Sustainability reporting or integrated reporting: Which one is valuable for investors?

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Sustainability reporting or integrated reporting: Which one is valuable for investors?

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Abstract

Purpose – This research is motivated by the development of dialogue and debate regarding company reporting in the form of sustainability reporting (SR) – which is separate from the annual report (AR) – or integrated reporting (IR). Research into SR and IR is still fascinating, and this study addresses the debate about them. This study aims to examine which of the two reports is more valuable for investors, and also examine whether IR has value relevance because the information in the IR could reinforce the importance of the accounting information.

Design/methodology/approach – As with previous studies, we adopted a valuation approach – the Ohlson model – to assess the value relevance of non-financial information (in the form of SR/IR) and financial information. As a preliminary study, we used non-financial information as a binary variable, i.e. a group of companies that issue sustainability reports and a group of companies that issue integrated reports. Therefore, they complement and interact with the financial statements' information. This paper used panel data consisting of 931 firm-years of SR issuers and 922 firm-years of IR issuers in Europe and Africa in the period from 2005 to 2019.

Findings – The results showed that SR had a higher value relevance than IR. However, when the authors interact the corporate reporting form with the accounting information, IR had value relevance because the information contained in the IR could reinforce the importance of the accounting information.

Practical implications – This study will support regulators in various countries to monitor the reporting practices of companies in those countries. The results of this study provide evidence that sustainability reports get a higher response than integrated reports. However, when interacted with the accounting variables, information in the IR is considered to be more relevant than that found in the SR. Therefore, it is hoped that the results of this study will help the International Integrated Reporting Council (IIRC) in reviewing IR practices around the world so that the implementation of IR practices can be realized in accordance with the mission that the IIRC wants to achieve.

Originality/value – Research into the value relevance of SR and IR has been carried out by several previous researchers separately, but to the best of the author's knowledge, there are no studies comparing the value relevance of the two.

Keywords Sustainability reporting, Value relevance, Integrated reporting

Paper type Research paper

1. Introduction

Financial statements are used to determine the value of a company as a whole. The accounting information contained in financial reports should aim to provide a basis for

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investors when making decisions. The amount of information disclosed by companies has increased sharply, for mandatory and/or voluntary reasons, thus leading them to prepare various forms of reports, from traditional financial reports (annual reports), corporate governance reports, sustainability reports, to integrated reports (Cortesi and Vena, 2019). Those reports are made as a form of transparency for stakeholders, especially stockholders as their basis for decision making. Information is said to be relevant if it is able to make a difference in investment decisions. Therefore, information is said to be relevant if the information is useful and able to influence stock prices (Badu and Appiah, 2018). Most studies into value-relevance still emphasize the importance of accounting numbers for investors (Pierre Thijssen and Iatridis, 2016; Elbakry *et al.*, 2017; Badu and Appiah, 2018; So *et al.*, 2018; Harakeh *et al.*, 2019; Gavana *et al.*, 2020), while there are still few studies examining the value relevance of non-accounting information to stock prices (Cortesi and Vena, 2019; Ricci *et al.*, 2020; Liao *et al.*, 2020; Sam and Zhang, 2020; Govindan *et al.*, 2021). However, when capital market participants perceive that the information provided by financial reports is inadequate, they will look for other sources of information, namely, non-financial information.

Non-financial information is important because it can lead to future financial performance and success, which is important for the achievement of the main goals of the organization (Graham *et al.*, 2002; Wyatt, 2008; Orens and Lybaert, 2010). The current development in corporate reporting is integrated reporting (IR). Meanwhile, there are still many companies that publish sustainability reports (SR), which are separate from their financial information (annual reports). The purpose of this study is to determine which of these two types of reporting is more appreciated by capital market investors. Besides, this study aims to determine whether a company that publishes the IR has value relevance because the information in the IR could reinforce the importance of the accounting information. Full disclosure is needed by the decision-makers, especially the external parties and the shareholders so that there is no asymmetrical information. This study is motivated by the growing debate over which form of the corporate reporting – SR or IR – is more relevant to the investors. Previous studies have looked at the relevance of SR or IR separately, and for this reason, it has not been answered yet, which form of reporting is more relevant for the investors' decision-making.

On the one hand, SR which is undertaken in addition to the company's annual report (AR) is intended to increase firm value so that it can affect the value-relevance (Goettsche *et al.*, 2014). Many companies around the world undertake sustainability disclosures for a variety of purposes, including increasing their share prices, reducing the cost of capital, or improving future performance. Bachoo *et al.* (2013) found a significant negative relationship between SR's quality and the cost of equity capital, as well as a significant positive relationship between SR's quality and expected future performance. Kaspereit and Lopatta (2016) found a positive relationship between market value and company sustainability. However, they found no evidence of an interaction between value relevance and SR. However, Berthelot *et al.* (2012) and Iatridis (2013) found that investors rate SR positively, where high-quality disclosures have value-relevance and increase the investor's perceptions.

