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RESEARCH ARTICLE

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Voluntary Adopters of Integrated Reporting – Evidence on Forecast Accuracy and Firm Value

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[Correction added on 20 October, after first online publication: Reutlingen University was added for Annika Wahl.]

Abstract

This study investigates how integrated reporting (IR) creates value for investors. It examines how providers of financial capital benefit from an improved firm information environment provided by IR. Specifically, this study investigates the effect of voluntary IR disclosure on analyst earnings forecast accuracy as well as on firm value. To do so, we use an international sample of 167 listed companies that voluntarily publish an integrated report. Our analysis shows no significant effect of a voluntary IR publication on analyst earnings forecast accuracy and no significant effect on firm value. We thus do not find evidence for the fulfillment of IR's promises regarding improved information environment and value creation of voluntary adopters. We conclude that such companies might already have a relatively high level of transparency leading to an absent additional effect of IR disclosure. Positive effects of IR appear to be more relevant in environments where IR is mandatory.

KEYWORDS

ESG, firm value, forecast error, information asymmetry, integrated reporting

JEL CLASSIFICATION

M41; G14

1 | INTRODUCTION

In recent decades, reporting of non-financial information such as a firm's corporate social responsibility (CSR) activities has become increasingly popular among companies worldwide (Stubbs & Higgins, 2014). The underlying reason for this movement is the criticism of financial reporting for not addressing the informational needs of all stakeholders (Bernardi & Stark, 2018). For instance, many intangible assets such as human capital are not recognized on a balance sheet and, therefore, not presented in financial reports. Furthermore, traditional reporting does not capture the impact of changes in business and capital market environments (Healy & Palepu, 2001). In order to address this deficiency, more and more companies disclose such additional information in standalone sustainability reports (De Villiers, Rinaldi, & Unerman, 2014).

When focusing on a specific group among the stakeholders, namely the investors and shareholders, it is primarily the complexity and length of these reports that make it difficult for them to extract the relevant information (De Villiers et al., 2014). Another major criticism concerns the reports' failure to explain the links between financial and non-financial information, and to place the information in the context of the company's strategy and business model, in order to support investors' decision making (Bernardi & Stark, 2018; Churet & Eccles, 2014; Serafeim, 2015). This lack of connectivity and context combined with the information overload makes it harder for investors to decide which information is of material importance and to

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understand how CSR activities can affect a company's financial performance (Zhou, Simnett, & Green, 2017). The latter is particularly important for 'socially responsible investors' (SR investors) who seek information about environmental, social or governance performance (Woods & Urwin, 2010). In addition to that, the reports lack credibility and timeliness. There are diffuse regulations and the reports are usually not audited or audited with limited assurance only. Furthermore, they are often released only several months after the annual report, which limits the usefulness of the information for investors (Serafeim, 2015).

As a response to these deficiencies a new reporting approach called integrated reporting (IR) has materialized in the recent years. Particularly with the formation of the International Integrated Reporting Council (IIRC) in 2010, and its publication of the first general IR framework, the International Integrated Reporting Framework (<IR > Framework) in 2013, IR has rapidly attracted global attention. In a very simplified form, it is the combination of financial and non-financial reports into one concise and coherent report. Two guiding IR principles are the materiality and connectivity of information: management should communicate the links between sustainability and financial performance and "the full range of factors that materially affect the ability of an organization to create value over time" (IIRC, 2013, p. 2). Thus, the focus of IR lies on the long-term value creation of a business.

Those who make chief use of IR are providers of financial capital, i.e. shareholders and investors (IIRC, 2013). The IIRC even recommends that the report should include only those social or environmental aspects that are material to the firm's ability to create value for shareholders (IIRC, 2013; Kannenberg & Schreck, 2019). Proponents of IR list several benefits for this group of users, namely the focus on material and connected information as well as the required context to improve information quality and investors' understanding (Churet & Eccles, 2014). Thus, IR is supposed to reduce the information asymmetries between a company's insiders and outsiders. Investors can obtain the necessary information in less time and at a lower cost, while being able to allocate their capital in a more efficient manner (Lee & Yeo, 2016).

However, due to the relatively young stage of the IR movement, empirical evidence for improvements in financial performance and value creation is still relatively sparse. In particular, most prior studies use samples consisting of South African firms, where IR is already a mandatory practice (Girella, Rossi, & Zambon, 2019). Few studies have investigated the impact of IR disclosure in other countries – where integrated reports are published merely on a voluntary basis.

In contrast to a mandatory setting, though, value-creating factors of improved reporting have a different effect in a voluntary environment. An improved disclosure can only unfold its full potential if the level of transparency and information quality is not already very high. While in a mandatory IR regime, all firms have to disclose information according to the high standards of the IIRC, in a voluntary setting, it is only a selection of firms that adopt this way of reporting. The firms that voluntarily choose to publish an integrated report may already exhibit a high level of information transparency, thus limiting the value potential of an additional IR disclosure to investors. Consequently, we raise the question whether the benefits for the providers of capital identified in a mandatory setting also hold true in a voluntary setting.

This study aims at providing the empirical evidence to answer the question of how IR creates value for shareholders and investors in settings other than the mandatory framework in South Africa. To do so, we investigate whether there is an association between voluntary IR disclosure and two variables that add value to shareholders. Following an extensive body of literature, the first variable is analyst earnings forecast accuracy as a proxy for the firm's information environment (e.g. Lang, Lins, & Miller, 2003). In addition, firm value is used as a second variable.

With IR being a relatively young approach, empirical data are naturally limited to the recent years only. Using an international sample of listed companies from 2011 to 2018, we find no significant association between voluntary IR disclosure and analyst earnings forecast accuracy (H1). Furthermore, the analysis of the sample period does not provide any significant evidence for a relation between voluntary IR disclosure and company value (H2). Even though these results may be surprising for IR proponents, they do not necessarily contradict the promises of IR. The positive effects of IR may unfold only in a mandatory setting. Also, the lack of auditing and the related differences in reporting quality may play a role, so that further research on voluntary IR adoption is required to evaluate the potential of IR.

This study's contributions are twofold. First, it contributes to the literature that investigates the effects of non-financial information on analyst earnings forecast accuracy as well as on firm value. There is already evidence that non-financial information is value-relevant (e.g. Cheng, Ioannou, & Serafeim, 2014; El Ghoul, Guedhami, Kwok, & Mishra, 2011) by improving a firm's information environment (e.g. Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012). However, there is little research on the impact of IR on forecast accuracy and firm value. Secondly, it complements existing literature on IR by making use of a diverse international sample. While most previous studies have solely used South African samples in a mandatory setting, our work investigates the effects of IR on the value creation potential in an international and voluntary setting.

