working capital and excess debt, may be more inclined to manipulate information (Park and Shin, 2004). In the work carried out by Martínez-Ferrero (2014), they demonstrated that there is a positive relationship between the cost of capital and the variable WC when analysing the impact of the quality of financial information.

**3.2.3.8. Analysts (ANALYST).** There is no clear relationship among the number of analysts following the company, the disclosure of information and the cost of capital. Botosan (1997) argued that greater disclosure of information is associated with a minor decrease in the cost of capital in those companies followed by a small number of analysts. Healy et al. (1999) found that companies that increase their level of disclosure increase their stock performance, institutional ownership, analyst following and stock liquidity. Richardson and Welker (2001a, 2001b) claimed that the quality of information available to the stakeholders depends on the number of analysts that process separate reports

**Table 5**  
Bivariate correlations.

	COC	1	2	3	4	5	6	7	8	9	10	
1	IR	-.062**										
2	FRQ	-.032	-.022									
3	GRI	-.095**	.061**	.090**								
4	SIZE	.169**	-.113**	.342**	.061**							
5	ROA	-.086**	.031	.015	.030	.029						
6	LEVERAGE	.000	-.007	-.005	.017	-.090**	-.100**					
7	MTB	-.086**	.070**	-.030	.030	-.373**	.104**	-.002				
8	WC	.054**	-.011	.539**	.059**	.165**	-.010	-.002	-.005			
9	ANALYST	-.083**	-.047**	.243**	.184**	.423**	.233**	-.024	-.062**	.065**		
10	INDUSTRY	-.024	.066**	-.044*	.030	-.159**	-.039*	-.008	.133**	-.054**	-.109**	
11	REGION	-.096**	-.061**	.071**	-.004	.136**	.022	-.065**	-.044*	.058**	.077**	-.085**

COC represents the cost of capital using the PEG ratio based on the model by Easton (2004). The IR independent variable takes the value of one if the company discloses an integrated report and zero in the opposite case. FRQ represents the index that measures the quality of the information using the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application indicated by the GRI report. SIZE represents the size of the company and is measured by the logarithm of the total assets. ROA is the economic profit of the company measured with the quotient of operative benefit and total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and the total assets. MTB represents the opportunity to grow of the company measured by the ratio market value/accountant value. WC represents the working capital of the company measured by the difference between the current assets and the current liability. ANALYST represents the number of analysts following the company. REGION represents the geographic region to which the original country of the company belongs.

\* The correlation is significant at the 0.05 level (bilateral).

\*\* The correlation is significant at the 0.01 level (bilateral).

**Table 6**  
Statistical differences in contrast COC.

IR	
INDUSTRY	
U Mann-Whitney	509373.50
W Wilcoxon	595278.50
Z	-4.80
p-value	.000

on the company, observing a positive relationship. Botosan and Plumlee (2002), following Botosan's approach (1997), found that companies that are followed by many analysts provide more information in their annual report.

**3.2.3.9. Business sector (INDUSTRY).** The sector to which the company belongs is an important variable in the disclosure of financial and non-financial information (Bonsón and Escobar, 2004; Oyelere et al., 2003; Watson et al., 2002). According to the sign theory, companies adopt the politics of disclosure following the model of other companies that operate in the same sector, due to the fact that if one company does not adopt the same strategy for corporate information disclosure as its competitors, it can be interpreted by the market as a negative signal. Additionally, companies that operate in the same sector can be more politically vulnerable and could have more incentives to disclose a larger volume of information to minimize their possible political cost (Oyelere et al., 2003).

The results of the previous research are not conclusive; in some works, we observe that the sector to which the company belongs can influence the quantity of information disclosed (Bonsón & Escobar, 2004; Oyelere et al., 2003; Richardson & Welker, 2001a, 2001b; Watson et al., 2002). Conversely, some other works did not show a statistically significant relationship, that is, Giner (1997), Larrán and Giner (2002), Frías-Aceituno, Rodríguez-Ariza, and García Sánchez (2012) and Rodríguez Domínguez and Noguera Gámez (2014). Furthermore, other works did not produce significant results (Blanco et al., 2015; Martínez-Ferrero, 2014; Saini & Herrmann, 2013).

**Table 7**  
Basic analysis.

	Model 1a Coef. (Std error)	t (p-value)	Model 1b Coef. (Std error)	t (p-value)	Model 1c Coef. (Std error)	T (p-value)	Model 1 Coef. (Std error)	T (p-value)
IR	-62.200 (16.662)	-3.730 (0.000)	-37.292 (14.580)	-2.560 (0.011)	-67.486 (18.765)	-3.600 (0.000)	-37.022 (14.967)	-2.470 (0.014)
FRQ			-0.001 (0.000)	-4.380 (0.000)			-0.001 (0.000)	-4.330 (0.000)
GRI					-27.702 (9.685)	-2.860 (0.004)	-2.587 (6.237)	-0.410 (0.678)
SIZE	58.390 (6.387)	9.140 (0.000)	38.784 (6.566)	5.910 (0.000)	43.209 (7.743)	5.580 (0.000)	37.452 (7.210)	5.190 (0.000)
LEVERAGE	8.001 (4.023)	1.990 (0.047)	-0.879 (2.685)	-0.330 (0.743)	4.250 (3.787)	1.120 (0.262)	-1.140 (2.761)	-0.410 (0.680)
ROA	-2.098 (0.439)	-4.780 (0.000)	-1.061 (0.473)	-2.240 (0.025)	-1.826 (0.462)	-3.950 (0.000)	-1.029 (0.476)	-2.160 (0.031)
MTB	9.626 (2.334)	4.120 (0.000)	3.992 (2.005)	1.990 (0.047)	10.458 (2.159)	4.840 (0.000)	3.899 (2.040)	1.910 (0.056)
WC	0.000 (0.000)	15.080 (0.000)	0.000 (0.000)	11.180 (0.000)	0.000 (0.000)	15.590 (0.000)	0.000 (0.000)	11.100 (0.000)
ANALYST	Dropped		Dropped		Dropped		Dropped	
INDUSTRY	Yes		Yes		Yes		Yes	
REGION	Yes		Yes		Yes		Yes	
YEAR	Yes		Yes		Yes		Yes	
z <sub>1</sub>	70.96 (5)		97.52 (6)		66.62 (6)		84.62 (7)	
m <sub>1</sub>	-2.60		-1.58		-2.65		-1.58	
m <sub>2</sub>	1.59		1.75		1.60		1.74	
Hansen	130.42 (41)		89.49 (33)		121.67 (40)		89.26 (32)	

Notes:  
 (i) Heteroskedasticity-consistent asymptotic standard errors in parentheses.  
 (ii) \*, \*\* and \*\*\* indicate significance at the 1%, 5% and 10% level, respectively.  
 (iii) z<sub>1</sub> is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as  $\chi^2$  under the null of no relationship; degrees of freedom in parentheses.  
 (iv) m<sub>i</sub> is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.  
 (v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of no correlation between the instruments and the error term; degrees of freedom in parentheses.

