Integrated reporting and the effect on corporate reporting quality

Abstract

This study examines the relationship between integrated reporting and corporate reporting quality. In order to do so, a distinction has been made between sustainability reporting quality and financial reporting quality to represent corporate reporting quality. The results of this study show that the adoption of integrated reporting does not have a significant effect on sustainability reporting quality, financial reporting quality or corporate reporting quality as a whole. When assessing whether legitimizing and signalling theory as an incentive for voluntary disclosure, the results show that the quality of information is significantly higher for superior performing firms in comparison to poor performing firms when looking at sustainability reporting quality, financial reporting quality and corporate reporting quality. This indicates that legitimizing and signalling theory both provide an explanation for the adoption of integrated reporting

Master's thesis

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Contents

1. Introduction

In recent years we have learned a lot about how firms operate and how they create value for the firm, and for society as a whole. This is because, since the financial scandals of firms like Enron and Ahold, there has been an increased focus on the need for transparent reporting by the public. Public trust in firms declined which led to the increased demand for transparency from firms in what they do and how they do it. It seems that society is questioning the traditional reason for a firms' existence, which is to create value. But in today's modern society, this reason does not seem enough anymore to justify a firms practices and actions, because this narrow focus does not comprise the way a firm adds value for people, the environment or society as a whole (Gray, 2006). The focus is shifting from the needs of the shareholders to the needs of the stakeholders. This resulted in new ways of reporting information, one of which was triple bottom line reporting. This included the performance of a firm from a social, environmental and economical perspective (Elkington, 1997). This evolved into sustainability reporting, where the guidelines of the Global Reporting Initiative are the leading practice.

However, these new reporting trends have led to different kinds of reports being issued. There are many sources where stakeholders need to gather their information in order to asses a firms' performance. This resulted in a segregated reporting landscape, and have made it fragmented and confusing (Flower, 2015). Integrated reporting attempts to solve this problem, by creating a single document which contains "a comprehensive description of the firm's activities, giving investors an in-depth and holistic view of both its value creation process and each factor contributing to the final performance" (Cortesi & Vena, 2019, p. 745) Since the adoption of integrated reporting is on a voluntary basis and assurance for sustainability information is not mandatory, the quality of reports can differ. Therefore, the International Integrated Reporting Council (IIRC) has created the International Integrated Reporting Framework because they believe integrated reporting "promotes a more cohesive and efficient approach to corporate reporting and aims to improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital" (IIRC, 2013, p. 4).

The impact of Integrated Reporting on the relevance of financial reporting is a topic of debate. Eccles & Saltzman (2011) argue that for firms whom do not take their impact on their external environment into account, it is questionable whether they fairly present their financial performance in the financial statements. This is due to the fact that the financial statements do not include information on non-financial performance that can also determine a firms long term

financial picture. This notion is supported by Cho, Lee, & Pfeiffer (2013), who state that more timely and integrated reporting may lead to less information asssymetry. Eccles and Serafeim (2011) label integrated reporting as the most effective way to communicate a firms performance in implementing a sustainable strategy, which is defined as a strategy that creates value over the long term, while meeting the needs of all stakeholders. Middleton (2015) performed a study on the value relevance of environmental performance and found that environmental performance is value relevant and therefore recommend that environmental performance should be included as part of financial reporting to give a holistic view of the overall performance.

According to Solomon and Maroun (2012), it is yet an open empirical question whether the relevance of financial information is increased in an integrated format. Cortesi & Vena (2019) state that despite an increased interest of academics, research into the effects of integrated reporting remain mostly confined to a mandatory adoption context, such as in South Africa where they advocate an 'apply or explain' basis. In other countries, however, the adoption of integrated reporting is on a voluntary basis and there is little research in this setting. In addition, Cortesi & Vena (2019) state that literature provides no insight whether disclosure quality increases due to the voluntary issuing of an integrated report and call for more research on the subject. Martinez Ferrero et al. (2015) study the relationship between the quality of financial information and the quality of corporate social responsibility information. They used three different proxies for financial reporting quality: the level of earnings management, accounting conservatism and accruals quality. Their results indicate that there is a positive relationship between the quality of financial information and sustainability disclosures for every measure of financial reporting quality. It is interesting to see whether the quality of this information increases with the adoption of integrated reporting, since it aims to reconcile the worlds of financial reporting and sustainability reporting.