The remainder of this study is structured as follows. Section 2 provides background information on the research topic, summarizes the preceding and relevant literature, and develops the hypotheses. Section 3 explains the sample, the variables, and the research methodology. Section 4 presents the results of the study while the final section 5 summarizes the main results and their implications.

2 | LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 | Background

The IR process originated in practice. The first publishers of 'self-declared' integrated reports were two Danish companies, namely the enzymes company Novozymes in 2002 and the pharmaceutical

company Novo Nordisk in 2004, as well as the Brazilian cosmetics company Natura in 2003 (Gibassier, Adams, & Jerome, 2019). Since there was no general definition of an integrated report at that time, each company had its own approach and investors struggled to understand the new format of reporting (Eccles, Krzus, & Ribot, 2015).

With the formation of the IIRC in 2010, IR has gained increasing momentum at the organizational, country, and regulatory levels (Gibassier et al., 2019). The 'Integrated Reporting Pilot Programme', initiated by the IIRC in 2011, already named world-leading, multinational companies among its participants, including Unilever, Deutsche Bank, Hyundai or Microsoft. The two-year program was to create a network of knowledge and experience from different industries and investors in order to develop the most suitable framework (IIRC, 2011). Still, even outside of the program, companies worldwide, including firms such as Mitsubishi or General Electric, publish integrated reports on a voluntary basis (Barth, Cahan, Chen, & Venter, 2017).

A first step towards a uniform regulation at the country level was already taken before 2010. As a response to concerns about ineffective management, the South African Institute of Directors issued the so-called 'King reports' on corporate governance. The latest version requires every firm listed on the Johannesburg Stock Exchange (JSE) to publish an integrated report as of March 1, 2010, or to explain its reasons for not following the regulation (De Villiers et al., 2014). Despite this 'apply or explain' approach, South Africa is de facto the first country and still the only one that has mandated IR. In the first year of application, companies struggled with implementing the regulation, as there was no proper framework or guideline. To address this problem, the Integrated Reporting Committee of South Africa (IRC) published the first national initiative for IR guidelines in January 2011. Following the publication of the <IR> Framework in 2013, the IRC adopted the new framework for all South African firms and ceased its own regulations in 2014 (Barth et al., 2017).

While other stock exchanges, like the ones in Singapore or Copenhagen, plan to follow the example of the JSE (Zhou et al., 2017), as of today, IR is mandatory only in South Africa. In the meantime, though, a substantial number of firms in other countries have decided to voluntarily prepare integrated reports that follow the <IR> Framework. As of July 2018 the <IR> Example database included 523 companies that have adopted IR in compliance with the IIRC, of which only 129 were listed at JSE (International Integrated Reporting Council [IIRC], 2018). Thus, the majority of firms that prepare integrated reports do so voluntarily. This study concentrates on the voluntary adopters of IR.

With regard to the time period covered in this study, we base our sample selection on the emergence of IR as guided by the IIRC. Therefore, our sample period starts in 2011 and covers the years until 2018, to include recently available data.

2.2 | Related research

Due to IR's relatively short history, IR-based literature is not very extensive. On a meta level, several papers suggest possible directions for future research (e.g. De Villiers et al., 2014; Adams, 2016; Vitolla, Raimo, & Rubino, 2019) or provide a review of prior literature (e.g. Velte & Stawinoga, 2017; Dumay, Bernardi, Guthrie, & Demartini, 2016; Kannenberg & Schreck, 2019). Gibassier et al. (2019) give a detailed discussion of the IR history and provide an overview of the diffusion of IR until 2017. Speziale (2019) provides an overview of the most frequently employed theories for explaining the phenomenon of IR. Apart from such general studies, we identify two streams in the context of this paper that provide a more in-depth analysis of IR.

The first stream focuses on the factors and firm characteristics that increase the likelihood of voluntary IR adoption. At a firm level, characteristics such as profitability or size (Frias-Aceituno, Rodríguez-Ariza, & García-Sánchez, 2014), ratings on environmental, social and governance (ESG) disclosure (Lai, Melloni, & Stacchezzini, 2016; Grassmann, Fuhrmann, & Guenther, 2019), and the diversity of board members (Frias-Aceituno, Rodriguez-Ariza, & García-Sánchez, 2013b) increase the probability of adopting IR. At a country level, companies in civil law countries (Frias-Aceituno, Rodríguez-Ariza, & García-Sánchez, 2013a) or in countries with intense investor protection, market orientation, and a higher CSR level (Jensen & Berg, 2012) are more likely to disclose an integrated report (see Velte & Stawinoga 2017). In a recent comprehensive study in a voluntary disclosure setting, Girella et al. (2019) contradict some of these findings (e.g. legal system and board diversity), but confirm others (e.g. profitability, size, ratings).

The second stream addresses the potential benefits of IR for the organization or for its providers of financial capital (cf. Velte & Stawinoga, 2016). This study contributes to this second stream and mainly builds on these papers: Dhaliwal et al. (2012), Zhou et al. (2017), García-Sánchez and Noguera-Gámez (2017a), Bernardi and Stark (2018) and Flores, Fasan, Mendes-da-Silva, and Sampaio (2019) all of whom investigate the impact of IR on analyst forecast accuracy as a proxy for information asymmetry, as well as Lee and Yeo (2016), Vitolla, Salvi, Raimo, Petruzella, and Rubino (2020) and Barth et al. (2017), who focus on the association between IR and firm value or its components.

Dhaliwal et al. (2012) provide evidence for an improved forecast accuracy for firms publishing non-financial reports. Since IR was just about to emerge during their sample period of 1994–2007, they focus solely on standalone CSR reports. García-Sánchez and Noguera-Gámez (2017a) study a large-scale sample of world-wide listed companies during the early years of IR from 2009 to 2013 and find that an integrated report can reduce information asymmetry (measured by analyst forecast accuracy) and thus mitigates agency problems.

As a complementary work, Bernardi and Stark (2018) investigate whether the change of the reporting regime in South Africa has an impact on analyst forecast accuracy. They find an improvement after the adoption of IR, mainly driven by the quality of the integrated reports. Similarly, Zhou et al. (2017) provide evidence that South African firms publishing integrated reports that are more aligned with the <IR> Framework exhibit a significantly lower forecast error. Further, this error reduction leads to a lower cost of equity. Flores et al. (2019) compare continental European and North American

IR adopters with non-adopters and find a positive effect of IR publication on forecast accuracy. This effect is stronger in America, which the authors link to a stronger shareholder orientation there.