The IR independent variable takes the value of one if the company discloses an integrated report and zero in the contrary case. FRQ represents the index that measures the quality of financial information, measured by the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application indicated by the GRI report. SIZE represents the size of the company and is measured by the logarithm of the total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and the total assets. ROA is the economic profitability of the company measured with the quotient of operative benefit and total assets. MTB represents the opportunity to grow of the company measured by the market value/accountant value ratio. WC represents the working capital of the company measured by the difference between the current assets and the current liability. ANALYST represents the number of analysts following the company. INDUSTRY represents the sector to which the company belongs. REGION represents the geographic region to which the original company belongs. YEAR represents each of the economic exercises included in the exercise.

3.2.3.10. *Geographic distribution (REGION)*. With the purpose of learning whether the place where the company is located affects the voluntary disclosure of integrate reports and to evaluate the effect on the cost of capital, we include the variable (REGION) location in this work to identify the principle geographic regions of the countries analysed.

3.3. Methodology

The purpose of this work is to determine the effect of the voluntary disclosure of integrated reports on the capital cost. Accordingly, we construct the following general model:

Model 1:

$$COC_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 FRQ_{it} + \beta_3 GRI_{it} + \beta_4 SIZE_{it} + \beta_5 LEVERAGE_{it} + \beta_6 ROA_{it} + \beta_7 MTB + \beta_8 WC_{it} + \beta_9 ANALYST_{it} + \beta_{10} INDUSTRY_{it} + \beta_{11} REGION_{it} + \beta_{12} YEAR_{it} + \eta_i + \mu_{it}$$

With the aim of identifying the effect of the integrated report and the moderating role of the relevance to financial funding and sustainability, we will estimate the following three sub-models, in which each variable will be included successively:

Model 1a:

$$COC_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 SIZE_{it} + \beta_3 LEVERAGE_{it} + \beta_4 ROA_{it} + \beta_5 MTB + \beta_6 WC_{it} + \beta_7 ANALYST_{it} + \beta_8 INDUSTRY_{it} + \beta_9 REGION_{it} + \beta_{10} YEAR_{it} + \eta_i + \mu_{it}$$

Model 1b:

$$COC_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 FRQ_{it} + \beta_3 SIZE_{it} + \beta_4 LEVERAGE_{it} + \beta_5 ROA_{it} + \beta_6 MTB + \beta_7 WC_{it} + \beta_8 ANALYST_{it} + \beta_9 INDUSTRY_{it} + \beta_{10} REGION_{it} + \beta_{11} YEAR_{it} + \eta_i + \mu_{it}$$

Model 1c:

$$COC_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 GRI_{it} + \beta_3 SIZE_{it} + \beta_4 LEVERAGE_{it} + \beta_5 ROA_{it} + \beta_6 MTB + \beta_7 WC_{it} + \beta_8 ANALYST_{it} + \beta_9 INDUSTRY_{it} + \beta_{10} REGION_{it} + \beta_{11} YEAR_{it} + \eta_i + \mu_{it}$$

where: COCA numeric dependent variable representing the cost of capital measured through the PEG ratio based on the model by Easton (2004). IRA dummy independent variable taking the value of one if the company discloses an integrated report and zero in the opposite case. FRQA numeric variable of control representing the quality of the information though the model proposed by Ball and Shivakumar (2006). GRIA numeric variable of control representing the level of the sustainability measure agreed with the three levels of application indicated in the GRI report. SIZEA numeric variable of



**Table 8**  
Robustness analysis I.

	Model 2 Increment capital and debt		Model 3 Litigation sector	
	Coef. (Std error)	t (p-value)	Coef. (Std error)	T (p-value)
IR	-32.693 (20.209)	-1.620 (0.106)	-27.001 (11.300)	-2.390 (0.017)
INCRCAPITALDEBT	9.958 (22.912)	0.430 (0.664)		
IR*INCRCAPITALDEBT	-57.661 (5.564)	-10.360 (0.000)		
LITINDUSTRY			Dropped	
IR*LITINDUSTRY			227.540 (270.776)	0.840 (0.401)
FRQ	0.001 (0.000)	0.430 (0.667)	-0.001 (0.000)	-3.700 (0.000)
GRI	13.365 (6.446)	2.070 (0.039)	4.298 (6.286)	0.680 (0.494)
SIZE	88.112 (10.882)	8.100 (0.000)	45.671 (8.787)	5.200 (0.000)
LEVERAGE	10.917 (4.320)	2.530 (0.012)	1.644 (3.143)	0.520 (0.601)
ROA	-0.140 (0.512)	-0.270 (0.785)	-1.014 (0.521)	-1.940 (0.052)
MTB	11.872 (3.073)	3.860 (0.000)	4.244 (2.624)	1.620 (0.106)
WC	0.000 (0.000)	5.600 (0.000)	0.000 (0.000)	9.610 (0.000)
ANALYST	Dropped		Dropped	
INDUSTRY	Yes		Yes	
REGION	Yes		Yes	
YEAR	Yes		Yes	
$z_1$	61.05 (9)		61.51 (8)	
$m_1$	-1.89		-1.58	
$m_2$	2.00		1.89	
Hansen	67.02 (30)		85.87 (37)	

Notes:

- (i) Heteroskedasticity-consistent asymptotic standard errors in parentheses.
- (ii) \*, \*\* and \*\*\* indicate significance at the 1%, 5% and 10% level, respectively.
- (iii)  $z_1$  is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as  $\chi^2$  under the null of no relationship; degrees of freedom in parentheses.
- (iv)  $m_i$  is a serial correlation test of order  $i$  using residuals in first differences, asymptotically distributed as  $N(0, 1)$  under the null of no serial correlation.
- (v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of no correlation between the instruments and the error term; degrees of freedom in parentheses.

