

**LEVEL OF ADHERENCE OF THE INTEGRATED REPORTING
FRAMEWORK IN TRADITIONAL REPORTS**

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Thematic area: A) Información Financiera y Normalización Contable.

Key words: Integrated report, Sustainability reporting, Incentives, Disclosure, Six capitals, IIRC.

JEL Descriptors: G32; M41; M48

Level of adherence of the integrated reporting framework in traditional reports

Abstract

This study analyzes the level of adherence to the IIRC framework in traditional reports and determines the explanatory factors for this level of adherence considering the six capitals that characterize the framework. Based on a content analysis of the reports prepared by companies in the Dow Jones Sustainability Europe Index 2017, we obtain a disclosure index. Results confirm a high level of use of the IIRC framework. Natural capital makes companies to have a high level of adherence, but human-related capital has a negative influence, particularly intellectual capital. In addition, companies stating they follow the IIRC guidelines have more adherence.

1. Introduction

Nowadays, firms develop their activity in a highly competitive environment that makes necessary to manage not only financial information but also non-financial information for decision-making. In addition, the number and variety of stakeholders have also grown exponentially. The notion of corporate social responsibility (CSR) suggests that firms should behave in an ethical manner regarding several aspects, such as environment protection, human resources management, health and safety at work, relations with local communities, as well as suppliers and consumers (Carroll, 1979, 1991; Castelo & Lima, 2006). This has also had an influence on the way firms interact with the vast variety of stakeholders, and so disclose information exceeding legal requirements. In particular, social and environmental reporting has been voluntarily provided, either in the management report or as stand-alone statements, and prior research has explained this communication change as an attempt to achieve legitimacy (Gray, 2010; Guthrie & Parker, 1989). But also, sustainability reporting responds to the measures taken by certain institutions that seek to promote ethical and responsible behavior in society, such as the guidelines established by the Global Reporting Initiative (GRI), which aim to help organizations to understand and communicate their impacts on several aspects, such as climate change, human rights and corruption. In addition, there have also been market pressures to enlarge non-financial information to help investors understand how the market value of a company exceeds its book value on a permanent basis.¹ At some extent the low explanatory capacity of financial information derives from the existence of

¹ It is remarkable that in forty years (from 1975-2015), in the S&P 500 index tangible assets have declined from representing 83% to 16% of market capitalization (Ocean Tomo, 2017).

value drivers not recognized by the accounting system, but that the market values. As Lev (2018) has been denouncing for some years now, this is due to the rise of intangibles not recognized on the balance sheet.

The two pressures mentioned above have made firms to prepare extensive and complex reports in which the lack of link between financial and non-financial data gives rise to a fragmented view of the organization (Brown & Dillard, 2014; Eccles, Serafeim, & Krzus, 2011; Kilic & Kuzey, 2018). In order to avoid this problem, and to acknowledge the interconnections between the financial, social and environmental dimensions of business performance, since 2010 the IIRC has been promoting the so-called integrated reporting. Thus, the integrated reporting aims to show a holistic image of the firm, and so explain how it generates value over time (short, medium and long term) through interaction with the external environment (Zhou, Simnett, & Green, 2017).

Integrated reporting is voluntary with the exception of South Africa, where since 2010 companies listed on the Johannesburg Stock Exchange have to prepare integrated reports. Although during the first years not many companies produced such document, after the release of the IIRC framework in 2013 (IIRC, 2013b), the number has been gradually growing. In Europe there is a growing interest in this type of reporting as well. Thus, as indicated in Message (2017)'s report, which analyzes the trend in the presentation of integrated reports by companies in the STOXX all Europe 800 Index,² there has been an increase of 18% from 2015 to 2017 in the publication of this type of information. In addition, the report indicates a trend towards the integration of sustainability aspects into the general strategy and business model, both in corporate websites and in the digital formats of the annual reports.

The aim of this paper is twofold, to analyze the level of adherence to the IIRC framework in the traditional statements prepared by companies and to determine the factors that influence it. Two main aspects distinguish this research from others; first the sample under study, EU firms that are part of the Dow Jones Sustainability European Index, and second the determinants that we consider, based on the value drivers identified by the IIRC framework. Most studies that have investigated the level of disclosure based on that framework in traditional reports do not specifically refer to EU countries, while this is a particularly coherent zone in which there is a strong demand for non-financial reporting,

² The STOXX All Europe 800 Index is derived from the STOXX All Europe TMI, which represents the 800 largest companies in Eastern and Western Europe.

particularly after the issuance of the Non-financial Reporting Directive (NFRD) in 2014.³ Furthermore, this group of companies has been selected because a positive relationship is observed in the literature between inclusion in a sustainability index and the disclosure of corporate information (Michelon & Parbonetti, 2012; Özdemir & Pamukcu, 2016), as well as the level of adherence to IIRC framework (Kılıc & Kuzey, 2018).

Our results confirm that the average disclosure level is quite high, 82.9%; firms tend to almost disclose retrospective information fully, although they do not pay adequate attention to forecasts. Another area that ranks low is connectivity between financial and non-financial information. Regarding the explanatory factors of disclosure, a significant and positive association is observed between natural capital and level of adherence, although the influence of human capital is contrary to our expectations. These contradictory results might suggest that the assumption that integrated thinking is behind the preparation of the integrated report is not entirely true, perhaps due to a lack of understanding of the meaning of integrated thinking (Feng, Cummings, & Tweedie, 2017). In addition, these results might also suggest that there is a need to improve the IIRC framework (Romero, Ruiz & Fernández-Feijoo, 2019).

After this introduction, in section two we include the literature review and establish the hypothesis. Section three provides the empirical analysis. Section four includes the results and the discussion of the analysis. In section five we conclude.

2. Literature Review and Hypothesis Development

2.1 On the IIRC framework

IIRC came up in August 2010 from the Accounting for Sustainability Project (A4S), established by the Prince of Wales, and the GRI, two leading organizations in sustainability reporting. As stated in the press release issued by both institutions (A4S & GRI, 2010): “The IIRC’s remit is to create a globally accepted framework for accounting for sustainability. A framework which brings together financial, environmental, social and governance information in a clear, concise, consistent and comparable format —put briefly, in an ‘integrated’ format. The intention is to help with the development of more

³ Directive 2014/95/EU has led to profound changes in the way in which organizations communicate with all stakeholders on different matters, both related to the organization, and with the environment and society as a whole. The Directive is in the process to be reviewed, and the 21st of April 2021 the EC made public a proposal for a Corporate Sustainability Reporting Directive (CSRD).

comprehensive and comprehensible information about an organization's total performance, prospective as well as retrospective, to meet the needs of the emerging, more sustainable, global economic model". In brief, they had in mind to combine economic information with environmental, social and governance (ESG) information as a way to contribute to social and economic development.

