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Integrated reporting and business segmentation: An international overview

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Master in Accounting

Supervisor:

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ISCTE-IUL – Instituto Universitário de Lisboa

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*To my mother,
for all the sacrifices she has made for me and for always believing in me.*

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Abstract

In furtherance of future research, this study aims to explore the *status quo* of integrated reporting (<IR>) by evidencing geographic and firm-level characteristics of <IR> reporters, and differences in their firm value, both before and after <IR> adoption and distinguishing between reference and regular reporters. Despite the heightened emphasis on <IR> in recent years, the influence of <IR> in segment reporting remains unexplored. This study aims to fill this literature gap by analysing the effect of <IR> in segment disclosures according to a proprietary cost theory approach.

The analysis is conducted through descriptive and inferential statistics, followed by empirical research through the estimation of a logistic regression model based on competitive harm proxies (abnormal profitability and industry concentration), for a sample of 366 <IR> reporters (79 classified as reference and 287 as regular) from 2010 to 2019, retrieved from the Integrated Reporting Examples Database.

Main findings indicate that the majority of reporters are from South Africa, Japan and the UK whilst reference reporters are located in South Africa and Europe. On average, reporters are larger, less profitable and higher valued in the post <IR> adoption period meanwhile reference reporters are larger and more profitable than their counterparts. Firms increased their segment disclosure after <IR> adoption. Overall, competitive harm concerns, considering industry-based metrics, do not constrict segment disclosure before or under <IR>. However, higher firm (own) profitability suggests proprietary cost motivations for lower disclosure. Larger and more leveraged (only under <IR>) firms are more likely to be multi-segmented or report a higher number of segments.

Keywords: Integrated reporting; segment reporting; proprietary costs; competitive harm.

JEL classification: G30, M41

Resumo

Este estudo visa explorar o *status quo* do relato integrado (<IR>), evidenciando as características geográficas e ao nível de empresa das organizações que adotam o <IR>, bem como as diferenças no respetivo valor de empresa, tanto antes e depois da adoção do <IR>, como distinguindo entre repórteres de referência e regulares. Visa ainda preencher a lacuna na literatura sobre a influência do <IR> no relato por segmentos, analisando o efeito do <IR> em divulgações de segmento na ótica da teoria de custos proprietários.

A análise é realizada através de estatística descritiva e inferencial, seguida da estimação de um modelo empírico de regressão logística baseado em *proxies* de dano competitivo, para uma amostra de 366 empresas (79 de referência e 287 regulares) de 2010 a 2019, extraída da base de dados do International Integrated Reporting Council.

As principais conclusões indicam que a maioria dos repórteres são da África do Sul, Japão e Reino Unido, enquanto que os repórteres de referência são da África do Sul e da Europa. Em média, as empresas são maiores, menos rentáveis, mais valorizadas e aumentaram as divulgações de segmento após a adoção do <IR>; as empresas consideradas de referência são maiores e mais rentáveis do que as regulares. Genericamente, considerando as métricas baseadas na indústria, as preocupações com o dano competitivo não restringem a divulgação de segmentos antes ou após o <IR>. No entanto, a maior rendibilidade (própria) da empresa sugere motivações de custo proprietário influenciando negativamente a divulgação de informação por segmentos. Empresas maiores e mais alavancadas (apenas sob <IR>) têm maior probabilidade de serem multissegmentadas ou relatar mais segmentos.

Palavras-chave: Relato integrado; relato por segmentos; custos proprietários; danos de competitividade.

Classificação JEL: G30, M41

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Glossary

A4S	Prince's Accounting for Sustainability Project
AICPA	American Institute of Certified Public Accountants
CDSB	Climate Disclosure Standards Board
CEO	Chief Executive Officer
CLT	Central Limit Theorem
CODM	Chief Operating Decision Maker
CSR	Corporate Social Responsibility
EC	European Commission
EER	Extended External Reporting
EP	European Parliament
ESG	Environmental, Social and Governance
EU	European Union
EUR	Euros
FASB	Financial Accounting Standards Board
GAAP	Generally Accepted Accounting Principles
GRI	Global Reporting Initiative
HHI	Herfindahl-Hirschman Index
IAASB	International Auditing and Assurance Standards Board
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standard
IIRC	International Integrated Reporting Council
IIRF	International Integrated Reporting Framework
<IR>	Integrated Reporting
IR	Integrated Report
IREDB	Integrated Reporting Examples Database
IRQ	Integrated Reporting Quality
ISSB	International Sustainability Standards Board

<IT>	Integrated Thinking
JSE	Johannesburg Stock Exchange
King III	King Report on Governance for South Africa 2009
MEP	Member of the European Parliament
OI	Operating Income
PIR	Post-Implementation Review
ROA	Return on Assets
ROE	Return on Equity
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goals
SFAS	Statement of Financial Accounting Standards
SIC	Standard Industrial Classification
SR	Segment Reporting
UK	United Kingdom
UN	United Nations
US	United States
VRF	Value Reporting Foundation

Introduction

The current socio-economic context, characterized by globalization, financial and governance crises and increased environmental concerns (Bobitan & Stefea, 2015; Dragu & Tiron-Tunder, 2014; Flower, 2015; IIRC, 2011; Sharma, 2015; Steyn, 2014), has led to greater scrutiny about the value-creating processes of organizations (Bridwell, 2010) and stakeholders “*expect more than accounts, financial and business indicators, and want to know why, where and how companies create and add value, and how they deal with responsibility and sustainability*” (Morros, 2016: 337). Traditional corporate reporting has been deemed insufficient (Bobitan & Stefea, 2015; Cohen et al., 2012; de Villiers et al., 2017; Flower, 2015; Huguen et al., 2014). Regulators have tried to solve the reporting gaps by issuing new reporting and listing requirements (IIRC, 2011) however these initiatives only lead to information overload as companies disclose a plethora of mandatory and voluntary reports, presenting information in an unconnected and confusing manner, without coherence to organizations’ long-term objectives, therefore lacking value relevance (Abeysekera, 2013; ACCA, 2016; FRC, 2011; IIRC, 2011; Serafeim, 2015) and increasing information processing costs (Lee & Yeo, 2016).

Integrated reporting (<IR>) – the combination of financial and non-financial information in a single report (Eccles & Saltzman, 2011; Hoque, 2017) –, as proposed by the International Integrated Reporting Council (IIRC), emerges as an initiative to address the limitations of existing corporate reporting approaches, by providing a holistic view of the way organizations create and sustain value in a concise and interrelated manner (Baboukardos & Rimmel, 2016; Bhasin, 2017; Brown & Dillard, 2014; Burke & Clark, 2016; Kannenberg & Schreck, 2019; Slack & Tsalavoutas, 2018; Steyn, 2014).

Although research on <IR> has been emerging, it remains scarce and several authors have identified agendas for future research (Cheng et al., 2014; Dumay et al., 2016; Perego et al., 2016). It is pivotal to examine the existing state of affairs of <IR> to gain insightful knowledge about <IR> reporters and to guide future research. While prior literature on the determinants of <IR> and <IR> quality has explored similar avenues (e.g. Lopes & Coelho, 2018; Sierra-García et al., 2015; Vaz et al., 2016), this study evidences the geographic dispersion and firm characteristics of firms reporting according to <IR> methodology, making distinctions based on (i) <IR> adoption, comparing between the pre and the post-<IR> adoption periods and (ii) <IR> recognition, comparing the characteristics of reporters that presented higher recognized reports (reference reports) and those who presented regular reports. Anchored in a second research objective, this comparison is further extended to the differences in the reporters’ firm value.

Furthermore, considering prior studies in the field of <IR> and segment reporting (SR), a gap was noted in the relationship between <IR> and SR, more specifically in the way <IR> could influence segment disclosures. SR, one of the disclosures made by firms, while considered vital to the investment analysis process (AIMR, 1993), contributes to the information overload problem, having been criticised for not improving the understanding of the firm’s business model (Barneto & Ouvrard,

2015) and for allowing management discretion in segment definition, with many studies finding that proprietary cost concerns have led companies to withhold segment information (e.g. Aboud & Roberts, 2018; André et al., 2016; Edwards & Smith, 1996; Nichols & Street, 2007; Wang, 2009, 2016), raising concerns about the usefulness of the reported segment data.

The author posits that by allowing greater insights into the firm's business model and value creation, <IR> could lead to a better understanding of the firm's segmentation, as the reported segments should reflect the firm's business model. In turn, this could make it harder for companies to mask or withhold segments. Nonetheless, proprietary cost concerns could still lead to pseudo-disclosures in the scope of <IR> as in the International Integrated Reporting Framework (IIRF), the IIRC (2013) exempts organizations from providing certain information if, among others, it causes significant competitive harm. Therefore, the final research objective is to estimate, if the relationship between competitive harm and lower segment disclosures persists with <IR> adoption.

The sample is retrieved from the International Integrated Reporting Examples Database (IRED), which classifies organizations from all over the world that prepare integrated reports, or use the IIRF, into two sub-groups: <IR> reference reporters and <IR> regular reporters. The total sample comprises 366 organizations, 79 classified as reference reporters and 287 as regular reporters. Subsample A is created, excluding entities that presented IRs in all the years in analysis, to compare the effects of <IR> adoption; this subsample consists of 305 organizations. Data is collected from the Worldscope database and the firms' segment reports for a period of 10 years, ranging from 2010 to 2019.

Main findings indicate that the majority of reporters are from South Africa, Japan and the UK and that South Africa, followed by Europe, has the highest count of reference reporters. On average, organizations are larger, less profitable and higher valued in the post <IR> adoption period. Organizations preparing reference reports are larger and more profitable than their counterparts. Results are sensitive to the metrics used to compute the variables, especially for profitability, which could potentially bias future research when these variables are included in studies.

After <IR> adoption, firms increased their segments disclosures, by either reporting more than a single segment or reporting a greater number of segments. Results for <IR> recognition suggest that reference reporters disclose more than a single segment in comparison with regular reporters. Overall, competitive harm concerns do not seem to influence segment disclosure before or after the adoption of <IR>. Only the firm's (own) profitability suggests proprietary cost motivations for lower disclosure, for both periods. Larger (pre and post-<IR>) and more leveraged (only under <IR>) firms are more likely to report a higher number of segments and/or be multi-segmented.<IR> recognition does not affect the firm's likelihood of disclosing more segments or being multi-segmented.

The remainder of the dissertation is organized as follows. The next section discusses prior literature on <IR> and SR, followed by the research questions. The "Research Design" section describes the sample, the data and the methodology. Section 4 analyses and discusses the empirical results. Finally, the last section presents the concluding remarks.

CHAPTER 2

Literature Review and Research Questions

2.1. Integrated Reporting

Integrated reporting (<IR>), as defined by the International Integrated Reporting Council (IIRC) (2013: 33), is a “*process founded on integrated thinking that results in a periodic integrated report by an organization*” intended to serve (i) an information function, by explaining to providers of financial capital (and other interested stakeholders) how the organization creates value over time; and (ii) a transformational function, by improving internal decision-making processes (Barth et al., 2017; Eccles & Serafeim, 2015; IIRC, 2013).

The information function is fulfilled by the integrated report (IR), “*a concise communication about how an organization’s strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term*” (IIRC, 2013: 7). The transformation function, on the other hand, is achieved by integrated thinking (<IT>), defined as “*the active consideration by an organization of the relationships between its various operating and functional units and the capitals that the organization uses or affects*” (IIRC, 2013: 2) that “*leads to integrated decision-making and actions that consider the creation of value over the short, medium and long term.*” (IIRC, 2013: 2).

<IR> has been developed as an initiative to address the limitations of existing corporate reporting approaches (Zhou et al., 2017). Changes such as globalization, population growth, advances in technology, climate change, resource scarcity, financial and governance crises and increased environmental concerns (Bobitan & Stefea, 2015; Dragu & Tiron-Tunder, 2014; Flower, 2015; IIRC, 2011; Sharma, 2015; Steyn, 2014) have led to criticisms about the short-termism of capital markets (Cheng et al., 2014; Johnstone, 2017) and investors to require greater scrutiny about the value-creating processes of organizations (Bridwell, 2010). Companies have to address a greater variety of stakeholders, not only their shareholders, which raises the concern that traditional corporate reporting is inadequate to suffice the information needs of the variety of stakeholders firms must report to (Bobitan & Stefea, 2015; Cohen et al., 2012; de Villiers et al., 2017; Flower, 2015; Huguen et al., 2014). Regulators have tried to solve this gap by issuing new reporting and listing requirements (IIRC, 2011). Additionally, in light of growing concerns about environmental, social and governance (ESG) issues (Chersan, 2015; James, 2015; Velte & Stawinoga, 2017), companies have started to produce voluntary disclosures of non-financial information (Cohen et al., 2012) in the form of stand-alone corporate social responsibility (CSR) or sustainability reports (Dragu & Tiron-Tunder, 2014; Jensen & Berg, 2012; KPMG, 2015) which have been increasingly standardized by organizations such as the Global Reporting Initiative (GRI) (Velte & Stawinoga, 2017).

However, these regulatory and voluntary initiatives only lead to information overload as reports become longer and more complex, presenting information in an unconnected and confusing manner,

without coherence to organizations' long-term objectives, therefore lacking value relevance (Abeysekera, 2013; ACCA, 2016; FRC, 2011; IIRC, 2011; Serafeim, 2015). Whilst the merits of sustainability reports have been recognized (Dhaliwal et al., 2011; Dhaliwal et al., 2012), criticisms persist, as information is “*only as valuable as how it is used*” (Johnstone, 2017: 31) and the separate presentation of non-financial data fails to demonstrate the linkage between financial and non-financial aspects (Bernardi & Stark, 2018; Frías-Aceituno et al., 2013a; Jensen & Berg, 2012; Krzus, 2011; PwC, 2016), providing an incomplete picture of the organization to stakeholders (Cortesi & Vena, 2019; de Villiers et al., 2014).

In this context, by combining the financial and non-financial information in a single report (Eccles & Saltzman, 2011; Hoque, 2017), <IR> emerges as a way to provide a holistic view of the way organizations create and sustain value in a concise and interrelated manner (Baboukardos & Rimmel, 2016; Bhasin, 2017; Brown & Dillard, 2014; Burke & Clark, 2016; Kannenberg & Schreck, 2019; Slack & Tsalavoutas, 2018; Steyn, 2014), in an attempt to address the demands for better-quality and forward-looking information by stakeholders (ACCA, 2016; FRC, 2011; Frías-Aceituno et al., 2013b; IIRC, 2015).

2.1.1. Background to integrated reporting

A handful of pioneer organizations such as the Danish Novozymes have been presenting IRs dating back to 2002 (de Villiers et al., 2017; Eccles & Saltzman, 2011), howbeit <IR> only started gaining prominence with the publication of the King Report on Governance for South Africa 2009 (King III) written by Professor Mervyn King (Bhasin, 2017; Eccles & Saltzman, 2011; IODSA, 2009). As a means to fight corruption and socio-economic inequalities dating back to the apartheid era (Barth et al., 2017; Haji & Hossain, 2016), King III recommends that companies prepare IRs connecting their financial and sustainability performance (IODSA, 2009). The principles of King III were later incorporated in the Johannesburg Stock Exchange (JSE) and South Africa became the first country to mandate <IR> (Cheng et al., 2014) by requiring companies listed in the JSE to publish IRs in an “apply or explain” basis, starting March 2010 (Boerner, 2012; Chaidali & Jones, 2017; Roberts, 2017). The King IV, released in 2016 and effective as of April 2017, has since replaced the King III, requiring <IR> on an “apply and explain” basis (du Toit, 2017; Dumay et al., 2017).

Internationally, <IR> started gaining attention in 2010 when the Prince's Accounting for Sustainability Project (A4S) and the GRI created the IIRC as a consequence of the dissatisfaction with the existing reporting systems to address the challenges of the 21st century (A4S & GRI, 2010; IIRC, 2011). The main purpose of the IIRC is to develop a comprehensive framework that combines different strands of reporting – the <IR> framework - and to promote its use at a global scale (Coelho, 2016; de Villiers et al., 2014; IIRC, 2011; Loprevite et al., 2018), with the ambition to eventually become the corporate reporting norm (Chaidali & Jones, 2017; IIRC, 2013; Paolucci & Cerioni, 2017). For that effect, it relies on a “*global coalition of regulators, investors, companies, standard setters, the accounting profession and NGOs*” (IIRC, 2013: 2) as its members.

To facilitate the development of the framework, the IIRC (i) released a discussion paper in 2011, followed by a consultation draft in April 2013 to receive feedback on its concept of <IR> (Cheng et al., 2014; Conradie & de Jongh, 2017); and (ii) implemented the IIRC Pilot Programme, comprising more than 75 companies and 25 investor bodies - the ‘<IR> Business Network’ - to test the principles and concepts of the framework in those organizations (Caraianni et al., 2018; Dilling & Caykoylu, 2019; Mio et al., 2016). In December 2013, after due consideration, it released the International Integrated Reporting Framework (IIRF) (Cheng et al., 2014) to help preparers identify pertinent information to be included in the report by establishing Guiding Principles¹ and Content Elements² that dictate the overall content of an IR and explain the fundamental concepts that underpin them (IIRC, 2013). These fundamental concepts consist of (i) the value creation for the organization and others; (ii) the different capitals; and (iii) the value creation process. The capitals are inputs in the organization’s value creation process and are transformed into outputs and outcomes by its business model to create value for the organization and others. Conversely, the capitals can be destroyed or depleted in this process resulting in value destruction (Fried et al., 2014; IIRC, 2013; Morros, 2016). The IIRC (2013) offers a broader base of “value” than just financial capital, by considering that organizations rely on six different capitals for their success: financial, manufactured, intellectual, human, natural and social and relationship capital.

The IIRF takes a principles-based approach to strike an appropriate balance between flexibility and prescription to accurately reflect different organizational realities at the same time as allowing sufficient comparability across organizations to meet information needs (IIRC, 2013).

Several countries and stock exchanges across the world followed in the footsteps of South Africa and have started to issue recommendations in the direction of <IR> and supporting its practice, such as the case of Australia, Brazil, China, India, Japan, Malaysia, Singapore and the US (Barth et al., 2017; Burke & Clark, 2016; de Villiers et al., 2014; Deloitte, 2015; Girella et al., 2019; IIRC, 2015).

The European Union (EU) in particular, issued the Directive 2014/95/EU - applicable starting 2017 - which requires all public interest entities from the EU with over 500 employees to disclose non-financial and diversity information either as a part of a management report or through a CSR report or an IR, following – among others – the IIRF³ (EU, 2014; Flores et al., 2019; Kannenberg & Schreck, 2019; Velte & Stawinoga, 2017).

¹ The Guiding Principles are: strategic focus and future orientation; connectivity of information; stakeholder relationships; materiality; conciseness; reliability and completeness; consistency and comparability (IIRC, 2013).

² The Content Elements are: organizational overview and external environment; governance; business model; risks and opportunities; strategy and resource allocation; performance; outlook; basis of presentation (IIRC, 2013).