The IR independent variable takes the value of one if the company discloses an integrated report and zero in the contrary case. FRQ represents the index that measures the quality of financial information, measured by the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application indicated by the GRI report. SIZE represents the size of the company and is measured by the logarithm of the total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and total assets. ROA is the economic profitability of the company measured with the quotient of operative benefit and total assets. MTB represents the opportunity to grow of the company measured by the ratio market value/accountant value. WC represents the working capital of the company measured by the difference between the current asset and the current liability. ANALYST represents the number of analysts following the company. INDUSTRY represents the sector to which the company belongs. REGION represents the geographic region to which the original company belongs. YEAR represents each of the economic years included in the exercise.

control representing the size of the company measured through the logarithm of the total assets. LEVERAGEA numeric variable of control representing the indebtedness of the company measured by the debt/total assets ratio. ROAA numeric variable of control representing the profitability of the company measured through the quotient of operative benefit and total assets. MTBA numeric variable of control representing the opportunities of the company

to grow measured through the market value/account value ratio. WCA numeric variable of control representing the working capital of the company measured by the difference between the current assets and the current liabilities. ANALYSTA numeric variable of control representing the number of analysts following the company. INDUSTRYA categorical variable of control representing the sector to which the company belongs. REGIONA categorical variable of control representing the geographic region and the country of origin to which the company belongs. YEARA categorical variable representing each fiscal year included.

The technical model proposed to contrast the hypothesis suggested will consist of the estimation of equations for the panel data through the Generalized Method of Moments (GMM), proposed by Arellano and Bond (1991). Previous studies have used panel-data methodology based on lineal regression that controls heterogeneity but does not consider endogeneity problems. The use of the GMM estimate permits us to control the problems of endogeneity between the dependent and the independent variable and in that way to control effects that are not observed by country. This method allows us to obtain consistent estimates of the lineal regression model and corroborate the independence of the exogenous variables of the model. The method does not require the normality assumption and allows estimations of a considerable level of trust by using conditions of orthogonality or moments to find more efficient estimations.

The use of panel data stimulates the evaluation of the sample companies' behaviour throughout time by analysing the observations of several years in a row from the same company. With the use of temporal series or cross-cut data, both methodologies allow the unobservable heterogeneity of differences that is not observable among individuals to be captured. This is potentially correlated with the explanatory variable. Furthermore, it denominates the individual specific effects that may change in time and influence directly the decisions taken by the companies being analysed regarding aspects such as the capacity of the company, favourable behaviour towards corporate transparency and so on. In addition, the consideration of the temporal dimension of the data enriches the study, especially during periods of great changes. In this sense, the panel data allow us to control the effects on the business practices that can occur each year.

#### 4. Analysis of the results

##### 4.1. Descriptive statistics

In Table 4, we observe the descriptive statistics of the variables analysed. The median of the variable cost of capital (COC) is 1.771 and the typical deviation is 2.560; considering the cost of capital as the minimal rate of return that an investor expects, this indicates that on average the companies in the sample could provide the shareholders with 1.771 points as a result of their investment, and the typical deviation of 2.560 points means that the variation could have this return of capital according to the return-risk principle (more risk means a greater expectation of returns). Regarding the independent variable, IR, we observe that 414 companies, representing 12.57% of the sample, disclose this type of document.

Table 5 shows the coefficients of the Pearson correlation between the variables used in the analysis. We can observe that the majority of the variables present a significant correlation with the dependent variable, COC. Specifically, the variables SIZE (0.169), GRI (-0.095), MTB (-0.086), ROA (-0.086) and IR (-0.062) have a major correlation with the dependent variable. The coefficients of correlation among the independent variables and control are not elevated, eliminating problems of multicollinearity.

Table 6 contains the statistic contrast that shows differences in the capital cost depending on the disclosure or otherwise of the

integrated report and the sector and continent where the company is located. We observe significant differences in the dependent variable.

4.2. Basic analysis

Table 7 shows the results of the models proposed in the previous paragraph. Analysing each variable, we can say that variable IR has negative and significant effects in the four models at a level of 99% (models 1a and 1b) and 95% (models 1 and 1b). This result indicates that those companies that disclose this kind of information achieve a lower cost of capital, confirming the utility that the integrated report has in decision making, as is upheld by the studies of Frías-Aceituno et al. (2013a, 2013b, 2014) and García-Sánchez et al. (2013). This result proves our hypothesis H1, that firms providing integrated information are expected to be rewarded with a lower cost of capital.

Analysing the FRQ variable, we observe a negative and significant effect on models 1 and 1b at the 99% level of trust. This result indicates that those companies that issue financial information with higher quality will have a lower cost of capital.

Regarding the variable GRI, we notice that it has a negative and significant effect in model 1c at the 99% level of trust. However, this effect disappears in model 1, which considers the effect of this information together with the quality of the financial information.

Together, these results indicate that the information on sustainability affects only the cost of capital in those companies with financial statements of lower quality and no limited quality for investors and the market in the process of decision making.

In relation to the other control variables, the variable SIZE has a positive effect in the four models proposed at the 99% level of trust. This result indicates that bigger companies have a greater need for funding, supporting a higher cost of capital. This result matches those obtained by Botosan et al. (2004), Plumlee et al. (2010) and Dhaliwal et al. (2011).

The variable ROA has a negative and significant effect in the four models at the significance level of 99% for models 1a and 1c and 95% for models 1 and 1b. This result indicates that the most profitable companies will disclose more information and as a result will have fewer problems of information asymmetry, implying that the necessity of external funding does not lead to a major cost of capital.