The aim of the IIRC framework is to encourage organizations to improve their reporting by focusing on their business model and on how they create value for financial capital providers (IIRC, 2013b). The framework is based on six capitals, which are considered stores of value that define an organization, and so they are inputs to its business model. Therefore, they are enhanced, consumed, modified or otherwise affected by the organizations' activities (IIRC, 2013a). The six capitals include not only financial and manufactured capitals that are captured in the traditional financial report, but also another three categories related to human activities, which are intellectual capital, human capital, and social/relationship capital (which reflects the so-called "social license to operate" that suggests the existence of a business is conditioned to the acceptance of society), as well as natural capital (which provides the environment in which the other capitals sit).⁴ The IIRC has a long-term vision, which assumes integrated thinking is embedded in business practice, and reflected in the communication through the integrated reporting. The principle guidelines and the content elements for IR support a holistic view of the organization, overcoming the limitations of traditional reports, and can be seen as a pivotal point of evolution towards the integration of financial and non-financial information (Beck, Dumay, & Frost, 2017). This comprehensive view of the organization is not new, on the contrary, it had already been under discussion by both academics and practitioners for more than 20 years (de Villiers, Rinaldi, & Unerman, 2014).

Although at first it might appear that the aim was to establish a global framework for accounting for sustainability and so it should have a broad stakeholder approach, IIRC has always been oriented towards the financial stakeholders. It represents an important difference with the multi-stakeholder approach of GRI and the NFRD.⁵ In fact the

⁴ In no way this framework is closed, since it contemplates that "Some organizations could, however, think of relationships as a separate capital, as part of human or intellectual capital, or as inherent in, and therefore cutting across and linking, a number of the individual capitals. Similarly, the intangibles associated with brand and reputation (part of intellectual capital in the Prototype Framework), could be considered separate capitals, part of other capitals or cutting across a number of individual capitals" (IIRC, 2013a, p. 5).

⁵ At the time of writing this paper, there are plans to merge the IIRC and the Sustainability Accounting Standards Board (SASB) into a unified organization, the Value Reporting Foundation. This is a major step towards simplifying the corporate reporting landscape. See

framework states: “The primary purpose of an integrated report is to explain to providers of financial capital how an organization creates value over time” (IIRC, 2013b, p. 4). Although it is understood that other stakeholders might also benefit from integrated reporting, as some authors highlight it does not alleviate the concern that the focus on investors could be to the detriment of other key stakeholders (Cheng, Green, Conradie, Konish, & Romi, 2014). The framework also mentions that in the creation of value, interrelations between the organization and society emerge, and: “When these are material to the organization's ability to create value for itself, they are included in the integrated report” (IIRC, 2013b, p. 4). From this, some authors have criticized IIRC since in their view it has abandoned the objective of accounting for sustainability; thus, they argue that the objectives of getting “value for investors” and “value for the society” are not compatible, or even might be in contradiction (Brown & Dillard, 2014; Flower, 2015; Ogata, Inoue, Ueda, & Yagi, 2018). However, in her discussion to Flower (2015), Adams (2015) argues that “value for society” and “value for investors” should be aligned to coexist in a mutually beneficial way. And, more recently she has stated that IIRC focuses on value creation for both the organization and society (Adams, 2020).⁶ It is also relevant to mention that integrated reporting disclosures are required to link non-financial performance to the entity's goals (Beck et al., 2017).

2.2. IIRC literature review

The IIRC framework establishes some general guidelines, but does not provide rules about how things should be specifically disclosed. Some papers have adopted a descriptive approach and contemplated the detailed content of the annual reports to find out their alliance with the framework. We just refer to an early paper (Stent & Dowler, 2015), which analyzes the gap between the requirements of the Discussion Paper on integrated reporting (2011) and the annual reports of four companies classified as “best reporting practices” in New Zealand. The study uses a disclosure index with 33 items that address aspects of the business model, external environment, strategies, corporate governance, performance, prospects, and assurance. It finds that between 70% and 87% of the information required by the IIRC framework is in the annual reports; but with regard to assurance, there is a great disparity, from no assurance to reasonable assurance. The

<https://integratedreporting.org/news/iirc-and-sasb-announce-intent-to-merge-in-major-step-towards-simplifying-the-corporate-reporting-system/>.

⁶ Interestingly in the consultation process that took place when the framework was under discussion, the traditional users, this is investors and their coalitions, did not actively lobby the IIRC, but, if the term “user” is understood in a broader sense, including non-governmental organizations (NGOs), non-profit organizations (NPOs), and government institutions, which means that the emphasis is on the public interest, then there is no difference between their lobbying and that of the preparers (Reuter & Messner, 2015).

authors highlight the lack of attention to future uncertainties despite being required by the integrated reporting.

Another strand of academic literature has adopted a more interpretative approach in their analysis of the use of integrated reporting, as summarized in review papers (de Villiers, Hsiao, & Maroun, 2017; Velte & Stawinoga, 2017; Vitolla, Raimo, & Rubino, 2019). Velte and Stawinoga (2017) comprehensively analyze 44 empirical studies categorized in three groups, market level, organizational level and individual/group decision-making level; most of the studies are in the two first groups and focus on the management incentives to implement integrated reporting. Based on the results, the authors conclude that the decision is influenced by firm characteristics (industry, size and profitability), as well as corporate governance mechanisms, both internal (board size and board diversity) and external (legal environment and investor base). Vitolla et al. (2019) highlight the number of studies that focus on the analysis of the determinants and effects of integrated reporting. Regarding the determinants, based on a detailed analysis of 18 papers, they summarize that the adoption of integrated reporting is influenced by two dimensions: internal and external. Among the internal dimension, the following firm characteristics are identified: size, profitability, ownership structure, market orientation, nonfinancial performance, board characteristics, and assurance. Among the external dimension, the authors refer to: legal tradition, investor and employment protection law, country development level, cultural context, and industry. De Villiers et al. (2017) develop a conceptual model which allows to identify five categories of papers (determinants of integrated reporting, integrated reporting and users, integrated reporting and preparers, IIRC processes, and consequences of integrated reporting); although they are highly interrelated, as the several causal links established between the five categories show. In this research we aim at linking one of the most extensively-researched group, the determinants, with the one referred to the role of integrated reporting for preparers. After this general view about the literature on integrated reporting, we refer next to those specific papers that are closer to our research.