The work by Lee and Yeo (2016) can be linked to the second variable examined in this study, market value. Using a sample of firms listed at the JSE, they find a positive association between a company's market value and integrated reporting quality (IRQ). The authors conclude from their findings that the disclosure of high-quality integrated reports reduces investors' information processing costs and mitigates the information asymmetries between a company's insiders and outsiders. Their results suggest a stronger relation for firms with high organizational complexity, including large firms or those with several business units. Similarly, Vitolla et al. (2020) find a negative association between IRQ and the cost of equity capital in a sample of 116 IR adopters. This evidence is consistent with the promises of the IIRC that IR improves information quality (IIRC, 2013).

Barth et al. (2017) support these findings using a similar sample. They provide evidence that IRQ primarily affects firm valuation through higher liquidity and expected future cash flows (FCF). Furthermore, they analyze through which channel a firm's FCF will affect firm value. Their results indicate that higher FCF result from improved internal decision-making, however not from enhanced cash flow forecast accuracy on behalf of analysts (Barth et al., 2017).

Additionally, some papers from the first literature stream use the market-to-book ratio as a control variable in their models, and thus indirectly contribute to investigating an association with firm value. Overall, they find mixed results. While Frias-Aceituno et al. (2013b) and Girella et al. (2019) find a positive association between IR and the market-to-book ratio, Frias-Aceituno et al. (2014) and García-Sánchez, Rodríguez-Ariza, and Frías-Aceituno (2013) find contradicting results.

To conclude, the limited existing scholarly literature is divided on whether IR can contribute to creating value for investors. In addition, the mechanisms behind the increase in value are still controversial. While there is evidence of better internal decision making through IR (Barth et al., 2017), IR's other objective of providing improved external information has not yet been uniformly confirmed (Flores et al., 2019, p. 1466). Although the majority of the existing studies argues that improved external information through IR should reduce information asymmetries and thus enable capital market participants to make more accurate cash flow predictions (Bernardi & Stark, 2018; Lee & Yeo, 2016; Zhou et al., 2017), the findings of Barth et al. (2017) do not confirm this.

Besides, these findings relate predominantly to mandatory adopters, which is rooted in the ease of collecting data about firms engaging in IR (Barth et al., 2017; Bernardi & Stark, 2018; Lee & Yeo, 2016; Zhou et al., 2017). In fact, most of the existing research appears to be a large-scale field trial concentrating on South African firms. Other jurisdictions, though, have barely been researched. The findings of the existing literature seem to largely confirm the promises of IR to improve disclosure and subsequently create value for investors. However, this relationship has rarely been studied for a voluntary setting outside the South African disclosure setting.

This study contributes to the limited existing scholarly works but differs in the following key aspects. First, while the prior studies in this stream typically base their analysis on a sample of South African firms mandatorily publishing integrated reports, this study concentrates on voluntary adopters of IR. To our knowledge, no study exists that directly tests the relationship of IR with firm value in a voluntary setting. The only existing evidence in this question for voluntary disclosures comes as a byproduct from the control variables and finds contradicting results. However, since no other country has mandated IR yet, it is important to investigate whether the promise of IR also holds true for voluntary adopters outside the South African disclosure regime.

Secondly, this study tries to shed light on the still controversial question of whether IR is capable of reducing information asymmetries and thus enabling capital market participants to make more accurate cash flow predictions. While this matter has been researched already in a mandatory setting (Barth et al., 2017; Bernardi & Stark, 2018; Lee & Yeo, 2016; Zhou et al., 2017), this question is particularly important for a voluntary framework. Although Dhaliwal et al. (2012) study this relationship for voluntary adopters, they use CSR disclosure, not IR. Initial evidence on the effects of voluntarily adopting IR is provided by García-Sánchez and Noguera-Gámez (2017a) and Flores et al. (2019) using data from the first years of IR, until 2013 (2016 respectively). Studies covering the development of more recent years are not available.

Finally, preceding literature focused on either analyst forecast accuracy or firm value, while this study investigates both variables.

2.3 | Theory and hypotheses

2.4 | Integrated reporting and information asymmetry

The principle-agent problem described in agency theory can be applied to managers and investors of publicly listed companies. Investors (principles) delegate the task of running a firm to the company's managers (agents; Berle & Means, 2010; Fama & Jensen, 1983). Typical for principle-agent situations is the issue of information asymmetry, which Akerlof (1970) describes as the 'lemon problem': it arises between corporate insiders, such as managers, and outsiders, like investors, because managers have superior information. Since some outsiders might have access to private information and could use it to their own advantage when trading shares, this results in an adverse selection. The resulting trade frictions and uncertainties among market participants lead to lower share prices, reduced liquidity and higher cost of capital, as a higher risk premium is required to compensate for the increased information risk (Akerlof, 1970; Bartov & Bodnar, 1996).

Corporate disclosure, in general, is used to address market imperfections and reduce information asymmetries (Demartini & Trucco, 2017). Since the scope of the compulsory required information is often not large enough, voluntary disclosure is used by managers as a complement to reduce uncertainties of corporate outsiders

(Ball, Jayaraman, & Shivakumar, 2012). Theory suggests that voluntary disclosure of private information can further mitigate information asymmetries and thereby improve the companies' information environment (e.g. Diamond, 1985; Lang & Lundholm, 1993; Verrecchia, 1983). This is particularly true for analysts' view on a company's future development (Beyer, Cohen, Lys, & Walther, 2010).

Financial analysts use the available information on firms to regularly publish earnings forecasts. The accuracy of these forecasts can be used as a proxy for the firm's information environment (Lang et al., 2003). More precise analyst forecasts are generally preferable, since they allow investors to allocate their capital more efficiently. Empirical literature shows that a better, more informative disclosure policy does indeed enhance analyst forecast accuracy (e.g. Lang & Lundholm, 1996). Hope (2003) explains this relationship based on the fact that an improved information environment (through enhanced disclosure) improves analysts' understanding of a firm's performance, its strategy, and its accounting practices.

It is not only financial information that is useful in this process. As prior studies show, also non-financial information can reduce information asymmetries (Cho, Lee, & Pfeiffer, 2013; Dhaliwal et al., 2012; García-Sánchez & Noguera-Gámez, 2017a). Subsequent to the increasing number of companies publishing sustainability reports, the number of market participants using this information has also risen (Eccles, Serafeim, & Krzus, 2011; Serafeim, 2015). Further, studies show that both types of information – financial and non-financial – are used by investors when building their forecasts (e.g. Orens & Lybaert, 2007; Simpson, 2010).

The accuracy of analyst forecasts also depends on other factors. For instance, complex issues such as changes in tax laws or accounting standards increase the likelihood of forecast errors (Plumlee, 2003). This is caused by the fact that individuals cannot process all the information that is publicly and freely available, which is rooted in the natural limitation of a human's information processing capacities (e.g. Hirshleifer & Teoh, 2003; Sims, 2006). Thus, the current practice of disclosing separate financial and sustainability reports can become overwhelming for investors, which leads to unused information (De Villiers et al., 2014).