The variable LEVERAGE has a positive and significant effect on model 1a at the level of trust of 95%. This result indicates that those companies with more debt will have a higher cost of capital; this relationship disappears by the time more and better-quality information is disclosed. This effect matches those in the agency theory, which indicates that companies with more debt are the most likely to disclose more information with the purpose of reducing the cost of agency between shareholders and directors.

Table 9  
Robustness analysis II (model 3).

	ASIA		EUROPE		SOUTH AMERICA		NORTH AMERICA		OCEANIA	
	Coef. (Std error)	t (p-value)	Coef. (Std error)	T (p-value)	Coef. (Std error)	t (p-value)	Coef. (Std error)	T (p-value)	Coef. (Std error)	T (p-value)
IR	2.294 (31.779)	0.070 (0.943)	-0.770 (0.408)	-1.890 (0.060)	38.556 (4.583)	8.410 (0.000)	-84.885 (32.427)	-2.620 (0.010)	12.585 (3.495)	3.600 (0.001)
FRQ	-0.001 (0.000)	-1.630 (0.105)	-0.001 (0.000)	-0.120 (0.904)	-0.001 (0.000)	-7.570 (0.000)	-0.001 (0.000)	-37.140 (0.000)	0.000 (0.000)	0.070 (0.942)
GRI	18.547 (13.573)	1.370 (0.174)	-2.660 (17.240)	-0.150 (0.878)	-44.200 (6.007)	-7.360 (0.000)	-32.191 (10.004)	-3.220 (0.002)	-1.138 (2.669)	-0.430 (0.673)
SIZE	120.374 (18.881)	6.380 (0.000)	30.351 (11.730)	2.590 (0.010)	7.772 (4.159)	1.870 (0.069)	11.208 (5.672)	1.980 (0.050)	24.060 (1.015)	23.690 (0.000)
LEVERAGE	128.473 (217.864)	0.590 (0.556)	-6.083 (20.459)	-0.300 (0.766)	-15.049 (2.500)	-6.020 (0.000)	257.098 (126.570)	2.030 (0.044)	(Dropped)	
ROA	-2.400 (0.903)	-2.660 (0.009)	10.102 (10.556)	0.960 (0.339)	-0.248 (0.432)	-0.570 (0.570)	-1.638 (0.587)	-2.790 (0.006)	-2.098 (0.106)	-19.860 (0.000)
MTOB	12.438 (160.758)	0.080 (0.938)	4.651 (2.340)	1.990 (0.048)	-74.834 (58.983)	-1.270 (0.212)	1.098 (2.146)	0.510 (0.610)	-24.464 (42.944)	-0.570 (0.573)
WC	-0.001 (0.000)	-0.330 (0.739)	-0.001 (0.000)	-1.010 (0.315)	-0.001 (0.000)	-11.530 (0.000)	0.000 (0.000)	1.180 (0.240)	-0.001 (0.000)	-2.670 (0.012)
ANALYST	Dropped		Dropped		Dropped		Dropped		Dropped	
INDUSTRY	Yes		Yes		Yes		Yes		Yes	
REGION	Yes		Yes		Yes		Yes		Yes	
YEAR	Yes		Yes		Yes		Yes		Yes	
z <sub>1</sub>	7.78 (7)		2.18 (7)		2725.25 (7)		579.64 (7)		715.71 (7)	
m <sub>1</sub>	-1.53		-0.85		-0.94		-0.77		-0.91	
m <sub>2</sub>	1.12		1.99		1.22		0.72		1.20	
Hansen	35.47 (30)		34.36 (30)		22.19 (30)		43.00 (30)		307.62 (22)	

Notes:  
 (i) Heteroskedasticity-consistent asymptotic standard errors in parentheses.  
 (ii) \*, \*\* and \*\*\* indicate significance at the 1%, 5% and 10% level, respectively.  
 (iii) z<sub>1</sub> is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as  $\chi^2$  under the null of no relationship; degrees of freedom in parentheses.  
 (iv) m<sub>i</sub> is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.  
 (v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of no correlation between the instruments and the error term; degrees of freedom in parentheses.

The IR independent variable takes the value of one if the company discloses an integrated report and zero in the contrary case. FRQ represents the index that measures the quality of financial information using the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application indicated by the GRI report. SIZE represents the size of the company and is measured by the logarithm of the total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and the total assets. ROA is the economic profitability of the company measured with the quotient of operative benefit and total assets. MTB represents the opportunity to grow of the company measured by the market value/accountant value ratio. WC represents the working capital of the company measured by the difference between the current assets and the current liability. ANALYST represents the number of analysts following the company. INDUSTRY represents the sector to which the company belongs. REGION represents the geographic region to which the original company belongs. YEAR represents each of the economic years included in the exercise.

This result confirms those obtained by Sengupta (1998) and Richardson and Welker (2001a, 2001b).

Regarding the variable MTB, this has a positive and significant effect at the level of trust of 99% in models 1a and 1c, 95% in model 1b and 90% in model 1. This result shows that companies with more opportunities for business and more risk (La Porta, 1996) support a greater cost of capital. This result matches those obtained for different typologies of information by Botosan et al. (2004) and Botosan and Plumlee (2005).

In relation to the variable WC, this variable has a positive and significant effect on the dependent variable in the four models proposed at the 99% level of trust. This indicates that companies with more liquidity could respond more easily to the payment of their debt in a short period of time; consequently, the cost of capital will be lower. This results matches those presented by Martínez-Ferrero (2014).

### 4.3. Robustness analysis

To guarantee our results, we will proceed to analyse four robust reports. In the first one (model 2), with the aim of knowing the effect that the increment of capital and/or debt can have on the companies of the sample and the cost of capital, we control for a firm's financing activities by assessing the dummy variable

INCRCAPITALDEBT, which takes the value of one if the amount of debt or equity capital raised by the firm during the year has suffered an increment relating to the previous year and zero otherwise.