The first studies that analyze the factors that determine the publication of integrated reporting refer to a pre-IIRC period (Jensen & Berg, 2012; Frías-Aceituno, Rodríguez-Ariza, & García-Sánchez, 2013; García-Sánchez, Rodríguez-Ariza, & Frías-Aceituno, 2013), but their results are not entirely consistent when dealing with the institutional factors. Jensen and Berg (2012) find that dispersed ownership structures encourage the adoption of integrated reporting, and companies operating in countries with higher levels of market orientation are more likely to publish integrated reports; they underscore the

influence of some country characteristics, national corporate responsibility, education level, and trade union density. However, Frías-Aceituno et al. (2013) and García-Sánchez et al. (2013) conclude that firms in code law countries that have a stronger stakeholder orientation, and with feminist values are more prone to disclose this type of information; they confirm that larger and more profitable firms are more likely to implement integrated reports. As for the post-IIRC framework period, we just refer to Kılıc and Kuzey (2018) since it is the closest to our research in terms of its purpose: to analyze the level of adherence to the IIRC framework in annual reports.

Kılıc and Kuzey (2018) consider 64 non-financial companies listed on the Istanbul Stock Exchange in 2015, and measure the level of adherence using a disclosure index including 50 items. Their results confirm that companies refer to generic rather than specific risks and that they report more positive than negative aspects. In addition, they examine the influence of some CSR characteristics on the level of adherence. The authors find that the publication of sustainability reports, the adoption of GRI guidelines, the existence of a sustainability committee and being in a sustainability index have a significant and positive impact on the level of disclosure. Girella, Rossi, and Zambon (2019) examine the determinants of integrated reporting information by international listed firms in 2016; their results contradict some of the previous studies findings in terms of the influence of the legal system, but show that firms are more likely to implement integrated reporting in countries with a higher level of corruption perception, a better risk rating and that are considered more collectivist and feminist with a long-term orientation. As for company characteristics, Girella et al. (2019) confirm the influence of size, profitability, market-to-book ratio, and board size, but do not support that efficiency and board diversity and independence are influential.

Researchers have also considered the consequences of integrated reporting at internal and external level. Burke and Clark (2016) state that the participation of all departments in preparing the report and the better understanding of value creation help to reduce information processing costs, which are particularly relevant in companies that have a complex operational and informational environment. Consequently, integrated reporting should help to a better decision making in the organization. However, Maniora (2017) concludes that the benefits of integrated reporting over other ways of communicating ESG information are context specific. Regarding the capital market studies, it is argued that integrated reporting reduces the information asymmetry between the organization and capital providers. Thus, focusing on South Africa, Barth, Cahan, Chen, and Venter (2017) and Lee and Yeo (2016) provide evidence suggesting that mandatory integrated reporting results in positive market reactions; thus higher-quality integrated reports are

associated with lower bid–ask spreads, higher firm value and greater expected cash flows. These positive results contrast with those of the recent international study by Wahl, Charifzadeh, and Diefenbach (2020), who do not find evidence of an improvement in the accuracy of analyst forecasts or an increase in company value after the voluntary release of an integrated reporting.

2.3. Hypothesis development

Although based on Velte and Stawinoga (2017)'s classification, our research —aiming at identifying the factors that explain the adherence level to the IIRC framework— belongs to the market type category, it shares with the organizational one its lenses of study. We rely on both, institutional theory and resource dependence theory to establish our hypothesis.

As highlighted by Deegan (2002), the notion of legitimacy is central to institutional theory, to the point that in his view both theories are overlapping. Legitimacy theory is based on the social contract notion that motivates an organization to comply with the values, norms, and boundaries of society in order to survive (Dowling & Pfeffer, 1975; Shocker & Sethi, 1973); but given that societal values are dynamic, organizations have to adapt themselves due to institutional pressures. This is particularly the case in relation to ESG issues, and the voluntary use of integrated reporting can be seen as an effective tool for legitimizing the organization (Deegan, 2002). Thus, institutional theory emphasizes that organizations favor those structures and processes that have been adopted by other organizations, the relevant ones, rather than considering the specific benefits for them. And they chose procedures and processes in line with those socially accepted (DiMaggio & Powell, 1983), resulting in a so-called isomorphism. Precisely, mimetic isomorphism has been used by institutional theory to explain the adoption of high-quality standards, such as International Financial Reporting Standards (IFRS) (Touron, 2005), as well as an explanation for the decision to follow best CSR practices and so deflecting potential threats to organizational legitimacy and competitive disadvantages (Unerman & Bennett, 2004). That said, Melloni, Caglio, and Perego (2017) show that in the presence of weak financial performance and bad social performance firms provide foggier reports and less balanced and complete, which suggests firms use impression management strategies when preparing integrated reports (Melloni, Stacchezzini, & Lai, 2016).

The resource dependence theory contemplates the entity as a conglomerate of resources (financial, physical, human, technological, reputational, and organizational) that are decisive for obtaining above-average profits, as well as reducing environmental dependence and uncertainty (Grant, 1991; Hillman, Withers, & Collins, 2009). This is

aligned with the multiple capitals approach embedded in the IIRC framework, so in this study we use this theory to explain why firms adopt that framework in their annual reports. However, although the production of an integrated report aimed at ensuring long-term sustainability should be the result of strategic decisions deriving from the management control systems and the accounting infrastructure, the literature does not fully support a convincing view about the value of integrated reports from the perspective of preparers. Thus, based on interviews, Burke and Clark (2016) state that firms adopting integrated reporting will achieve better decision making due to their better understanding of value creation; but other researchers point out that integrated reporting is a compliance exercise and identify a number of doubts about its usefulness (Chaidali & Jones, 2017; McNally, Cerbone, & Maroun, 2017).

Next, we combine these lenses to establish our explanatory hypothesis for the level of adherence to the IIRC framework in traditional reports, which is based on the influence of the capitals that conceptualize the IIRC framework. Despite the lack of consensus on the usefulness of integrated reporting from the preparers' perspective, it is our belief that stakeholders demand and appreciate information on those aspects that generate firm value (Vitolla et al., 2019), and, to the extent that integrate reporting might evidence how the organizations create and sustain value (Hampton 2012, Watson 2011), it could be beneficial to follow the IIRC framework to inform third parties. Moreover, if an integrated thinking prevails, there should be a better alignment with the IIRC framework. Thus, we establish the following alternative hypothesis:

H: The greater the value drivers embedded in the capitals, the higher the adherence level to the IIRC framework.

3. Research design and sample

3.1. Disclosure index

Based on the content elements included in the IIRC framework (IIRC, 2013b), we have built the disclosure index. The content elements are categories of information that aim at giving a holistic view of the company and are linked each other. They are stated in the form of questions rather than checklists of specific requirements (see Table 1).

(Insert Table 1 about here)

Similar to Stent and Dowler (2015) and Kilic and Kuzey (2018), our index is made of 46 items: 12 related with what the organization does, 5 related with governance, 13 referring to the business model, 2 dealing with risks and opportunities, 6 dealing with strategy and resource allocation, 5 related to performance, and 3 related to outlook. The Appendix lists these items, as well as the average values obtained by the companies in the sample following the methodology explained below.