³ Dumay et al. (2017) believe that the human ties between the EU Directive and the IIRC – such as the case of Richard Howitt, former MEP (and major architect behind the EU Directive) and former CEO of the IIRC – will make IIRF the main framework for complying with the EU Directive. Deloitte (2015) estimated that roughly six thousand companies across Europe would be affected by this Directive.

Similarly, in light of target 12.6 of the United Nations' (UN) Sustainable Development Goals (SDG) "encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle" (UN, n.d.), the IIRF has been suggested as an effective mechanism to address the SDGs (Adams et al., 2020; CGMA & AICPA, 2018).

2.1.2. Previous studies in integrated reporting

<IR> is a relatively new development in corporate reporting that has predominantly emerged in 2010, with the creation of the IIRC and the establishment of the mandatory reporting regime in South Africa, accordingly, it has since been increasingly subject to academic research.

Research was preliminarily theoretical and conducted from a qualitative approach, through interviews, surveys and case studies for in-depth analysis (e.g. Burke & Clark, 2016; Eccles & Serafeim, 2015; James, 2015; Mio et al., 2016; Steyn, 2014) and gradually shifted to empirical studies and a content analysis approach on the reports produced by early adopters, either on a mandatory basis, by firms in South Africa (e.g. Barth et al., 2017; Bernardi & Stark, 2018; Zhou et al., 2017), or the reports produced by the firms part of the '<IR> Business Network' (e.g. ACCA, 2017, 2019; IIRC & Black Sun Plc, 2014, 2015). With the upsurge of <IR> adoption, authors started researching voluntary <IR> engagement worldwide, with particular focus on the EU (e.g. Loprevite et al., 2018; Paolucci & Cerioni, 2017).

Earlier research in <IR> focused on presenting and discussing the concept of the new reporting initiative, debating key issues related to the <IR> framework and identifying its potential benefits and possible further research questions (Abeysekera, 2013; Cheng et al., 2014; de Villiers et al., 2014; Eccles & Saltzman, 2011; Eccles & Serafeim, 2015; Krzus, 2011). Eccles & Saltzman (2011) identified three classes of benefits <IR> reporters should anticipate: (i) internal benefits, through improvements in resource allocation, shareholder and stakeholder engagement and reputation, through reduced reputational risk; (ii) external benefits, by meeting the ESG informational needs of investors, with the availability of more accurate non-financial information for data providers and appearing in sustainability indices; and (iii) management of regulatory risk, by being prepared for a likely wave of global regulation. The IIRC (2011) claims that the major benefit of <IR> lies within <IT> and academia has supported this view, alleging that <IR> shifts the focus from short to long-term strategy and stimulates greater clarity of the interrelation between financial and non-financial information leading companies to develop a better understanding of the most important factors that affect value creation and their contribution to strategic goals. In turn, the communication of these goals to employees allows them to better understand the company and its value creation process, encouraging connections and collaborations across the organization by breaking down silos, consequently promoting improved internal processes and decision making (García-Sánchez et al., 2013; IIRC, 2011, 2015; James, 2015; Krzus, 2011; Morros, 2016; Sierra-García et al., 2015; Simnett & Huggins, 2015; Tomorrow's Company et al., 2014).

As a means to provide empirical evidence of the claimed benefits, research started exploring the concrete effects that arise from the commitment to <IR>. Studies conducted by ACCA (2017, 2018) and the IIRC and Black Sun Plc. (2014, 2015) on participants from the ‘<IR> Business Network’ revealed that <IR> acts as a driver for <IT>- by shifting the focus to items most material to the company, <IR> allows greater insights into the business model and value creation, resulting in enhanced management and decision making; preparers also noted an improvement in internal processes and employee engagement, with connections being forged between different departments, leading to a broadening of perspectives and cooperation and reduction of silo-thinking. Moreover, as an internal understanding of strategy improves, external reporting becomes more efficient at answering stakeholder inquiries and providing a long-term outlook, resulting in enhanced reputation and stakeholder relations. Research conducted under different settings, such as the South African (Roberts, 2017) and Italian (Paolucci & Cerioni, 2017; Vitolla & Raimo, 2018) context yielded similar results, hence providing some evidence of previously claimed benefits.

As one of the purposes of <IR>, as stated by the IIRC, is to “*improve the quality of information available to providers of financial capital to enable more efficient and productive allocation of capital*” (IIRC, 2013: 3) authors have investigated the usefulness of the information provided in IRs, with particular focus on the effect it can have on capital markets (Barth et al., 2017; Bernardi & Stark, 2018; Cortesi & Vena, 2019; Flores et al., 2019; García-Sánchez & Noguera-Gámez, 2017a; Lee & Yeo, 2016; Serafeim, 2015; Zhou et al., 2017).

Prior research suggests that investors are increasingly interested in non-financial information (Abeysekera, 2013; Hughen et al., 2014; PwC, 2016) and use it to forecast future financial performance (Dhaliwal et al., 2012; Gal & Akisik, 2020); besides, companies that provide such information through sustainability reports benefit from a lower cost of capital (Dhaliwal et al., 2011). There are demands for improved data, more connectivity and consistently applied frameworks (Gal & Akisik, 2020; PwC, 2016); concretely, 64% of the participants attending an ‘<IR> Business Network’ event in 2018 declared they regularly get questions from investors regarding non-financial information, with topics covering ESG issues (ACCA, 2019). This has led to remarks that <IR>, through the principles of connectivity and materiality, can help organisations provide relevant information in meaningful ways, by showing the interrelations between financial and non-financial matters (ACCA, 2019; Flores et al., 2019; KPMG, 2012).

Knauer & Serafeim (2014) and Serafeim (2015) determined that firms that produce IRs attract a greater number of long-term investors and detract transient investors.

Studies have found that <IR> reduces information asymmetry (Cortesi & Vena, 2019; García-Sánchez & Noguera-Gámez, 2017b; Lee & Yeo, 2016) and information processing costs - especially in firms operating in complex environments and with greater external financing needs (Lee & Yeo, 2016) - and enhances analyst earning forecast accuracy (Bernardi & Stark, 2018; Flores et al., 2019; Zhou et al., 2017), suggesting that information contained in IRs is helpful for analysts in formulating

their prediction for earnings (Loprevite et al., 2018); furthermore, the improved reporting environment resulting from the adoption of <IR> and <IR> quality (IRQ) improves earnings quality (Baboukardos & Rimmel, 2016; Cortesi & Vena, 2019; Loprevite et al., 2018; Obeng et al., 2020), leads to a reduction in the cost of debt (Raimo et al., 2021) and induces an increase in firm value (Barth et al., 2017; Cortesi & Vena, 2019; Lee & Yeo, 2016; Pavlopoulos et al., 2019).

Vitolla et al. (2020b: 521) suggest that “*a greater number of long-term investors and a lower level of information asymmetry can lead to a reduction in the cost of equity capital*” and the main results from the literature on the capital market effects of <IR> attest their point by showing that <IR> adoption - and higher quality <IR> -, leads to a reduction in the cost of capital (García-Sánchez & Noguera-Gámez, 2017a; IIRC, 2015; IIRC & Black Sun Plc, 2014), particularly the cost of equity capital (Vitolla et al., 2020b; Zhou et al., 2017). These results especially apply to firms with a low analyst following (Zhou et al., 2017) or companies that increase their basic funding or experience more problems related to information asymmetry (García-Sánchez & Noguera-Gámez, 2017a).

However, several studies have questioned the usefulness of <IR> for capital markets. Abhayawansa et al. (2019) interviewed 23 analysts who covered companies participating in the ‘<IR> Business Network’ and found that these analysts were unaware of the concept of <IR>; moreover, <IR> is irrelevant in analysts' practice of firm assessment because the IRs do not provide the information required by analysts in sufficient detail or the preferred format. Similarly, interviews conducted by Slack & Tsalavoutas (2018) and ACCA (2016) on fund managers, equity analysts and other financial users revealed that they were generally not familiar with <IR>.

A strand of literature concerned with the identification of the drivers of <IR> adoption found determinants at (i) country level, including the legal system, cultural values and economic conditions (Busco et al., 2019; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019; Jensen & Berg, 2012; Vaz et al., 2016); (ii) industry level, namely industry concentration and affiliation (Busco et al., 2019; Chersan, 2015; Fasan & Mio, 2017; Frías-Aceituno et al., 2014; García-Sánchez et al., 2013; Gianfelici et al., 2018; Lai et al., 2016; Sierra-García et al., 2015); and at (iii) firm level, *inter alia* size, profitability, growth opportunities and certain characteristics of the board of directors (Frías-Aceituno et al., 2014; Frías-Aceituno, et al., 2013a; Frías-Aceituno, et al., 2013b; García-Sánchez et al., 2013; Girella, et al., 2021; Hichri, 2021).

At a country level, Frías-Aceituno et al. (2013a) found that companies operating in civil law countries, which are characterized by a high degree of governmental intervention and stakeholder orientation, are more likely to adopt <IR>. Examining the impact of the cultural system based on Hofstede's cultural dimensions, García-Sánchez et al. (2013) showed that companies based in countries with similar cultural systems adopt similar patterns of behaviour regarding <IR> and that companies located in societies with stronger collectivist and feminist values are more likely to publish an IR in the interest of facilitating decision-making by different stakeholders and improving the overall quality of life in the long-term. Girella et al. (2019) supported these findings and added that the

same applied to firms in countries with a higher corruption perception index and a safer rating. In a similar vein, Vaz et al. (2016) established that companies in more collectivist societies and in countries that present a 'comply or explain' <IR> regulation are more likely to present an IR.

Regarding the industry level, Frías-Aceituno et al. (2014) argue that industry concentration has a negative impact on the development of IRs as they found that companies in monopolistic situations are less likely to publish IRs containing information relevant to decision making in the interest of maintaining the abnormal profits being obtained. On the subject of industry affiliation, it has been suggested that certain industries, such as social and environmental sensitive ones, are more exposed to public scrutiny than others and are expected to suffer from more stakeholder and regulatory pressure (Bowen, 2000; Cho et al., 2012), including greater demand for ESG information (Kannenberg & Schreck, 2019). Accordingly, Busco et al. (2019) evidenced that firms that operate in sensitive industries and firms with higher environmental performance are more likely to produce integrated reports. Sierra-García et al. (2015) further revealed that industry affiliation has some influence on the adoption of <IR>, as firms from industries for which the GRI has issued a sector supplement are more susceptible to present information in an integrated manner.

At the firm level, several studies have found profitability (Frías-Aceituno et al., 2014; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019) and firm size (Busco et al., 2019; Frías-Aceituno et al., 2014; Frías-Aceituno et al., 2013b; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019; Sierra-García et al., 2015) to be influential of <IR> adoption, arguing that, on the one hand, larger firms are more visible in the market and society in general, presenting greater sensitivity to their public image and external pressure to disclose holistic information (Frías-Aceituno et al., 2014); on the other hand, more profitable firms have more resources available and can devote them to the production and disclosure of information (Frías-Aceituno et al., 2013a). Other scholars found no significant relation between the firm's profitability (Frías-Aceituno et al., 2013b; Lai et al., 2016) or size (Lai et al., 2016; Vaz et al., 2016) and the adoption of <IR>. Frías-Aceituno et al. (2013b) and Girella et al. (2019) drew attention to growth opportunities, as measured by market-to-book ratio, influencing the adoption of <IR>, however García-Sánchez et al. (2013) did not come across such influence in their investigation.

While <IR> practice is becoming increasingly popular, the quality of the reports remains quite low, with reports containing repetitive information and leaving out certain ESG items (Dilling & Caykoylu, 2019; Frías-Aceituno et al., 2013a; KPMG, 2017, 2019; Pistoni et al., 2018; PwC, 2013, 2014). In light of these findings, investigators have turned their attention to the drivers of IRQ, to understand what makes companies produce better quality reports. As encountered for <IR> adoption factors, research on IRQ also identified determinants at country, industry and firm level.

At a country level, the legal system (Vitolla et al., 2020a) and the national culture (Raimo et al., 2019; Vitolla et al., 2019c) play a part in determining IRQ. Firms operating in civil law countries (Vitolla et al., 2020a, 2020c) or countries with a cultural system with less power distance and more

restraint, uncertainty avoidance, femininity and collectivism (Raimo et al., 2019; Vitolla et al., 2019c) produce better quality reports. Bavagnoli et al. (2018) and Songini et al. (2020) additionally found that companies located in Europe and countries with mandatory <IR> present higher-quality IRs.

Firms whose activity affects the environment produce more detailed reports, therefore industry affiliation is also a determinant of IRQ (Buitendag et al., 2017).

Prior research has detected several IRQ determinants at the firm level. Even though Dilling & Caykoylu (2019) found conflicting results for profitability and Malola & Maroun (2019) and Songini et al.(2020) for size, both size and profitability are positively associated with IRQ (Buitendag et al., 2017; Dilling & Caykoylu, 2019; Iredele, 2019; Vitolla et al., 2020a). Malola & Maroun (2019) further concluded that firms with a CSR or sustainability committee and firms that have their disclosures externally assured produce better quality reports. Maroun (2019) and Erin & Adegboye (2021) corroborated their results regarding external assurance and Maroun (2019) added that the influence is stronger when the assurance services are provided by one of the Big 4. On a separate note, Vitolla et al. (2019b) identified that pressure from stakeholders, including customers, environmental protection organizations, employees, shareholders and governments, determines IRQ.

Some authors (Biondi et al., 2020; Brown & Dillard, 2014; Flower, 2015; Gerwanski, 2020; Milne & Gray, 2013; Thomson, 2015), sceptical of the new reporting initiative, presented critical perspectives on the concept of <IR> proposed by the IIRC⁴. In his study, Paternostro (2020) presented it as a “contested concept”. Given the main function of an IR is to “*explain to providers of financial capital how an organization creates value over time*” (IIRC, 2013: 4), prior literature has criticised the business case logic of <IR>, claiming it has suffered from regulatory capture by the IIRC’s governing council, which is dominated by the accountancy profession and multinational enterprises, thus not adequately representing social and environmental stakeholders’ interests (Chaidali & Jones, 2017; Flower, 2015; Thomson, 2015). As a consequence, it has disregarded sustainability and moved to a pure investor focus (Brown & Dillard, 2014; Conradie & de Jongh, 2017; de Villiers et al., 2014; Flower, 2015; La Torre et al., 2020; Milne & Gray, 2013), perpetuating the short-termism of capital markets (Brown & Dillard, 2014; Flower, 2015; Thomson, 2015). Moreover, by not placing any obligation on firms to report matters that are not material to its ability to create value for itself (IIRC, 2013), such as the damage inflicted on society or the environment (Flower, 2015), <IR> detracts from sustainability reporting achievements (Brown & Dillard, 2014) passing off unsustainable practices as sustainable (Thomson, 2015).

In light of these criticisms, Adams (2015) defended that <IR>’s main purpose is not to address sustainability, but rather act as a vehicle for profound change in corporate reporting and thinking, “*leading to the further integration of sustainability actions and impacts into corporate strategic planning and decision making*” (Adams, 2015: 23). The argument is that the integration of ESG issues

⁴ The South African <IR> framework follows the King Report and places a greater focus on social, environmental and sustainability issues than the IIRF (de Villiers et al., 2014).

into the core business model causes internalization of ethical norms, inducing a profound change towards more environmentally and socially responsible business practices (Adams, 2015; ACCA, 2016; James, 2015; Maniora, 2017; Simnett & Huggins, 2015; Stubbs & Higgins, 2014). Correspondingly, Coulson et al. (2015: 290) add that the <IR> agenda represents a “*shift from a financial capital market system’ to an ‘inclusive capital market system’ through recognition of multiple capitals and integrated reporting and thinking*”. Proponents of <IR> argue that the integration of financial and sustainability information in one report influences investors to consider financial effects of non-financial issues, helping them look beyond short-term results and consider long-term value (Kannenberg & Schreck, 2019; KPMG, 2012; Mio et al., 2020; Reimsbach et al., 2018), as per past requests in that direction (e.g. CFA Institute, 2006). Nevertheless, Slack & Tsalavoutas (2018) argue that, while <IR> has some appeal, its consideration in investment thinking remains aspirational until there is a significant shift towards longer-term thinking (Cheng et al., 2014; IIRC & Black Sun Plc, 2014).

Academics have debated the mandatory or voluntary requirement basis for <IR>, with some supporting mandatory <IR> adoption (Bhasin, 2017; Dilling & Caykoylu, 2019; Havlová, 2015; Kiron, 2012) and others voluntary (Higgins et al., 2014; Steyn, 2014). In her study of the motives for the preparation of an IR under the mandatory setting of South Africa⁵, Steyn (2014: 476) reported that “*managers are more motivated by the legitimising aspect of advancing corporate reputation and stakeholder needs in compiling the integrated report than satisfying investor needs*” suggesting there is a strong business case for voluntary <IR> adoption (Steyn, 2014). Likewise, Atkins & Maroun (2015), Stubbs & Higgins (2014) and Higgins et al. (2014) found that rather than engaging in <IT>, reports were merely compliance-based, emphasising form over substance. This led to concerns that mandatory <IR> might induce in a box-ticking practice to comply with regulation rather than reporting in the spirit of <IR> (Dumay et al., 2017), raising worries over the possibility of <IR> being used to manage impressions (du Toit, 2017; Haji & Hossain, 2016; Melloni et al, 2017; Melloni et al., 2016; Stacchezzini et al., 2016). The Guiding Principles of the IIRF stress that reports should be reliable and complete, presenting all material matters - both positive and negative - in a balanced way (IIRC, 2013) however findings reveal that, overall, positive information is emphasized over negative outcomes (ACCA, 2019; Haji & Hossain, 2016; Melloni et al., 2016; Roberts, 2017) and this positive tone is more pronounced on the limited forward-looking (i.e. less verifiable) information that is provided (Melloni et al., 2016; Stacchezzini et al., 2016). Firms with poor social and environmental results avoid providing information about their sustainability performance (Melloni et al., 2017; Stacchezzini et al., 2016) while firms with worse financial performance tend to produce reports that are longer, more complex and optimistic and tend to include more ESG topics (Melloni et al., 2017; Roman et al., 2019). ACCA (2019) noted that if IRs are to be seen as more than just marketing tools,

⁵ In their study under a similar setting, Hoang et al. (2020) found that mandatory <IR> disclosure resulted in a decline in the misreporting practices of firms.

they need to present information in a balanced and complete way (see also Vitolla et al., 2020b). Nevertheless, directors are wary of providing forward-looking information so as not to incur in liability (Deloitte, 2015; Manes-Rossi et al., 2017; Stacchezzini et al., 2016). In their paper, Lakshan et al. (2021) evidenced the strategies used to manage the risk associated with the disclosure of this type of information.