On the other hand, IR is a summary of all the other reports presented in a single report. In this case, the report users get a complete picture of the company by reading only one report. IR is structured by companies in facing a new paradigm, namely, value. Investors and stakeholders need reports that can provide information about how the organization creates value in the short- and long-term. The information presented in financial reports or annual reports alone is considered insufficient to present a complete picture of a company, such as information about the company's environment, governance, risk, social and business

sustainability (Cortesi and Vena, 2019) IR accommodates corporate reporting reforms into a single report and covers all the disclosure needs of financial and non-financial information (Baboukardos and Rimmel, 2016; Shanti *et al.*, 2020). The main content of IR is explaining how companies create value for stakeholders and several studies have proven that the IR approach has the potential to comprehensively support organizations in creating corporate value (Barnabè *et al.*, 2019; Setia *et al.*, 2015; Liu *et al.*, 2019). The IR framework provides a mechanism that accommodates the non-financial information needs of shareholders and stakeholders by communicating how the organization effectively creates value in unique ways through its strategy (Adams, 2017). IR introduces an understanding of the interdependence between basic capital and supports integrated thinking, decision making and action that focuses on short-, medium- and long-term value creation (Bananuka *et al.*, 2019; Barth *et al.*, 2017).

In practice, investors are faced with two types of reporting, namely, SR and IR. Berthelot *et al.* (2012) and Iatridis (2013) found that SR has a valuation relevance in investor's decision making. On the other hand, Baboukardos and Rimmel (2016), Tlili *et al.* (2019); Cortesi and Vena (2019) found that IR has value-relevance in investor's decision making. Their findings created a debate and the question, which is more valuable to investors, SR or IR? The next question is when financial information becomes irrelevant or has lost some of its value relevance, how can reports in the form of SR or IR compensate for the limitations of financial information? Is IR as the most recent form of reporting appropriate for the company to use to provide non-financial information? Our study attempts to close the debate in the previous research that examined the value-relevance of SR or IR separately, whereas our study compares the value-relevance of SR and IR, to discover which one is considered more relevant by investors in the capital market. As with previous studies, we adopted a valuation approach – the Ohlson model – to assess the value relevance of non-financial information (in the form of SR/IR) and financial information. The value-relevance model used refers to previous research, by using the Ohlson (1995) model (Burgstahler and Dichev, 1997; Collins *et al.*, 1997; Lev and Zarowin, 1999; Gu, 2007). As a preliminary study, we used non-financial information as a binary variable, i.e. a group of companies that issue SR and a group of companies that issue IR. Therefore, they complement and interact with the information in the companies' financial statements. We used panel data consisting of 931 firm-years of SR issuers and 922 firm-years of IR issuers in Europe and Africa during the period from 2005 to 2019.

Our results indicated that SR had a higher value-relevance than IR. Sustainability reports are viewed as having a broader focus and prioritizing the roots of social and environmental accounting. Based on our findings, investors still view the importance of SR even though it is separated from AR because they consider that the company's attention to sustainability issues and activities is one of their main considerations when making investment decisions. Interestingly, we support the notion that companies that produce IR publications are indirectly able to change the relevance of the financial information. This supports our initial assumption that investors will get a higher value for companies that issue IR when the information contained therein is used in conjunction with the accounting information.

Our study contributes to the debate on the two forms of corporate reporting by investigating the value-relevance of SR and IR in market valuations, and our results suggest that SR is perceived as being more relevant by investors. This study also makes a practical contribution to companies. First, the results of this study provide empirical evidence that shows the value-relevance of the two forms of corporate reporting, so that companies can use them as a basis for determining whether to publish SR or IR. Second, the value-relevance shown through this study can provide evidence of a company's involvement in

sustainability activities, which can drive its sustainable development goals. Third, investors' reactions through value-relevance can provide evidence that the company's efforts to carry out sustainable activities are considered important and receive attention from the investors.

This study is structured as follows. Section 2 reviews the literature related to SR, IR, value-relevance, and the development of the hypotheses. Section 3 describes the research methods used to test the hypotheses. Then, Section 4 presents the results of empirical testing and discussion. Finally, Section 5 provides the conclusions, limitations of the study and recommendations for future research.

2. Literature review and hypothesis development

This section reviews the literature that provides a theoretical discussion along with empirical evidence regarding the value relevance of financial and non-financial information.

2.1 Direct valuation theory, sustainability reporting and integrated reporting

This study uses the direct valuation theory from Holthausen and Watts (2001) because this theory includes all the variables that can explain current firm value or predict future firm value, including those that have not been reflected in the financial reports (Barth *et al.*, 2001). In this theory, accounting profit is closely related to changes in stock market value (through permanent profit). The book value of equity according to this theory is closely related to the market value of equity. This theory also asserts that relevant information is not only obtained from financial reports but also from other sources, including SR and IR, so that in our study SR and IR have the justification to act as other sources.