Through a content analysis, we investigate if the companies in our sample provide the information included in the index derived, this allows us to appreciate the level of adherence to the IIRC framework. The data used in this study have been hand-collected, and the unit of analysis is the published annual report. We apply a binary coding methodology to each disclosure item in the list, thus a score of 1 is assigned if the company has provided an item, 0 otherwise. Since there are no specific reasons to give different weights to the different items, we use an unweighted approach, which is the common methodology used in this literature (Haji & Anifowose, 2017; Kilic & Kuzey, 2018). Moreover, in Lee and Yeo (2016) the results remain qualitatively the same when using a weighted system. Thus, the following index is computed:

$$INDEX_{ij} = \frac{\sum_{i=1}^n x_i}{n} \quad (1)$$

Where:

$x_i = 1$ if i item is disclosed by company j , 0 otherwise, $n =$ total number of potential disclosure items (46 items).

3.2. Regression model

The model used to test the association between the capitals that capture the value drivers and the level of adherence to the IIRC framework is as follows:

$$INDEX = \beta_0 + \beta_1 CAPITALS + \beta_2 Controls + \varepsilon,$$

Where: INDEX is the disclosure index, the score is obtained according to (1) above. CAPITALS is the general name for the variables that represent the value drivers according to the IIRC framework and capture our hypothesis, we predict β_1 to be positive; controls are additional variables that have been found significant in the previous literature. We refer below to each of the variables (see Table 2).

Financial and manufactured capitals are elements included in the financial statements. The first focuses on the source of funding while the second refers to its application. Financial capital considers all the funds available to the firm, debt and equity. Manufactured capital refers to the investment side, and specifically focuses on property, plant and equipment, owned or controlled by the organization, used in the production of goods and services. In order to appreciate its adequacy to create value for the firm, two ratios are used. The return on assets (*ROA*), which is a profitability ratio that encompasses all assets, this is the financial capital. In addition, to capture the efficient use of the manufactured capital we use the property, plant and equipment turnover ratio (*TURNOVER*).

Regarding human-related capital, we use the market-to-book ratio (*M/B*), this is market capitalization divided by book value of equity, which is perhaps the best-known signal of the organization's ability to create value for the investors. This ratio captures: i) the intellectual capital, which includes the intangibles recognized in the financial statements, such as copyrights, patents trademarks, and the non-recognized ones, although valued by market participants, ii) the know-how, experience and abilities that characterize the people in the organization, and iii) the social/relationship capital that represents the strength of the links between the firm and its stakeholders (including those in the value chain, the community, the government, etc.), and so allows the firm to retain the social license and exist.

In order to be more specific, we have also used different proxies for each human-related capital. Thus, as a proxy for the intellectual capital we have considered the sum of recognized intangible assets and R&D expenses (*INTANG*), which have been standardized by total assets. Employee productivity has been used as a proxy for the quality of the human capital in the organization, and measured as net revenue divided by number of employees (*EMPPROD*). Based on the mimetic isomorphism notion, we understand that following practices that are perceived as good by others allows connecting the organization with society and thus facilitates its legitimization. Referring to institutional theory, Velte and Stawinoga (2017, p. 293) sustain: "This theory suggests that an organization is motivated to publish an integrated report by its drive to conform." Following Haveman (1993), the model to which the organization follows is the leader, which is the most successful firm in the industry. To that end we use *ROA* as the reference for leader, and include an indicator variable, *MIMET*, that is 1 the industry leader has a disclosure index greater than the median, 0 otherwise.

The natural capital (namely air, water and land) is made up of the ecosystems that provide renewable resources and services, as well as non-renewable deposits of fossil fuels and minerals, and although all firms impact and depend on it, not all do it equally. Thus, we use an industry classification that takes into the natural capital risk exposure, which is related not only to the direct consequences of capital depletion but also to new legislations. Based on a report by Allianz (2018), we understand that the oil and gas, mining, food and beverage and transportation sectors are riskier, and so they will face a different attitude, hopefully more proactive towards the IIRC framework. Thus, the variable *DANGERZONE* is 1 if the firm belongs to one of those industries, 0 otherwise.

Regarding the controls, we have added some firm characteristics. In particular, ownership structure (*OWNERCON*) and size (*SIZE*); *OWNERCON*, is an indicator variable that is 1 if there is a majority shareholder, 0 otherwise, and suggests a negative relationship with enlarged disclosure (Jensen & Berg, 2012). *SIZE* is measured through the logarithm of total assets, and is expected to positively influence the adherence (Frías-Aceituno et al., 2013; García-Sánchez et al., 2013; Girella et al., 2019). We also include the proportion of women on the board (*WOMEN*), since research points out that they positively influence the quality of corporate disclosure (Shehata, 2013; Ben-Amar, Chang & McIlkenny, 2017; García Lara, García Osma, Mora, & Scapin, 2017). In particular, Ben-Amar et al. (2017) find that the likelihood of voluntary climate disclosure by Canadian firms increases with the percentage of women on boards, which is line with research showing that the use of the IIRC framework is more frequent in countries with more feminist values (Frías-Aceituno et al., 2013; García-Sánchez et al., 2013; Girella et al., 2019). That said, this last paper does not confirm that board diversity influences IIRC disclosure. In addition, we consider the IIRC variable (*IIRC*) that captures if the firm declares to follow the IIRC framework, since we understand that those firms should be more committed to the adherence.

Finally, we take country characteristics into account through a combined measure (*COUNTRY*), which is the average of three well-known Worldwide Governance Indicators (WGI): Regulatory Quality, Rule of Law and Control of Corruption (Kaufmann, Kraay, & Mastruzzi, 2011).⁷ Although previous literature has highlighted how some

⁷ Regulatory Quality: assessment of perceptions of the ability of government to formulate and implement sound policies and regulations that permit and promote private-sector development. Rule of Law: assessment of the perceptions in which agents have confidence and abide by the rules of society—particularly the quality of contract enforcement, property rights, the police, and the courts. Control of Corruption: assessment of the perceptions to which public power is exercised for private gain. The three of them range between -2.5 and 2.5, with higher scores corresponding to better outcomes. Available at: www.govindicators.org.

institutional country factors related to the legal system affect the disclosure of integrated report, the results are not consistent; according to Frías-Aceituno et al. (2013) and García-Sánchez et al. (2013) civil law promotes integrated reporting, while this is not the case in Girella et al. (2019). Thus, instead we have used the WGI that show the perception of citizens about country governance characteristics. In our view this is more aligned with the pressure by stakeholders to improve disclosure, which helps to connect the traditional financial information with the non-financial one, and so improve the communication channels.