The prospect of <IR> being used for impression management raises questions about its credibility. It has been argued that if IRs are to be seen as being reliable and the information provided in them is to be used for decision-making, they need to be assured since assurance can increase the credibility and thus decision-usefulness of the reports (Barreiro Rodrigues & Morais, 2019; Burke & Clark, 2016; Cheng et al., 2014; Conradie & de Jongh, 2017; Deloitte, 2015; Goicoechea et al. 2019; IIRC, 2014; Lapteş & Sofian, 2016; Lopes & Coelho, 2018; Reimsbach et al., 2018; Simnett & Huggins, 2015; Vitolla et al., 2020b). Even though the IIRC (2013) encourages the independent assurance of these reports, a specific <IR> assurance standard is not available so far (Deloitte, 2015; IIRC, 2014; Maroun, 2017; Selimoglu & Yesilcelebi, 2021; Simnett & Huggins, 2015; Velte & Stawinoga, 2017) as it is challenging to assure the ESG and forward-looking information disclosed in them (ACCA, 2015; Borgato & Marchini, 2021; Burke & Clark, 2016; de Villiers et al., 2017; Oprisor, 2015). While the International Auditing and Assurance Standards Board (IAASB) has taken a step in this direction with the publication of its non-authoritative extended external reporting (EER) assurance guidance, which includes, among others, <IR>, it is merely indicative (IAASB, 2020a, 2020b). Despite the challenges the assurance of IRs pertains, results show that an increasing number of organizations are investing in and providing assurance of their IRs (ACCA, 2018; Briem & Wald, 2018; IIRC & Black Sun Plc, 2014). Whereas some are presenting assurance on the full report and others are doing so for only part of the report, the emitted opinion is usually a limited one (ACCA, 2018; Barreiro Rodrigues & Morais, 2019; Deloitte, 2015).

The IIRC hoped that <IR> would be a widely adopted practice by 2020 (Sierra-García et al., 2015). Despite the uptake of <IR> becoming increasingly popular, it is far from fulfilling the vision the IIRC had for it. Apart from the lack of recognition of this initiative and the subject of assurance, other challenges remain.

From a preparers perspective, <IR> requests too much confidential information that could cause competitive harm or lead to liability issues (Deloitte, 2015; Lee & Yeo, 2016; Pistoni et al., 2018; Steyn, 2014); the IIRC (2013) has addressed this topic in the IIRF, exempting organizations from providing certain information if it is unavailable, presents specific legal prohibitions or causes significant competitive harm. From a user's perspective, the comparability of IRs presents one of the biggest challenges to its usefulness (Dilling & Caykoylu, 2019). To increase the comparability and potential usefulness of IRs, several studies suggest that the IIRC should consider implementing a checklist in the IIRF to standardize reports (Velte & Stawinoga, 2017) or, given the influence of industry affiliation, define a set of sector-specific standards, particularly for sustainability metrics

(Eccles et al., 2012; Gianfelici et al., 2018; Kiron, 2012; Slack & Tsalavoutas, 2018; Stein Smith, 2015).

To address some of the challenges concerning the adoption of <IR>, the IIRC carried a revision of the IIRF in 2020, at the 10-year mark of the creation of the IIRC (IIRC, 2020a, 2020b). The revised framework was published in January 2021, with only a few minor alterations, proving that the IIRF remains fit for purpose (IIRC, 2020d, 2021). In September 2020, together with the CDP, Climate Disclosure Standards Board (CDSB), GRI and Sustainability Accounting Standards Board (SASB), the IIRC released a statement in which the organizations presented a shared vision of what is needed for progress towards comprehensive corporate reporting and announced the intent to work together to achieve it (CDP et al., 2020). Additionally, in November 2020, the IIRC and SASB announced their intention to merge into a unified organization, the Value Reporting Foundation (VRF), which was officially formed in June 2021 (IIRC & SASB, 2020).

2.2. Segment Reporting

As organizations become larger and more complex, operating in diverse industries and across the world, aggregated financial statements are no longer enough to evaluate a firm and financial analysts, among others, identified a need for disaggregated disclosures to improve decision making (Chen & Zhang, 2003; Edwards & Smith, 1996; Herrmann & Thomas, 1996; Prodhon & Harris, 1989).

In light of these demands, segment reporting (SR) - the disaggregation of a reporting entity's financial reports into segments - emerges as a way to improve the informational content of financial statements by helping users disentangle and more effectively estimate future cash flows streams that are subject to different economic environments, understand the entity's performance and better assess its risks and prospects (Edmonds et al., 2018; Givoly et al., 1999; Kajüter & Nienhaus, 2017; Lenormand & Touchais, 2014; Street & Nichols, 2002; Tse, 1989), therefore, helping them “*make more informed judgments about the enterprise as a whole*” (FASB, SFAS 131: para. 3).

SR has been deemed not only necessary, but “*vital, essential, fundamentally indispensable, and integral to the investment analysis process*” (AIMR, 1993: 39), with analysts claiming segmental data as one of the most important disclosure items firms provide (Berger & Hann, 2003; Schaberl, 2014). Its importance has drawn the attention of accounting standard setters and regulators who have introduced and continuously updated SR standards to address users' demands.

2.2.1. Background to segment reporting⁶

The first steps towards SR were taken by the Financial Accounting Standards Board (FASB) in 1976, when it introduced the “*Statement of Financial Accounting Standards no. 14 - Financial Reporting for Segments of a Business Enterprise*” (FASB, 1976) - from hereon SFAS 14 - to “*assist financial statement users in analyzing and understanding the enterprise's financial statements by permitting*

⁶ For a more detailed account of the background to SR, see Annex A – Segment Reporting Standard Setting Process.

better assessment of the enterprise's past performance and future prospects" (SFAS 14: para. 5).⁷ Similarly, in 1981 the International Accounting Standards Committee (IASC)⁸ issued the "*International Accounting Standard 14 - Reporting Financial Information by Segment*" (IASC, 1981) - hereupon IAS 14 - with an identical approach to SFAS 14⁹. Both these standards adopted an industry approach to SR, which was heavily criticized for, *inter alia*, allowing discretion in segment definition and the degree of disclosure and for the lack of coherence between the firm's internal organisation and the reported segments (FASB, 1997; Nichols & Street, 2007; Prather-Kinsey & Meek, 2004).

After prolonged pressure from users (AIMR, 1993; Herrmann & Thomas, 2000), the standard setters addressed these criticisms in 1997 by updating the reporting requirements. FASB issued "*Statement of Financial Accounting Standards no. 131 - Disclosures about Segments of an Enterprise and Related Information*" - SFAS 131 from now on - which superseded SFAS 14 (FASB, 1997); concurrently IASC replaced IAS 14 with the revised "*International Accounting Standard 14 - Segment Reporting*" (IASC, 1997) - from hereon IAS 14R. Both these standards substantially changed how firms should provide segment information by adopting a management approach to SR, which requires using the internal management reporting system to identify segments (SFAS 131: para. 4; IAS 14R: para. 27). While SFAS 131 adopted the 'full management approach', which is "*based on the way that management organizes the segments within the enterprise for making operating decisions and assessing performance*" (SFAS 131: para. 4); IAS 14R, on the other hand, adopted a 'modified management approach' whereby it established two-tier segmentation.¹⁰

In 2006, as a part of the short-term convergence project between the International Accounting Standards Board (IASB) and the FASB to improve financial reporting and to eliminate major discrepancies between International Financial Reporting Standards (IFRS) and the US Generally Accepted Accounting Principles (GAAP) (IASB, 2006a, 2006b: BC2), the IASB & IFRS Foundation published "*IFRS 8 - Operating Segments*" (IASB & IFRS Foundation, 2006) – henceforward IFRS 8. Except for minor differences and terminology amendments to conform to other IFRS, IFRS 8 is virtually identical to SFAS 131 (Crawford et al., 2014; IASB & IFRS Foundation, 2006; Kajüter & Nienhaus, 2017; Lenormand & Touchais, 2014).

Despite the rationales provided by the IASB in favour of IFRS 8, the adoption of the standard was met with opposition among investors and users, especially in Europe. As the management approach requires reporting consistent with the way entities are managed internally, SR under IFRS 8 should highlight the information and the measures that management deems important and uses internally for decision making, which do not necessarily have to be based on IFRS. As such, the main criticisms include: the leeway granted to entities to report segment items in non-IFRS measures (Crawford et al., 2014; EY, 2009; IASB, 2006b: DO4; Leung & Verriest, 2015; Verón, 2007), the reduced

⁷ For more detailed information, see SFAS no. 14: Financial Reporting for Segments of a Business Enterprise.

⁸ The IASC was later renamed IASB.

⁹ For additional information, see IAS 14: Reporting Financial Information by Segment.

¹⁰ For further clarification, see IAS 14: Segment Reporting

comparability of (cross-sectional) segment information (Barneto & Ouvrard, 2015; EY, 2009; Kwok & Sharp, 2005; Leung & Verriest, 2015) and the discretion entrusted in management to choose the extent and nature of the information reported, with the argument that data reported under IFRS 8 is more prone to manipulation (Kwok & Sharp, 2005; Nichols et al., 2012; Sukhraj, 2007; Véron, 2007).

One of the biggest objectors to IFRS 8 was the European Parliament (EP) (Crawford et al., 2014) who expressed concerns about bringing an ‘alien’ US standard - SFAS 131 - into EU law without assessing its impact (EP, 2007a) and ordered the IASB to carry out a post-implementation review (PIR) of IFRS 8 (EP, 2007b), which was published in July 2013 and concluded that while preparers generally think the standard works well, investors display mixed views (IASB, 2013).

Preparers expressed difficulty in identifying the Chief Operating Decision Maker (CODM) and concerns about releasing commercially sensitive information; however, they note that the costs of implementation are generally low and reported a decrease in ongoing costs. Some investors prefer the management approach to SR as it allows alignment across financial statements, management commentary and presentations; and presents audited information. Others investors are wary of it because they mistrust management’s intentions and believe that segments are reported in a manner that conceals the entity’s actual management structure (often due to commercial sensitivity concerns) or to cover up loss-making activities within individual segments.

2.2.2. Previous studies in segment reporting

Prior research in SR has addressed various issues such as the reporting incentives and disincentives, the information disclosed and the consequences of disclosure.

According to (segment) disclosure theory (Aboud & Roberts, 2018; Aleksanyan & Danbolt, 2015; Berger & Hann, 2003; Gisbert et al., 2014; Wang, 2009, 2016) entities have several motives to disclose or withhold accounting information (Fields et al., 2001; Healy & Palepu, 2001). The disincentives to reveal information result from (i) the proprietary cost of providing sensitive information to competitors, which might jeopardize the entity’s competitive position (Backer & McFarland, 1968; Verrecchia, 1983, 2001), (ii) the agency cost to managers of providing information to shareholders to avoid unwanted scrutiny or accomplish personal benefits (Graham et al., 2005; Healy & Palepu, 2001; Nagar et al., 2003) and (iii) other costs, such as the cost of collecting, processing, disseminating and auditing information and the potential counterproductive consequences of information overload (Gray, 1981). The incentives to reveal more information include (i) the reduction of information asymmetry, which can lead to capital market benefits such as the reduction of the cost of capital (Diamond & Verrecchia, 1991; Graham et al., 2005) and (ii) the threat of regulation enforcement (Suijs & Wielhouwer, 2019).

Prior studies on segment disclosure deficiencies found evidence consistent with proprietary (Aboud & Roberts, 2018; André et al., 2016; Bens et al., 2011; Botosan & Stanford, 2005; Edwards & Smith, 1996; Ellis et al., 2012; Harris, 1998; Leuz, 2004; Mande & Ortman, 2002; Nichols & Street, 2007; Tsakumis et al., 2006; Wang, 2009, 2016; Wang et al., 2011) and agency cost (Aboud &

Roberts, 2018; Bens et al., 2011; Berger & Hann, 2007; Bugeja et al., 2015; Wang, 2009; Wang et al., 2011) concerns for withholding information.

Proprietary cost concerns have led companies to withhold, aggregate, conceal and provide lower quality segment information (Aboud & Roberts, 2018; André et al., 2016; Edwards & Smith, 1996; Nichols & Street, 2007; Tsakumis et al., 2006; Wang, 2009, 2016; Wang et al., 2011).

Wang (2009) and Wang et al. (2011) argue that managers of companies with greater agency conflicts tend to engage in self-interested behaviour such as empire-building which makes them hesitant to reveal accurate information about segment earnings growth, as this could evidence the inefficient allocation of organizational resources. Aboud & Roberts (2018) find that firms with greater agency problems are more likely to report segment disclosures of lower quality and higher segment disclosure quantity to give the illusion that they are acting in the shareholders' interest and avoid external monitoring while masking inefficient decisions for their own benefit. Berger & Hann (2007) and Bens et al. (2011) further reveal that, due to agency conflicts, managers aggregate segments to suppress information regarding inefficient internal capital transfers or to conceal information about poorly performing segments.

By studying segment disclosures before and after the adoption of the management approach, researchers identified an increase in the number of reported segments (Berger & Hann, 2003; Bugeja et al., 2015; Crawford et al., 2012; Ettredge et al., 2002; Leung & Verriest, 2015; Street et al., 2000) and a reduction in the number of single-segment companies (Botosan & Stanford, 2005; Herrmann & Thomas, 2000; Street et al., 2000). Their examination of the motives behind the previous non-disclosure of segments indicates that segment information was withheld for proprietary and agency cost reasons, suggesting that managers used discretion in segment definition in previous standards and the introduction of the management approach reduced managers' discretion (Nichols & Street, 2007).

However, Nichols et al. (2013) conclude that the majority of companies did not change the number of segments following the adoption of IFRS 8, despite IASB's anticipated increase in the number of segments. Complementarily, Nichols et al. (2012) find that some companies continue to claim to operate in a single segment while the annual report taken as a whole suggests the existence of multiple segments. Regarding managers' use of discretion, while Lenormand & Touchais (2014) do not find evidence of groups with high proprietary costs making use of the discretionary nature of the management approach to reduce the reported segment information, other authors have found evidence consistent with the use of discretion due to proprietary cost concerns (non-disclosure, aggregation and lower quality disclosures) (Aboud & Roberts, 2018; Aleksanyan & Danbolt, 2015; Bugeja et al., 2015; Gisbert et al., 2014; Pardal et al., 2015; Wang, 2009, 2016).

Given the possibility (and use) of management discretion in SR, investigators raised concerns about the usefulness of the reported segment data. In accordance with the fineness theorem, Herrmann & Thomas (1997) suggest that the disclosure of more disaggregated information is preferable to the communication of limited consolidated data; authors have also argued that financial analysts' forecasts

of consolidated performance improve when they are based on segment data, especially for entities operating in diverse environments (AIMR, 1993; Cereola et al., 2018; Paul & Largay III, 2005). However, Lee & Yeo (2016) present a contrasting view, as they advocate that analysts' information processing costs are higher for multi-segment firms since they operate in complex information environments, which limits the usefulness of segment information.

Investigators that examined investors' information environment under different segment disclosure regimes find that more disaggregated information improves analysts' (earnings) forecast accuracy (Aboud et al., 2018; Baldwin, 1984; Behn et al., 2002; Berger & Hann, 2003; Blanco et al., 2015; Cereola et al., 2018; Ettredge et al., 2005; Hinson et al., 2019; Hope et al., 2008; Lenormand & Touchais, 2018; Wang, 2009, 2016) and reduces information asymmetries between managers and stakeholders (Greenstein & Sami, 1994), with firms withholding less segment information after the adoption of the management approach (e.g. Botosan & Stanford, 2005). Berger & Hann (2003) add that even though analysts and markets had access to some of the 'new' segment information before it was made public, the disclosure of more disaggregated segment data revealed previously concealed information, leading to a reduction in earnings forecast errors.

However, some investigators have found contrasting results. Mande & Ortman (2002) observe that while the introduction of SFAS 14 helps to forecast the sales of well-diversified firms, it does not improve the forecast accuracy of earnings. Identically, Bugeja et al. (2015), Leung and Verriest (2015) and Franzen & Weißenberger (2018) do not record improvements in analysts' forecasts or decline in information asymmetry following the adoption of IFRS 8. André et al. (2016) add that financial analysts do not always benefit from increased disclosure, as excessive disclosure quantity can impair their ability to forecast earnings; Botosan & Stanford (2005) further report weak evidence that while SFAS 131 increases analysts' reliance on public data, it also increases analysts' earnings forecast errors. Regarding capital market effects, empirical evidence reveals that segment disclosures can entail benefits for reporters. Given the previously discussed finding that SR improves the firm's information environment which allows for a more accurate forecast of earnings, leading to a reduced estimation risk (Blanco et al., 2015), researchers have suggested that segment disclosures can reduce the cost of (equity) capital (Blanco et al., 2015; Leung & Verriest, 2015; Wang, 2009, 2016).

Wang (2009, 2016) posits that motivated by the improved information environment benefit of segment disclosure, companies in need of external financing disclose more information to investors in pursuit of a lower cost of capital (Wang, 2009). Results by Ettredge et al. (2006) corroborate this assumption as they discover that firms that raise capital in the succeeding year are associated with disclosure of larger cross-segment differences in profitability. Following the result that segment disclosures permit better monitoring over managerial decision making plus at a lower cost (Bens & Monahan, 2004; Berger & Hann, 2003, 2007; Hope & Thomas, 2008), Blanco et al. (2015) find evidence that firms providing better segment disclosure are rewarded with lower costs of equity

capital, nonetheless, they note that the decrease in the cost of equity capital is less pronounced when firms face larger competitive pressures.

2.3. Research Questions

2.3.1. Objective of the study

The main purpose of this exploratory study is to gain a preliminary understanding of the effect of <IR> adoption and <IR> recognition, regardless of it being mandatory or voluntary, on the geographic and firm-level characteristics of the adopting entities and in their firm value. Additionally, it intends to explore proprietary costs theory based on <IR> adopters' potential competitive harm from disclosing, separately i.e. segmented, proprietary information about their operations. More specifically, the author analyses the effect of competitive harm on the level of segment disclosures under <IR>.

Since it's an exploratory study, its main purpose isn't to provide conclusive results but to lay the groundwork for future research.

2.3.2. Justification of the topic

This study aims to provide a characterization of <IR> preparers. While many have studied the determinants of <IR> adoption and IRQ, to the author's knowledge, only one other study (Lopes & Coelho, 2018) has carried out a comprehensive comparative analysis of the firm-level characteristics between <IR> adopters; however, they only compared the differences between reference and regular reporters, for data from 2011 to 2015, in the primordials of <IR>. <IR> has now become more widespread, with different levels of enforcement in various countries across the world. Therefore, the author considers it interesting to review and update the data provided by Lopes & Coelho (2018) to inform future <IR> studies, as per requests (Vitolla et al., 2019a) and complement it with a comparison between the pre and post-<IR> adoption periods, using different metrics. Furthermore, Lopes & Coelho (2018) do not study the influence of proprietary costs on information disclosure under <IR>, more specifically regarding segment disclosure.