The aim of this study is to provide new insights about whether the adoption of integrated reporting has an effect on the quality of both financial reporting and sustainability reporting. The sample used to test the proposed hypotheses consist of 35 listed (AEX) non-financial firms from the Netherlands for the period of 2008-2017, covering a time span of ten years. Information was obtained from the Thomson one Eikon Asset4 database, the database from the Dutch ministry of Economic affairs and some information was gathered manually. The data will be analysed using a panel data regression analysis.

The scientific contribution of this study will be threefold. Firstly, this research contributes to the literature by adhering to the call of Cortesi & Vena (2019) for more research on the effect of the

adoption of integrated reporting in a voluntary adoption context. This study does so by examining the relationship between Integrated Reporting and disclosure quality in the Netherlands. The types of disclosure that will be used are based on the definitions given by Farvaque, Refait-Alexandre & Saïdane (2011), who make the distinction between financial disclosures and non-financial disclosures. Financial disclosures are the financial reports, whose contents are defined by accounting standards. The second type of disclosures are non-financial disclosures. This includes information about the firms social and environmental responsibility. Therefore, disclosure quality will be analysed by looking at both financial reporting quality and sustainability reporting quality. Secondly, this study builds on the research by Martinez-Ferrero et al. (2015), who focused on the relation between the quality of disclosure of CSR reports and the financial reporting quality separately. This study analyses this relationship indirectly, since an integrated report consists of both financial and non-financial information. Thirdly, de Villiers et al (2017) present a literature overview about integrated reporting and present an agenda for future research. In their study they state that the process of preparing an integrated report will have an effect on decision making of managers by putting the focus more on long term sustainability and less on the short term. Therefore, they propose to study whether integrated reporting adoption is associated with lower levels of accruals-based earnings management.

The practical contributions of this research are twofold. Firstly, it could give firms insight into whether Integrated Reporting is an effective reporting tool. It can provide a basis to determine whether disclosure quality can be enhanced by the adoption of Integrated Reporting. Secondly, the information provided in this research can help reduce information asymmetry for the users of the integrated report, by establishing if the integrated report enhances the disclosure quality.

The remainder of this paper is structured as follows. In chapter two there will be an overview of the available literature and hypotheses will be developed. The research design and sample will be discussed in chapter three. Chapter four will contain the results of the empirical analysis. Finally, in chapter five the results will be discussed and conclusions will be drawn.

2. Background & hypotheses

2.1 Agency theory and voluntary disclosure theory

With the rise of integrated reporting, it is important to have an understanding about why firms choose to adopt such a reporting format. Since traditional reporting practices do not suffice anymore, the call for more transparent reporting is becoming more prominent, and the focus is shifting to a more shareholder oriented view. Therefore, information about sustainability, corporate social responsibility (CSR) and economic, social and governance (ESG) performance are increasingly important concepts. The disclosure of this information is in most cases on a voluntary basis, and therefore there are different views as to why firms would adopt non-financial disclosure, and what their motives are. The underlying concepts are agency theory and voluntary disclosure theory, which consists of two different reasons why firms choose to disclose non-financial information: legitimacy theory and signalling theory (Dawkins & Ngunjiri, 2008). These latter two theories are complementary and provide a basis to understand why firms disclose non-financial information (Hummel & Schlick, 2016).