The goal of IR is to overcome these problems by merely reporting information, both financial and non-financial, that is material to the firm's long-term value creation. This allows investors to better understand and process the available information and the existent links between different themes, such as CSR activities, financial performance, and strategy (IIRC, 2013). With reduced information asymmetries and an improved understanding through IR, analysts' forecasts should be more accurate. Hence, this leads to the first hypothesis to be tested in this study:

H1: Companies that publish an integrated report exhibit lower analyst earnings forecast errors.

Integrated reporting and a company's market value.

Does the publication of sustainability reports and alike create value for investors? There is an active debate on this question, which is divided into two schools of thought. The 'cost-concerned school' argues that the disclosure of sensitive competitive information means a loss of competitive advantage and that financing sustainability activities increases cost, thereby reducing a company's market value (e.g. Landau, Rochell, Klein, & Zwergel, 2020). The 'value creation school' argues that publishing sustainability reports creates value for investors and is associated with higher market valuations (Mervelskemper & Streit, 2017). We investigate the 'value creation school' arguments in the context of voluntary IR publications. In analogy to Barth et al. (2017), we do so in reference to the Discounted Cash Flow (DCF) model. In this model, the firm value is calculated by discounting expected free cash flows (FCF) to their present value by applying the cost of capital rate (Damodaran, 2006).

We use four closely related perspectives to identify effects on the cost of capital component: (1) information asymmetry in general and the market equilibrium model in particular, (2) legitimacy theory, (3) signaling theory and (4) effects on analyst's risk premiums.

(1) The principle-agency theory as described for H1 suggests that newly published, previously private information generally decreases information asymmetry – which can result in a lower cost of capital (Akerlof, 1970; Bartov & Bodnar, 1996; Verreccia, 2001). More specifically, the market equilibrium model with incomplete information (Merton, 1987, p. 500) shows that facilitating the access to company information can increase the investor base and thereby reduce the cost of capital. A prerequisite for a larger investor base is, that investors are aware of the firm and follow it. The complete, inexpensive and easily accessible form of integrated reports could reduce the information access costs for all investors.

The group of socially responsible investors seems particularly likely to join existing shareholders, when a company starts publishing integrated reports (El Ghoul et al., 2011). Deegan (2002, p. 291) mentions the purpose of attracting such investors as one reason for the voluntary publication of CSR reports. Beck et al. (2017, p. 202) observe that IR reports are used especially by investors and analysts focusing on ESG aspects.

(2) Legitimacy theory states that a firm operates under a social contract. Its existence is only justified if it provides benefits to society in general and specifically to individual groups. It is permanently required to demonstrate its legitimacy to the public, otherwise it risks losing societal support (Dowling & Pfeffer, 1975; Shocker & Sethi, 1973). The voluntary publication of social and environmental reports in general (Deegan, 2002) and IR in particular (Beck et al., 2017; Lai, Melloni, & Stacchezzini, 2016) is one way to gain such organizational legitimacy. The voluntary publication of an integrated report could thus reduce the risk of losing organizational legitimacy. A firm exposed to fewer risks requires a lower risk premium in the calculation of its cost of capital, which leads to a higher firm value in the DCF model.
(3) Signaling theory provides another argument for a positive link between the voluntary publication of an integrated report and better stock market performance: Market signals are alterable

attributes of one party that help another party make investment decisions (Spence, 1973). Managers might voluntarily publish an integrated report (market signal) to positively influence the decision of potential shareholders (investors). Such a positive link between market signals by disclosing information and firm value has been identified in prior studies (Frankel, Johnson, & Skinner, 1999, p. 149; Yeo & Ziebart, 1995). Socially responsible investors can be expected to be particularly receptive for such signals.

(4) A part of IR is an explanation of the risks a firm faces and how management and corporate strategy plans to handle these risks. This, in turn, could reduce investors' uncertainty when making investment decisions thus reducing the required risk premium (Barth et al., 2017).

Cheng et al. (2014) provide empirical support for the link between superior CSR performance and lower capital constrains and thus lower costs of capital. In the context of IR, there is some empirical evidence for a positive effect of IR disclosure (García-Sánchez & Noguera-Gámez, 2017b; Zhou et al., 2017) and IR quality (Vitolla et al., 2020) on the cost of capital.

The second component in the DCF model, expected free cash flows, can increase due to real or capital market effects. A real effect can be expected, if IR leads to improved internal decision making. Barth et al. (2017) provide support for this effect in a mandatory setup. Esch, Schnellbächer, and Wald (2019) show in a scenario-based experiment that the availability of IR information does in fact influence internal decision making. Separately, external stakeholders wishing to collaborate with sustainable organizations might be more likely to engage with the company, e.g. by buying its products or services (Plumlee, Brown, Hayes, & Marshall, 2015). If capital providers believe in such a positive link, the publishing of an integrated report should increase firm valuation in an efficient market.

Therefore, a firm's market value could either increase due to a lower cost of capital (reduced information asymmetry resulting in a larger investor base, better legitimization, positive market signals and/or lower risk premiums in analyst models) and higher expected cash flows (due to real and capital market effects). This leads us to the second hypothesis:

H2: Companies that publish an integrated report have a higher firm value.

3 | RESEARCH DESIGN

3.1 | Sample and data

There exists no central source or database that shows the exact number of companies that produce an integrated report. In a recent report, Gibassier et al. (2019) analyze the extent of diffusion of integrated reporting worldwide. Our sample selection is based on all companies named in the '<IR> Example database' as of July 2018 and comprises all companies that have adopted IR in compliance with the IIRC (International Integrated Reporting Council [IIRC], 2018). The initial sample included 523 companies. Since this study focuses on value creation for shareholders, all unlisted companies were excluded (377 remaining). Further, all companies listed on the JSE were excluded in order to investigate the IR effects in a purely voluntary setting (248 remaining). The integrated reports of each company were screened for a reference to the IIRC, its guidelines, or the <IR> Framework by searching for keywords like "Integrated Report" or "IIRC". Thereby, we checked whether the firms really published their reports in compliance with the IIRC and when they started to publish them (187 remaining). Table 1 shows a summary of the steps of the sample selection.

Financial data such as analyst earnings forecasts and the control variables were obtained from the financial data provider FactSet, if not otherwise indicated.

The remaining companies were then further filtered by the following requirements: (1) FactSet must provide the required data for calculating the analyst earnings forecast accuracy, firm value, and several control variables for the entire sample period; (2) the companies must have consistent fiscal year ends for the entire sample period; (3) the companies were not subject to any merger activity during the entire sample period.