In cases where financial information is irrelevant or has lost some of its value relevance, accounting research needs to explore the variables that can provide additional value relevance. The emergence of criticism of the focus on financial information has led to the inclusion of non-financial information in the financial accounting framework. The non-financial information contained in SR and IR should be the basis for users to predict the reporting company's future value. Capital market participants base their investments on their expectations of the future value of a company, which is determined not only by the company's financial performance but also on its disclosed non-financial performance. In our opinion, the way in which a company discloses its non-financial performance, whether in the form of single reporting (i.e. IR) or separate (i.e. SR) can influence investors' decisions in the capital market.

The main tools or components that are often used as a means of informing company value are earnings and book value. SR and IR are a means to provide accountability to company stakeholders. In general, SR and IR have different goals. SR aims to assist organizations in setting goals and managing change toward a sustainable global economy. SR combines long-term benefits with social responsibility and environmental care, whereas IR focuses on reporting the value creation of entities by integrating all the different types of reporting. The International Integrated Reporting Council (2013) stated that the objective of IR was to improve the quality of the information available to the providers of financial capital so that it would be possible for them to allocate their capital more efficiently and productively.

We adopt a valuation approach to determine the value relevance of financial and non-financial information. In practice, the reports made by companies can be in the form of SR, which is separate from AR; and IR, which combines all the information needed by the company in the form of a single report, including the information in SR. The non-financial

information contained in these two types of reporting is expected to help investors understand the value relevance of financial information so that it is useful for investors when they are making decisions.

2.2 *Value-relevance differences of non-financial information from sustainability reporting and integrated reporting*

Initially, research into value-relevance was aimed at determining the value-relevance of financial information (Beaver, 1968; Ohlson, 1995; Burgstahler and Dichev, 1997; Collins *et al.*, 1997; Lev and Zarowin, 1999; Gu, 2007). The most widely used value-relevance model is the Ohlson (1995) model. The Ohlson model assumes a perfect capital market, but with the added assumption that there is information dynamics, so a firm value can be restated as a linear function of the book value of equity, net income, dividends and other information (Barth *et al.*, 2001). Using this model, some researchers also determine the value-relevance of non-financial information (Black *et al.*, 2000; Riley *et al.*, 2003; Moneva and Cuellar, 2009; Cardamone *et al.*, 2012; Sutopo *et al.*, 2018; Ricci *et al.*, 2020). Consistent with previous research, this study examines the value relevance of non-financial information in the form of SR or IR.

Yen-Yen (2019) and Aras *et al.* (2018) found evidence that the performance of ESG disclosure in SR positively relates to firm value. Disclosure in SR promotes transparency, improves investors' information processing capabilities, and ultimately feeds that information into the stock market. The value of a company that is close to its fundamentals will be valued by the market because the investment risk is lower. Sutopo *et al.* (2018) examined whether information about Sustainability Reporting Award (SRA) winners contributed to the usefulness of the information in financial reports. The results of their study found that information about earnings per share (EPS), earnings per share change (EPSC) and book value per share (BVPS) all have value-relevance.

Meanwhile, Baboukardos and Rimmel (2016), Tlili *et al.* (2019); Cortesi and Vena (2019) examined whether the value relevance of accounting information (i.e., the book value of equity and income) of companies listed on the Johannesburg Stock Exchange (JSE) had increased after the implementation of mandatory IR under the King III report. The results showed that the application of IR could increase the usefulness of financial reporting for investors. Loprevite *et al.* (2018) compared the benefits of IR in mandatory (South Africa) and voluntary (Europe) regimes. The results of his research showed that (a) in the voluntary regime, the level of integrated performance achieved by companies was higher, (b) the regime had a positive effect on medium-term performance, and (c) the integrated performance indicators had value-relevance, even though the two regimes have different levels of relevance. In contrast, Camodeca *et al.* (2018) investigated the value-relevance of corporate sustainability disclosures through IR. The results of his research indicated that disclosure of sustainability through IR has no effect on market valuation, or in other words, it had no value-relevance.

Based on the developments in company reporting, capital market investors are faced with two types of reports, namely, SR and IR. Our study aimed to examine which of the two types of reporting are more valued by investors and more relevant for their decision making. Our study was based on the assumption that the information provided by SR and IR will be used by investors when making investment decisions. Decision making by investors is indicated by the market value, or share price, or change in the share price. Information is alleged to have value- relevance if it can explain stock prices or stock returns (Gu, 2007) or firm value (Beaver, 1968).

Fasan (2013) provided a comprehensive comparison between AR, SR and IR from the perspective of their reporting development. In particular, he argued for the limitations that AR has had over the past few years. Meanwhile, SR's main characteristics focus on the guidelines from the GRI. On the other hand, IR can be considered as the most cutting-edge and future-oriented corporate disclosure. He stated that it is very important to compare IR with previous forms of corporate disclosure to answer the current debate and predict its future development. Meanwhile, IR extends and organization's non-financial reporting and accountability to include the business environmental and social impacts and also provides a more cohesive and efficient approach to corporate reporting by bringing together financial information, operational data and sustainability information to focus only on material issues that impact on and organization's capability to create value in the short, medium and long term (Stubbs and Higgins, 2018). Based on these arguments, our study proposes the following hypothesis:

H1. The value-relevance of IR is higher than that of SR for investors.