Classical agency theory makes the distinction between the principals, which are the shareholders/stakeholders, and the agents, which is the management of a firm (Makar et al.,1996). An assumption is that agents will only serve their own interests and conflicts of interests will arise since the goals of the principals do not always align with the goals of the agent. Pistoni et al. (2018) also recognize this disalignment and state that managers could be inclined to reveal less information since more disclosures can give stakeholders more chances to discipline them. This could lead to information asymmetry, since managers consciously withold information. Information asymmetry exists when the principals have less information than the agents, and the agents attempt to influence the decision making of the principals. This is the same for voluntary disclosure, where the firms try to conform to societal expectations and decrease information asymmetry by disclosing more information. García-Sánchez & Noguera-Gámez (2017) study whether integrated reporting is able to reduce information asymmetry and find that the disclosure of an integrated report actually reduces information asymmetry and enhances the information of investors.

The disclosure of non-financial information is mostly explained by using legitimacy theory to substantiate the reason for this disclosure (Martínez-Ferrero et al., 2015). Legitimacy theory conceives the firm as a social contract, combining social and business interests. Sustainability practices are carried out in order to meet the expectations of both society and stakeholders and, as a result, ensure growth (Deegan, 2000). Legitimacy theory suggests that firms communicate

information to stakeholders in order to conform to societal expectations (Ashford & Gibbs, 1990). This is supported by O'Donovan (2002), who argues that legitimacy theory is based on the goal of operating satisfactorily, within the boundaries that are expected to be socially acceptable. Suchman (1995) gives the following definition: "Legitimacy is a generalized perception of assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions". In this regard, sustainability disclosure is used to provide favorable information about a firms contribution to society and the environment by placing emphasis on their positive actions and mitigating their negative ones (Lindblom, 1994). Therefore, this theory suggests that poor performing firms use disclosure as a legitimation tactic to conceal poor performance and influence public perception (Deegan, 2002).

Signalling theory on the other hand suggests that firms disclose sustainability information to inform the market that their performance is superior (Healy & Palepu, 2001). The fundamental concept is that signalling reduces information asymmetry between parties (Spence, 2002). Kirmani & Rao (2000) provide an example to illustrate the concept of signalling. In their example, there is a high quality firm and a low quality firm. These firms know the quality they produce, but the public however, does not. Therefore, there is information asymmetry. In order for the high quality firm to differentiate itself, it provides voluntary disclosure about the performance and signals its superiority. In order to differentiate themselves, firms with good corporate behaviour will issue non-financial reports to signal this information to stakeholders (Gugerty, 2009). This is based on the notion that stakeholders will assume the worst when information is not disclosed, due to information asymmetry (Milgrom, 1981). Every form of voluntary disclosure is based on the notion that managers want to disclose such information because stakeholders will react favourably to this information (Mahoney, 2012). According to KPMG international (2008), brand enhancement and reputation are the most important factors to issue these reports. In this line of reasoning, firms have an incentive to disclose sustainability information to let stakeholders know how well they are doing, because they will benefit from this issuance.

2.2   Background of integrated reporting
In order to get a grasp of what integrated reporting is, it is useful to understand how it came into existence as a tool for corporate reporting. Dragu & Tudor-Tiron (2013) identify three stages of corporate reporting literature in their study: non-financial reporting initiatives, the sustainability era and the integrated reporting revolution. The non-financial reporting initiatives span from 2001 to