The final treatment sample consists of 167 listed firms and covers a sample period from 2011 to 2018. However, due to the data constraints with respect to forecast data, only 127 (762 firm-year observations) are used for testing H1, while all of the 167 firms are used for testing H2 (1,336 firm-year observations). The H1 (H2) sample includes companies from 28 (33) countries. The country represented most frequently in the sample is Japan with 40 (68) companies, followed by Spain with 12 (13), and the United Kingdom with 12 (12) companies. Furthermore, the sample comprises companies from different industries such as financial services, utilities, pharmaceuticals, and retail. Most companies from the overall sample started to publish an integrated report between 2013 and 2016, with a peak of 48 companies in 2015.

In order to control for cross-sectional effects, a control sample was constructed including peer companies of those in the IR sample. We selected the top 5 closest competitors by sales. These

TABLE 1 Sample Selection

Steps of Sample Selection	Number of IR companies	Percentage of the initial sample
Initial list of companies practicing IR	523	100%
- Unlisted companies	−146	−28%
- Companies listed on the JSE	−129	−25%
- Companies excluded in screening process	−61	−12%
- Companies not meeting the data requirements	−20	−4%
Total number of companies used	**167**	**32%**

companies were filtered in the same way as those in the treatment sample. The final control sample consists of 94 companies (564 firm-year observations) for H1 and 144 companies (1,152 firm-year observations) for H2.

3.2 | Research model

We apply panel data analysis because our data includes observations from several cross-sectional companies over a period from 2011 to 2018. To test the hypotheses, we use the method of 'difference-in-differences'. It uses a treatment and a control group, both of which are observed over the sample period. In the first part of the period, none of the companies has implemented IR while in the second part, firms in the treatment sample published an integrated report on a yearly basis. Before-and-after comparisons for each firm then eliminate time-invariant fixed differences between the treatment and control groups as well as changes that affect both groups over time. Since most companies from the overall sample started to publish an integrated report between 2013 and 2016, we decided for a sample period of 2011 to 2018 in order to enable the aforementioned before-and-after comparisons.

After conducting Hausman's (1978) specification test, the results indicated that using a random effects (RE) model is inappropriate for our data set. Hence, we applied fixed effects (FE) estimation and included yearly dummies in our panel regression setting. Instead of making use of differences over time, the fixed effect estimator first calculates individual averages over time, then it subtracts those averages from every time period. The additional inclusion of yearly dummy variables ensures that even time-fixed effects are being taken into account. We use robust standard errors to account for possible heteroscedasticity of the underlying dataset. The standard errors were clustered at the firm level to allow errors of the same firm to be correlated over time.

3.3 | Main variables

The main variables of the analysis are the independent variable of 'IR disclosure' and the two dependent variables of 'analyst earnings forecast accuracy' and 'firm value'.

3.4 | IR Disclosure

The independent variable is measured as a dummy variable that equals 1 if the company has published an integrated report in that year and 0 otherwise.

3.5 | Analyst Earnings Forecast Accuracy

We use two-years-ahead analyst forecasts since IR is mainly aimed at a firm's long-term value creation potential. In contrast, traditional (financial) reporting is more relevant for short-term forecast accuracy. Following Dhaliwal et al. (2012), analyst forecast error (FERROR) is used as an inverse measure of analyst earnings forecast accuracy. FERROR is measured as the average of the absolute errors of all consensus forecasts made in the respective year for earnings per share at the end of the fiscal year, then scaled by the share price at the beginning of the fiscal year:

$$FERROR_{i,t} = \frac{1}{N}\sum_{j=1}^{N}\left|FC_{i,t,j} - EPS_{i,t}\right|/P_{i,t} \quad (1)$$

where the subscripts i, t, and j denote company i, year t, and forecast j, respectively.

N is the total number of consensus two-years-ahead forecasts made in the fiscal year t (12 per year), EPS is the actual earnings per share at the end of the fiscal year t + 2, and P is the share price at the beginning of the fiscal year t. FC is the consensus two-years-ahead forecast of month j for the EPS at the end of the fiscal year t + 2. The forecast horizon is limited to two years due to a lack of forecasts available for a longer time horizon.

3.6 | Firm Value

Following Lee and Yeo (2016) and Barth et al. (2017), we use Tobin's Q (TOBINQ) as a proxy for firm value. Tobin's Q is defined as book value of total assets plus market value of equity less the book value of equity scaled by book value of total assets (Lang, Lins, & Maffett, 2012), or short market value of equity (market capitalization) plus book value of total liabilities divided by book value of total assets:

$$TOBINQ_{i,t} = \frac{market\ capitalization_{i,t} + book\ value\ of\ total\ liabilities_{i,t}}{book\ value\ of\ total\ assets_{i,t}} \quad (2)$$

where the subscripts i and t denote company i and year t.

Tobin's Q is a measure of value that compares an asset's market value to its replacement cost. The market value also includes aspects not measured on the balance sheet. For instance, some intangible assets, such as intellectual and human capital, are not included in the asset book value. This makes Tobin's Q an ideal proxy in this setting, as IR fills this gap of traditional financial reporting by providing such additional information (Girella et al., 2019). Thus, if companies disclose an integrated report, their market value should increase as investors recognize the full potential of a firm's future value creation (Barth et al., 2017).

3.7 | Control Variables

Regarding the control variables for analyst earnings forecast accuracy, this study follows preceding literature (e.g. Dhaliwal et al., 2012; Hope, 2003). We include seven firm-level control variables, namely

firm size (SIZE), debt (DEBT), profitability (PROF), earnings volatility (VAREARN), number of analysts following (ANANO), number of major stock exchanges listed (STKEXCH), cross-listing in the USA (USLIST) as well as two country-level control variables, namely mandatory adoption of IFRS (MDIFRS) and legal enforcement of accounting standards (ENFORCE). The control variables for firm value are similar to an extensive prior literature using Tobin's Q (e.g. Lang et al., 2012; Lee & Yeo, 2016). These variables are firm size (SIZE), asset growth (GROWTH), debt (DEBT), dividend payment (DIV), profitability (PROF), and cross-listing in the USA (USLIST).

3.8 | Regression model

Hypothesis 1 is tested by estimating the following ordinary least squares (OLS) regression:

$$FERROR_{i,t} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DEBT_{i,t} + \beta_4 PROF_{i,t} + \beta_5 VAREARN_{i,t} + \beta_6 ANANO_{i,t} + \beta_7 STKEXCH_{i,t} + \beta_8 USLIST_{i,t} + \beta_9 MDIFRS_{i,t} + \beta_{10} ENFORCE_{i,t} + year\ dummies \quad (3)$$

where the subscripts i and t refer to company i and year t, respectively.