Model 2:

$$\begin{aligned} \text{COC}_{it} = & \beta_0 + \beta_1 \text{IR}_{it} + \beta_2 \text{INCRCAPITALDEBT}_{it} \\ & + \beta_3 \text{IR INCRCAPITALDEBT}_{it} + \beta_4 \text{FRQ}_{it} + \beta_5 \text{GRI}_{it} + \beta_6 \text{SIZE}_{it} \\ & + \beta_7 \text{LEVERAGE}_{it} + \beta_8 \text{ROA}_{it} + \beta_9 \text{MTB} + \beta_{10} \text{WC}_{it} \\ & + \beta_{11} \text{ANALYST}_{it} + \beta_{12} \text{INDUSTRY}_{it} + \beta_{13} \text{REGION}_{it} \\ & + \beta_{14} \text{YEAR}_{it} + \eta_i + \mu_{it} \end{aligned}$$

With regard to model 1, we incorporate the variable INCRCAPITALDEBT, which indicates whether the company has increased its debts or the exercise capital, and the interaction IR\*INCRCAPITALDEBT, which collects the situation, only for those companies that disclose an integrated report.

In Table 8, we can observe the empirical results of this model, revealing that variable IR and IR\*INCRCAPITALDEBT have a statistically negative effect. This indicates that disclosing integrated information results in a reduction in the cost of capital for companies (coef. IR = -32.693), which is greater for those companies that have increased their basic funding in the long term (coef. IR + coef. IR\*INCRCAPITALDEBT = -32.693 - 57.661 = -90.354).

**Table 10**  
Robustness analysis III (model 4).

	COC percentile 5%		COC percentile 25%		COC percentile 50%		COC percentile 75%		COC percentile 95%	
	Coef. (Std error)	t (p-value)	Coef. (Std error)	t (p-value)	Coef. (Std error)	t (p-value)	Coef. (Std error)	T (p-value)	Coef. (Std error)	t (p-value)
IR	0.443 (8.942)	0.050 (0.961)	-14.122 (17.710)	-0.800 (0.426)	-32.391 (17.879)	-1.810 (0.072)	-6.206 (1.387)	-4.470 (0.000)	-44176.630 (6804.586)	-6.490 (0.000)
FRQ	-0.001 (0.000)	-0.690 (0.493)	-0.001 (0.000)	-0.920 (0.357)	0.000 (0.000)	0.440 (0.659)	-0.001 (0.000)	-37.190 (0.000)	0.000 (0.000)	3.550 (0.002)
GRI	7.519 (15.731)	0.480 (0.633)	-11.740 (11.809)	-0.990 (0.321)	-0.785 (7.160)	-0.110 (0.913)	-16.517 (7.902)	-2.090 (0.038)	-25.015 (12.098)	-2.070 (0.054)
SIZE	53.178 (15.117)	3.520 (0.001)	33.877 (10.888)	3.110 (0.002)	41.699 (8.969)	4.650 (0.000)	24.759 (7.843)	3.160 (0.002)	11.605 (8.118)	1.430 (0.171)
LEVERAGE	17.665 (24.334)	0.730 (0.469)	158.854 (113.332)	1.400 (0.163)	16.287 (6.873)	2.370 (0.019)	-36.148 (23.861)	-1.510 (0.132)	-67.040 (350.228)	-0.190 (0.850)
ROA	-4.702 (1.590)	-2.960 (0.004)	-0.491 (0.422)	-1.160 (0.246)	-0.651 (0.247)	-2.630 (0.009)	-1.879 (0.603)	-3.120 (0.002)	-1.695 (0.558)	-3.040 (0.007)
MTB	8.692 (2.642)	3.290 (0.001)	16.694 (11.668)	1.430 (0.154)	9.817 (6.085)	1.610 (0.109)	81.589 (24.501)	3.330 (0.001)	4.350 (40.089)	0.110 (0.915)
WC	-0.001 (0.000)	-1.530 (0.128)	-0.001 (0.000)	-0.650 (0.517)	0.000 (0.000)	0.150 (0.883)	0.000 (0.000)	10.660 (0.000)	-0.001 (0.000)	-5.420 (0.000)
ANALYST	Dropped		Dropped		Dropped		Dropped		Dropped	
INDUSTRY	Yes		Yes		Yes		Yes		Yes	
REGION	Yes		Yes		Yes		Yes		Yes	
YEAR	Yes		Yes		Yes		Yes		Yes	
z <sub>1</sub>	26.08 (7)		1.91 (7)		5.05 (7)		661.79 (7)		282.38 (7)	
m <sub>1</sub>	-1.51		-0.90		-0.73		-0.85		-1.19	
m <sub>2</sub>	1.69		1.85		0.45		0.04		0.47	
Hansen	20.73 (31)		32.28 (31)		33.56 (30)		58.44 (31)		12.02 (27)	

Notes:

(i) Heteroskedasticity-consistent asymptotic standard errors in parentheses.

(ii) \*, \*\* and \*\*\* indicate significance at the 1%, 5% and 10% level, respectively.

(iii) z<sub>1</sub> is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as  $\chi^2$  under the null of no relationship; degrees of freedom in parentheses.

(iv) m<sub>i</sub> is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.

(v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of no correlation between the instruments and the error term; degrees of freedom in parentheses.

COC represents the capital cost using the PEG ratio based on the model by Easton (2004). FRQ represents the index that measures the quality of the financial information using the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application in the GRI report. SIZE represents the size of the company measured by the logarithm of the total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and the total assets. ROA is the economic profit of the company measured by the quotient of operative benefit and total assets. MTB represents the opportunity to grow of the company measured by the market value/accountant value ratio. WC represents the working capital of the company measured by the difference between the current assets and the current liability. ANALYST represents the number of analysts following the company.

In the second robustness analysis, we consider the risk of the company suffering a lawsuit, a factor that determines the corporate transparency. Skinner (1994) argued that the threat of lawsuits arising from large negative earnings surprises provides managers with incentives to disclose information to reduce the litigation costs. Secondly, Prado-Lorenzo and García-Sánchez (2010) observed that several industries are more sensitive to GHGE and are therefore more likely to be subjected to litigation and to suffer pressure from regulatory bodies in terms of environmental topics. Kaznik and Lev (1995) identified firms in several sectors as being more likely to warn investors of an earnings surprise, supporting the argument that litigation risk provides incentives for early disclosure.