To the extent of the author's knowledge, only one other study has somewhat previously explored the relationship between SR and <IR>; specifically, Lee & Yeo (2016) explored the effect of <IR> adoption on firm value. They assumed that firms with high organizational complexity have complex operating and information environments that are characterized by costly information acquisition and processing; consequently, they theorised that <IR> would improve the information environment of such firms, leading to higher firm valuation. To test their hypothesis, they used the number of business and geographic segments - alongside firm size and intangible assets - as proxies for organisational complexity and found a positive association between firm valuation and <IR> for firms with higher organizational complexity. However, the purpose of their research was to assess the effect of organizational complexity on the association between <IR> and firm valuation. Furthermore, Lee & Yeo (2016) conducted their research using a sample of South African listed firms, i.e. in a mandatory setting, using a self-constructed <IR> score to check the alignment of firm disclosures with the IIRF,

which involves significant judgement of the researcher (Healy & Palepu, 2001), thus this study differs from Lee & Yeo's (2016) paper.

Instead of using a self-constructed index to check the IR's alignment with the IIRF, the author will resort to IIRC's <IR> Examples Database (IRED) which distinguishes between recognized reports, leading practices - denominated <IR> reference reports for the purposes of this study - and <IR> regular reports. This approach does not require judgement from the investigator, thus it is more objective and its choice is supported by Hammond & Miles (2004) and de Villiers et al. (2017), who identify award schemes aimed to highlight and reward best practices as an approach to assess the quality of CSR and integrated reports; besides, it has been previously used in <IR> research (e.g. Braz, 2019; Lopes & Coelho, 2018; Vitolla et al., 2019c).

Moreover, this investigation contributes to the literature by answering calls for further research on <IR> practice (Dumay et al., 2016), especially in a voluntary setting (e.g. Cortesi & Vena, 2019; Lee & Yeo, 2016), the capital market effects of <IR> (ACCA, 2016; Cheng et al., 2014; de Villiers et al., 2017; Sierra-García et al., 2015), the benefits of <IR> (ACCA, 2016; Dumay et al., 2016; Fried et al., 2014) and the effects of revealing sensitive information under <IR> (Fried et al., 2014).

This research is also timely, as the IIRC recently carried a revision of the IIRF (IIRC, 2021) and the journal 'Critical Perspectives on Accounting' is planning a special issue dedicated to <IR>, anticipated to be published in 2022 (Cooper et al., 2019), which implies <IR> is (going to be) an important and largely discussed topic and consolidates <IR>'s relevance as a research subject.

2.3.3. Research questions

Despite the merits of SR, shortcomings apparent from literature lead the author to suggest <IR> can entail benefits for users and preparers of segment reports.

<IR> adoption

Literature indicates that, in order to make decisions, analysts face informational costs: (i) information acquisition costs, i.e. the costs of retrieving information; and (ii) information processing costs, which are the costs of evaluating the implications of the available information and making business decisions based on them, such as forecasting earnings and estimating firm value (Lee & Yeo, 2016; Maines & McDaniel, 2000).

Furthermore, regarding the information used in decision making, Barron et al. (1998) divide analysts' total information into two components: (i) common information, i.e. information that is publicly available to all analysts, such as that provided by the firm, either on a mandatory or voluntary basis; and (ii) idiosyncratic information, which is the private information generated from analysts' efforts to acquire and process available information as such, it can be of varied quality among analysts.

While some authors have found segment disclosures to be useful for analysts as they reduce information asymmetry (Greenstein & Sami, 1994) and help improve the forecast accuracy (e.g. Aboud et al., 2018; Blanco et al., 2015; Cereola et al., 2018; Ettredge et al., 2005; Hinson et al., 2019; Lenormand & Touchais, 2018; Wang, 2016) others, however, have reported contrasting results

(Bugeja et al., 2015; Franzen & Weißenberger, 2018; Gutsche & Rif, 2019; Leung & Verriest, 2015; Mande & Ortman, 2002). Additionally, André et al. (2016) alerted to the adverse effects of segment disclosures, pointing that financial analysts do not always benefit from increased disclosure, as excessive disclosure quantity can impair their ability to forecast earnings. Addedly, Barneto & Ouvrard (2015) report that segment disclosures contained in the notes of multi-segment companies' financial statements do not improve the understanding of their business model.

In conformity with the discussed informational theories, segment disclosures are a form of common information provided by firms; part of the information disclosed in segment reports used to be idiosyncratic, as Berger & Hann (2003) found that analysts and investors had access to some information that was previously unknown under SFAS 14 but was later disclosed under SFAS 131, which indicates they acquired this information. Taking these results into account, it is possible to observe that segment disclosures reduced analysts' information acquisition costs (Schaberl, 2014). However, the increased amount of information disclosed in segment reports (e.g. Aleksanyan & Danbolt, 2015; Behn et al., 2002; Bugeja et al., 2015; Crawford et al., 2012; Ettredge et al., 2002) requires greater analyst effort to generate idiosyncratic information, leading to increased information processing costs (Frankel et al., 2006; Griffin et al., 2020; Schaberl, 2014). Moreover, since analysts' information processing capacity is limited (Cohen & Lou, 2012; Sims, 2006), the freely provided data might not be fully used or incorporated into asset prices promptly, reducing the usefulness of segment disclosures (André et al., 2016; Frankel et al., 2006; Griffin et al., 2020; Sims, 2006).

From a preparer's perspective, given the complexity of firms that contain diverse segments which can be subject to different environments, be managed varyingly and have different cultures, it can be quite costly to collect and process information, as combining and aligning diverse operations can generate aggregation problems which lead to information asymmetries within the firm (Habib et al., 1997; Lee & Yeo, 2016; Gray, 1981). Managers of individual segments might make decisions that improve their segment's performance but undermine the firm's performance; additionally, since resources can be transferred between segments, capital can also be allocated inefficiently within the firm to mask or subsidize loss-making segments (e.g. Aboud & Roberts, 2018; Bens et al., 2011; Berger & Hann, 2007; Lee & Yeo, 2016; Wang, 2016). It can be argued that the introduction of the management approach to SR has emphasized the role of the CODM which could augment managers' discretion in both decision making and information disclosure (e.g. Bugeja et al., 2015; Wang, 2009).

Following Paul & Largay III's (2005) observation that firms should make segment disclosures as useful as possible and voluntarily disclose supplementary data to meet users' informational needs as such disclosures can increase users' understanding of the firm's segment data and bring about more robust market valuations; and based on previously discussed literature, the author infers that <IR> can benefit multi-segment firms and their stakeholders in many ways.

First of all, due to its emphasis on the process of <IT>, <IR> can push CODMs of companies to look at the company as a whole rather than a composition of individual segments thus improving their

understanding of the entire company's value creation process and reducing internal information asymmetries. As a consequence of the enhanced internal information environment, <IR> can promote improved internal processes, organization and decisions by diminishing opportunistic behaviour - through greater emphasis on the company's core strategy over individual segments - and encouraging cross-segment connections and collaborations across the organization - through breaking down silos (e.g. ACCA, 2017, 2018; Hughen et al., 2014; IIRC & Black Sun Plc, 2014, 2015; Mio et al., 2020).

The aforementioned internal improvements could then be reflected in better SR, especially through the management approach, improving users' information environment; simultaneously, the adoption of <IR> can entail other benefits for users.

<IR> can reduce (i) information acquisition costs by providing new value-relevant information that can help assess the firm's long-term prospects; and (ii) information processing costs, through disclosing relevant information in a precise, concise and integrated manner by showing the interrelations between financial and non-financial matters and between different reports and segments, following the principles of connectivity and materiality (e.g. ACCA, 2019; Flores et al., 2019; IIRC, 2013; KPMG, 2012; Lee & Yeo, 2016; Zhou et al., 2017).

Accordingly, <IR> can provide analysts with useful information, in particular a greater understanding of the business model, and help alleviate the information overload problem resulting from the plethora of mandatory and voluntary firm communications - including SR. In this way, <IR> reduces information asymmetries and improves analysts' forecast accuracy by allowing investors to properly assess the risks and returns of their investment decisions and facilitating the incorporation of all pertinent information into the user's decision-making process and asset prices promptly (e.g. Bernardi & Stark, 2018; Cortesi & Vena, 2019; Flores et al., 2019; Lee & Yeo, 2016; Loprevite et al., 2018; Zhou et al., 2017).

As a consequence of the decreased uncertainty in the information environment, reporting companies can benefit from a reduced cost of equity capital, as investors are willing to accept a lower rate of return in exchange for reduced information risk (Diamond & Verrecchia, 1991; García-Sánchez & Noguera-Gámez, 2017a; IIRC, 2015; Verrecchia, 1983; Vitolla et al., 2020b; Zhou et al., 2017), and increased firm valuation (Baboukardos & Rimmel, 2016; Barth et al., 2017; Cortesi & Vena, 2019; Lee & Yeo, 2016; Pavlopoulos et al., 2019), by enabling better decisions.

Contrarily, <IR> could also be irrelevant to investors, thus not affect firm value (Abhayawansa et al., 2019; ACCA, 2016; Slack & Tsalavoutas, 2018) or even negatively affect the firm value if it forces adopters to incur in costs, such as the cost of reporting or revealing sensitive information (e.g. Landau et al., 2020). However, research suggests that while <IR> can increase the cost of reporting, it is considered a worthwhile investment as it can bring new or better quality data to be used for improved decision making, leading to cost reductions in the long term. (Burke & Clark, 2016; IIRC & Black Sun Plc, 2014, 2015; Mio et al., 2016).

In sum, it is expected that <IR> benefits (i) preparers, through its transformational function of <IT> and (ii) users, through the information function of the IR, by reducing information asymmetries and improving the internal and external information environment of companies that prepare segment reports. In turn, the disclosed information is expected to be more useful and less costly for analysts, therefore, improving analysts' forecasts and reducing the firm's cost of capital thus resulting in higher firm valuation. In accordance, the following research questions are presented:

***RQ₁:** Did the adoption of <IR> result in a significant change in firm value?*

<IR> recognition

The previous research question is also studied distinguishing between regular and reference reports. Preceding studies using the level of the report's alignment with the IIRF as a proxy for <IR> quality found that firms providing higher quality disclosures benefit from an improved information environment, resulting in improved analyst forecast accuracy, reduced cost of equity capital and higher firm value (Barth et al., 2017; Lee & Yeo, 2016; Pavlopoulos et al., 2019; Vitolla et al., 2020b; Zhou et al., 2017). Higher-quality IRs are more concise and connected, including only material matters and showing a greater articulation between strategy and risk (Roberts, 2017). Additionally, Barth et al. (2017) suggest these reports can be used as an indicator of the quality of internal management, as companies that invest in high-quality <IR> have a strong awareness of the concept of <IT> and its benefits, thus may also have improved internal decision-making processes which affect future cash flows (Barth et al., 2017; SAICA, 2015).

Considering (i) Dilling & Caykoylu's (2019) finding that companies listed in IRED are more likely to publish higher-quality IRs; (ii) prior research that suggests using a measure of IRQ from an external source, such as a scoring system to award IR prizes (de Villiers et al., 2017); and given that (iii) <IR> reference reports are reports compliant with the IIRF that have been recognized as a leading practice by a reputable awards process (or through benchmarking), the author expects reference reporters to benefit from improved firm valuation, thus the following research question:

***RQ₂:** Are there differences in the firm value of the two groups of <IR> reporters?*

Competitive harm

Proprietary disclosure cost theory argues that firms face competitive harm due to the risk of disclosing sensitive information to stronger rivals; as such, entities make fewer disclosures when such disclosures reveal proprietary information (e.g. to competitors) as that might jeopardize the entity's competitive position (Backer & McFarland, 1968; Verrecchia, 1983, 2001). Firms acting in less competitive (more concentrated) industries and obtaining higher abnormal profits are likely associated with withholding relevant segment information in order to detract potential competitors from entering

the market and to protect their market share and profitability (Berger & Hann, 2007; Botosan & Stanford, 2005; Ettredge et al., 2006; Harris, 1998; Nichols & Street, 2007; Paldal et al., 2015).

SR research finds that managers use discretion while reporting, particularly driven by proprietary disclosure cost concerns (e.g. André et al., 2016; Botosan & Stanford, 2005; Edwards & Smith, 1996; Harris, 1998; Leuz, 2004), and continue to do so after the adoption of the management approach under IFRS 8/SFAS 131 (e.g. Aboud & Roberts, 2018; Aleksanyan & Danbolt, 2015; Bugeja et al., 2015; Gisbert et al., 2014; Wang, 2016), despite IASB's (2006b: BC44) refusal in including a competitive harm exemption on the basis that firms would be unlikely to suffer competitive harm from the segment disclosures required under IFRS 8 as most competitors have alternative sources of detailed information about a firm. While IRs are one of such sources of alternative information, they can still be subject to management discretion as in the IIRF, the IIRC (2013) exempts organizations from providing certain information if, among others, it causes significant competitive harm.

In order to estimate the possible effect of <IR> in declining non-disclosure of segment information due to competitive harm reasons, the following research questions are presented:

***RQ₃**: Did the adoption of <IR> result in a significant change in segment disclosure?*

***RQ₄**: Are there differences in the segment disclosure of the two groups of <IR> reporters?*

***RQ₅**: Did competitive harm influence the level of segment disclosure prior to <IR> adoption?*

***RQ₆**: Does competitive harm influence the level of segment disclosure under <IR>?*

Research questions 3 and 4 are intended to provide a descriptive analysis of SR quantity - in the pre and post-<IR> adoption periods and distinguishing between reference and regular reporters, respectively - allowing the identification of changes in SR, hence serving as first evidence on the effect of <IR> adoption (and recognition) improving, or not, segment disclosure. Research question 5 is intended to verify whether the possible changes in segmentation previously identified had any connection to firms that previously displayed lower levels of disclosure due to competitive harm pressures; finally, research question 6 is to identify whether that relationship persists.

CHAPTER 3

Research Design

3.1. Data and Sample

The starting point for data collection for this research was the <IR> Examples Database (IRED) which is an open-access database available from IIRC (IIRC, 2020c) that contains examples of emerging practice in <IR>. The database distinguishes between recognized reports, leading practices and <IR> reports. Recognized reports and leading practices consist of IRs of superior recognition which were considered as a leading practice by the IIRC, by a reputable award process or through benchmarking; <IR> reports include all other reports, for which no quality assessment was involved, that refer to either the IIRC or the IIRF or are influenced by the IIRF through the reporter's participation in the '<IR> Business Network'.

While using the IRED, i.e. an external source, ensures the independence of the researcher from the assessors of <IR> recognition as it does not require judgement from the researcher, it has the disadvantage of restricting the initial sample to that evaluated by the external source, i.e. to only those organizations represented in the IRED (de Villiers et al., 2017). However, the author has confidence in the sample retrieved, as the Database is regularly updated and has been previously used in <IR> research (e.g. Braz, 2019; Gianfelici et al., 2018; Lopes & Coelho, 2018; Vitolla et al., 2019c).

<IR>, according to the IIRC, started gaining attention in 2010, with first reports according to the IIRF being published in 2011 (Lopes & Coelho, 2018); moreover, the latest standard in SR, IFRS 8, became effective starting 2009. Thus, in order not to bias the results with the change in SR norms, data were collected for the period of 10 years comprised between 2010 and 2019, with this study being developed after the latter date. The year 2020 was excluded from the analysis, so as not to bias the results with the effects of the COVID_19 pandemic.

The author started by collecting the list of all the unique organizations included in the IRED, including the indication of <IR> recognition i.e. if the organization was considered a reference or a regular reporter in a specific year, totalling 535 organizations. Subsequently, information regarding the number of segments reported by the organizations was hand-collected directly from the notes to the financial statements contained in the gathered integrated, financial and annual reports. Additionally, the Thomson Reuters Datastream Database was used to retrieve the necessary financial data, notably data concerning firm-level characteristics.

Consequently, some organizations were eliminated as per the following criteria: unlisted entities; entities whose website was unavailable; entities whose reports were unavailable; entities whose reports were in a language other than Portuguese, English, Spanish, French or Italian; outliers. Thus, the total sample of <IR> reporters of this study consists of 366 different organizations.

To study the effect of <IR> implementation in these organizations, the author created a subsample (subsample A) with information regarding the average values of the studied variables, for the pre and

post- \langle IR \rangle adoption periods, for each of the organizations. The author started by searching the company's website for data regarding the period they adhered to \langle IR \rangle , a common procedure in accounting studies to assess the effects of new practices (e.g. Paul & Largay III, 2005), and excluded all the organizations that presented IRs in or before 2010, to allow for comparisons before and after the adoption of \langle IR \rangle . This resulted in the elimination of 61 reporters from the initial sample of 366 reporters. Afterwards, the average values of all the pre- \langle IR \rangle adoption periods and all the post- \langle IR \rangle adoption periods were computed for each of the variables. Thus, subsample A consists of 305 reporters, with 610 observations (305 referring to the pre- \langle IR \rangle adoption period and 305 to the post- \langle IR \rangle adoption period).

Furthermore, using the initial sample of \langle IR \rangle reporters, the author compiled a list of \langle IR \rangle reference reporters, following the same criteria and using the list provided by the IIRC in the IRED, which contains organizations whose reports have been classified as recognized or as a leading practice. The list contains 79 unique organizations from the original 336. Resuming, from the sample of 366 organizations classified as \langle IR \rangle reporters, two different groups were identified: one containing only 79 organizations - classified as reference reporters (22 per cent of total) - and the other containing the remaining 287 organizations - classified as regular reporters (78 per cent of total) -, as detailed in Table 1. The sample period covers 10 years, from 2010 to 2019, totalling 3,660 firm-year observations - 790 for reference reporters and 2,870 for regular reporters.

Table 1 - Sample distribution by type of reporter

Type of reporter	No. of companies	Firm-year observations (2010-2019)
\langle IR \rangle reference reporters	79	790
\langle IR \rangle regular reporters	287	2,870
Total \langleIR\rangle reporters	366	3,660

Throughout the research, the total sample or the subsample will be used alternatively according to the type of analysis. The normality of data is assumed according to the Central Limit Theorem (CLT), which states that the sampling distribution of the mean grows closer to a normal distribution, as the sample size increases and can be assumed whenever the sample size n is at least 30 (Ross, 2020; Siegel, 2016).

3.2. Research Model

Recalling that the main purposes of this exploratory study are to (i) provide an understanding of the characteristics of the companies that have adopted \langle IR \rangle , (ii) to infer the differences between the reporters' concerning the firm value and segment disclosure in accordance with \langle IR \rangle adoption and \langle IR \rangle recognition and (iii) to analyse the influence of competitive harm in segment disclosure under \langle IR \rangle , the research was divided into three phases and conducted using different methods.

3.2.1.Characterization study

In order to achieve the first goal, the author used several variables to capture geographic dispersion and firm characteristics. These variables were chosen due to (i) their use in prior <IR> and similar research (ii) their potential to benefit future <IR> studies.