(Insert Table 2 about here)

3.3 *Sample*

The initial sample includes the 148 companies that are part of the Dow Jones Sustainability Europe Index as of 2017. This index covers the top 20% of the largest 600 European companies in terms of sustainability, which means that the economic, social and environmental performance of those companies are monitored on a regular basis. As in other studies financial and insurance companies were excluded. The final sample is made of 120 companies from 10 different sectors following the Global Industry Classification Standard (GICS). The Industrial sector stands out, representing 25% of the sample, the second largest industry is Consumer discretionary, with 14.2%. Regarding geographical distribution, 14 European countries are represented, although France and the United Kingdom represent 45% of the total sample. Table 3, panels A and B, provides the sample composition by industry and country, respectively; for informational purposes we include a column in each panel with the average disclosure index. The industries with the lowest and highest scores are Health care (75.5%) and Energy (90.9%), respectively. Interestingly, Denmark is the country with the lowest score (62%), while Norway is the one with the highest score (91.3%).

(Insert Table 3 about here)

4. Results

We first address the descriptive statistics of the disclosure index, and next present the results obtained in the explanatory analysis.

4.1. Disclosure of information

As shown in the Appendix, risks and opportunities are the content elements in the framework that have the highest score (98%), while performance has the lowest one (67%). Total average is 82.9%, which is line with previous studies (in Table 4). We discuss below some relevant aspects of the different elements.

Organizational overview and external environment

There is a high level of disclosure regarding number of employees, social factors and environmental factors with values ranging between 99% and 98%. The lowest values within this category refer to the mission and vision statement and the code of conduct, whose values are 75% and 84%, respectively.

Governance

The board of directors is indicated by 99% of the companies, and 98% disclose compensation policies for directors and executives. However, only 46% of the companies refer to the culture, ethics and values of the organization.

Business model

The business model component has three sections. First, the “inputs” section achieves 82%; it covers disclosure of innovation, delivery channels and marketing, and employee training, with 98%, 94% and 93%, respectively. However, the disclosure on after-sales services only reaches 48%. Second, the “outputs” section obtains 91%, being the information on key products and services, the one with the largest score, 98%. Finally, the “outcomes” section shows that all companies disclose information on profits and cash flows. It should be noted that companies report how they create value, 88%, and how capital decreases, 77%. The most remarkable issue is that only 47% companies disclose information on employee morale.

Risks and opportunities

On average, companies present a 98% level of disclosure on both internal and external risks and opportunities. All companies provide generic information on their risks, and almost all companies also disclose their opportunities, 95%. This finding is in accordance with Clayton, Rogerson, and Rampedi (2015) and Kilic and Kuzey (2018) who point out that companies that adopt integrated reports improve the level of risk disclosure, thereby overcoming the existing barrier in traditional reports.

Strategy and resource allocation

Almost all companies, 99%, indicate their strategic objectives in the short, medium and long term without a specific time frame, in turn 71% disclose information about these strategies with deadlines. The measurement of the achievements and target outcomes has a high score as well, 95%. However, hardly half of the companies report the link between strategies and key capitals, 53%.

Performance

All companies present financial indicators, 97% show the links between past and current performance; however, only 13 companies (11%) reveal indicators that combine financial measures with other aspects (e.g., the ratio greenhouse gas emissions to sales). The financial consequences of significant effects on other capitals only achieves 63%, and the comparison between industrial/regional benchmarks, 65%. This finding is in line with the studies by Stent and Dowler (2015) and Kilic and Kuzey (2018), who find out that companies have a low level of information disclosure referred to regional/industrial benchmarks.

Outlook

On average this element gets a score of 70%, which is made of 88% for the information about future expectations in a generic way, while 51% of companies disclose forecasts about KPIs. In addition, 70% of companies reveal the links between current performance and the organization's outlook. In line with Stent and Dowler (2015) and Kilic and Kuzey (2018), these results suggest that companies prefer to disclose retrospective rather than prospective information.

4.2. Descriptive statistics

In Table 4 we report the descriptive statistics of all variables used in the multivariate analysis. The companies in the sample have on average 82.9% of adherence to the IIRC framework (*INDEX*) in traditional reports, although this value rises up to 98% and has a minimum of 54%. These results are consistent with Kilic and Kuzey (2018), who find that companies that belong to a sustainability index are inclined to disclose information related to the IIRC framework.

Regarding the independent variables, mean *ROA* is 8.5%, although there is a high level of dispersion (between -0.2% and 24.3%), *TURNOVER* presents a wide range of values from almost 0 to 174 times, and the mean is 13, which is not surprising given the

existence of very different industries in our sample. Average *M/B* is 3.48. We also include those variables that independently capture the human-related capitals, mean *INTANG* is 0.12 (median is 0.08), while the maximum value is 0.57, *EMPPROD* also varies very much from 0.02 to 2.7, being the average 0.43, finally the mean *MIMET* indicates that only 44.2% of the industry leaders have a high adherence level to the IIRC framework. As for *DANGERZONE*, only 14.2% of the companies in the sample belongs to those sectors with a high level of environmental risk.

Concerning ownership (*OWNERCON*), most companies have not a concentrated ownership, since only in 12.5% of the companies in the sample there is a majority shareholder. Regarding *SIZE*, the average amount of total assets per firm is €29,915.30 million (non-tabulated data). In relation to board diversity (*WOMEN*), on average women represent 32% of board members. Besides, 15.8% of companies state that they follow the IIRC guidelines (*IIRC*). Finally, the average variable of *COUNTRY* is 1.6 that indicates we are dealing with companies established in institutions that have good reputation, in fact the lower value is 0.4 and the maximum is 2 (the WGI range between -2.5 and 2.5).

(Insert Table 4 about here)

Table 5 displays the mean and median of the variables classified by firms with disclosure index higher and lower than the median. Given the small sample size, we perform both parametric (*t*-test) and non-parametric (Mann–Whitney) tests. We find that firms with more disclosure have less intellectual capital, belong to a high-risk sector, and declare to follow the IIRC guidelines for the IR (statistically significant differences).

(Insert Table 5 about here)

Before performing the multivariate analysis, the correlation between the variables was examined through Pearson correlation coefficient. Table 6 shows the Pearson correlations for the variables used in the multivariate regression, none of which are highly correlated. Although the low values of the correlations between the independent variables suggest that there are no multicollinearity problems, we have computed the variance inflation factors, and the results confirm that there are no multicollinearity problems.

(Insert Table 6 about here)

4.3 Regression results

Table 7 shows the results of the multivariate regression, using the White (1980) test robust option. We first present a base model in which we only include the capitals, and next we add the controls. Besides in the last two columns we decompose the human-related capital into the three capitals mentioned above (intellectual, human, and social and relationship). Both columns 2 and 3 indicate that only human-related capital and natural capital represented through *M/B* and *DANGERZONE* are significant. The sign of natural capital is consistent with our expectations since those companies in high-risk sectors show a higher level of adherence to the IIRC framework. But, the sign of the human capital variable is contrary to the expectations, companies with more human-capital are less prone to follow the framework. Once we decompose this capital, columns 4 and 5 confirm that the negative sign derives from intellectual capital. This is the more intangibles (*INTANG*) a company has the lower the adherence to the IIRC framework. IIRC is the only significant control, confirming that companies that declare they follow the framework provide more information related to the elements included in the framework.