2006, when various non-financial reporting regulations were issued. The most famous reporting initiative is the Global Reporting Initiative as a guideline for sustainability disclosure. In 2007 firms increasingly started reporting sustainability information. 2010 marked the debut of integrated reporting literature, as a response to the financial crisis and the changing perspective with regard to extra-financial information. The crisis led to the need for more information by stakeholders, since it could be considered that the financial crisis was a result of a lack of transparent reporting. In order to meet this increased demand for disclosure, the IIRC proposed a reporting model based on the following principles: strategic focus and future orientation, connectivity of information, stakeholder relationships, materiality, conciseness, reliability and completeness, and consistency and comparability (Romero et al., 2019; IIRC, 2013). The first discussion paper on integrated reporting as presented in 2010 by the IIRC aimed to build on the "foundations of financial, management commentary, governance and remuneration, and sustainability reporting in a way that reflects their interdependence" (IIRC, 2011, p. 1). The IIRC published the integrated reporting framework in 2013, along with the guiding principles on how an integrated report should be created and what it should entail. In 2014, the IIRC stated that we need integrated reporting because "investors need to understand how the strategy being pursued creates value over time" (Dumay et al., 2016 p.167). A survey performed by KPMG showed that fourteen percent of both the largest 250 global companies by revenue, based on the fortune 500 ranking, and the top 100 companies in 49 countries, label their report as an integrated report in 2017. This rate is growing slowly but steadily (KPMG, 2017).

With the creation of the Integrated Reporting Framework in 2013 by the IIRC, came the following definition of what an integrated report is: "An integrated report is a concise communication about how an organization's strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term" (IIRC, 2013, p.7). The focus of the integrated report has shifted from sustainability and a stakeholder perspective, to an invester oriented focus since the primary purpose of an integrated report is to explain to providers of financial capital how value will be created over time. It aims to provide information about the external environment, the resources and relations it uses and affects, which are called 'the capitals', and how value is created. The framework provides guiding principles to help preparers with the preparation and presentation of the integrated report and in addition to the guiding principles, the framework presents eight content elements that should be included in the report. The capitals, the value creation process, the fundamental concepts and the guiding principles of the integrated reporting framework are presented in appendix 1.

2.3   Literature review
2.3.1   Integrated reporting and disclosure quality

The integrated report is different from stand-alone financial statements or sustainability reports. The integrated report is supposed to combine and integrate financial, economic, governance and social aspects of a company (Rupley, Brown, & Marshall, 2017). Because of the struggle of investors and company boards to get a true picture of business value and how management is adding value, the trend of integrated reporting is hailed as one of the ways to close the gap between investor needs and reporting (KPMG, 2013). In the view of Eccles & Saltzman (2011), there are three main advantages of adopting integrated reporting. The first reason is because of internal benefits, such as improved decision making regarding resource allocation, increased engagement with stakeholders and reduced reputational risk. The second reason is because of external market benefits, such as helping investors who seek environmental, social and governance information. The third reason is the management of regulatory risk. Examples include being able to prepare for possible global regulation or to have influence whe frameworks or standards are being developed.

When it comes to the quality of the integrated report, Mervelskemper & Streit (2017) conclude that integrated reporting is superior to stand-alone Environmental, Social and Governance (ESG) reporting when it comes to value relevance. Research by Lee & Yeo (2015) support this since they found a positive association between integrated reporting scores and firm valuation for firms that are listed in South Africa. Furthermore, they suggest that integrated reporting mitigates information assymetries between insiders and external actors because it reduces the information processing costs for firms in complex operating environments. Barth et al. (2008) study whether integrated reporting leads to higher quality of information. Their findings suggest that accounting information quality is higher with integrated reporting, in comparison to stand-alone reports. Therefore their study confirms that integrated reporting fullfills the objective of improving external information quality. Eccles and Krzus (2014) state that integrated reporting is bound to improve transparancy, since it sheds more light on the factors that contribute to creating value in a firm. Another study was performed by Cortesi & Vena (2019), who studied whether integrated reporting was able to enhance corporate disclosure quality and reduce information assymetry. They found that integrated reporting reduces information assymetry which concequently led share prices of adopting companies to trade at a premium. This, in turn, indicates that a higher quality of disclosure can be traced, due to the increase in market value of the adopting firm. To go even more in-depth, research about the relationship between financial reporting quality and voluntary sustainability

disclosure shows that there is a positive relation between the two, based on three measures for financial reporting quality (earnings management, accounting conservatism and accruals quality) (Martínez-Ferrero et al., 2015).