2.3 Integrated reporting publication has value relevance because the information in the integrated reporting could reinforce the importance of accounting information

Non-financial information is a complement to the financial information used by investors to make investment decisions. Apart from financial information, investors and other stakeholders increasingly need non-financial information to decide on an investment, credit and other decisions. This means that financial reporting no longer meets the needs of investors and other stakeholders (Aureli *et al.*, 2020).

Furthermore, the relevance of stand-alone financial information will only be significant when mixed with non-financial information. In the "new economy," financial information about knowledge-intensive and innovative companies will lose its value relevance. This is due to the increasing amount of stock trading based on non-financial information, thereby reducing the ability of stock prices to reflect accounting information (Vafaei *et al.*, 2011; Dontoh *et al.*, 2004).

We also wanted to examine whether IR publications influenced the relevance of accounting data, further helping to explain the market value of firms. To achieve this goal, following Cardamone *et al.* (2012) and Baboukardos and Rimmel (2016) we included in our research model the IR variable both as a single independent variable and as an independent variable combined with financial information. We argue that IR publications can be considered by investors as a source of further information about traditional accounting variables that are considered value-relevant, such as BPS and EPS. In this case, the IR variable acts indirectly on the share price. By providing further disclosure of the value of BPS and EPS, IR can interact with them, thereby changing the importance of each individual piece of financial information. Based on this description, we develop the following hypothesis:

H2. IR publication has value relevance because the information in the IR could reinforce the importance of the accounting information.

3. Data and methodology

This study used a value-relevance analysis or model from Ohlson (Hassel *et al.*, 2005; Xu *et al.*, 2007; Berthelot *et al.*, 2012; Dimitropoulos *et al.*, 2013; Lourenço *et al.*, 2014; Baboukardos and Rimmel, 2016; Sarumpaet *et al.*, 2017; Sutopo *et al.*, 2018) to confirm the

hypotheses developed. Information is believed to have value-relevance if it is able to provide information about a company's market value (Ho *et al.*, 2001; Cardamone *et al.*, 2012). The first hypothesis examined whether IR had higher value-relevance than SR or not. To answer this hypothesis, we used the dummy variable IRSR where IR was equal to one if the company issues IR and zero if it issues SR. Furthermore, to answer the second hypothesis, this dummy variable is interacted with financial information in the form of book value per share (BVS) and earnings per share (EPS) to determine whether this non- financial information can affect the impact of accounting information on stock prices. Thus, the model developed to confirm these two hypotheses was as follows:

$$MVE_{it} = \alpha_0 + \alpha_1 BVS_{it} + \alpha_2 EPS_{it} + \alpha_3 IRSR_{it} + \alpha_5 (IRSR_{it} \times BVS_{it}) + \alpha_6 (IRSR_{it} \times EPS_{it}) + \sum_{j=7}^{13} \alpha_j Controls_{it} + \alpha_{14} INDUSTRY_i + \alpha_{15} COUNTRY_i + \alpha_{16} YEAR_i + \varepsilon_{it}$$

where $MVEit$ is the market value of equity divided by the number of shares outstanding, i.e. the share price four months after the financial reporting period; BVS_{it} is book value per share; EPS_{it} is earnings per share. The control variables used in this study were leverage (debt-to-equity ratio), return on equity, company size (natural logarithm of total assets), operating cash flow divided by total assets, book-to-market ratio and industry effect, country effect and year effect. To test *H1*, we looked at the significance of the $IRSR_{it}$ coefficient. Meanwhile, to test *H2*, we looked at the significance of the interaction coefficient.

3.1 Sample

We selected several countries in Europe because companies in these countries were considered to have good reputations for managing their sustainability and environmental information and have been at the forefront of SR (Loprevite *et al.*, 2018; Landau *et al.*, 2020), particularly in the UK and Germany (Schaltegger and Zvezdov, 2015) and France (Baboukardos, 2018). Generally, sustainability disclosures have been promoted by the European Parliament in Directive 2014/95/EU which imposes a "public interest" on European entities to disclose non-financial information in their annual reports (Camodeca *et al.*, 2018). Meanwhile, Africa (particularly South Africa) was chosen because it was the first country to introduce a *de facto* mandatory requirement for companies listed on Johannesburg Stock Exchange to prepare integrated reports in response to social, political, environmental and economic challenges (Atkins and Maroun, 2015); (Loprevite *et al.*, 2018). In addition, South Africa has been one of the most active IR adopter countries and has also been the first and only country to date to require all its public-listed companies to publish their integrated reports (Hoang *et al.*, 2020). Therefore, our sample consisted of 931 firm-years of SR issuers and 922 firm-years of IR issuers for the period from 2005 to 2019 located in Europe and Africa. These two continents were chosen because they were early adopters of IR. The list of SR issuers was obtained from the global reporting website and IR issuers from the IIRC website (Table 1 and Table 2). Companies that issue SR are the companies that use GRI for reporting guidance. By using unbalanced panel data, this study retrieved data on accounting variables and stock prices used in our regression model obtained from the OSIRIS database.