With the purpose of determining the effect of a company belonging to a sector that has greater lawsuit risk in the capital cost, we propose the following model:

$$\text{Model 3: } \text{COC}_{it} = \beta_0 + \beta_1 \text{IR}_{it} + \beta_2 \text{LITINDUSTRY}_{it} + \beta_3 \text{IR} * \text{LITINDUSTRY}_{it} + \beta_4 \text{FRQ}_{it} + \beta_5 \text{GRI}_{it} + \beta_6 \text{SIZE}_{it} + \beta_7 \text{LEVERAGE}_{it} +$$

$$\beta_8 \text{ROA}_{it} + \beta_9 \text{MTB} + \beta_{10} \text{WC}_{it} + \beta_{11} \text{ANALYST}_{it} + \beta_{12} \text{INDUSTRY}_{it} + \beta_{13} \text{REGION}_{it} + \beta_{14} \text{YEAR}_{it} + \eta_i + \mu_{it}$$

In relation to model 1, we define a dummy variable, LITINDUSTRY, which identifies the litigation risks associated with industry sensibility and the visibility of corporate information. Following Sengupta (2004) and Dhaliwal et al. (2011), we include LITINDUSTRY, a broader indicator of industries prone to litigation that equals one if a firm operates in a high-litigation industry with the SIC codes of 2833–2836 (drugs), 8731–8734 (R&D services), 3570–3577 (computers), 7370–7379 (programming), 3600–3674 (electronics) and 5200–5961 (retail) and zero otherwise. In addition, to observe the moderating effect, we include the interaction IR\*LITINDUSTRY, a variable that indicates whether the company is in a sector with lawsuit risk and discloses an integrated report.

The results in Table 8 for model 3 allow as to observe that the variable IR has a negative effect, significant at the 95% level of trust, while the variable IR\*LITINDUSTRY is statistically not significant. Analysing both effects together, we can confirm that the disclosure

**Table 11**  
Complementary results for integrated reports and the cost of capital (I).

The sample is divided into two clusters according to the level of investor protection setting: a low institution country framework (low GDP) versus a strong institution environment (high GDP). Prior research has shown that countries with greater economic development are more likely to have stronger institutions that protect investors and enable private contracting.

	Weak institutional environment		Strong institutional environment	
	Coef. (Std error)	t (p-value)	Coef. (Std error)	T (p-value)
IR	-32.919 (17.804)	-1.850 (0.066)	8.149 (13.874)	0.590 (0.557)
FRQ	-0.001 (0.000)	-0.060 (0.954)	-0.001 (0.000)	-6.700 (0.000)
GRI	-21.778 (12.643)	-1.720 (0.086)	-39.031 (14.456)	-2.700 (0.007)
SIZE	63.977 (13.964)	4.580 (0.000)	9.330 (9.883)	0.940 (0.346)
LEVERAGE	3.945 (4.364)	0.900 (0.367)	-27.904 (26.123)	-1.070 (0.286)
ROA	-1.144 (1.012)	-1.130 (0.260)	-0.475 (0.407)	-1.170 (0.244)
MTB	129.270 (92.636)	1.400 (0.164)	3.158 (1.850)	1.710 (0.089)
WC	0.000 (0.000)	1.900 (0.059)	0.000 (0.000)	7.480 (0.000)
ANALYST	Dropped		Dropped	
INDUSTRY	Yes		Yes	
REGION	Yes		Yes	
YEAR	Yes		Yes	
z <sub>1</sub>	6.13 (7)		60.19 (7)	
m <sub>1</sub>	-1.53		-0.26	
m <sub>2</sub>	1.20		1.91	
Hansen	37.65 (32)		50.85 (32)	

Notes:  
(i) Heteroskedasticity-consistent asymptotic standard errors in parentheses.  
(ii) \*, \*\* and \*\*\* indicate significance at the 1%, 5% and 10% level, respectively.  
(iii) z<sub>1</sub> is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as  $\chi^2$  under the null of no relationship; degrees of freedom in parentheses.  
(iv) m<sub>i</sub> is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation.  
(v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of no correlation between the instruments and the error term; degrees of freedom in parentheses.

The IR independent variable takes the value of one if the company discloses an integrated report and zero in the contrary case. FRQ represents the index that measures the quality of financial information using the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application indicated by the GRI report. SIZE represents the size of the company and is measured by the logarithm of the total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and the total assets. ROA is the economic profitability of the company measured with the quotient of operative benefit and total assets. MTB represents the opportunity to grow of the company measured by the ratio market value/accountant value. WC represents the working capital of the company measured by the difference between the current assets and the current liability. ANALYST represents the number of analysts following the company. INDUSTRY represents the sector to which the company belongs. REGION represents the geographic region to which the original company belongs. YEAR is the representative variable of each economic exercise.

of the integrated information reduces the cost of capital, an effect that is not modified by the lawsuit risk from the sector of activity in which the company operates.

In the third robustness analysis, we estimate model 1 for various sub-samples formed by the geographical location of the companies. The objective of this analysis is to show whether the geographical area where the company resides influences the practice of disclosure of integrated reports and to assess their effect on the cost of capital. Specifically, the initial sample was stratified into five geographical areas according to their idiosyncrasies: Asia, Europe, South America, North America and Oceania.

Mature markets, such as North America, Oceania and Europe, have significantly different market characteristics than emerging capital markets such as South America and Asia. Preqin (2014) reports that these differences have led to an increase in risk-adverse investors, and, consequently, have led to higher expected returns for companies located in emerging markets such as Asia or South America than in mature markets. These risk-adverse decisions are related to the existence of a stable legal framework and investor-protection environment, as well as to the development of the capital market. In Europe, in contrast to North America,

segmentation and lack of EU integration on corporate governance and taxation infrastructure has caused European private equity to be segmented into national markets (Megginson, 2004). Between emerging markets, South-American returns and transaction capitalization are also determined by high inflation. In contrast, Asia presents economic growth and lenient regulation towards foreign investment.

In Table 9, we can see by region the effect of voluntary information disclosure concerning integrated reports on the cost of capital. This impact is negative for companies located in Europe and North America, while in Asia, South America and Oceania, the relationship is positive, being statistically significant in South America and Oceania.

The latest robust analysis estimates model 1 for various sub-samples formed by the cost of capital percentiles. The objective of this analysis is to determine whether the effect of the integrated report disclosure differs between companies depending on the supported cost of capital.