(Insert Table 7 about here)

We have also performed some additional robustness tests in order to confirm the reported results. We consider alternative definitions for some explanatory variables: for the human-related capital, we use Tobin's q (measured as market value of equity plus book value of liabilities divided by total assets) instead of the market-to-book ratio (*M/B*); *INTANG* is measured as just research and development expenses divided by total assets or just intangible assets divided by total assets; *MIMET*, the industry leader is considered the company with the highest market capitalization or the highest Tobin's q instead of the highest ROA; *SIZE* has been measured as the natural logarithm of market capitalization and as the natural logarithm of total revenue. The results remain basically consistent with those reported in table 7.

In sum our results suggest that the assumption that integrated thinking is behind the preparation of the integrated report might not be entirely true, which as Feng et al. (2017) argue could be due to a lack of understanding of integrated thinking. Consequently, as Romero et al. (2019) indicate, perhaps it could be convenient to improve the IIRC framework, since it does not produce the desired quality information. This could also help

to avoid, as Melloni et al. (2016) conclude, that impression management strategies be used when preparing integrated reports.

5. Concluding remarks

The IIRC has promoted integrated reporting with the aim of counteracting the disconnection of financial and non-financial information presented in traditional reports. In this way, it proposes a single report aimed to give information to capital providers on how the company creates value over time through its interaction with the external environment.

The IR is voluntary, with the exception of South Africa, and its use has increased notably worldwide. This paper contributes to the literature through the analysis of the level of adherence of the IR framework in the traditional reports of the companies included in the Dow Jones Sustainability Europe Index, companies that in principle are expected to disclose information of this nature. In addition, based on institutional theory and that of dependence factors, it examines at what extent the capitals embedded in the IIRC framework explain that level of adherence.

The results of this study reveal that companies in the sample disclose an average of 82.9% of the elements of the IIRC framework in the traditional reports. This high score is consistent with the literature that indicates that companies that are part of a sustainability index tend to disclose ESG information. Secondly, the content analysis shows that companies give more retrospective information than prospective, and do not pay adequate attention to connectivity of financial and non-financial information, which is a key aspect of the integrated reporting. Finally, through multivariate regression, a significant association is observed between the natural capital and the intellectual capital and the adherence level, however the negative sign of the second suggests that either there is not a full understanding of the purpose of this report, or some firms use it as an impression management strategy. In any case, they suggest that a clarification of the framework would not be a bad initiative to pursue in the next future.

This work contributes to the literature on the publication of non-financial information by the private sector. It can help advance this line of research and serve as guidance to regulators, particularly in the European context, in which the current NFRD already requires abundant information on sustainability aspects.

As other studies, this is not entirely free from limitations that must be considered when interpreting the findings. It focuses on the content required by the IIRC framework, so future studies may develop broader disclosure indices that combine the requirements with the principles that govern it. A Likert scale could be used to determine with greater precision the level of adherence of the IIRC framework in traditional reports, but obviously this may lead to some subjectivity in assigning the score. As for future extensions, enlarging the period of analysis could help to see if there is a learning curve as normally happens when referring to disclosure.

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Appendix: Disclosure index companies disclosing

DISCLOSURE INDEX ITEMS	N.	%
Organizational overview and external environment		92%
Organizational overview		90%
O1. Mission and vision statement	90	75%
O2. Explanations about organization culture, ethics and values	113	94%
O3. Code of conduct	101	84%
O4. Ownership or operating structure	115	96%
O5. Number of employees	119	99%
O6. Countries in which it operates	111	93%
External environment		94%
E1. Legal factors	113	94%
E2. Political factors	111	93%
E3. Social factors	118	98%
E4. Market forces	103	86%
E5. Key stakeholders	113	94%
E6. Environmental factors	118	98%
Governance		82%
G1. Board of directors list	119	99%
G2. Board members experience/skills	97	81%
G3. Culture, ethics and values influencing the different capitals	55	46%
G4. Actions taken to monitor strategic direction	104	87%
G5. Remuneration and compensation policies	117	98%
Business model		83%
Inputs		82%
B1. Product differentiation	92	77%
B2. Delivery channels and marketing	113	94%
B3. After sale service	57	48%
B4. Innovation	118	98%
B5. Employee training	112	93%
Outputs		91%
B6. Key products and services	118	98%
B7. GHG emission	112	93%
B8. Water use	97	81%
Outcomes		80%
B9. Employee morale	56	47%
B10. Organizational reputation	105	88%
B11. Profits, cash flows	120	100%
B12. Increase in capitals (value creation)	106	88%
B13. Decrease in capitals (value destruction)	92	77%

Risks and opportunities			98%
R1.	Internal or external risks	120	100%
R2.	Internal and external opportunities	114	95%
Strategy and resource allocation			80%
S1.	Short, medium, and long term strategic objectives (without time frame)	119	99%
S2.	Short, medium, and long term strategic objectives (with time frame)	85	71%
S3.	Strategies in place, or to be in place, to achieve the strategic objectives	95	79%
S4.	Measurement of achievements and target outcomes	114	95%
S5.	Understanding of the organization's ability to adapt to change to achieve objectives	97	81%
S6.	Link between strategies and key capitals	63	53%
Performance			67%
P1.	KPIs that present financial indicators	120	100%
P2.	KPIs that combine financial measures with other aspects (e.g., ratio GHG emissions to sales)	13	11%
P3.	Linkages between past and current performance	116	97%
P4.	Comparison between industry/regional benchmarks	78	65%
P5.	Financial implications of significant effects on other capitals	75	63%
Outlook			70%
O1.	Expectations about future or explain about uncertainties	106	88%
O2.	Forecast about KPIs	61	51%
O3.	Linkages between current performance and the organization's outlook	84	70%

Table 1. Content elements description

Content elements	An integrated report should answer the question:
Organizational overview and external environment	What does the organization do and what are the circumstances under which it operates?
Governance	How does the organization's governance structure support its ability to create value in the short, medium and long term?
Business model	What is the organization's business model?
Risks and opportunities	What are the specific risks and opportunities that affect the organization's ability to create value over the short, medium and long term, and how is the organization dealing with them?
Strategy and resource allocation	Where does the organization want to go and how does it intend to get there?
Performance	To what extent has the organization achieved its strategic objectives for the period and what are its outcomes in terms of effects on the capitals?
Outlook	What challenges and uncertainties are the organization likely to encounter in pursuing its strategy, and what are the potential implications for its business model and future performance?
Basis of preparation and presentation	How does the organization determine what matters to include in the integrated report and how are such matters quantified or evaluated?