Hypothesis 2 is tested by estimating the following OLS regression:

$$TOBINQ_{i,t} = \beta_0 + \beta_1 IR_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 DEBT_{i,t} + \beta_5 DIV_{i,t} + \beta_6 PROF_{i,t} + \beta_7 USLIST_{i,t} + year\ dummies \quad (4)$$

where the subscripts i and t refer to company i and year t, respectively.

4 | RESULTS

4.1 | Descriptive statistics

Table 2 shows descriptive statistics on the sample used for the analyst earnings forecast accuracy analysis. It is comprised of 1,186 firm-year observations (of both, treatment and control sample) covering the period 2011–2018. The average forecast error is 0.506. The individual forecast errors range from a minimum of 0.002 to a maximum of 12.003. This range is relatively large, leading to a standard deviation of 0.779. Among the control variables, the average legal enforcement score is 71 out of a maximum possible score of 100. This shows that

TABLE 2 Descriptive Statistics H1 Testing

Variable	N	Mean	Stand. Dev.	Min	p25	Median	p75	Max
FERROR	1,186	0.5062	0.7786	0.0023	0.1284	0.2778	0.5709	12.00
IR	1,186	0.4317	0.4955	0	0	0	1	1
SIZE	1,186	9.880	1.80	4.243	8.7574	9.7429	10.751	17.331
DEBT	1,186	0.2490	0.1581	0	0.1376	0.2386	0.3517	0.6858
PROF	1,186	4.2984	6.0588	−24.509	1.3207	3.4032	6.2745	41.288
VAREARN	1,186	−0.563	1.3808	−6.7259	−1.3856	−0.3931	0.2732	4.8894
ANANO	1,186	2.7139	0.5460	0.6931	2.3979	2.7726	3.0910	4.1271
STKEXCH	1,186	1.0548	0.9535	0	0	1	2	4
USLIST	1,186	0.1636	0.370	0	0	0	0	1
MDIFRS	1,186	0.5261	0.4995	0	0	1	1	1
ENFORCE	1,186	71.40	12.572	35.375	66.375	74.688	79.5	90.938

TABLE 3 Descriptive Statistics H2 Testing

Variable	N	Mean	Stand. Dev.	Min	p25	Median	p75	Max
TOBINQ	2,488	1.4086	0.8943	0.08945	0.9752	1.15502	1.5256	12.5383
IR	2,488	0.3276	0.4694	0	0	0	1	1
SIZE	2,488	15.514	2.8981	4.41440	14.522	16.0128	17.21	21.7014
GROWTH	2,488	0.0586	0.2849	−0.4865	−0.0456	0.02706	0.1051	6.15462
DEBT	2,488	0.2706	0.1707	0	0.1498	0.25601	0.3707	1.12105
DIV	2,488	0.8694	0.3371	0	1	1	1	1
PROF	2,488	3.8992	6.9458	−168.18	1.2560	3.32016	5.9224	56.2794
USLIST	2,488	0.2319	0.4221	0	0	0	0	1

the average sample company operates in an environment where the legal enforcement of accounting standards is relatively high.

The sample of H2 is comprised of 2,488 firm-year observations (see table 3). The average Tobin's Q is around 1.410, which means that the market value of the average sample company is higher than its assets' replacement costs. The standard deviation is 0.894. All Tobin's Q ratios are between the minimum of 0.089 and the maximum of 12.538. The maximum ratio represents an outlier whose stock price almost quadrupled from 0.46 USD to 1.61 USD.

4.2 | Regression results

4.2.1 | H1 testing

The results of the regression analysis of H1 are presented in Table 4. In H1, a negative association is hypothesized between the disclosure of an integrated report and analyst forecast error. The regression results show an effect close to zero and a p-value of 0.880, which is not below the significance level of 0.05. H1 can therefore not be confirmed by the analysis.

Regarding the control variables, firms listed on several stock exchanges as well as firms operating in countries with a high legal enforcement result tend to have a lower analyst forecast error. Also, firms with a larger number of analysts following have a lower analyst forecast error (0.153), similar to the findings of Lys & Soo (1995). However, all three effects are not statistically significant. The association between analyst forecast error and the remaining control variables is not as expected. For instance, Horton, Serafeim, and Serafeim (2013) find that analyst forecast accuracy significantly improves after the mandatory adoption of IFRS in the country the firm is operating in. In our analysis, however, there is an indication for a positive association between IFRS and analyst forecast error (+0.254), but it is not significant. VAREARN is omitted because of collinearity. Table 5 shows the table of correlation of H1.

4.2.2 | H2 testing

The empirical results of the regression analysis of H2 are presented in Table 6. In H2, a positive association is hypothesized between the disclosure of an integrated report and firm value. The regression analysis shows a small positive association with a coefficient of +0.060. With a p-value of 0.092, this analysis does not provide significant support for the hypothesis.

Nevertheless, there is significant evidence for the association between the control variables SIZE and Tobin's Q. Hence, larger firms tend to show a lower firm value (−0.135). Further, higher leverage also decreases firm value (−0.634), while higher profitability increases Tobin's Q (+0.012), even though these effects fail to meet the significance level. These results are consistent with the findings of Lang et al. (2012) and Yermack (1996), respectively. Table 7 shows the table of correlation of H2.

4.3 | Robustness tests

We conducted several robustness tests. First, the regressions are estimated using only observations of treatment companies, i.e. those companies that implemented IR. By doing so, every treatment company is also its own control company during the first part of the sample period, known as the 'non-reporting period' (Dhaliwal et al., 2012). The results, however, do not differ materially from the regression analysis with both the treatment and control sample. The relation between IR and forecast error is still insignificant (p-value of 0.798), but the coefficient is more negative (−0.018). Also the relationship between IR and Tobin's Q remains insignificant (p-value of 0.551).