Country - the country in which the reporting entity is based - and region - aggregation of reporters' countries by continent - were retrieved for the total sample of <IR> reporters from the IRED and used as geographic dispersion variables. Forthcoming studies could analyse tendencies in different countries or cultural settings that either mandate or encourage the use of <IR>. Other authors have previously used geographic characteristics in their studies of <IR> determinants (Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019; Vaz et al., 2016).

Firm characteristics variables were included not only due to their usage in the study of <IR> determinants but also because of their generalized inclusion as control variables in the analysis of the impact of <IR> adoption on relevant research areas, such as firm value or market performance. Previous authors have used industry (Busco et al., 2019; Frías-Aceituno et al., 2014; Gianfelici et al., 2018; Lai et al., 2016; Sierra-García et al., 2015; Vaz et al., 2016), firm size (Busco et al., 2019; Frías-Aceituno et al., 2014; Frías-Aceituno et al., 2013b; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019; Sierra-García et al., 2015) and profitability (Frías-Aceituno et al., 2014; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019) as determinants of <IR> adoption in their studies. In this study, the author utilized similar and other additional variables, commonly used in well-established research on accounting matters, to make comparisons between the reporters before and after the adoption of <IR>, using subsample A, and also between the different groups within the sample of <IR> reporters. These variables include:

Industry, based on the two-digit Standard Industrial Classification (SIC) codes, is used to evidence the leading sector(s) in <IR>.

Size, measured by the natural logarithm of total assets and the market capitalization at the end of the fiscal year, provides information about the dimension and economic importance of the reporters.

Profitability represents corporate profitability as captured by the operating income (OI) and the return on assets (ROA) and the return on equity (ROE) ratios.

Leverage represents the company's leverage, computed as the ratio between end-of-year total debt and end-of-year total equity.

These data will be subjected to descriptive analysis and inferential statistics tests to determine whether there are statistically significant differences between the means before and after the adoption of <IR> and in the two unrelated groups - reference and regular reporters.

3.2.2.Changes in firm value and segment disclosure

In order to provide answers to the research questions regarding the changes to firm value and segment disclosure with <IR> adoption and <IR> recognition, similarly to the method applied to the characterization study, data for the following variables will be subjected to inferential statistics tests:

Firm value, measured by the market value of the reporter and by the reporter's Tobin's Q, used as a proxy for firm value, as per previous studies and recommendations (Barth et al., 2017; de Villiers et al., 2017; Gal & Akisik, 2020; Lee & Yeo, 2016). This study uses a simplified version of Tobin's Q, measured as the market value of equity plus book value of total liabilities divided by total assets.

Segment disclosure, measured by two metrics. The first – MULTISEG - is represented by a binary response based on confronting single-segment organizations (if it reports a single segment) with multi-segment organizations (if it reports two or more segments); the second – NSEG - is indicated by the number of reported segments.

3.2.3. Regression model

Empirical research was performed to analyse the influence of proprietary costs in segment disclosure under <IR>, with a competitive harm model being estimated for the pre and post-<IR> adoption periods. Prior literature majorly used abnormal profitability and industry concentration as competitive harm proxies; they represent organizations' competitive environment that may lead to proprietary costs as a result of segment disclosure hence proprietary costs should be superior for organizations operating in more concentrated industries (less competitive) and with higher profitability relatively to industry mean. In this study, industry-adjusted ROA (ADJROA), Herfindahl-Hirschman Index (HHI) and the concentration ratio (CONC) are used as proxies to capture proprietary costs.

As a consequence of the different variables used to measure segment disclosure (MULTISEG and NSEG), the estimation was performed through different regression models. A binary logistic regression model was applied for MULTISEG, a binary (dummy) dependent variable. As for NSEG, it represents an ordinal dependent variable, therefore an ordinal regression model was used (Long, 1997; Pardal et al., 2015). The regression model (1) is designed as follows:

$$MULTISEG_i \text{ (or } NSEG_i) = \alpha_0 + \alpha_1 ADJROA_i + \alpha_2 HHI_i + \alpha_3 CONC_i + \alpha_4 SIZE_i + \alpha_5 ROA_i + \alpha_6 LEV_i + (\alpha_7 RECOGN_i)^{11} + \varepsilon \quad (1)$$

Where:

MULTISEG_i is the dependent dummy variable that assumes 0 if firm i reported a single segment or 1 if it reported two or more segments.

NSEG_i is the dependent ordinal variable that represents the number of segments disclosed by firm i, excluding segments such as headquarters, corporate or unallocated segments, as they do not represent real operating segments under IFRS 8 (Berger & Hann, 2003, 2007; Leung & Verriest, 2015; Pardal et al., 2015).

ADJROA_i is the industry-adjusted return on assets, calculated as firm i's ROA minus the industry median ROA of all firms operating in the same industry, as measured by the two-digit SIC code (Nichols & Street, 2007; Pardal et al., 2015). Also known as abnormal profitability, it is a proxy for

¹¹ Only used in the post-<IR> implementation analysis.

higher exposition to competitive harm, in which case firms are presumably more linked to non-disclosure and to hiding their profitable activities (Botosan & Stanford, 2005; Leuz, 2004; Nichols & Street, 2007). Previous authors have defended ROA as the preferential metric to measure abnormal profitability at the firm level (Leuz, 2004; Nichols & Street, 2007; Pardal et al., 2015). Companies having higher abnormal profits face greater threats from current and potential competitors and are more likely to protect information from them (Frías-Aceituno et al., 2014; Wang, 2009, 2016).

HHI_j is the Herfindahl-Hirschman Index. It measures the level of concentration in an industry and has been previously used to measure competitive harm (e.g. Blanco et al., 2015; Frías-Aceituno et al., 2014; Pardal et al., 2015; Wang, 2009, 2016). Companies operating in highly concentrated industries, in the presence of a few strong competitors, have a greater tendency to protect information from their competitors (Aboud & Roberts, 2018; Aleksanyan & Danbolt, 2015; Bugeja et al., 2015; Gisbert et al., 2014; Wang, 2009, 2016). It is measured as:

$$HHI_j = \sum_{i=1}^N \left(\frac{sales_{ij}}{sales_j} \right)^2 \quad (2)$$

Where sales_{ij} are firm i's sales in industry j, as defined by the two-digit SIC code; sales_j is the sum of sales for all firms in industry j; N is the number of firms in industry j. Using this measure, the weight of larger firms increases proportionally to the weight of smaller firms; greater values of HHI represent more concentrated and less competitive industries.

CONC_i is the four-firm concentration ratio for firm i's primary industry. It is calculated as the top four firms' sales in industry j divided by the sum of all firms' sales in the same industry. Despite being previously used by Bugeja et al. (2015), Ettredge et al. (2006) and Harris (1998), Pardal et al. (2015) argue that, comparatively to the HHI, the four-firm concentration ratio could accentuate the problem of identifying differences in industry concentration, in industry groups with fewer firms.

The competitive harm proxies are based on industry measures. For the purpose of this study, the author followed the Standard Industrial Classification (SIC) codes available from Thomson Reuters Datastream Database at a two-digit level of desegregation as previously done by Berger and Hann (2007) and Pardal et al. (2015). While a four-digit industry code would allow for a more desegregated industry analysis, read a better measure for direct competition, Pardal et al. (2015) elucidate that in samples containing different countries, such as the case of this sample, a higher disaggregation level can result in many industry codes with a single firm, which hampers competition comparison.

To avoid biased results, several control variables commonly used in <IR> and SR literature are added to the model:

SIZE_i, measured by the natural logarithm of total assets, provides information about the dimension and economic importance of the reporters. Scholars have found that larger firms have higher levels of disclosure (e.g. Diamond & Verrecchia, 1991; Leuz, 2004); the author expects a

positive association to the level of segment disclosure. It has been included as a control variable in several <IR> and SR studies (e.g. Aboud & Roberts, 2018; Blanco et al., 2015; García-Sánchez & Noguera-Gámez, 2017; Pavlopoulos et al., 2019).

ROA_i, calculated as net income scaled by total assets, represents the firm's profitability without the industry context (unlike ADJROA), as per previous studies that suggest that more profitable firms have more resources available and can devote them to the production and disclosure of information (Frías-Aceituno et al., 2013a). It serves as a control for the influence of agency costs motives in segment disclosure in the opposite way of abnormal profitability, measured by ADJROA. It is expected that combined with ADJROA, it reveals agency costs motives (i) for higher disclosure - when organizations intend positive exposure in the market - or (ii) for lower disclosure - when managers seek to avoid unveiling poor performance (Berger & Hann, 2007; Verrecchia, 1983).

LEV_i represents the company's leverage calculated as the end-of-year total debt divided by end-of-year total equity and it is commonly tested as a proxy for discretionary disclosure in SR studies (e.g. Leuz, 2004; Pardo et al., 2015). Literature displays mixed results on the influence of leverage on the disclosure level. On the one hand, a positive relationship is expected seeing that when the financial leverage rate is high, the disclosure of more information could reduce agency and monitoring costs (Blanco et al., 2015; Dilling & Caykoylu, 2019; García-Sánchez & Noguera-Gámez, 2017; Jensen & Meckling, 1976). On the other hand, if leverage is used to monitor managers' performance conforming to shareholders' interests, it could lead to lower disclosure levels (Hope, 2003). In light of the mixed results provided by prior literature on the relationship between leverage and disclosure, this study prefers not to predict a sign for the variable LEV.

RECOGN_i is a dummy variable that equals 1 if the entity is considered a reference reporter and 0 if the entity is considered a regular reporter.

The data for all three methods were retrieved from Thomson Reuters Datastream Database for all the entities included in the sample, for each year between 2010 and 2019, resulting in 10 years of firm-year observations. Data regarding the number of segments was hand-collected from the notes to the organizations' financial reports, retrieved from their website. In the case of missing values for any of the years, the author used the remaining years' average (distinguishing between pre and post-<IR> adoption periods) for each entity. Data analysis was aided with the use of Microsoft Excel and IBM SPSS version 27.

Results and Discussion

4.1. Characterization Study

4.1.1. Number of reports

Figure 1 provides an overview of the number of reports published per year. The tendency is towards the increase in the number of reports, which aligns with IIRC's goals of wide-spreading <IR> and making it the corporate reporting norm (IIRC, 2021). Table 1 evidenced that 79 organizations, from the total sample of 366 <IR> reporters, were classified as <IR> reference reporters, i.e. the number of organizations who, at some point in the sample period, presented an IR classified either as recognized or as a leading practice in the IRED. However, the fact that an organization is classified as a reference reporter in one year does not guarantee that it will be classified as such in later years. The number of reference reports published has also been increasing over time. The relatively low numbers for 2018 and 2019 can be explained by the fact that the reports for each year were published in 2019 and 2020, respectively and it takes a while for the competent organizations to distribute the various awards and recognitions and for the IIRC to classify the reports and update the IRED. Moreover, the IRED's "recognized reports" page only contains examples starting 2013 and does not include the year 2018, further explaining the (reduced) number of reference reports in those periods.

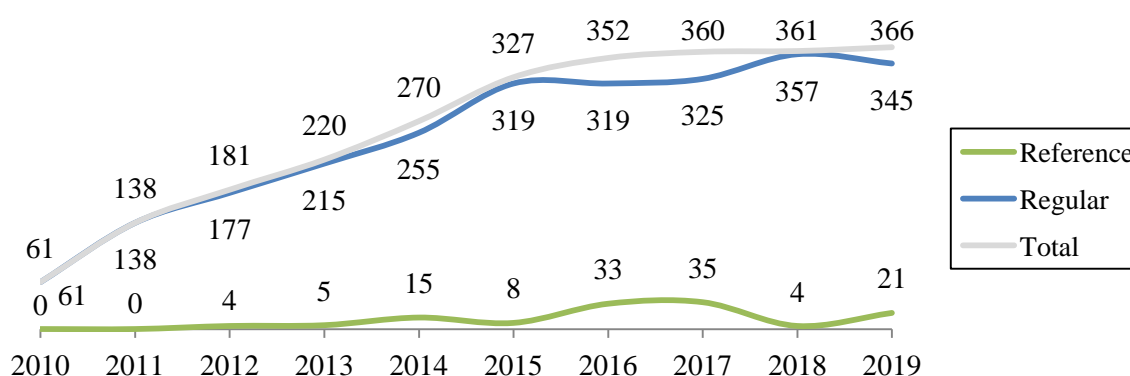


Figure 1 - Number of reports published per year

4.1.2. Geographic dispersion

Table 2 presents the distribution of the reporters by country and region. The sample covers 43 countries from 5 different regions. The most representative regions in the sample are Asia with 131 organizations out of 366 (36% of the total reporters) and Africa with 119 organizations (33%), followed by Europe with (89 reporters, 24%), the Americas (22 reporters, 6%) and finally Australasia (5 reporters, 1%). As expected, South Africa is the leading country in the sample, with 115 reporters (31%). This result is unsurprising due to the mandatory <IR> regime in the country since 2010 (Boerner, 2012; Chaidali & Jones, 2017; Roberts, 2017). The second country presenting the highest number of reports (89) is Japan, where <IR> has been gaining traction in recent years (Deloitte, 2015),

followed by the UK in third place (17 reporters), which can be explained by the proximity of the IIRC to England (Bhasin, 2017), and Sri Lanka in fourth (14 reporters).

South Africa is also the country with the highest count of reference reporters (32), followed by the region of Europe (20) which complies with the findings of Bavagnoli et al. (2018) and Songini et al. (2020) that companies located in Europe and countries with mandatory <IR> present higher-quality IRs.

Table 2 - Geographic dispersion

Geographies	No. of reporters	% (per region)	No. of reference reporters	No. of regular reporters
Africa	119	33	35	84
Botswana	2		1	1
Namibia	2		2	0
South Africa	115		32	83
Americas	22	6	2	20
Argentina	1		0	1
Brazil	9		1	8
Chile	1		0	1
Colombia	2		0	2
Costa Rica	1		0	1
Mexico	1		1	0
US	7		0	7
Asia	131	36	18	113
Bangladesh	1		1	0
China	1		0	1
Hong Kong	4		0	4
India	6		3	3
Japan	89		6	83
Malaysia	3		0	3
Philippines	1		0	1
Saudi Arabia	1		0	1
Singapore	4		1	3
South Korea	4		1	3
Sri Lanka	14		4	10
Thailand	2		2	0
United Arab Emirates	1		0	1
Australasia	5	1	4	1
Australia	3		2	1
New Zealand	2		2	0
Europe	89	24	20	69
Austria	2		1	1
Belgium	1		0	1
Denmark	1		1	0
Finland	4		0	4

France	8		1	7
Germany	3		1	2
Italy	12		1	11
Luxembourg	1		1	0
Netherlands	11		3	8
Norway	1		1	0
Poland	2		0	2
Russia	2		1	1
Slovenia	1		0	1
Spain	12		0	12
Sweden	5		0	5
Switzerland	5		1	4
Turkey	1		1	0
UK	17		7	10
Total	366	100	79	287

4.1.3. Firm characteristics

4.1.3.1. Industry dispersion

Analysing the business sectors of the reporters, using the SIC code as evidenced by Table 3, the most representative sector in the sample is manufacturing, with 129 reporters (35%), followed by the finance, insurance and real estate (82 reporters, 22%), jointly representing over half the sample (57%). These are also the leading sectors in reference reporters, with 25 (32%) and 19 (24%) reporters respectively. Following are the utilities (48 reporters) and the mining and construction (45 reporters) sectors, representing 25% of the sample and 8% and 12% of the reference reporters, respectively. After that come the services (32 reporters) and the wholesale and retail trade (28 reporters) sectors. Finally, the least represented sector is public administration, with 2 reporters (1% of total).

These results are in line with ACCA (2019), García-Sánchez et al. (2013), Lai et al. (2016) and Chersan (2015) who revealed that firms operating in the financial, industrial or utilities sectors are more likely to adopt <IR> than firms operating in other sectors. Additionally, Bowen (2000) and Cho et al. (2012) suggested that certain industries, such as social and environmental sensitive ones – the mining industry, for instance - are more exposed to public scrutiny than others and are expected to suffer from more stakeholder and regulatory pressure, including greater demand for ESG information (Kannenberg & Schreck, 2019). Accordingly, Busco et al. (2019) evidenced that firms that operate in sensitive industries are more likely to produce IRs.

While Frías-Aceituno et al. (2014), Gianfelici et al. (2018) and Vaz et al. (2016)'s results showed no statistical influence of industry on the decision to prepare IR, they agreed that industry membership could impact the content of the IRs, with Gianfelici et al. (2018) evidencing that industry membership affects stakeholder salience and, consequently, the content of the IRs. Along the same lines, Fasan & Mio (2017) suggest that industry affiliation plays a central role in shaping materiality disclosure among the '<IR> Business Network' participants.

Table 3 - Industry dispersion

Industry	Reference		Regular		Total	
	N	%	N	%	N	%
Mining and Construction (SIC 1)	12	15	33	11	45	12
Manufacturing (SIC 2 and 3)	25	32	104	36	129	35
Utilities (SIC 4)	8	10	40	14	48	13
Wholesale and Retail Trade (SIC 5)	6	8	22	8	28	8
Finance, Insurance and Real Estate (SIC 6)	19	24	63	22	82	22
Services (SIC 7 and 8)	8	10	24	8	32	9
Public Administration (SIC 9)	1	1	1	0	2	1
Total	79	100	287	100	366	100

4.1.3.2. Size

In order to assess the reporters' dimension, the author analysed the information regarding each reporter's total assets and market capitalization. The natural logarithm of total assets was later calculated to control for size effects.

To analyse whether <IR> adoption had any effect on the reporters' size, the author performed a paired samples test using subsample A which contains information about the reporters' size before and after the adoption of <IR>. Table 4 depicts the output. Results suggest that reporters differ significantly (at a 1% confidence level) in size ($t_{304} = -8.013$; $p = 0.000$ and $t_{304} = -4.248$; $p = 0.000$) before and after the adoption of <IR>. On average, reporters become larger in the post <IR> adoption period, for both measures.

Table 4 - Size of each reporter before vs after the adoption of <IR>

Pre IR	Post IR	Mean difference	t-test	df	p-value	Decision
Panel A: size measured as the natural logarithm of "total assets"						
15.21	15.45	-0.23	-8.013	304	0.000	Reject the null
Panel B: size measured as "market capitalization"						
8,134,352.89	9,868,107.6	-1.733.754.71	-4.248	304	0.000	Reject the null

Prior studies have demonstrated firm size to be influential of <IR> adoption (Busco et al., 2019; Frías-Aceituno et al., 2014; Frías-Aceituno et al., 2013b; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019; Sierra-García et al., 2015), arguing that larger firms are more visible in the market and society in general, presenting greater sensitivity to their public image and external pressure to disclose holistic information (Frías-Aceituno et al., 2014); moreover, research not directly related to <IR> found that larger companies tend to have a wider stakeholder base and be subjected to higher public pressure to exhibit social responsibility than smaller sized companies (Cowen et al., 1987); in addition, their larger dimension grants them the necessary resources for compiling and reporting the relevant information. Other scholars found no significant relationship between the firm's

size (Lai et al., 2016; Vaz et al., 2016) and the adoption of <IR>. This study adds that, on average, organizations become larger after the adoption of <IR>.