Table 1.
Sample of SR issuers

Year	Germany	Sweden	UK	France	Italy	Finland	Norway	The Netherlands	Switzerland	Portugal	South Africa	Austria	Russia	Spain	Belgium	Luxembourg	Hungary	Total
2005	6	1	2	2	1	1	1	0	0	0	1	0	0	1	0	0	0	16
2006	8	2	2	2	1	1	1	1	0	0	2	0	0	2	0	0	0	22
2007	8	2	3	2	2	1	1	1	0	3	2	0	0	2	0	0	0	27
2008	10	2	5	2	2	1	2	3	1	3	3	2	0	2	0	0	0	38
2009	10	5	6	3	3	1	2	4	1	3	3	2	0	2	0	0	0	45
2010	12	7	7	5	3	2	2	5	4	3	6	2	0	2	0	0	0	60
2011	13	9	9	6	3	2	3	5	4	3	5	3	0	2	1	0	0	68
2012	15	11	8	7	4	4	3	5	5	3	3	4	2	2	1	1	0	78
2013	16	12	8	8	5	5	3	5	6	4	4	4	2	1	1	1	0	85
2014	16	14	7	9	6	6	5	4	6	4	3	4	2	1	2	1	0	90
2015	15	13	7	9	6	6	5	4	5	4	3	4	2	0	2	1	1	87
2016	17	13	7	9	5	6	6	3	5	3	3	4	3	0	2	1	1	88
2017	17	12	7	9	5	6	6	3	3	3	2	4	3	0	2	1	1	84
2018	17	11	7	8	5	6	5	3	2	3	1	4	3	0	1	1	1	78
2019	13	10	6	7	3	6	4	2	4	3	0	3	2	0	1	1	0	65
Total	193	124	91	88	54	54	49	48	46	42	41	40	19	17	13	8	4	931

Year	South Africa	UK	Sweden	Italy	Germany	The Netherlands	Spain	France	Austria	Finland	Switzerland	Portugal	Total
2005	5	0	0	0	0	0	0	0	0	0	0	0	5
2006	6	0	0	1	0	0	0	0	0	0	0	0	7
2007	7	0	0	1	0	0	0	0	0	0	0	0	8
2008	9	0	1	1	0	0	0	0	0	0	0	0	11
2009	11	0	1	1	0	0	0	0	0	0	0	0	13
2010	13	0	1	1	0	0	0	0	0	0	0	0	15
2011	45	0	2	1	0	0	0	0	0	0	0	0	48
2012	57	2	3	2	1	1	0	0	0	0	0	0	66
2013	67	5	3	3	2	1	1	0	0	0	0	0	82
2014	75	10	3	3	2	2	1	0	1	1	0	0	98
2015	84	11	5	3	3	2	2	1	1	1	0	0	113
2016	87	11	5	4	3	2	2	1	1	1	1	1	119
2017	87	12	5	4	3	3	2	2	1	1	1	1	122
2018	88	12	5	4	3	3	2	2	1	1	1	1	123
2019	67	9	5	2	3	1	0	1	1	1	1	1	92
Total	708	72	39	31	20	15	10	7	6	6	4	4	922

Table 2.
Sample of IR issuers

3.2 Control variables

Bepari (2015) suggested that deteriorating financial health and extreme returns on equity can affect the value relevance of book value and earnings, thus our study controlled for the influence of these contextual factors, such as ROE, leverage, operating cash flows and firm size. We estimated the model by including time and industry fixed effects to control for differences in the time and industry type. Thus, we added the time dummy set (year) as one if the report is compiled as of December 31 and zero otherwise. We defined the industrial dummy as a two-digits of the SIC code. Each country has a different background and context which can influence the findings. The economic and political system, the way rules and regulations are enforced as well as social-cultural factors of the community can also influence the findings (Kadri *et al.*, 2009). Therefore, to minimize this effect, we control for the country effect, one for South Africa and zero for the rest. Models that do not control for the effects of these contextual factors will produce biased results (Bepari, 2015). To test H_1, we looked at the significance of the $IRSR_{it}$ coefficient. Meanwhile, to test H_2, we look at the significance of the interaction coefficient.

4. Analysis and discussion

4.1 Descriptive statistics

Table 3 shows the descriptive statistics for the entire sample. The average of MVE is 30.21. The market value of equity varies from \$0.01 to \$1,194.62. The average of BVS and EPS are \$33.20 and \$2.14, respectively. To get a better delineation, we divided the sample into the group of SR issuers and the group of IR issuers (Table 4 and 5). On average, companies that issue SR have a higher average market value of equity than those that produce IR, and they also have a higher standard deviation. Likewise, the average book value and earnings per share of SR issuers are higher than those of IR issuers.