Source: Adapted from IIRC (2013b)

Table 2. Capitals and measurement of variables

Capitals	Variables
<i>Financial capital:</i>	<i>ROA:</i> Return on Assets, measured as earnings before interest and taxes divided by total assets.
<i>Manufactured capital:</i>	<i>TURNOVER:</i> Tangible non-current asset turnover, measured as net revenue divided by tangible non-current assets.
<i>Human-related capitals:</i>	<p><i>M/B:</i> market-to-book ratio, measured as market value of equity divided by book value of equity.</p> <p>Or decomposed in:</p> <p><i>Intellectual capital: INTANG,</i> measured as research and development expenses plus intangibles divided by total assets.</p> <p><i>Human capital: EMPPROD,</i> employee productivity, measured as net revenue divided by number of employees.</p> <p><i>Social and relationship capital: MIMET,</i> mimetic isomorphism, indicator variable that is 1 if the 1 industry leader has an index greater than the median, 0 otherwise</p>

	(the industry leader is considered the company with the highest ROA).
<i>Natural capital</i>	<i>DANGERZONE</i> : indicator variable that is 1 if the firm belongs to a danger zone sector according to Allianz (2018)'s report (sectors: oil and gas, mining, food and beverage, and transportation).
<i>Controls:</i>	<p><i>OWNERCON</i>: Ownership concentration, indicator variable that is 1 if a firm has a majority shareholder, 0 otherwise.</p> <p><i>SIZE</i>: natural logarithm of total assets.</p> <p><i>WOMEN</i>: percentage of women on the board.</p> <p><i>IIRC</i>: indicator variable that is 1 if the company declares to follow the IIRC guidelines for the IR, 0 otherwise.</p> <p><i>COUNTRY</i>: Country variable that is the mean of three of the Worldwide Governance Indicators (WGI) (Kaufmann et al., 2011): Regulatory Quality, Rule of Law and Control of Corruption.</p>

Table 3. Industry and country distribution of the sample companies***Panel A: Distribution of observations by industry***

<i>GICS Sector Name</i>	Freq.	Percent	Mean index
Energy	5	4.2%	0.909
Materials	13	10.8%	0.818
Industrials	30	25.0%	0.853
Consumer Discretionary	17	14.2%	0.830
Consumer Staples	14	11.7%	0.854
Health Care	8	6.7%	0.755
Information Technology	9	7.5%	0.879
Communication Services	10	8.3%	0.770
Utilities	8	6.7%	0.780
Real Estate	6	5.0%	0.790
Total	120	100.0%	0.829

Panel B: Distribution of observations by country

Country	Freq.	Percent	Mean index
Belgium	1	0.8%	0.674
Denmark	2	1.7%	0.620
Finland	6	5.0%	0.848
France	27	22.5%	0.857
Germany	14	11.7%	0.795
Ireland	1	0.8%	0.783
Italy	4	3.3%	0.793
Netherlands	12	10.0%	0.866
Norway	2	1.7%	0.913
Portugal	2	1.7%	0.826
Spain	9	7.5%	0.812
Sweden	4	3.3%	0.788
Switzerland	9	7.5%	0.785
United Kingdom	27	22.5%	0.846
Total	120	100.0%	0.829

Note: This Table presents the distribution of the final sample observations. We identify a firm industry based on the Global Industry Classification Standard (GICS).

Table 4. Descriptive statistics of the variables

Panel A: Continuous variables					
Variable	Mean	St. Dev.	Min.	Median	Max.
<i>INDEX</i>	0.829	0.105	0.543	0.826	0.978
<i>ROA</i>	0.085	0.051	-0.002	0.076	0.243
<i>TURNOVER</i>	13.232	26.076	0.184	4.682	173.912
<i>M/B</i>	3.482	5.396	-9.312	2.483	49.962
<i>INTANG</i>	0.122	0.118	0.000	0.085	0.571
<i>EMPPROD</i>	0.432	0.437	0.023	0.312	2.703
<i>SIZE</i>	9.74	1.054	7.592	9.669	12.217
<i>WOMEN</i>	0.321	0.114	0.100	0.300	0.660
<i>COUNTRY</i>	1.568	0.408	0.406	1.746	2.023

Panel B: Dichotomous variables

Variable	Proportion dummy = 1	Median
<i>MIMET</i>	0.442	0
<i>DANGERZONE</i>	0.142	0
<i>OWNERCON</i>	0.125	0
<i>IIRC</i>	0.158	0

Notes:

INDEX: disclosure index; *ROA*: earnings before interest and taxes divided by total assets; *TURNOVER*: net revenue divided by tangible non-current assets; *M/B*: market value of equity divided by book value of equity; *INTANG*: research and development expenses plus intangibles divided by total assets; *EMPPROD*: net revenue divided by number of employees; *MIMET*: indicator variable that is 1 if the 1 industry leader has an index greater than the median, 0 otherwise (the industry leader is considered the company with the highest ROA); *DANGERZONE*: indicator variable that is 1 if the firm belongs to a danger zone sector according to Allianz (2018)'s report (sectors: oil and gas, mining, food and beverage, and transportation); *OWNERCON*: Ownership concentration, indicator variable that is 1 if a firm has a majority shareholder, 0 otherwise; *SIZE*: natural logarithm of total assets; *WOMEN*: percentage of women on the board; *IIRC*: indicator variable that is 1 if the company declares to follow the IIRC guidelines for the IR, 0 otherwise; *COUNTRY*: mean of three of the Worldwide Governance Indicators (WGI) (Kaufmann et al., 2011): Regulatory Quality, Rule of Law and Control of Corruption.

Table 5. Comparison of explanatory variables between firms with high and low disclosure index

Variable	High disclosure index		Low disclosure index		Diff. in means	Diff. in medians
	Mean	Median	Mean	Median		
<i>ROA</i>	0.086	0.076	0.085	0.076	0.001	-0.0004
<i>TURNOVER</i>	11.724	6.183	14.690	4.253	-2.966	1.930
<i>M/B</i>	3.205	2.468	3.750	2.497	-0.545	-0.029
<i>INTANG</i>	0.103	0.080	0.140	0.098	-0.037*	-0.018
<i>EMPPROD</i>	0.426	0.313	0.438	0.306	-0.012	0.007
<i>MIMET</i>	0.475	0.000	0.410	0.000	0.065	0.000
<i>DANGERZONE</i>	0.203	0.000	0.082	0.000	0.121*	0.000*
<i>OWNERCON</i>	0.102	0.000	0.148	0.000	-0.046	0.000
<i>SIZE</i>	9.629	9.531	9.847	9.773	-0.217	-0.243
<i>WOMEN</i>	0.306	0.290	0.335	0.330	-0.028	-0.040
<i>IIRC</i>	0.220	0.000	0.098	0.000	0.122*	0.000*
<i>COUNTRY</i>	1.607	1.746	1.531	1.744	0.076	0.002

Notes:

ROA: earnings before interest and taxes divided by total assets; *TURNOVER*: net revenue divided by tangible non-current assets; *M/B*: market value of equity divided by book value of equity; *INTANG*: research and development expenses plus intangibles divided by total assets; *EMPPROD*: net revenue divided by number of employees; *MIMET*: indicator variable that is 1 if the 1 industry leader has an index greater than the median, 0 otherwise (the industry leader is considered the company with the highest ROA); *DANGERZONE*: indicator variable that is 1 if the firm belongs to a danger zone sector according to Allianz (2018)'s report (sectors: oil and gas, mining, food and beverage, and transportation); *OWNERCON*: Ownership concentration, indicator variable that is 1 if a firm has a majority shareholder, 0 otherwise; *SIZE*: natural logarithm of total assets; *WOMEN*: percentage of women on the board; *IIRC*: indicator variable that is 1 if the company declares to follow the IIRC guidelines for the IR, 0 otherwise; *COUNTRY*: mean of three of the Worldwide Governance Indicators (WGI) (Kaufmann et al., 2011): Regulatory Quality, Rule of Law and Control of Corruption.

Table 6. Pearson correlation matrix

	<i>INDEX ROA</i>	<i>TURNOVER</i>	<i>M/B</i>	<i>INTANG</i>	<i>EMPPROD</i>	<i>MIMET</i>	<i>DANGERZONE</i>	<i>OWNERCON</i>	<i>SIZE</i>	<i>WOMEN</i>	<i>IIRC</i>	<i>COUNTRY</i>	
<i>INDEX</i>	1.000												
<i>ROA</i>	-0.025	1.000											
<i>TURNOVER</i>	-0.017	-0.043	1.000										
<i>M/B</i>	-0.073	0.272***	-0.062	1.000									
<i>INTANG</i>	-0.176*	0.154*	-0.145	0.096	1.000								
<i>EMPPROD</i>	-0.005	-0.057	0.153*	-0.176*	-0.206**	1.000							
<i>MIMET</i>	0.081	0.085	0.357***	0.116	-0.176*	-0.131	1.000						
<i>DANGERZONE</i>	0.198**	0.043	-0.157*	-0.077	0.089	0.331***	-0.265***	1.000					
<i>OWNERCON</i>	-0.099	0.054	-0.057	-0.011	0.088	-0.085	-0.032	-0.081	1.000				
<i>SIZE</i>	-0.102	-0.207**	-0.264***	-0.119	0.241***	0.083	-0.240***	0.164*	-0.124	1.000			
<i>WOMEN</i>	-0.022	0.081	0.034	0.004	0.123	-0.125	0.135	-0.013	0.033	-0.034	1.000		
<i>IIRC</i>	0.169*	-0.095	-0.113	-0.099	-0.068	0.192**	-0.202**	0.020	0.112	0.020	-0.087	1.000	
<i>COUNTRY</i>	0.009	0.217**	0.105	0.169*	-0.084	-0.141	-0.026	-0.067	-0.125	-0.233**	-0.062	-0.248***	1.000

Notes:

ROA: earnings before interest and taxes divided by total assets; *TURNOVER*: net revenue divided by tangible non-current assets; *M/B*: market value of equity divided by book value of equity; *INTANG*: research and development expenses plus intangibles divided by total assets; *EMPPROD*: net revenue divided by number of employees; *MIMET*: indicator variable that is 1 if the 1 industry leader has an index greater than the median, 0 otherwise (the industry leader is considered the company with the highest ROA); *DANGERZONE*: indicator variable that is 1 if the firm belongs to a danger zone sector according to Allianz (2018)'s report (sectors: oil and gas, mining, food and beverage, and transportation); *OWNERCON*: Ownership concentration, indicator variable that is 1 if a firm has a majority shareholder, 0 otherwise; *SIZE*: natural logarithm of total assets; *WOMEN*: percentage of women on the board; *IIRC*: indicator variable that is 1 if the company declares to follow the IIRC guidelines for the IR, 0 otherwise; *COUNTRY*: mean of three of the Worldwide Governance Indicators (WGI) (Kaufmann et al., 2011): Regulatory Quality, Rule of Law and Control of Corruption.

Table 7. Multivariate regression analysis

	Human-related capitals without decomposition		Human-related capitals decomposed	
	Base model	Base model and controls	Base model	Base model and controls
Constant	0.821*** [26.847]	0.858*** [6.635]	0.842*** [24.956]	0.841*** [6.647]
ROA	-0.138 [-0.634]	-0.175 [-0.866]	-0.142 [-0.641]	-0.146 [-0.726]
TURNOVER	-0.000 [-0.693]	-0.000 [-1.017]	-0.000 [-0.729]	-0.000 [-0.646]
M/B	-0.002** [-2.097]	-0.002* [-1.941]		
INTANG			-0.202*** [-3.137]	-0.163** [-2.192]
EMPPROD			0.001 [0.037]	-0.017 [-0.537]
MIMET			-0.034 [-0.589]	-0.006 [-0.093]
DANGERZONE	0.070** [2.433]	0.074*** [2.674]	0.081*** [2.798]	0.086*** [3.054]
OWNERCON		-0.030 [-1.150]		-0.028 [-1.084]
SIZE		-0.007 [-0.776]		-0.002 [-0.243]
WOMEN		-0.007 [-0.071]		0.006 [0.056]
IIRC		0.096*** [4.221]		0.094*** [4.251]
COUNTRY		0.021 [0.806]		0.010 [0.414]
Industry dummies	Yes	Yes	Yes	Yes
Mean VIF	1.29	1.39	2.87	2.63
Adjusted R²	0.082	0.155	0.112	0.167

Notes:

t statistics are based on the White (1980) estimator.

*** 1% significance; ** 5%; * 10%.

ROA: earnings before interest and taxes divided by total assets; *TURNOVER*: net revenue divided by tangible non-current assets; *M/B*: market value of equity divided by book value of equity; *INTANG*: research and development expenses plus intangibles divided by total assets; *EMPPROD*: net revenue divided by number of employees; *MIMET*: indicator variable that is 1 if the 1 industry leader has an index greater than the median, 0 otherwise (the industry leader is considered the company with the highest *ROA*); *DANGERZONE*: indicator variable that is 1 if the firm belongs to a danger zone sector according to Allianz (2018)'s report (sectors: oil and gas, mining, food and beverage, and transportation); *OWNERCON*: Ownership concentration, indicator variable that is 1 if a firm has a majority shareholder, 0 otherwise; *SIZE*: natural logarithm of total assets; *WOMEN*: percentage of women on the board; *IIRC*: indicator variable that is 1 if the company declares to follow the IIRC guidelines for the IR, 0 otherwise; *COUNTRY*: mean of three of the Worldwide Governance Indicators (WGI) (Kaufmann et al., 2011): Regulatory Quality, Rule of Law and Control of Corruption.