In a second robustness check, we excluded companies located in the USA and Japan, as these countries are the most represented in the sample and thus, account for the highest number of observations. Following Dhaliwal et al. (2012) this allows us to examine whether the

TABLE 4 Regression Results H1 Testing

FERROR	Coef.	Std. Error	t	P > |t|	[95% conf. interval]	
IR	**−0.008690**	**0.057716**	**−0.15**	**0.880**	**−0.122437**	**0.105057**
SIZE	0.465792	0.270074	1.72	0.086	−0.066471	0.998055
DEBT	0.613522	0.420020	1.46	0.146	−0.214255	1.44130
PROF	0.002284	0.010384	0.22	0.826	−0.018179	0.022748
VAREARN	0	(omitted)				
ANANO	−0.124754	0.086918	−1.44	0.153	−0.296052	0.046544
STKEXCH	−0.232155	0.168519	−1.38	0.170	−0.564273	0.099964
USLIS	0.401076	0.402882	1.00	0.321	−0.392925	1.195077
MDIFRS	0.253507	0.140274	1.81	0.072	−0.022947	0.529960
ENFORCE	−0.015385	0.013358	−1.15	0.251	−0.041711	0.010942
N	1,186					
R^2 between	0.0125					

TABLE 5 Table of Correlation H1 Testing

	FERROR	IR	SIZE	DEBT	PROF	VAREARN	ANANO
FERROR	1.0000						
IR	−0.0723	1.0000					
SIZE	0.0452	0.0422	1.0000				
DEBT	0.1157	0.1239	0.0805	1.0000			
PROF	−0.2324	0.0364	−0.2401	−0.2176	1.0000		
VAREARN	0.2128	−0.0514	0.0119	−0.0669	−0.0554	1.0000	
ANANO	0.0168	−0.0680	0.3115	−0.0014	0.0624	0.2283	1.0000
STKEXCH	0.0286	−0.0930	0.2759	0.0481	−0.0501	0.1863	0.1804
USLIST	0.0865	−0.0357	0.3058	0.0652	0.0557	0.0199	0.2300
MDIFRS	0.0826	0.1453	0.0904	0.1290	0.0047	−0.0244	0.2051
ENFORCE	−0.0575	−0.0588	0.0197	−0.2062	0.0217	0.4149	0.0884

	STKEXCH	USLIST	IFRS	ENFORCE
STKEXCH	1.0000			
USLIST	0.6514	1.0000		
IFRS	−0.2147	0.1321	1.0000	
ENFORCE	0.1156	−0.0407	−0.0996	1.0000

TABLE 6 Regression Results H2 Testing

TOBINQ	Coef.	Std. Error	t	P > |t|	[95% conf. interval]	
IR	**0.059996**	**0.035491**	**1.69**	**0.092**	**−0.009838**	**0.12983**
SIZE	−0.135405	0.064525	−2.10	0.037	−0.262368	−0.008442
GROWTH	−0.026633	0.034728	−0.77	0.444	−0.094966	0.04270
DEBT	−0.633940	0.378878	−1.67	0.095	−1.37944	0.111558
DIV	0.010466	0.042987	0.24	0.808	−0.074117	0.095049
PROF	0.012138	0.006796	1.79	0.075	−0.001237	0.025510
USLIST	0.369203	0.261534	1.41	0.159	−0.145404	0.883809
N	2,488					
R^2 between	0.1771					

results of the analysis are driven by these two countries. The robustness test does not show any meaningful differences in the results compared to the main analysis. The effects of both dependent variables are insignificant and the same holds for the control variables of the respective dependent variable. To be sure that the results are not driven by the two countries, we added two dummy variables indicating whether the company is located in the US or Japan. The results of this analysis do not differ from the initial analysis. Thus, the results are not driven by these two countries.

As a last robustness check, we added two dummy variables indicating whether the company operates in the financial services or utilities sector, since those sectors account for the highest number of observations. Similar to the other robustness tests, the results of this test do not significantly differ from the main analysis. Hence, the results are not driven by these two industries.

5 | DISCUSSION

The findings from our study suggest that there is no significant relationship between voluntarily disclosing an integrated report and improved information transparency. However, despite the non-significant results of the research analysis, these results do not necessarily contradict the promises of IR. We believe that the following line of argument can provide a logical explanation to our findings.

Voluntary disclosure is defined as disclosure of financial and non-financial information in excess to regulatory requirements in order to provide information deemed relevant to the decision needs of users (Meek, Roberts, & Gray, 1995). Voluntary disclosure theory assumes that companies only disclose such additional private information voluntarily if their benefits exceed the costs (Demartini & Trucco, 2017). Such cost can be direct cost, such as the cost of preparing the data, or

TABLE 7 Table of Correlation H2 Testing

	TOBINQ	IR	SIZE	GROWTH	DEBT	DIV	PROF
TOBINQ	1.0000						
IR	−0.0012	1.0000					
SIZE	−0.0983	−0.1165	1.0000				
GROWTH	0.0652	−0.0718	−0.0394	1.0000			
DEBT	−0.1376	−0.0555	0.0592	0.0314	1.0000		
DIV	−0.0581	0.1308	0.0733	−0.0231	−0.1606	1.0000	
PROF	0.3638	0.0326	−0.0761	0.1059	−0.1730	0.2291	1.0000
USLIST	0.1838	−0.1583	0.1405	0.0373	0.0946	−0.1402	0.0453
	USLIST						
USLIST	1.0000						

indirect cost, such as the potential loss of competitiveness due competitors' access to potentially sensitive corporate information (Lee & Yeo, 2016). Hence, companies that publish an integrated report are likely to expect that the benefits exceed their direct and indirect cost.

A typical situation where the costs of disclosing an integrated report are relatively low is when a company already practices a high degree of disclosure. Companies that already have a relatively high level of transparency will exhibit comparably low incremental cost of preparing and publishing an integrated report. For such companies a large share of the information that is needed for preparing an integrated report will be already available by the firms' information systems. Furthermore, the comparably high level of disclosure will typically result in a situation where some of the potentially sensitive information is already available in the market and thus available to company outsiders. Therefore, the incremental cost of preparing a voluntary integrated report should not be significant and the likelihood of an additional loss of competitiveness as a result of voluntary IR disclosure should be rather low, which in turn could be an explanation for the weak significances in the data. This would suggest that since the companies in our voluntarily IR sample already have high transparency, the incremental effect of adopting IR is so minimal that it cannot be captured by the analysis. In this sense, our findings are in line with the selection bias that Barth et al. (2017) suggest in a voluntary sample, and therefore exclude voluntary adopters from their sample. Lai et al. (2016) provide empirical evidence for such a higher general disclosure level of voluntary adopters using Bloomberg ESG disclosure ratings of the 52 IIRC Pilot Programme companies.

This could look different, however, if the analysis were to be based on a mandatory setting as in the majority of previous IR literature (Barth et al., 2017; Bernardi & Stark, 2018; Lee & Yeo, 2016; Zhou et al., 2017). A compulsory adoption of reporting requirements affects all firms within the given area of application, regardless of the level of transparency they have exercised to this point. Similarly, Horton et al. (2013) provide evidence that "forecast accuracy [...] increase[s] significantly more for mandatory adopters relative to non-adopters and voluntary adopters" (p. 389). In their study, they analyze 2,235 firms that adopted IFRS mandatorily, and 635 firms that adopted IFRS voluntarily. As both IR and IFRS enhance a company's transparency, our findings point in the same direction. Hence, one can assume that the benefits of IR are more likely to be measurable in a mandatory setting.