On the other hand, some authors have some critical remarks regarding integrated reporting. Flower (2015) argues that the integrated report will not become the primary reporting format, but instead will be just another addition to the cluttered reporting landscape. Additionally, Pavlopoulos et al. (2017) examine integrated reporting disclosure quality and their results imply that financial reports that are redacted based on integrated reporting principles show less earnings quality, which measures financial reporting quality. Pistoni, Songini & Bavagnoli (2018) are also sceptic when it comes to the adoption of integrated reporting. By developing a scoring model and an integrated report scoreboard, they find that the reporting quality was low among the 116 firms that used the integrated reporting framework. Even though firms follow the integrated reporting framework, more emphasis is on form rather than its content.

2.3.2   The relation between sustainability reporting quality and financial reporting quality

In order to understand the effect of integrated reporting on both financial reporting quality and sustainability reporting quality, their reciprocal connection should be considered. Since integrated reporting aims at providing and interconnecting both financial and non-financial information, a certain trade-off could be present with the adoption of integrated reporting. Previous studies have analysed the relation between sustainability practices or corporate social responsibility practices (as a proxy for sustainability reporting quality) and earnings management (as a proxy for financial reporting quality), and there are mixed findings. Salewski & Zulch (2014) find that the higher the corporate social responsibility score of a company is, the more earnings management is conducted. Therefore, the financial reporting quality is lower for firms with a high corporate social responsibility score. Prior et al (2008) investigate the connection between corporate social responsibility and earnings management, measured using the modified Jones model. They find a positive relationship between the level of earnings management and the level of corporate social responsibility, arguing that better corporate social responsibility is used to disguise earnings management practices. This could be the case when managers choose to invest in corporate social responsibility as a managerial entrenchment strategy. Putting up a socially friendly image is then used as a diversion to redirect focus from the damaging earnings management strategies that are employed. Chih et al (2008) propose the same relation, stating that an increase in corporate social responsibility increases

earnings management practices because it intensifies the agency problem. This is based on the concept of the multiple objectives hypothesis by Jensen (2001). This hypothesis entails that when managers pursue multiple goals and try to serve all stakeholders, managers will be left unaccountable and there is no clear criteria on which their performance can be based. Thus, managers are able to redirect resources in a firm to pursue their own interests instead of the interests of the firm or society. However, Chih et al (2008) found that the relation between earnings management and corporate social responsibility depends on the type of earnings management. Firms tend to perform less earnings smoothing and display less interest in loss avoidance, but they are prone to more earnings aggressiveness.

On the other hand, Choi & Pae (2011) studied the relationship between business ethics and financial reporting quality. They found that firms carry out less earnings management practices when they have a high level of ethical commitment. These firms are also less likely to abuse accounting standards as a result of this high level of ethical commitment. Carrol (1979) includes ethics as one of the most important factors of corporate social responsibility. So when there is a high level of ethical commitment, it is likely that a firm finds corporate social responsibility important and it has high financial reporting quality. This notion is supported by Verrechia (1990), who concluded that firms with a higher quality of financial information are more inclined to report information about the corporate social responsibility performance of a firm. Kim et al. (2011) have also studied whether there is a relation between corporate social responsibility practices and earnings management practices. They found that there is a negative relationship between corporate social responsibility performance and earnings management through discretionary accruals, which indicates that a higher level of sustainability reporting quality leads to better financial reporting quality.