4.2 Regression results

Table 6 presents the pairwise correlation coefficient of the variables used in the analysis. The MVE and BVS as well as BVS and EPS have a high positive correlation (0.7495 and 0.6545 respectively). Meanwhile, the other pairs have a low correlation with each other. We used GLS regression because of heteroscedasticity and autocorrelation problems in testing the model. The problem of heteroscedasticity comes from a population with great variability so that OLS cannot be used. GLS assigns the same weight or level of importance to each observation, in such a way that it is able to produce BLUE estimators. GLS transforms the

	Mean	SD	Min	Max
MVE	30.20	72.08	0.01	1,194.62
BVS	33.20	191.16	−8.05	4,549.88
EPS	2.14	15.64	−262.09	247.91
LnTA	15.11	2.20	7.20	21.10
DER	2.75	7.33	−77.99	84.48
ROE	6.76	24.44	−502.70	383.07
CFO	0.08	0.20	−4.13	3.59
BTM	0.95	10.91	−289.05	208.89

Table 3.
Descriptive statistics for entire sample

Notes: Abbreviations: MVE = market value of equity; BVS = book value per share; EPS = earnings per share; LnTA = natural logarithm of total assets; IRSR = dummy variable of IR and SR; DER = debt-to-equity ratio; ROE = return on equity; CFO = operating cash flow/total asset; BTM = book-to-market ratio

	Mean	SD	Min	Max
MVE	48.49	95.97	0.01	1,194.62
BVS	55.86	265.84	−8.05	4,549.88
EPS	3.67	20.60	−262.09	247.91
LnTA	15.96	2.10	7.20	20.76
DER	3.22	8.92	−77.99	84.48
ROE	6.56	26.35	−502.70	383.07
CFO	0.10	0.24	−0.47	3.59
BTM	0.99	1.39	−0.39	19.37

Notes: Abbreviations: MVE = market value of equity; BVS = book value per share; EPS = earnings per share; LnTA = natural logarithm of total assets; IRSR = dummy variable of IR and SR; DER = debt-to-equity ratio; ROE = return on equity; CFO = operating cash flow/total asset; BTM = book-to-market ratio

Table 4. Descriptive statistics for SR issuers

	Mean	SD	Min	Max
MVE	11.74	21.64	0.01	164.42
BVS	10.33	32.76	−4.41	426.67
EPS	0.60	7.66	−176.75	30.41
LnTA	14.25	1.93	9.07	21.10
DER	2.28	5.21	−6.06	78.86
ROE	6.95	22.34	−257.38	116.26
CFO	0.06	0.16	−4.13	0.53
BTM	0.92	15.41	−289.05	208.89

Notes: Abbreviations: MVE = market value of equity; BVS = book value per share; EPS = earnings per share; LnTA = natural logarithm of total assets; IRSR = dummy variable of IR and SR; DER = debt-to-equity ratio; ROE = return on equity; CFO = operating cash flow/total asset; BTM = book-to-market ratio

Table 5. Descriptive statistics for IR issuers

original OLS model, thus the variance of the disturbance is transformed into homoscedasticity. Therefore, when using GLS, we apply OLS to the transformed model and this will produce a BLUE estimator. The procedure which transforms the original variables in such a way that the transformed variable satisfies the assumptions of the classical model and then applies OLS to them is known as the GLS method. In summary, the GLS is the OLS of the transformed variable that satisfies the standard least-squares assumptions. The same is true when there is autocorrelation. The beta estimator from GLS includes the autocorrelation parameter in the estimating formula, while the OLS formula just ignores it. That is why the GLS estimator is said to be BLUE and not the OLS estimator, in other words, the GLS estimator makes the most use of the available information.

The first hypothesis was answered through the significance of the *IRSR* coefficient (Table 7). The results showed that the *IRSR* was significantly negative at the 1% level, with a coefficient = −16.75. This suggests that the value-relevance of SR is higher than that of IR (the first hypothesis was rejected). As with Klerk and Villiers (2012), we found a positive and significant association between financial information (book value and earnings) and the market value of equity as expected, but for non-financial information (the *IRSR* in this study), the result showed that SR has a higher response than IR. Although Klerk and Villiers (2012) examined the value relevance of corporate responsibility reporting, it is implied that SR is another form of corporate responsibility reporting. Similar results were obtained by

Table 6.
Pearson correlation matrix

Variables	MVE	BVS	EPS	LnTA	IRSR	IRSR × BVS	IRSR× EPS	DER	ROE	CFO	BTM
MVE	1.0000										
BVS	0.749***	1.0000									
EPS	0.529***	0.654***	1.0000								
LnTA	0.273***	0.152***	0.113***	1.0000							
IRSR	−0.255***	−0.119***	−0.098***	−0.391***	1.0000						
IRSR×BVS	0.033*	0.092***	−0.097***	0.154***	0.218***	1.0000					
IRSR×EPS	0.014*	−0.034*	0.339***	−0.038*	0.055**	−0.205***	1.0000				
DER	0.074***	0.162*	0.059*	0.206***	−0.064***	0.086***	−0.127***	1.0000			
ROE	0.003***	−0.03*	0.096***	−0.026*	0.008*	−0.009*	−0.049**	0.012*	1.0000		
CFO	0.015*	−0.019*	−0.007*	0.006*	−0.077***	−0.041*	0.012*	−0.052**	0.018*	1.0000	
BTM	0.005*	0.063***	−0.015*	0.028*	−0.003*	0.306***	−0.061***	0.053**	−0.007*	−0.002*	1.0000