The natural logarithm of total assets and the market capitalization (in thousands of EUR) were computed for the two unrelated groups of reporters (<IR> reference reporters and <IR> regular reporters), per year (2010-2019), and for the average of the pooled sample period. Figure 2 and Figure 3 illustrate. Analysing the pooled sample results, it is possible to conclude that the reference reporters are larger than the regular reporters, in both measures. On average, the market capitalization of reference reporters is 8,471,318.0 thousands of EUR while for regular reporters, that value equals 8,267,641.8 thousands of EUR. These results are in congruence with Dilling & Caykoylu (2019) who found that larger organizations are more likely to produce high-quality IRs.

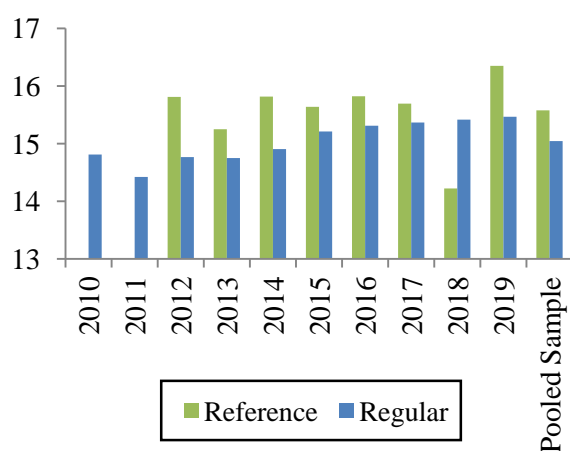


Figure 2 - Size of reference vs regular reporters, measured as logarithm of total assets

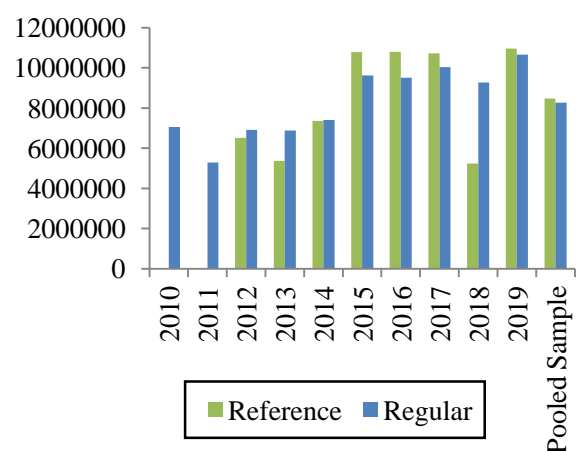


Figure 3 - Size of reference vs regular reporters, measured as market capitalization

The independent samples tests (Table 5) evidence that the reporters differ significantly at a 5% confidence level in size for the variable total assets ($t_{133.626} = -2.906$; $p = 0.004$) but not for the variable market capitalization ($t_{2634} = -0.665$; $p = 0.506$). On average, the logarithm of total assets and market capitalization are higher for reference reporters, however, the tests for the equality of means for the variables suggest that the difference is only statistically significant for total assets. These results suggest that “SIZE” is sensitive to the metrics used to compute the variable, therefore future research should (i) be mindful of the fact that the results may be biased depending on the metric used to compute the variable and (ii) try to mitigate this bias by either including multiple variables for size or running robustness checks.

Keeping in mind that results can be biased due to differences in sample construction and the metrics used to compute the variable in question (Vaz et al., 2016), the result for the “total assets” metric is in congruence with prior research that found larger organizations to be more likely to produce high-quality IRs (Braz, 2019; Buitendag et al., 2017; Dilling & Caykoylu, 2019; Iredele, 2019; Vitolla et al., 2020a). Likewise, the result for the “market capitalization” metric is similar to

Malola & Maroun (2019) and Songini et al.(2020), who found that firm size does not necessarily influence IRQ.

Table 5 - Size of reference vs regular reporters

Regular	Reference	Mean difference	t-test	df	p-value	Decision
Panel A: size measured as the natural logarithm of “total assets”						
15.15	15.79	-0.63	-2.906	133.626	0.004	Reject the null
Panel B: size measured as “market capitalization”						
8,806,751.7	9,861,417.08	-1,054,665.4	-0.665	2,634	0.506	Retain the null

4.1.3.3. Profitability

Profitability was analysed through information about the reporters’ ROE, ROA and operating income (OI), also referred to as EBIT.

Similarly to previously done for “SIZE”, the author performed paired samples tests using subsample A to analyse whether <IR> adoption had any effect on the reporters’ profitability. Table 6 depicts the output. Results for metrics ROE and ROA suggest that, on average, organizations are more profitable before the adoption of <IR>. On the contrary, results for the same variable measured by the OI suggest that organizations are more profitable after the adoption of <IR>. However, results for the tests of equality of means suggest that the aforementioned differences are only statistically significant at a 10% level for ROE ($t_{304} = 1.924$; $p = 0.055$) and ROA ($t_{304} = 1.830$; $p = 0.068$) but not statistically significant for OI ($t_{304} = -0.359$; $p = 0.720$). I.e. the reporters do not significantly differ in profitability before and after the adoption of <IR> if using OI but do differ if using ROE or ROA. It is important to note that the values for ROE could be misleading; since the ROE is the ratio between the company’s net income over its equity, if a company posts both negative income and negative equity, it could result in a deceptively high (i.e. positive) ROE.

Table 6 - Profitability of each reporter before vs after the adoption of <IR>

Pre IR	Post IR	Mean difference	t-test	df	p-value	Decision
Panel A: profitability measured as ROE						
20.14	15.59	4.55	1.924	304	0.055	Reject the null
Panel B: profitability measured as ROA						
6.01	5.44	0.57	1.830	304	0.068	Reject the null
Panel C: profitability measured as OI						
962,832.43	985,584.89	-22,752.46	-0.359	304	0.720	Retain the null

While several studies have found profitability to be influential of <IR> adoption (Frías-Aceituno et al., 2014; Frías-Aceituno et al., 2013a; García-Sánchez et al., 2013; Girella et al., 2019), arguing that more profitable firms have more resources available and can devote them to the production and disclosure of information (Frías-Aceituno et al., 2013a), others have found no significant relationship between the firm’s profitability (Frías-Aceituno et al., 2013b; Lai et al., 2016) and <IR> adoption.

While the conclusions of this study are ambiguous, the results for ROE and ROA align with the former as they indicate that profitability differs significantly after the adoption of <IR>. The results for OI align with the latter, as reporters' profitability does not differ significantly after the adoption of <IR>.

Similarly to the procedure adopted for size, the ROE, ROA and the OI (in thousands of EUR) were calculated for the two groups of reporters, per year (2010-2019), and for the average of the pooled sample period. Using ROE (Figure 4) as a proxy for profitability, the performance of reference reporters is lower than the performance of regular reporters in the pooled sample. On the contrary, when profitability is measured using ROA (Figure 5) and OI (Figure 6), the reference reporters outperform the regular reporters in the pooled sample.

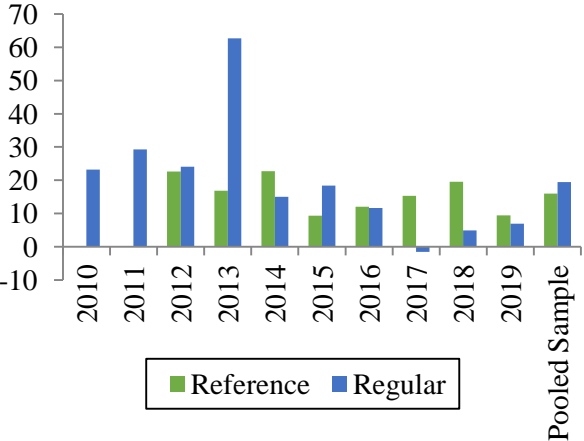


Figure 4 - Profitability of reference vs regular reporters, measured as ROE

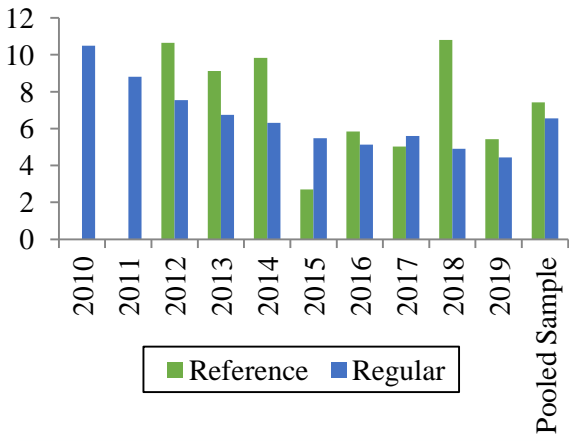


Figure 5 - Profitability of reference vs regular reporters, measured as ROA

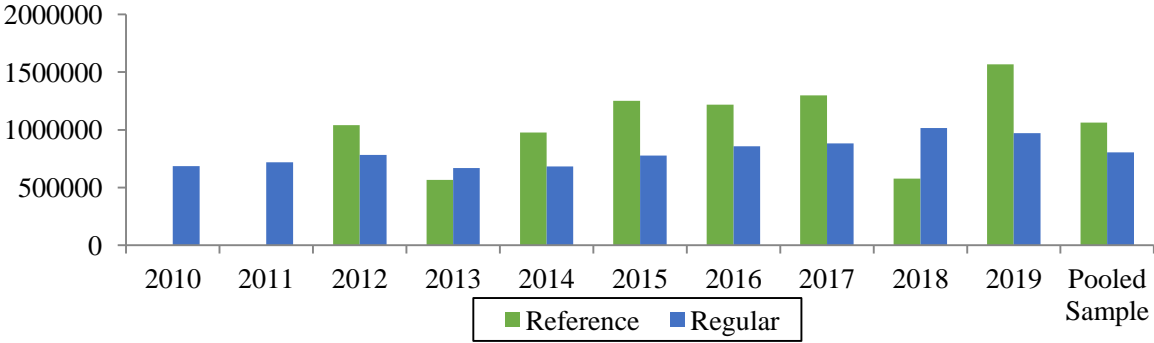


Figure 6 - Profitability of reference vs regular reporters, measured as OI

The independent samples t-test for the equality of the means between the two groups was performed for the three proxies of profitability (Table 7). The results for this test were also contradictory. They only allow for the rejection of the null hypothesis of the equality of the means on profitability measured as OI at a 5% confidence level ($t_{2634} = -2.303$; $p = 0.021$) i.e. when using the metric OI, reference reporters are more profitable than regular reporters, and the difference on means is statically significant. However, there are no statistically significant differences between the reporters if using the metrics ROE ($t_{2634} = 0.077$; $p = 0.938$) or ROA ($t_{2634} = -0.541$; $p = 0.588$).

Table 7 - Profitability of reference vs regular reporters

Regular	Reference	Mean difference	t-test	df	p-value	Decision
Panel A: profitability measured as ROE						
16.03	14.39	1.63	0.077	2,634	0.938	Retain the null
Panel B: profitability measured as ROA						
5.87	6.26	-0.39	-0.541	2,634	0.588	Retain the null
Panel C: profitability measured as OI						
837,368.92	1,219,940.66	-382,571.73	-2.303	2,634	0.021	Reject the null

Prior studies have also found ambiguous results. On the one hand, researchers found that more profitable firms disclose better quality information and produce higher-quality reports (Buitendag et al., 2017; Iredele, 2019; Lopes & Coelho, 2018); on the other hand, Dilling & Caykoylu (2019) found a significant negative impact of profitability on disclosure quality. The results of this study are conflicting. If profitability is measured by OI then reference reporters are, on average, more profitable than regular reporters, supporting the view of the former group of authors. Nonetheless, if profitability is measured by ROE or ROA, the results show no statistically significant differences between the two groups. In the first case, the indicator only covers information from the income statement. In the latter, it uses an indicator of profitability obtained from the use of resources (assets) or finance (equity).

Once again and identically to the variable “SIZE”, this study adds that “PROFITABILITY” is also sensitive to the metrics used to compute the variable; therefore researchers should be mindful of this fact when including this variable in their research models.

Authors have argued that information about profitability can be used as (i) a differentiating factor, to distinguish a firm from its less successful counterparts, (ii) as an indicator of investment quality in order to raise capital at lower costs, and (iii) to the manager’s personal advantage, by convincing shareholders of their superior managerial abilities to increase their level of remuneration and to ensure the stability of their position (Buitendag et al., 2017; Dilling & Caykoylu, 2019; Frías-Aceituno et al., 2014). Conversely, higher returns could tempt competitors to enter the market; in that case, researchers have estimated the possibility of a negative relationship between profitability and information disclosure, since it is necessary to take into consideration the effect of those proprietary costs of information disclosure, that tend to increase with increasing profitability (Backer & McFarland, 1968; Frías-Aceituno et al., 2014; Verrecchia, 1983, 2001). Therefore, investigators examining the influence of profitability should take into account the proprietary costs of information disclosure on their analysis.

This study shows ambiguous results, therefore it could be interesting for future research to analyse whether proprietary cost concerns played a part in the difference of results.

4.1.3.4. Leverage

Leverage was analysed through the leverage ratio which is approximated by the ratio between total debt to total equity.

To analyse whether <IR> adoption had any effect on the reporters' leverage level, the author performed a paired samples test using subsample A. Table 8 depicts the output. Descriptive statistics suggest that, on average, reporters are less leveraged in the post <IR> adoption period. However, the results for the paired samples test do not allow the rejection of the null of the equality of means with an acceptable level of confidence ($t_{304} = 1.573$; $p = 0.117$). Additional (not reported) tests revealed that results for leverage are sensitive to how the variable is computed, which could potentially bias future research that includes leverage as a control variable. Using a different metric (not reported), while still not statistically significant, results suggest that on average, reporters are less leveraged in the pre <IR> adoption period.

Table 8 - Leverage of each reporter before vs after de adoption of <IR>

Pre IR	Post IR	Mean difference	t-test	df	p-value	Decision
203.49	122.03	81.46	1.573	304	0.117	Retain the null

Authors have argued that more leveraged firms incur in larger monitoring costs thus are expected to disclose more to decrease these costs; moreover, the agency cost is higher for more leveraged firms, therefore (i) leveraged organizations and organizations in need of external funding are more likely to voluntarily disclose more information in order to diminish agency costs (ii) as the level of debt increases, creditors ask for more information to decrease information asymmetry (Blanco et al., 2015; Dilling & Caykoylu, 2019; García-Sánchez & Noguera-Gámez, 2017; Jensen & Meckling, 1976).

Results from the empirical research are not conclusive regarding the relationship between firm leverage and <IR> adoption. In accordance with the agency cost argument, some authors have found a positive relationship between company's debt or leverage level and information disclosure through <IR> (Busco et al., 2019; García-Sánchez & Noguera-Gámez, 2017; Pavlopoulos et al., 2017); on the contrary, others found no impact of this variable in the decision to adopt <IR> (Girella et al., 2019).

The results of this study are congruent with the latter, as they show no statistical difference in the reporters' leverage in the pre and post <IR> adoption periods.

Analysing the leverage ratio level of the two different groups of reporters it is possible to observe in Figure 7 that (i) the total debt level is inferior to the total equity level, for all the years and (ii) the amount of debt used to finance the organization's assets is, on average, lower for reference reporters than for regular reporters i.e. the reference reporters have a lower debt level than regular reporters.

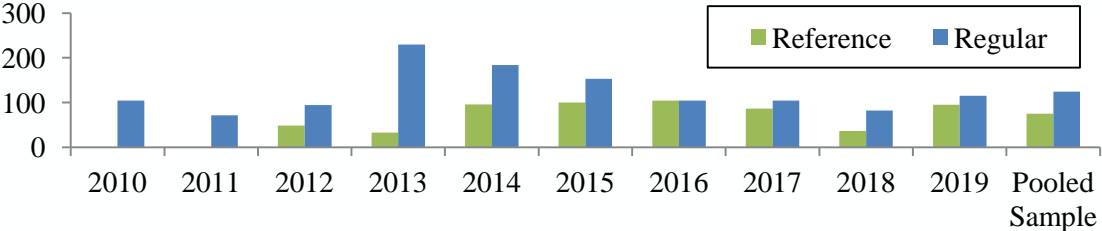


Figure 7 - Leverage of reference vs regular reporters

Albeit, the independent samples test for the equality of means (Table 9) does not allow for the rejection of the null i.e. the results evidence that there are no statistically significant differences between the groups ($t_{2634} = 0.497$; $p = 0.619$). These results are in line with Iredele (2019) and Lopes & Coelho (2018) who found no significant relationship between IRQ and leverage, however, they clash with the conflicting results of Braz (2019) and Pavlopoulos & Magnis (2019) who found statistically significant evidence of entities with higher leverage being prone to producing IRs of higher recognition and Dilling & Caykoylu (2019) who found that firms with lower leverage were more likely to produce a high-quality IRs.

Table 9 - Leverage of reference vs regular reporters

Regular	Reference	Mean difference	t-test	df	p-value	Decision
125.10	89.84	35.26	0.497	2,634	0.619	Retain the null

In light of the ambiguous results regarding the influence of leverage in IRQ, it could be interesting for future research to investigate the influence of agency costs in <IR> disclosure quality.

4.2. Changes in Firm Value

4.2.1. Changes in firm value with <IR> adoption

In order to assess whether there were any changes in the organizations' firm value after the adoption of <IR>, the author ran a paired samples test using subsample A on the two proxies of firm value: Tobin's Q and market value. Table 10 depicts the output. Results present contradictory evidence. When using Tobin's Q, results suggest that reporters have a higher firm valuation before the adoption of <IR>, however, those differences are not statistically significant ($t_{304} = 1.262$; $p = 0.208$). Contrastively, when using the market valuation, results suggest that the firm value of reporters does in fact significantly differ at a 1% significance level ($t_{301} = -5.306$; $p = 0.000$) before and after the adoption of <IR>, being higher after the adoption of <IR>.

Table 10 - Firm value of the reporters before vs after de adoption of <IR>

Pre IR	Post IR	Mean difference	t-test	df	p-value	Decision
Panel A: firm value measured as TOBIN's Q						
1.52	1.36	0.16	1.262	304	0.208	Retain the null
Panel B: firm value measured as market value						
7,654.37	9,739.15	-2,084.78	-5.306	301	0.000	Reject the null

These preliminary results suggest that when the firm is valued using Tobin's Q, the results are in line Abhayawansa et al. (2019), ACCA (2016) and Slack & Tsalavoutas (2018) who found that the adoption of <IR> does not affect firm value thus <IR> could be irrelevant to investors. On the contrary, when the market value is used as a proxy for firm value, firms are higher valued after the adoption of <IR>, suggesting that on average, the benefits of <IR> exceed its costs. This result is

congruent with prior research that found the adoption of <IR> results in higher firm valuation (Baboukardos & Rimmel, 2016; Barth et al., 2017; Cortesi & Vena, 2019; Lee & Yeo, 2016; Pavlopoulos et al., 2019).