Table 10 shows that the IR variable has a negative and significant effect from the econometric point of view for the percentiles 50, 75 and 95 of the cost of capital of the sample. The

**Table 12**  
Complementary results for integrated reports and the cost of capital (II).

	Strong information asymmetry problems		Weak information asymmetry problems	
	Coef. (Std error)	t (p-value)	Coef. (Std error)	T (p-value)
IR	-2.293 (0.748)	-3.060 (0.002)	-0.261 (0.196)	-1.330 (0.184)
FRQ	-0.001 (0.000)	-4.880 (0.000)	0.001 (0.000)	2.920 (0.004)
GRI	-19.650 (13.660)	-1.440 (0.151)	- 5.599 (1.285)	- 4.360 (0.000)
SIZE	31.370 (9.667)	3.240 (0.001)	42.334 (4.316)	9.810 (0.000)
LEVERAGE	-4.931 (2.973)	-1.660 (0.098)	-16.462 (7.113)	-2.310 (0.022)
ROA	-17.678 (14.368)	-1.230 (0.219)	-1.026 (3.223)	-0.320 (0.751)
MTB	91.189 (34.313)	2.660 (0.008)	8.335 (1.533)	5.440 (0.000)
WC	0.000 (0.000)	9.160 (0.000)	0.000 (0.000)	1.560 (0.120)
ANALYSTS	Dropped		Dropped	
INDUSTRY	Yes		Yes	
REGION	Yes		Yes	
YEAR	Yes		Yes	
$z_1$	77.25 (7)		21.25 (7)	
$m_1$	-1.60		-0.24	
$m_2$	1.76		0.27	
Hansen	76.96 (31)		46.61 (31)	

Notes:

- (i) Heteroskedasticity-consistent asymptotic standard errors in parentheses.
- (ii) \*, \*\* and \*\*\* indicate significance at the 1%, 5% and 10% level, respectively.
- (iii)  $z_1$  is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as  $\chi^2$  under the null of no relationship; degrees of freedom in parentheses.
- (iv)  $m_i$  is a serial correlation test of order  $i$  using residuals in first differences, asymptotically distributed as  $N(0,1)$  under the null of no serial correlation.
- (v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as  $\chi^2$  under the null of no correlation between the instruments and the error term; degrees of freedom in parentheses.

The IR independent variable takes the value of one if the company discloses an integrated report and zero in the contrary case. FRQ represents the index that measures the quality of financial information using the model proposed by Ball and Shivakumar (2006). GRI represents the level of sustainability measured according to the three levels of application indicated by the GRI report. SIZE represents the size of the company and is measured by the logarithm of the total assets. LEVERAGE is the ratio of indebtedness measured by the quotient between the total debt and the total assets. ROA is the economic profitability of the company measured with the quotient of operative benefit and the total assets. MTB represents the opportunity to grow of the company measured by the market value/accountant value ratio. WC represents the working capital of the company measured by the difference between the current assets and the current liability. ANALYST represents the number of analysts following the company. INDUSTRY represents the sector to which the company belongs. REGION represents the geographic region to which the original company belongs. YEAR is the representative variable of each economic exercise.

coefficient of this variable is greater as the percentile increases, also increasing its significance. Thus, a reduction in the cost of capital due to the integrated corporate disclosure occurs only for companies that support a cost of capital greater than the market average.

## 5. Complementary test

Our initial tests show that a private firm's voluntary disclosure of integrated reports reduces its cost of capital. However, several firm incentives and institutional pressures are important in explaining the voluntary disclosure of integrated information, so it is necessary to consider their impact in depth. Accordingly, we consider two potential scenarios: in the first, we consider the level of institutional pressures; and in the second, we control for the strength of the firm incentives identified by the level of asymmetric information problems.

Our initial analyses are based on the traditional information theories and do not recognize that the contracting or institutional environment varies across countries, which in turn will influence the nature of contracts in place and the related demand for governance mechanisms (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). Companies operating in similar contracting environments will adopt homogeneous forms of behaviour (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). This isomorphic behaviour enhances companies' stability and survival because they honour the rules of the game in the market.

From the theoretical point of view, there could be a complementary or substitutive relationship between the disclosure practices and the contracting environment. Empirical studies have observed that the contracting process, including the use of accounting and auditing to mitigate agency problems, is in part a consequence of the high quality of investor protection (i.e., Doidge et al., 2007; Doidge, Karolyi, & Stulz, 2007; Francis et al., 2008). However, in countries with weak investor protection, a firm with financing needs may be unable to reduce the information asymmetry credibly, even though it would like to do so to obtain financing with a lower cost of capital (i.e., Covrig, DeFond, & Hung, 2007; Durnev & Kim, 2005; Francis, Khurana, Martin, & Pereira, 2011).

Following Doidge et al. (2007), we analyse the relative effect of integrated reports and country factors, with a sharp contrast between countries with weak and strong institutions. Accordingly, we classified countries into low and high GDP per capita based on the median country's GDP per capita in our sample. The partition of countries by low and high GDP per capita creates a set of countries with weaker institutions (low GDP) versus countries with stronger institutions (high GDP). The rationale for partitioning by GDP per capita stems from the work of La Porta et al. (1998) and Claessens and Laeven (2003), who showed that economically developed countries have stronger legal systems and other institutions that better facilitate private contracting.

In Table 11, for the GDP country subsamples, it is possible to observe that the reduction of the cost of capital for the voluntary disclosure of integrated reports is higher in countries with a weaker institution macro-context (IR coef. =  $-32.919$  in higher GDP countries and IR coef. =  $8.149$  in lower GDP environments); moreover, the IR coefficient is not statistically significant in strong institutional environments.

In addition, we analyse the relative effect of firm incentives and country factors with a sharp contrast between firms with weak and strong asymmetry problems. Accordingly, we classify firms into low and high based on the median firm's information asymmetry in our sample. The partition of firms by low and high asymmetry information (IA) creates a set of firms with lower asymmetry problems (low IA) versus companies with stronger asymmetry

problems (high IA). The rationale for partitioning by IA stems from our theoretical framework; following authors such as Lang and Lundholm (1996), Marquardt and Wiedman (1998) and Lang and Lundholm (2000), we define as a proxy for information asymmetry the analyst forecast accuracy – as the absolute value of earnings per share minus the median of forecasted earnings per share – scaled by the total share price. A lower absolute error suggests greater availability of information and therefore less asymmetric information (Marquardt and Wiedman, 1998).