Notes: Dependent variable: MVE. Abbreviations: MVE = market value of equity; BVS = book value per share; EPS = earnings per share; LnTA = natural logarithm of total assets; IRSR = dummy variable of IR and SR; DER = debt-to-equity ratio; ROE = return on equity; CFO = operating cash flow/total asset; BTM = book-to-market ratio. *, **, and *** significant at 10%, 5% and 1% respectively

	Coeff.	z-stat	p-value
Constant	−43.18	−4.92	0.000
BVS	0.27	35.04	0.000***
EPS	0.18	1.94	0.052**
IRSR	−16.75	−6.98	0.000***
IRSR*BVS	0.01	0.20	0.840
IRSR*EPS	0.56	2.77	0.006***
LnTA	4.88	8.95	0.000***
DER	−0.75	−5.09	0.000***
ROE	0.07	1.72	0.086*
CFO	4.78	0.94	0.350
BTM	−0.19	−1.85	0.065*
Number of observations 1,853			
Wald chi2 2,974.07			
Prob > chi2 0.0000			

Notes: ***significant at 1%. **significant at 5%. *significant at 10%. Abbreviations: MVE = market value of equity; BVS = book value per share; EPS = earnings per share; LnTA = natural logarithm of total assets; IRSR = dummy variable of IR and SR; DER = debt-to-equity ratio; ROE = return on equity; CFO = operating cash flow/total asset; BTM = book-to-market ratio

Table 7. Generalized least squares Regression of Sustainability/ Integrated Reporting to Market Value of Equity

Cardamone *et al.* (2012) in the context of social reporting. This suggests that the market still gives higher value-added to companies dealing with ethical, economic, environmental and social issues.

The second hypothesis was answered through the significance of the interaction effect coefficient between *IRSR* and *BVS* and *EPS*. The results showed that the interaction coefficient for *IRSR* and *EPS* is positive and significant at the 1% level, with the coefficient = 0.56. This suggests that if there is an increase in financial information in the form of earnings per share, the market value of the company that issued the IR will be higher. Meanwhile, this does not apply to financial information in the form of book value per share, or in other words, the existence of book value per share information will have the same effect on the value of the company, whether it issued IR or SR.

4.3 Discussion

4.3.1 The value-relevance of sustainability reporting is higher than integrated reporting

This study tested two hypotheses, that IR has a higher value relevance to stock prices than SR does for investors. The second hypothesis stated that the non-financial information contained in IR indirectly modifies the relevance of the financial variables in the form of BVS and EPS. The results of this study indicated that we should reject the first hypothesis. It suggests that SR is considered to be of higher value by capital market investors than IR is. Conradie (2018) stated that a number of social and environmental scholars criticize the existence of IR that ignores the roots of social and environmental accounting (SEA). These critics are of the view that IR has a narrow focus and is aimed more at financial capital providers, so it does not provide equal treatment to all stakeholders. Basically, economic, social and environmental issues are published in the company's sustainability report and that report discusses the attention paid to those three issues in detail. In particular, our study uses GRI as the basis for preparing a sustainability report. SR discloses all the company's activities aimed at supporting SDGs and informs investors and other stakeholders in a balanced manner. It is for this kind of corporate concern that investors consider SR to be more valuable than IR. Investors continue to believe companies that do separate reporting for their annual reports and sustainability reports, rather than IR.

Mcnally *et al.* (2017) found that IR is still not consistently regarded as a natural part of the business process, stakeholder involvement is limited, and guidelines for its preparation are considered to be a disclosure checklist. Furthermore, they noted that IR preparers themselves still do not believe that IR is taken seriously by investors, thus limiting the linkage between sustainability performance and IR. Based on interviews conducted by Chaidali and Jones (2017) with several IR preparers, the credibility of a single report is still doubted by the preparers themselves and it seems that they are not sure of the benefits or beneficiaries of IR. These preparers reported problems stemming from a lack of adequate and clear guidance, the high costs of the preparation, format and length of reports which they believed could undermine IR's credibility.

4.3.2 Integrated reporting publication has a value relevance because the information in the integrated reporting could reinforce the importance of accounting information. The second hypothesis stated that the publication of IR indirectly modifies the relevance of the financial variables in the form of BVS and EPS. The results of this study support this hypothesis. The results of our study indicated that the publication of IR is able to moderate the value-relevance of financial information through earnings per share, but not for book value. This is consistent with (Cortesi and Vena, 2019) that IR is able to increase company disclosure and reduce information asymmetry as well as improve the quality of reported earnings per share. This is consistent with Chiang *et al.*, 2017 that good corporate governance tends to encourage a greater value relevance on earnings than on book value, although their study does not focus on aspects of corporate governance mechanisms. Corporate reporting is one of a company's communication methods for all stakeholders. The dramatic change in corporate reporting has led to full communication about non-financial aspects to complement the financial information so that stakeholders (especially investors) are able to assess the company's economic achievements, competitive advantage and value creation.