The performed tests reveal that results for firm value are sensitive to how it is computed, which could potentially bias future research when this variable is included in studies. While authors have used Tobin's Q as a proxy for firm value (e.g. Barth et al., 2017; Gal & Akisik, 2020; Lee & Yeo, 2016) as per recommendations in that direction (de Villiers et al., 2017), it should be used with caution as scholars have drawn attention to the limitations of Tobin's Q to assess firm value (Bartlett & Partnoy, 2020; Bendle & Butt, 2018).

4.2.2.Changes in firm value with <IR> recognition

In order to analyse if there are any differences in the firm value of the reference and regular reporters, Tobin's Q and the market valuation were computed for the two unrelated groups of reporters. The independent samples test (Table 11) evidences that the reporters do not significantly differ in firm value, in any of the metrics ($t_{2634} = 0.597$; $p = 0.550$ and $t_{2613} = -0.280$; $p = 0.779$). According to Tobin's Q, reference reporters have, on average, lower firm value than regular reporters. Albeit, analysis of the market value suggests that reference reporters are, on average, higher valued than regular reporters.

Table 11 - Firm value of reference vs regular reporters

Regular	Reference	Mean difference	t-test	df	p-value	Decision
Panel A: <i>firm value measured as TOBIN's Q</i>						
1.46	1.38	0.08	0.597	2,634	0.550	Retain the null
Panel B: <i>firm value measured as market value</i>						
8,690.46	9,119.09	-428.63	-0:280	2,613	0.779	Retain the null

Prior research found that better quality <IR> disclosures lead to higher market valuation. Lee & Yeo (2016) and Barth et al. (2017) found a positive relation between IRQ and firm value, measured by Tobin's Q. The results of this study diverge from prior literature as they suggest <IR> recognition does not lead to statistically significant differences in firm value, i.e. that reference and regular reporters do not significantly differ in firm value.

4.3. Changes in Segment Disclosure

4.3.1.Changes in segment disclosure with <IR> adoption

Primary evidence on SR for subsample A, using data regarding the number of reported segments collected from the financial reports of the organizations is presented in Table 12. It demonstrates the weight of single and multi-segment firms on segment disclosure, before and after the adoption of <IR>. In a total of 305 organizations, almost a tenth (28 firms, 9.2%) discloses a single-segment before the adoption of <IR>; after the adoption of <IR>, that number reduces to 4.3% (13 firms). The

results show that, with <IR> adoption, the number of single-segment firms decreased in a total of 15 firms (54% of all single-segment firms before the adoption of <IR>).

Table 12 - Changes in single vs multi-segment firms with <IR> adoption

Segment Disclosures	Number of segments	Pre <IR>		Post <IR>		Change
		N	%	N	%	
Single-segment	0-1	28	9.2	13	4,3	-15
Multi-segment	>1	277	90.8	292	95.7	15
Total		305	100	305	100	-

The statistical relevance of the changes in the segment disclosures before and after <IR> adoption is presented in Table 13. In line with Table 12, results for the equality of proportions test show that the aforementioned increase in the number of multi-segment firms after the adoption of <IR> is statistically significant at a 1% level ($t_{304} = -3.174$; $p = 0.002$). Before the adoption of <IR>, 90.8% (277) of firms reported more than one segment, i.e. were multi-segment; after the adoption of <IR>, this number increased to 95.7% (292) of firms reporting more than one segment. This result, combined with the decrease of single-segment firms, indicates that <IR> adoption had a positive effect on information disclosure, increasing the potentially relevant information to stakeholders.

Conducting a similar analysis on the number of segments reported by the organizations it is possible to conclude that in the pre-<IR> adoption period, organizations reported, on average, 3.55 segments. In the post-<IR> adoption period the average number of reported segments increased to 3.67 segments. This increase in the number of reported segments is statistically significant at a significance level of 10% ($t_{304} = -1.720$; $p = 0.086$). Even though the null is only rejected at a lower confidence level, the results indicate that the firms increased their segment disclosures, i.e. number of reported segments, after the adoption of <IR>.

Table 13 - Changes in segmentation typology and number of segments with <IR> adoption

Pre IR	Post IR	Mean difference	t-test	df	p-value	Decision
Panel A: changes in segmentation using MULTISEG						
0.908	0.957	-0.049	-3.174	304	0.002	Reject the null
Panel B: changes in segmentation using NSEG						
3.55	3.67	-0.12	-1.720	304	0.086	Reject the null

The change in segment disclosure with <IR> adoption is notorious. These preliminary results suggest <IR> can entail benefits for firms and their stakeholders in the scope of SR as after <IR> adoption, firms increased their segments disclosures, by either reporting more than a single segment or reporting a greater number of segments.

Since the influence of <IR> adoption on firms' SR is a novel research subject it is not possible to analyse how these results compare to prior findings, however, this study contributes to the literature on the possible explanations of firms reporting a higher number of segments or being multi-segment.

4.3.2.Changes in segment disclosure with <IR> recognition

Table 14, was devised using data regarding the entire sample and using the information about the number of segments reported by the organizations that was previously collected from the financial reports of the organizations. It demonstrates the weight of single and multi-segment firms on segment disclosure, distinguishing between regular and reference reporters. In a total of 2,636 firm-year observations¹², 2,511 belong to regular reporters and 125 to reference reporters. While 6.3% (157) of firm-year observations for regular reporters disclosed a single segment, only 2.4% (3) of firm-year observations for reference reporters identified as single-segment firms. The data suggests reference reporters disclose more (segment) information than regular reporters.

Table 14 - Single vs multi-segment firms according to <IR> recognition

Segment Disclosures	Number of segments	Regular		Reference	
		N	%	N	%
Single-segment	0-1	157	6.3	3	2.4
Multi-segment	>1	2,354	93.7	122	97.6
Total		2,511	100	125	100

The statistical comparison tests of segment disclosures according to reporter type are presented in Table 15. In line with Table 14, results for the equality of proportions test show that the differences in the segmentation typology (single vs multi-segment) between the reporters (regular vs reference) are statistically significant at a 1% level ($t_{156} = -2.644$; $p = 0.009$). Whereas 93.7% of firm-year observations for regular reporters disclosed more than one segment, i.e. were multi-segment, this proportion was higher in the case of reference reporters firm-year observations, corresponding to 97.6% (122). These results indicate that <IR> recognition i.e. the fact that a reporter belongs to the reference category had a positive effect on (segment) information disclosure.

Conducting a similar analysis on the number of segments disclosed by the reporters it is possible to conclude that regular reporters identified, on average, 3.67 segments. By contrast, the reference reporters identified 3.74 segments on average. However, this difference in means is not statistically significant ($t_{2634} = -0.426$; $p = 0.670$) hence the number of reported segments does not significantly differ according to <IR> recognition.

Table 15 - Segmentation typology and number of segments according to <IR> recognition

Regular	Reference	Mean difference	t-test	df	p-value	Decision
Panel A: changes in segmentation using MULTISEG						
0.937	0.976	-0.039	-2.644	156	0.009	Reject the null
Panel B: changes in segmentation using NSEG						
3.67	3.74	-0.07	-0.426	2,634	0.670	Retain the null

¹² This analysis only includes the years in which the organizations presented IRs.

The preliminary results for <IR> recognition suggest reference reporters disclose more than a single segment in comparison with regular reporters. However, it is not possible to make conclusive comparisons regarding the number of segments, as the result for the comparison of means was not statistically significant.

4.4. Competitive Harm Influence in Segment Reporting Pre vs Post-<IR>

The competitive harm model is applied in the period prior to and post-<IR> adoption to substantiate whether proprietary costs motivations constrained segment disclosure before the implementation of <IR> and to evaluate whether they do so after the adoption of <IR>.

Table 16 presents the correlations for the continuous variables included in the regression (1). Due to its discrete nature and limited range, the dummy variable RECOGN is not included in the Pearson correlation analysis.

Regarding the main variables, ADJROA is statistically and negatively correlated with CONC (-0.056). HHI is statistically and positively correlated with the variables CONC (0.769) and ROA (0.101) and negatively with SIZE (-0.129). The variable CONC is statistically and negatively correlated with SIZE (-0.103) and positively with ROA (0.066). The variable SIZE is statistically and negatively correlated with ROA (-0.209). Overall, correlations are low, except for the one between HHI and CONC, which is 0.769. Nonetheless, it is still lesser than 0.80, which indicates that multicollinearity problems are minimal. They are both proxies for industry concentration; as such, a relatively higher correlation between the two variables was expected.

Table 16 - Correlation matrix

	ADJROA	HHI	CONC	SIZE	ROA	LEV
ADJROA	1	-	-	-	-	-
HHI	-0.026	1	-	-	-	-
CONC	-0.056**	0.769**	1	-	-	-
SIZE	0.010	-0.129**	-0.103**	1	-	-
ROA	0.020	0.101**	0.066**	-0.209**	1	-
LEV	0.015	0.003	0.000	-0.001	-0.031	1

**, * Correlation is significant at the 0.01 level (2-tailed) and at the 0.05 level (2-tailed), respectively.

ADJROA is the industry-adjusted return on assets; HHI is the Herfindahl-Hirschman Index; CONC is the four-firm concentration ratio; SIZE is the natural logarithm of total assets; ROA is the return on assets; LEV is the leverage.

Table 17 details the estimation of the competitive harm model (1) for two different measurements of segment disclosure, for the pre and post-<IR> adoption periods. Columns C1 and C3 depict the results of disclosure according to NSEG – the ordered number of reported segments – whose output was achieved through an ordinal regression. Columns C2 and C4 depict the estimation of a binary logistic regression, using the binary variable MULTISEG, which separates multi-segment firms from single-segment ones; this reduces the potential error from the effect of higher disclosure due to real

firm diversification (Pardal et al., 2015), as firms that report more than one segment are classified in the same category, independently of the number of reported segments.

Likelihood ratio chi-square tests show significant improvement in the fit of the final model over the null model, for NSEG in the pre ($\chi^2_6=78.882$; $p < 0.01$) and the post ($\chi^2_7=153.018$; $p < 0.01$) <IR> adoption periods. Regarding MULTISEG, the logistic regression model was statistically significant for the pre-<IR> adoption period, $\chi^2_6=20.631$, $p < 0.01$; it explained 4,6% of the variance and correctly classified 91.8% of cases. The model was also statistically significant for the post-<IR> adoption period, $\chi^2_7=58.506$, $p < 0.01$; it explained 6% of the variance and correctly classified 93.9% of cases. Therefore, it can be stated that the models are well-calibrated.

Table 17 - Competitive harm and the level of segment disclosure pre vs post-<IR>

Variables	(C1)	(C2)	(C3)	(C4)
	Pre-<IR>		Post-<IR>	
	NSEG ¹ (ordinal)	MULTISEG (binary)	NSEG ¹ (ordinal)	MULTISEG (binary)
Constant	-	0.626	-	-1.400*
<i>Main variables:</i>				
ADJROA	0.001*	0.001	0.001	0.002
HHI	0.001	0.001	0.001*	0.001
CONC	0.356	0.594	0.798***	1.401***
<i>Control variables:</i>				
SIZE	0.157***	0.095*	0.184***	0.209***
ROA	-0.034***	-0.043**	-0.008*	-0.017*
LEV	0.001	0.001	0.001***	0.001***
RECOGN	-	-	-0.082	0.785
Number of firms	1,024	1,024	2,636	2,636
LR test	78.882***	20.631***	153.018***	58.506***
Cox & Snell Pseudo R ²	0.074	0.020	0.056	0.022
Nagelkerke R ²	0.076	0.046	0.058	0.060
Percentage correct	-	91.8	-	93.9

*, **, ***, represents, respectively, statistical significant at 10% ($p < 0.10$), 5% ($p < 0.05$) and 1% ($p < 0.01$).

NSEG is the number of reported segments; MULTISEG is a dummy variable that assumes 0 if the firm *i* reported a single segment or 1 if it reported two or more segments ADJROA is the industry-adjusted return on assets; HHI is the Herfindahl-Hirschman Index; CONC is the four-firm concentration ratio; SIZE is the natural logarithm of total assets; ROA is the return on assets; LEV is the leverage; RECOGN is a dummy variable that equals 1 if the entity is considered a reference reporter and 0 if the entity is considered a regular reporter.

¹ Ordinal regression with ordered categories from 0 to 13 business segments, which meets the assumption of proportional odds (parallel lines test).

Regarding the pre-<IR> adoption period, ADJROA is statistically significant at a 10% significance level for NSEG (coefficient = 0.001; $p < 0.10$). The coefficient of the variable presents a positive value, which suggests that the more the firm's profitability increases in relation to industry

mean profitability, its ordered log-odds of being in a higher NSEG category, i.e. reporting more segments, increase by a residual value (coefficient = 0.001) while the other variables in the model are held constant. This association loses significance for MULTISEG, i.e. when confronting single-segment to multi-segment firms (coefficient = 0.001; $p > 0.10$).

HHI (coefficient = 0.001; $p > 0.10$ for both NSEG and MULTISEG) and CONC (coefficient = 0.356; $p > 0.10$ for NSEG and coefficient = 0.594; $p > 0.10$ for MULTISEG), do not significantly affect firms' SR in the period before <IR> adoption.

The sample firms, which are reporters present in the IRED, do not seem to be influenced by competitive harm concerns when disclosing segment information. Industry concentration seems to have no significant effect on segment disclosure in the period prior to <IR> adoption. On the contrary, higher abnormal profitability, while still residually and at a reduced confidence level, leads to higher segment disclosure instead of masking, contradicting the proprietary costs theory and previous findings which suggest that abnormal profitability is a factor influencing managers to practice discretionary disclosure in SR i.e. masking or non-disclosing segments with higher abnormal profitability (Botosan & Stanford, 2005; Leuz, 2004; Nichols & Street, 2007).

For the post-<IR> adoption period, ADJROA is not statistically significant for any of the dependent variables (coefficient = 0.001; $p > 0.10$ and coefficient = 0.002; $p > 0.10$, for NSEG and MULTISEG, respectively).

Conversely from the pre-<IR> adoption period, under <IR> industry concentration has a significant effect on segment disclosure. HHI is statistically significant at a 10% level (coefficient = 0.001; $p < 0.10$), with a positive coefficient, which suggests that firms in more concentrated industries' ordered log-odds of being in a higher NSEG category, i.e. reporting more segments, increase by a residual value (coefficient = 0.001) while the other variables in the model are held constant. This variable loses significance for MULTISEG. CONC is statistically significant at a 1% level for both dependent variables, with a positive coefficient (coefficient = 0.798; $p < 0.01$ and coefficient = 1.401; $p < 0.01$, for NSEG and MULTISEG, respectively). This suggests firms operating in increasingly concentrated firms with an increased likelihood of disclosing a higher number of segments and/or being multi-segment firms.

<IR> reporters do not seem to be influenced by competitive harm concerns while disclosing segment information. Abnormal profitability seems to have no significant effect on segment disclosure under <IR>. On the contrary, higher industry concentration rates seem to be related to higher levels of segment disclosure, once again contradicting proprietary costs theory and prior findings, which propose that firms operating in less competitive industries (i.e. more concentrated industries) are prone to withholding relevant segment information as they fear competitive harm from strong existing firms or from new competitors, leading to potential loss of profitability or market share reduction (Berger & Hann, 2007; Ettredge et al., 2006; Harris, 1998; Pardal et al., 2015).

Despite the exemption granted by IIRC (2013), in the IIRF, to organizations from providing certain information if, among others, it causes significant competitive harm, firms do not seem to be making use of it for management discretion in SR. Overall, this study does not find evidence of competitive harm concerns influencing segment disclosure within the sample of <IR> reporters, under the management approach, both before or after the adoption of <IR>. These results are in line with Lenormand & Touchais (2014) who do not find evidence of groups with high proprietary costs making use of the discretionary nature of the management approach to reduce the reported segment information and also with Nichols & Street (2007) who found that the introduction of the management approach reduced managers' discretion. However, they contradict prior SR literature that suggests managers still use discretion in segment definition under the management approach, motivated by proprietary costs concerns, by withholding segment information from operations in less competitive industries (highly concentrated industries) when firms present high abnormal earnings (Aboud & Roberts, 2018; Aleksanyan & Danbolt, 2015; Bugeja et al., 2015; Gisbert et al., 2014; Pardal et al., 2015; Wang, 2009, 2016).

As for the control variables, SIZE is statistically significant with a positive coefficient for both dependent variables – NSEG and MULTISEG – and for both periods – before and after <IR> adoption - albeit at different significance levels. In the pre-<IR> adoption period, SIZE is statistically significant at a 1% level for NSEG (coefficient = 0.157; $p < 0.01$) and at 10% for MULTISEG (coefficient = 0.095; $p < 0.10$). Under <IR>, SIZE is statistically significant at a 1% level for both NSEG (coefficient = 0.184; $p < 0.01$) and MULTISEG (coefficient = 0.209; $p < 0.01$). These results indicate that increasing firm size is associated with an increased likelihood of reporting a higher number of segments and/or reporting more than a single-segment (being a multi-segment firm).

Evidence aligns with prior literature, which identifies that, in general, larger firms have more incentives to disclose (segment) information: (i) larger firms are more visible in the market and society in general, presenting greater sensitivity to their public image and external pressure to disclose (holistic) information, (ii) their larger dimension grants them the necessary resources for compiling and reporting the relevant information, (iii) they are better equipped to avoid competition harm due to their diversity and complexity and (iv) they face increased agency costs caused by information asymmetry (e.g. Cowen et al., 1987; Frías-Aceituno et al., 2013a, 2013b & 2014; García-Sánchez et al., 2013; Pardal et al., 2015).

ROA is statistically significant with a negative coefficient for every analysis. In the pre-<IR> adoption period, ROA is statistically significant at a 1% level for NSEG (coefficient = -0.034; $p < 0.01$) and at 5% for MULTISEG (coefficient = -0.043; $p < 0.05$). Under <IR>, ROA is statistically significant at a 10% level for both NSEG (coefficient = -0.008; $p < 0.10$) and MULTISEG (coefficient = -0.017; $p < 0.10$). These results indicate that increasing firm (own) profitability, as measured by ROA, is associated with a reduction in the likelihood of reporting a higher number of segments and/or reporting more than a single-segment, thus seem to be consistent with the proprietary cost motive for

non-disclosure (Backer & McFarland, 1968; Frías-Aceituno et al., 2014; Verrecchia, 1983, 2001) as higher returns could tempt competitors to enter the market. However, as previously discussed, this effect is non-existent when taking into account ADJROA i.e. the effect of performance over industry. This evidence is incompatible with the agency cost motivation for non-disclosure due to negative profitability suggesting that agency cost motives were not of influence in segment disclosure (Graham et al., 2005; Healy & Palepu, 2001; Nagar et al., 2003).