From the IA firm subsamples in Table 12, it is possible to observe that the reduction of the cost of capital for the voluntary disclosure of integrated reports is higher in firms with stronger information asymmetry problems (IR coef. =  $-2.293$  for higher IA problems and IR coef. =  $-0.261$  for lower IA problems); moreover, the IR coefficient is not statistically significant in firms with weaker information asymmetry problems.

Taken together, the estimations of Tables 11 and 12 indicate that firm incentives associated with information asymmetry problems and lower investor protection requirements have equal explanatory effects regarding the voluntary disclosure of integrated reports to reduce the cost of capital. This result supports the “substitutive” view of Doidge et al. (2007), because the voluntary disclosure of integrated reports should be more important in firms that have greater information asymmetries and are located in countries with weaker institutions.

## 6. Conclusions

The business world has seen the need to increase the information disclosed, preparing financial statements, management reports, CSR reports, corporate governance reports and so on to meet the demands of investors and other stakeholders. Currently, the complexity involved in analysing this information, which scattered among numerous reports, is encouraging corporations to start developing an integrated report. This report provides an organized way to provide business strategies, corporate governance, corporate social responsibility and financial information.

Numerous empirical studies have tried to demonstrate the economic benefits associated with the quality of financial information and the various types of non-financial information. In this context, the principal aim of this paper is to analyse the effect that the disclosure of integrated reports has on the cost of capital.

The results confirm that companies that disclose integrated information support lower capital costs, confirming the usefulness of this report in making decisions. In addition, we find that firm incentives associated with greater asymmetry problems and a higher previous cost of capital determine the disclosure of integrated reports to reduce the actual and future cost of capital. In contrast, lower institutional pressures associated with the level of investor protection determine the voluntary integrated transparency practices in firms with lower levels of information asymmetry problems. In contrast, there are no differences for the risk of industry litigation. Additionally, the tests show that companies that issue financial information with higher quality will have lower capital costs. We also note that the reduction in the cost of capital is higher for companies that have increased long-term liabilities.

This study contributes to the previous literature in several respects. In particular, it offers an in-depth analysis of the causes of voluntary disclosure in general, in specific environments characterized by strong vs. weak investor protection and in different corporate information asymmetry contexts. Second, previous studies have considered as information disclosure the quality of information, segment information, earnings quality and so on,

while this study provides evidence for the specific case of the voluntary disclosure of integrated reports. Therefore, we control not only for the economic and financial aspects of the disclosed information, but also for the reaction of shareholders and stakeholders to social and environmental issues. Furthermore, using an international sample for the period 2003–2009 provides more generalizable results that are applicable to other countries. In addition, we incorporate an appropriate technique to analyse our models, the GMM estimator of Arellano and Bond (1991), which allows us to control for unobserved heterogeneity and endogeneity problems correctly.

Beyond these theoretical implications, our study also has several practical implications. Specifically, the empirical findings suggest that companies may influence their cost of capital by affecting the information availability in the market, both with regard to financial and non-financial aspects. These findings are particularly relevant for managers, shareholders and policy-makers. Managers may see corporate information as an incentive to minimize information asymmetries, avoiding the costs of adverse selection and then decreasing the cost of equity. Thus, managers should consider the accuracy of disclosure in determining the optimal reporting strategy (reducing risk estimation, returns' stock volatility, increasing long-term shareholder value and reputation of the firm).

In addition, our evidence suggests that policy disclosure does not only relate to the information required by law, but also to company-specific factors; that is, those that determine the voluntary disclosure decision about integrated reports. Our results suggest that companies should give greater priority to the development of appropriate and complete policies about disclosure. Thus, one implication of our results is that companies should be concerned about their possible influence on analysts to improve the credibility of their information, and must determine their strategy to influence the information available to the capital market, which affects the estimation risk component and then the cost of capital.

Additional practical implications of this study concern the conclusions that should be drawn by shareholders and other stakeholders in companies affected directly by the disclosure policies, both about financial and non-financial information. Our evidence could be useful for investors in evaluating the information provided by firms in their disclosure policies, and more precisely, the accuracy of this information. Our findings suggest that uninformed investors can require compensation for participating in a market with other more informed investors. However, the quality of corporate information reported may solve this financial compensation. By reporting more accurate financial and social information, companies can decrease the return demanded by investors, where all have the same information availability. Moreover, investors should be aware of the use of disclosure policies to enhance credibility and confidence about financial and non-financial information as a signal for future investment decisions. In any case, accuracy of disclosure may add value for shareholders and stakeholders by showing the managerial commitment to reporting credible financial and sustainability information.

Our findings may be also interesting for policy markets and regulatory organisms, given our understanding of the benefits of the greater accuracy of integrated financial and non-financial disclosures. For example, they could collaborate with companies in the promotion of institutional support programmes to ensure the quality of information reported. Thus, as a policy implication, our evidence suggests that different information availability between informed and uninformed investors that influences the return rate of their investments can be solved through a good disclosure strategy.

Public authorities should provide new national laws and requirements, legislative reforms, institutional programmes or financial support to influence increased integrated information reporting, which adds value to organizations without costly regulation. Financial information is regulated by legislation, but in general, non-financial disclosure is unregulated and non-standardized given the absence of regulatory laws and the lack of any standards for reporting. Our findings suggest that integrated reporting is also valued by investors when making their investment decisions, by reducing information asymmetries and the cost of capital. Moreover, the combined work of national governments seems necessary for achieving improvements in non-financial disclosures; for instance, the development of a regulatory law and/or a generalized standard at international level.

Finally, it is necessary to note some limitations of this research. Future research needs to determine the relationship analysed here in the context of a single country, since different countries are characterized by different corporate governance systems and various institutional contexts. Furthermore, this study does not take into account other variables that can affect the relationship between disclosure and the cost of capital, such as ownership concentration, market development or discretionary decisions by managers.

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### Further reading

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