4.4 Additional analysis

We used the stock prices four months after the year-end reporting date to test for value relevance. To overcome the subjectivity of this stock price selection and to test the reliability of the results, we repeated the analysis with the robustness test as an additional analysis using stock prices one month and three months after the end of the financial year (Table 8). The result was consistent with the primary test that capital market investors value SR more when making investment decisions than IR. However, the robustness test showed different results for the second hypothesis, that IR publications have a higher relevance when used together with accounting information in the form of book value per share, but not for earnings per share. These differing results imply that the investor continues to consider that financial information is important and that this financial information will change his or her decision when used together with the non-financial information, contained in both IR and SR.

5. Conclusion

This study aimed to investigate the value-relevance of SR and IR, to find which is higher. In addition, this study also examined whether the non-financial information contained in the SR/IR was able to moderate the financial information or not. The results showed that SR has a higher value-relevance than IR and IR publication has a value relevance because the information in the IR could reinforce the importance of accounting information. Although IR is considered a revolution from AR, its existence is considered less relevant for capital

	A Month After Reporting Period			Three Months After Reporting Period		
	Coeff.	z-stat	p-value	Coeff.	z-stat	p-value
Constant	−36.69	−2.03	0.043	−29.66	−1.30	0.193
BVS	0.27	19.69	0.000***	0.27	15.16	0.000***
EPS	0.21	1.18	0.237	0.19	0.83	0.405
IRSR	−18.47	−3.12	0.002***	−20.90	−2.80	0.005***
IRSR*BVS	0.73	8.04	0.000***	1.19	10.41	0.000***
IRSR*EPS	−3.65	−9.44	0.000***	−6.05	−12.42	0.000***
DER	−0.43	−1.66	0.097*	−0.11	−0.34	0.737
ROE	0.07	0.92	0.359	0.10	1.10	0.273
CFO	5.47	0.61	0.539	7.29	0.65	0.515
BTM	−0.66	−3.74	0.000***	−1.02	−4.60	0.000***
Country	−5.21	−0.75	0.451	−3.46	−0.40	0.691
Year	0.37	0.07	0.947	−2.03	−0.29	0.769

Notes: ***Significant at 1%. *significant at 10%. Abbreviations: MVE = market value of equity; BVS = book value per share; EPS = earnings per share; LnTA = natural logarithm of total assets; IRSR = dummy variable of IR and SR; DER = debt-to-equity ratio; ROE = return on equity; CFO = operating cash flow/total asset; BTM = book-to-market ratio

Table 8. Generalized least squares Regression of Sustainability/ Integrated Reporting to Market Value of Equity (A Month and Three Months After Reporting Period)

market investors than SR. The focus of IR is viewed as being too narrow, that is, it focuses more on financial capital providers, and therefore it is not balanced with other stakeholders.

This study has practical and theoretical implications. As a practical implication, although IR aims to improve the quality of the information available to capital providers, it is still unclear how IR information directly affects investment decisions. This is shown in the results of this study, which provide evidence that SR is considered by investors to be more relevant to their investment decisions. Policymakers such as standard-setters (such as IIRC and others) can seek to improve IR's content toward information that is needed by investors. This is understandable because IR is relatively new, in such a way that the standard setters need to conduct campaigns more actively, especially those affecting the university curriculum, to introduce the benefits of IR to investors in particular and stakeholders in general.

For managers, the results of this study provide evidence that corporate reporting in the form of SR is more relevant for the investors' decision-making. However, the results also provide evidence that corporate reporting in the form of IR is indirectly relevant for investors. This has implications for the company's management that has not published IR yet, as they need to learn about the benefits of IR to the stakeholders. Management may need to adapt and go through a learning process to direct their resources toward the integrated thinking that IR brings.

The results of this study also reinforce the value-enhancing theory in terms of what specific information is needed by investors. This theory can be brought by researchers to examine various kinds of information that are thought to have relevance for the investors' decision-making. Specifically, the results of this study support the notion that IR indirectly provides value relevance when it is used in conjunction with the accounting information.

Our study has several limitations. First, our sample is only from the early adopters of IR, which were countries in Europe and South Africa, so it is expected that future studies will use a sample from all the IR reporters, including on other continents. Second, SR and IR are proxied by dummy variables. Future research is expected to use a stronger proxy, for instance, the important values contained in the two types of reporting. Our findings question

the credibility of IR with investors and there is an argument that IR is considered to limit the relationship between sustainability performance and IR. Therefore, future research needs to investigate empirically to accommodate this issue.

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Sustainability reporting or integrated reporting: Which one is valuable for investors?

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