Results for LEV are only statistically significant at a 1% level for the post-<IR> adoption period, for both dependant variables (coefficient = 0.001; $p < 0.01$ and coefficient = 0.001; $p < 0.01$, for NSEG and MULTISEG, respectively). Increasing leverage is associated with an increased likelihood of the firm reporting a higher number of segments and being multi-segmented. This result is in congruence with prior studies who suggested that more leveraged firms are expected to disclose more information to decrease the larger monitoring costs they incur in and to diminish the agency costs they are subjected to (Blanco et al., 2015; Dilling & Caykoylu, 2019; García-Sánchez & Noguera-Gámez, 2017; Jensen & Meckling, 1976).

RECOGN, which is only included in the competition harm model for the post-<IR> adoption period analysis, is not statistically significant for any of the dependent variables (coefficient = -0.082; $p > 0.10$ and coefficient = 0.785; $p > 0.10$, for NSEG and MULTISEG, respectively), evidencing that an entity being considered a reference reporter does not affect its likelihood of disclosing more segments or being multi-segmented.

Conclusion, Limitations and Future Research

This research was undertaken (i) to explore the *status quo* of integrated reporting (<IR>), by presenting evidence on the geographic dispersion and firm characteristics of entities that communicate their business model to stakeholders following <IR> methodology; (ii) to analyse whether the adoption and recognition of <IR> lead to significant differences on the firm value of the reporting entities; and (iii) to investigate whether competitive harm motives influence segment disclosures among <IR> adopters.

The analysis was conducted using two different methodologies. Firstly, using descriptive and inferential statistics, the author compared the entities before and after <IR> adoption and also distinguished between <IR> reference reporters and <IR> regular reporters; afterwards, empirical research was conducted through the estimation of a competitive harm regression model based in competitive harm proxies (abnormal profitability and industry concentration).

Covering a sample period from 2010 to 2019, the total sample of <IR> reporters, retrieved from the Integrated Reporting Examples Database (IRED), was composed of 366 organizations, 79 of which classified as reference reporters and 287 of which classified as regular reporters. To compare the effects of <IR> adoption, subsample A, consisting of 305 organizations, was created by the exclusion of entities that adopted <IR> in or before the first year in analysis (2010).

The majority of reporters are from South Africa, followed by Japan and the UK. Europe is the second continent (after Africa, whose leading role is attributed to South Africa) where the majority of reference reporters are located. Reporters are significantly larger (either in assets allocated to business or in market capitalization), less profitable (in ROE and ROA, but not in OI) and higher valued after the adoption of <IR>. Reference reporters are significantly larger (in assets allocated to business) and more profitable (in OI) than their counterparts. It is not possible to conclude regarding reference reporters' firm value as non-statistically significant results are ambiguous. Results for leverage, although not statistically significant, suggest reporters are less leveraged post-<IR> adoption and when presenting a report of higher recognition. Results are sensitive to the metrics used to compute the variables, which could potentially bias future research when these variables are included as a control.

Findings suggest that firms increased their segment disclosures, by either reporting more than a single segment or reporting a greater number of segments after <IR> adoption. Reference reporters significantly differ from regular reporters, by disclosing more than a single segment. Overall, competitive harm concerns, taking into consideration industry-based metrics, do not seem to constrict segment disclosure before or after <IR> adoption. The same cannot be said regarding the firm's (own) profitability, as results suggest more profitable firms are more likely to disclose a lower number of segments or be single-segment, for both periods. This outcome suggests proprietary cost motivations for lower disclosure, raising concerns about <IR> credibility; however, this effect disappears when (industry) abnormal profitability is taken into consideration. Control variables included in the model

further indicate that larger (for both periods) and more leveraged (only under <IR>) firms are more likely to report a higher number of segments and/or be multi-segmented. In turn, <IR> recognition does not affect the firm's likelihood of disclosing more segments or being multi-segmented.

This study contributes to research on <IR> and <IR> quality determinants by evidencing the diversity in number, geography, size and profitability among <IR> reporters, pertaining to its adoption and recognition. Furthermore, it updates on Lopes & Coelho's (2018) characterization study of <IR> reporters – comparing reference and regular reporters – and complements it with a comparison between the pre and post-<IR> adoption periods and also by using additional metrics. Moreover, it adds to segment reporting (SR) and <IR> literature by exploring the influence of proprietary costs on segment disclosure under <IR>, in other words, the potential benefit of <IR> in reducing management discretion in SR, a topic that, to the best of the author's knowledge, has not been previously explored.

Overall this study contributes to <IR> literature by answering the calls for further research (Cheng et al., 2014; Dumay et al., 2016; Perego et al., 2016) on <IR> practice (Dumay et al., 2016), the (potential) benefits of <IR> (ACCA, 2016; Dumay et al., 2016; Fried et al., 2014) and the effects of revealing sensitive information under <IR> (Fried et al., 2014); and it encourages new research by providing a characterization of <IR> reporters which can guide for future research.

This research is also timely as in recent years increasing progress has been made towards <IR>. In September 2020, together with the CDP, Climate Disclosure Standards Board (CDSB), GRI and Sustainability Accounting Standards Board (SASB), the IIRC released a statement in which the organizations presented a shared vision of what is needed for progress towards comprehensive corporate reporting and announced the intent to work together to achieve it (CDP et al., 2020). In November 2020, the IIRC and SASB announced their intention to merge into a unified organization, the Value Reporting Foundation (VRF), which was officially formed in June 2021 (IIRC & SASB, 2020). Moreover, in November 2021, at COP23, the UN's global summit to address “*the critical and urgent issue of climate change*” (VRF, 2021), the International Financial Reporting Standards Foundation announced the creation of the International Sustainability Standards Board (ISSB) through the consolidation of the CDSB and the VRF, by June 2022, in order to “*develop a comprehensive global baseline of high-quality sustainability disclosure standards to meet investors' information needs*” (VRF, 2021). Besides, the IIRC carried a revision of the International Integrated Reporting Framework (IIRF) in 2020, at the 10-year mark of the creation of the IIRC (IIRC, 2020a, 2020b), which was published in January 2021, with only a few minor alterations, proving that the IIRF remains fit for purpose (IIRC, 2020d, 2021). Finally, a new cycle around the research on <IR> themes will begin, with the journal ‘Critical Perspectives on Accounting’ is planning a special issue dedicated to <IR>, anticipated to be published in 2022 (Cooper et al., 2019), which implies <IR> is (going to be) an important and largely discussed topic and consolidates <IR>'s relevance as a research topic.

This research suffers from several limitations. First and foremost, while using the IRED ensures the independence of the researcher from the assessors of <IR> recognition as it does not require

judgement from the researcher, it has the disadvantage of restricting the initial sample as it only covers entities that voluntarily send their reports to the database and not all the entities reporting according to <IR> methodology. The lack of available information for some of the entities, which led to the exclusion of 169 organizations from the initial sample of <IR> reporters, constitutes a further limitation of this research.

The choice of competitive harm proxies was limited by the availability of information. Due to its computation, Pardal et al. (2015) draw attention to the fact that the four-firm concentration ratio (CONC) could accentuate the problem of identifying differences in industry concentration, in industry groups with fewer firms, comparatively to the Herfindahl-Hirschman Index (HHI). Results for industry concentration should be taken with caution, as there could be industries with a single operating firm, possibly indicating a monopolistic competition, in which situation it is unclear whether the firm faces potential competitive harm pressures from proprietary information disclosure. Thus, if competitors are non-existent, the argument of withholding segment information from potential or existing competitors loses some legitimacy. Therefore, for maximum levels of concentration, there could be a potential inverse effect of HHI and CONC, with a negative association not being so expected. It would be interesting to see if this effect influenced these results.

Future research in this field may increase the sample, either using the IRED as it is constantly updated or using an alternative source; it can also use a sample consisting of <IR> adopters and non-adopters to analyse how results compare.

Seeing how the results of this study did not find a significant influence of industry-based competitive harm proxies on segment disclosure in a sample of <IR> reporters, future studies could use a different industry classification – the Industry Classification Benchmark or the Global Industry Classification Standard, per example - and/or analyse additional proxies for competitive harm, e.g. the speed of abnormal profit adjustment (Harris, 1998), labour-power (Bens et al., 2011; Pardal et al., 2015) and entry barriers (Aboud & Roberts, 2018; Bens et al., 2011; Leuz, 2004; Pardal et al., 2015). Future studies on the influence of industry concentration on information disclosure could further benefit from including a (binary) variable to control for the previously identified potential inverse effect of industry concentration from monopolistic industries as done by Pardal et al. (2015), per example. Furthermore, proprietary cost concerns might have affected segment disclosure in a way that was not captured by the competitive harm model as Bugeja et al. (2015) found that multi-segment firms that did not change the number of their reported segments post-IFRS 8 exploited the flexibility in IFRS 8 to reduce the number of line items disclosed; this effect was greater for firms with a higher number of profitable segments and firms operating in more concentrated industries. Therefore future studies should extend the analysis to key items reported.

As previously stated, this study proposes a novel research topic, as such, it urges future research on the influence and potential benefits of <IR> adoption and quality in firms' segment disclosures and SR usefulness, to further analyse the study's findings and consequently provide more insights.

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Annex A - Segment Reporting Standard Setting Process

In 1976 the FASB introduced the “*Statement of Financial Accounting Standards no. 14 - Financial Reporting for Segments of a Business Enterprise*” (FASB, 1976) to “*assist financial statement users in analyzing and understanding the enterprise's financial statements by permitting better assessment of the enterprise's past performance and future prospects*” (SFAS 14: para. 5). SFAS 14 disaggregated an entity’s consolidated financial information and mandated segmental disclosures of revenues, identifiable assets, profitability information – such as net (operating) income or other profitability measures – and other related disclosures (SFAS 14: para. 22-27) by line-of-business (industry) and geographical location (SFAS 14: para. 7).

Similarly, in 1981 the IASC issued the “*International Accounting Standard 14 - Reporting Financial Information by Segment*” (IASB, 1981) - hereupon IAS 14 - with an identical approach to SFAS 14, requiring public entities to report about the significant industry and geographic segments in which they operate (IAS 14: para. 2) while leaving to the judgment of individual companies to determine what was significant (IAS 14: para. 7).

The industry approach adopted by SFAS 14 and IAS 14 was heavily criticized for allowing discretion in segment definition and the degree of disclosure, not providing sufficiently detailed definitions of and guidance for key items and the lack of coherence between the firm’s internal organisation and the reported segments (FASB, 1997; Nichols & Street, 2007; Prather-Kinsey & Meek, 2004). Studies showed that some of the largest companies in the US and across the world were reporting only one, very broadly defined segment, hence withholding value relevant information (Albrecht & Chipalkatti, 1998; Berger & Hann, 2003; Botosan & Stanford, 2005; Street & Nichols, 2002; Street et al., 2000; Troberg et al., 2010).

After prolonged pressure from users (AIMR, 1993; Herrmann & Thomas, 2000), the standard setters addressed these criticisms in 1997 by updating the reporting requirements. FASB issued “*Statement of Financial Accounting Standards no. 131 - Disclosures about Segments of an Enterprise and Related Information*” - SFAS 131 from now on - which superseded SFAS 14 (FASB, 1997) and became effective for financial statements for periods beginning after December 15, 1997 (SFAS 131: para. 40). Concurrently IASC replaced IAS 14 with the revised “*International Accounting Standard 14 - Segment Reporting*” (IASB, 1997) - from hereon IAS 14R - which became effective for accounting periods beginning on or after 1 July 1998 (IAS 14R: para. 84). Both these standards substantially changed how firms should provide segment information by adopting a management approach to SR, which requires using the internal management reporting system to identify segments (SFAS 131: para. 4; IAS 14R: para. 27). While SFAS 131 adopted the ‘full management approach’, which is “*based on the way that management organizes the segments within the enterprise for making operating decisions and assessing performance*” (SFAS 131: para. 4) and will be addressed in more detail later on; IAS 14R, on the other hand, adopted a ‘modified management approach’ whereby it

established two-tier segmentation, where business and geographical segments had to be identified as primary and secondary, by observing the enterprise's internal organisational and management structure to determine its risk and return characteristics. Activities with similar risks and returns had to be placed in the same segment. If the primary basis of segmentation was geographical, the secondary had to be business and vice versa with considerably more disclosures being required for primary than for secondary segments (IAS 14R: para. 26-30, 50-72).¹³

In 2006, as a part of the short-term convergence project between the IASB and the FASB to improve financial reporting and to eliminate major discrepancies between IFRS and US GAAP (IASB, 2006a, 2006b: BC2), the IASB & IFRS Foundation published “*IFRS 8 - Operating Segments*” (IASB & IFRS Foundation, 2006) – henceforward IFRS 8 – which superseded IAS 14R and became effective starting 2009, with earlier application permitted (IFRS 8: para. 35). Except for minor differences and terminology amendments necessary to conform to other IFRS, IFRS 8 is virtually identical to SFAS 131 (Crawford et al., 2014; IASB & IFRS Foundation, 2006; Kajüter & Nienhaus, 2017; Lenormand & Touchais, 2014). The rationale behind this move to the ‘full management approach’, provided by IASB based on academic research and meetings with users of financial statements (IASB, 2006b: BC3), was that this management approach was preferred because it would increase the number of reported segments and enable more segment information to be provided, including in interim financial reports; it would provide more useful information by allowing users to see the entity ‘through the eyes of management’; additionally, because the information to be reported was already used internally by management, it would be available on a timely basis, with few extra costs for preparers (IASB, 2006a, 2006b: BC6-7).

IFRS 8's core principle is that “*an entity shall disclose information to enable users of its financial statements to evaluate the nature and financial effects of the business activities in which it engages and the economic environments in which it operates*” (IFRS 8: para. 1) and it applies to the separate or consolidated financial statements of an entity or group with a parent whose debt or equity instruments are publicly traded or that issue, or are in the process of issuing, any type of instrument in a public market (IFRS 8: para. 2).

Operating segments are defined as components of an entity (i) that engage in business activities from which they may earn revenues and incur in expenses; (ii) whose operating results are regularly reviewed by the chief operating decision-maker (CODM) to assess the segment's performance and make decisions about resource allocation; and (iii) for which separate financial information is available (SFAS 131: para. 10; IFRS 8: para. 5)¹⁴. However, not all operating segments are reportable, they are only required to be reported if they exceed certain quantitative thresholds; furthermore, operating segments may be aggregated if they share similar economic characteristics or satisfy specific

¹³ For further clarification, see IAS 14: Segment Reporting

¹⁴ Since IFRS 8 and SFAS 131 are virtually identical, the requirements that will be discussed for IFRS 8 are the same for SFAS 131, except for minor differences.

conditions (SFAS 131: para. 16-24; IFRS 8: para. 11-19)¹⁵. For each reportable segment, entities are required to disclose general information about the identification and aggregation of segments; about reported segment profit or loss, segment assets, segment liabilities and the basis of measurement; reconciliations of the totals of segment revenues, reported segment profit or loss, segment assets, segment liabilities and other material segment items to corresponding amounts in the entity's statement of financial position (SFAS 131: para. 25-26; IFRS 8: para. 21-22)¹⁶. Moreover, companies are required to make entity-wide disclosures about the revenue derived from products or services, about certain geographical area information and major customers. However, entities are not required to disclose information that is not prepared for internal use if the cost to develop it would be excessive (SFAS 131: para. 37-39; IFRS 8: para. 32-34).

Despite the rationales provided by the IASB in favour of IFRS 8, the adoption of the standard was met with opposition among investors and users, especially in Europe.

As the management approach requires reporting consistent with the way entities are managed internally, segment reporting under IFRS 8 should highlight the information and the measures that management deems important and uses internally for decision making, which do not necessarily have to be based on IFRS. As such, two members of the IASB, among others, have criticized IFRS 8 for the leeway granted to entities to report segment items in non-IFRS measures (Crawford et al., 2014; EY, 2009; IASB, 2006b: DO4; Leung & Verriest, 2015; Véron, 2007). Besides, since entities are managed differently and CODMs might use different financial measures to make operating decisions, opponents argue that reporting under IFRS 8 might reduce the comparability of (cross-sectional) segment information (Barneto & Ouvrard, 2015; EY, 2009; Kwok & Sharp, 2005; Leung & Verriest, 2015). The lack of formalization of IFRS 8 and the subsequent discretion entrusted in management to choose the extent and nature of the information reported have also been criticized, with the argument that data reported under IFRS 8 is more prone to manipulation (Kwok & Sharp, 2005; Nichols et al., 2012; Sukhraj, 2007; Véron, 2007); according to Sukhraj (2007), investors are particularly disturbed by the removal of (mandatory) geographical segmentation, which they consider very important (see also Leung & Verriest, 2015).¹⁷

One of the biggest objectors to IFRS 8 was the European Parliament (EP) (Crawford et al., 2014) who expressed concerns about bringing an 'alien' US standard - SFAS 131 - into EU law without assessing its impact (EP, 2007a). It also deemed controversial the discretion and potential lack of comparability associated with IFRS 8 and the use of non-IFRS measures (EP, 2007a; Véron, 2007). On those grounds, it requested the European Commission (EC) to carry out an in-depth impact

¹⁵ For preciseness see IFRS 8 – Operating Segments and SFAS no. 131 - Disclosures about Segments of an Enterprise and Related Information

¹⁶ Differently from IFRS 8, SFAS 131 does not require disclosure about segment liabilities.

¹⁷ Similar criticisms were levelled against SFAS 131 regarding the use of non-GAAP measures, lack of comparability and management discretion (Albrecht & Chipalkatti, 1998; Berger & Hann, 2003; Edmonds et al., 2018; Paul & Largay III, 2005; Wang & Ettredge, 2015)

assessment before deciding on the endorsement of the standard (EP, 2007a). After the EC analyzed the potential consequences of IFRS 8 and proposed its endorsement, the EP finally but regretfully endorsed IFRS 8, while ordering the IASB to carry out a post-implementation review (PIR) of IFRS 8 (EP, 2007b).

The PIR was published in July 2013 and concluded that while preparers generally think the standard works well, investors display mixed views (IASB, 2013).

Preparers expressed difficulty in identifying the CODM and concerns about releasing commercially sensitive information; however, they note that the costs of implementation are generally low and reported a decrease in ongoing costs because with IFRS 8 they only need to maintain one set of reporting systems and processes. Some investors prefer the management approach to segment reporting as it allows alignment across financial statements, management commentary and presentations; and presents audited information. Other investors are wary of it because they mistrust management's intentions and believe that segments are reported in a manner that conceals the entity's actual management structure (often due to commercial sensitivity concerns) or to cover-up loss-making activities within individual segments; as a result, investors think too much aggregation of segments takes place, limiting the usefulness of the information disclosed. Stakeholders also raised concerns about comparability across entities, including entities within the same industry, but IASB (2006b: BC63, BC65), while acknowledging that comparability of accounting information is important, dismissed these concerns by justifying that comparability could impair relevance and that it can rarely be achieved regardless of the basis of segmentation (IASB, 2013).