Another explanation for our findings in a voluntary setting is that, in contrast to financial information, auditing of non-financial information is not mandatory. Even if a company wants to ensure the credibility of its integrated report, it faces difficulties in providing an effective third-party assurance. Reasons for this are, among others, a lack of audit regulations and standards as well as "a standard assurance procedure" (Demartini & Trucco, 2017, p. 20). Furthermore, the focus of IR on future value creation results in dilemmas for auditors, as they are "not allowed to assure non-predictable information" (Briem & Wald, 2018, p. 1476). The assurance issue may be too risky for investors to include the non-financial information in forming their expectations for FCF or in forecasting target earnings. Empirically, there is evidence that audited IR reports are valued more by investors (Landau et al., 2020, p. 11). Thus, IR cannot develop its full potential yet, as investors may not use the new information.

There are also methodological reasons, why our results may add to the already inconclusive evidence: Dhaliwal et al. (2012) find a positive effect of CSR reports on forecast accuracy. They study standalone CSR reports (not integrated reports) and do so for data from 1994 to 2007 – a time frame during which the overall information environment and the investors' interest in CSR differed from today. In contrast to Flores et al. (2019), who use current year forecasts, we use two-years-ahead forecasts to reflect the long-term character of IR.

García-Sánchez and Noguera-Gámez (2017a) find a negative effect of integrated information on information asymmetry measured by forecast accuracy. However, their study includes a period (2009–2012) before the IICR was founded in 2010 and companies were able to adopt IR guidelines. Their analysis confirms that for companies with a higher financial reporting quality and better sustainability report utility, the incremental effect of publishing integrated information is relatively lower. This seems to undermine our interpretation above, that firms with already high level of transparency benefit only marginally by publishing an IR.

This study is subject to several limitations. First of all, the sample period is relatively short. The effects may not be captured in this short time frame but could increase over time as companies get more experienced with producing integrated reports and related internal processes. Also, investors and shareholders may not be aware of the potential of IR yet but may learn more about it as the amount of literature and empirical evidence increases.

As a second explanation, this study does not assess the quality of the integrated reports, but rather only the fact that the companies have disclosed such reports. Hence, it does not capture the degree to which the companies actually implemented the principles of IR. Further, the <IR> Framework is only principle-based, leaving management some leeway in deciding what to disclose and how to interpret the principles. Zhou et al. (2017) and Bernardi and Stark (2018) did in fact identify such a positive link between forecast accuracy and quality.

6 | CONCLUSION

This study examines how voluntary IR publication creates value for the primary addressees of IR, investors and shareholders, by investigating two possible channels, analyst earnings forecast accuracy and firm value. Higher earnings forecast accuracy can be expected as a result of an improved firm information environment. IR should contribute to an improved information environment and thus enable a more efficient resource allocation for investors and shareholders while also improving their monitoring capabilities. The improved information environment also reduces information risk and thus, may reduce the cost of capital (Baboukardos & Rimmel, 2016). Furthermore, reduced information asymmetry and a belief in more efficient internal decision-making as a result of integrated thinking may positively affect investors' view on expected FCF. Taken together, firm value should increase with IR adoption.

Prior studies largely use samples of countries where IR is a mandatory practice. Hardly any studies have investigated the impact of IR disclosure in countries where integrated reports are published on a voluntary basis. Using data from listed companies that voluntarily publish an integrated report, there is no evidence for a significant association between IR and analyst earnings forecast accuracy. Similar results have been found in a comparable research investigating the informational effects of IFRS adoption (Horton et al., 2013). Furthermore, there is no significant evidence for an association between IR and firm value. We believe that the unexpected findings result from this study's focus on voluntary IR adopters – companies that already have a relatively high level of transparency and therefore only marginally decrease information asymmetry by publishing an IR.

Our findings have important implications for investors, shareholders, and managers, but also policy-makers, standard-setters or capital markets authorities who evaluate the advantages of adopting IR. As voluntary theory suggests, it will rather be the firms that already practice a high level of transparency who decide in favor of an additional integrated report, since their incremental cost of preparing and publishing is low. For such firms, though, the value potential from IR is limited. In contrast, IR has a large potential, as shown by previous studies, if it is introduced on a mandatory basis. Interpreting this study's results in the broader context, it appears more fruitful to make IR – or other forms of standardized CSR reports – mandatory than to hope for positive effects from voluntary adoption.

In this sense, our findings may be useful for policy makers and regulators such as the European Commission which has already expressed interest in IR. They may complement the consultations and review of the European Union's Non-Financial Reporting Directive, which is mandatory only for large companies until now. Japan may find our results reassuring for further steps, as Japanese companies are not currently required to report according to the integrated reporting format, but are strongly encouraged by their government (Gibassier et al., 2019).

Managers of companies operating in jurisdictions where IR is not mandatory may find our findings interesting if they wish to initiate new or justify ongoing board discussions on the voluntary introduction of IR.

For investors the results may be useful when selecting stocks for portfolios. In this study, we focus on the interests of 'traditional investors' who seek value creating investments. However, in our view, also 'socially responsible investors' (SR investors) may find our results informative. The investment strategy of SR investors is to select investments with a focus on sustainable business models (and avoid investments in companies that have negative ethical, social or environmental impacts; Woods & Urwin, 2010). For instance, "poor supply chain management, including the use of child labor, can destroy a brand" (Matteini, 2018, p. 16), and thus value. SR investors, therefore, believe that investments in companies with higher ethical, social or environmental standards generate (at least in the long run) higher returns than investments in companies with lower standards. Despite a different investment strategy, however, they too are ultimately interested in whether an investment generates the expected return (Statman, 2008). In this respect, our study may provide interesting insights in this promise of IR for SR investors. However, our study does not answer the question whether IR can fulfill other information needs of SR investors, such as the environmental impact of a company's activities.

This study can be seen as an important step in evaluating the potential of IR for the primary interest group, namely the investors in a voluntary setting. Future research could try to mitigate the limitations of this study by expanding the timeframe or controlling for further effects. Another interesting approach would be to analyze relationships beyond the binary decision to disclose an integrated report and consider the quality of the voluntarily published reports (Bernardi & Stark, 2018; Vitolla et al., 2020; Zhou et al., 2017) or the extent of the connectivity of the capitals disclosed in an integrated report (Grassmann et al., 2019). Additionally, we would like to point out that our study focuses on the information needs of investors and the value creation in a financial sense. Future research could analyze the benefits for and the information needs of other stakeholders, in

particular non-shareholding stakeholders to address other promises of the IR concept and the IIRC.

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