2.4   Hypotheses development

Since this study established that disclosure quality can be analysed by looking separately at both sustainability reporting quality and financial reporting quality (Farvaque et al., 2011), this study tests if there is a relation between integrated reporting and the concepts of: sustainability reporting quality and financial reporting quality. Based on the analyses of prior literature about integrated reporting, there seem to be mixed findings. Cortesi & Vena find higher disclosure quality with integrated reporting, as do Eccles & Krzus (2014). However, Pistoni et al. (2017) find that reporting quality is low with integrated reporting. In addition, Salewski & Zulch (2014) find that more

corporate social responsibility leads to more earnings management. Chih et al. (2008) state the same relation. Kim et al. (2011) on the other hand, find that a higher level of corporate social responsibility lead to higher financial reporting quality. Overall, there seems to be more support for the positive impact integrated reporting has on reporting quality. Therefore, this study proposes the following hypotheses:

Hypothesis 1: The adoption of integrated reporting positively influences the sustainability reporting quality

Hypothesis 2: The adoption of integrated reporting positively influences the financial reporting quality

Hypothesis 3: The adoption of integrated reporting positively influences the corporate reporting quality

Based on voluntary disclosure theory, this study proposes an additional set of hypotheses to test whether the adoption of integrated reporting has the same effect for firms that report based on the theoretical incentives of legitimizing and signalling. This will be tested by dividing the total sample into two subsamples, based on the return of assets of a firm as a proxy for performance. The 50 percent lowest scoring firms will be the subsample of poor performing firms, while the 50 percent highest scoring firms will be the subsample for superior performing firms. Based on legitimizing theory (Deegan, 2000) and signalling theory (Healy & Palepu, 2001) it is expected that both poor performing firms, as well as superior performing firms use a form of sustainability reporting or integrated reporting. However, superior performing firms use this reporting tool to exhibit superior performance, and are therefore expected to have higher corporate reporting quality in comparison to poor performing firms, who are expected to use this reporting tool as a means of concealing poor performance. The effects of the adoption of integrated reporting on sustainability reporting quality and financial reporting quality will be evaluated per subsample. Based on voluntary disclosure theory, this study proposed the following additional hypotheses:

Hypothesis 4a: The adoption of integrated reporting positively influences the sustainability reporting quality of poor performing firms

Hypothesis 4b: The adoption of integrated reporting positively influences the sustainability reporting quality of superior performing firms

Hypothesis 4c: The sustainability reporting quality differs between poor performing and superior performing firms

Hypothesis 5a: The adoption of integrated reporting positively influences the financial reporting quality of poor performing firms

Hypothesis 5b: The adoption of integrated reporting positively influences the financial reporting quality of superior performing firms

Hypothesis 5c: The financial reporting quality differs between poor performing and superior performing firms

Hypothesis 6a: The adoption of integrated reporting positively influences the corporate reporting quality of poor performing firms

Hypothesis 6b: The adoption of integrated reporting positively influences the corporate reporting quality of superior performing firms

Hypothesis 6c: The corporate reporting quality differs between poor performing and superior performing firms

3. Research method

3.1 Sample

The sample used to test the proposed hypotheses consist of 35 listed Dutch (AEX) non-financial firms for the period of 2008-2017. This resulted in 284 observations, when taking missing values into account. Key firm level information was obtained from the Thomson one Eikon Asset4 database. Information on whether a firm issues an integrated report was gathered manually, by assessing annual reports as published by the firms that are in the sample. The information about the transparency benchmark was gathered using the database from the Dutch ministry of economic affairs and climate policy.

3.2 Variables

3.2.1 Dependent variables

Sustainability reporting quality

This study uses the transparancy benchmark, as created by the Dutch ministry of economic affairs and climate policy, in cooperation with the Dutch Institute of Chartered Accountants (NBA), to measure the quality of sustainability reporting. The transparancy benchmark was created in 2004 because of the increasing interest in transparancy from companies regarding their performance on corporate social responsibility. It aims to provide an opinion about the content and quality of

external reports regarding corporate responsibility issues. The transparancy benchmark does not provide an opinion on the actual performance of the firm however. It measures the transparancy in the published reports of firms and gives the firms a score between zero and 200, based on several criteria. The principal qualitative requirements for reporting in general are comprehensability, relevance, reliability and comparability. The reports are assessed based on two categories: content related and quality related. Both categories can get a score of up to 100 points, in total adding up to 200 points. Figure 1 presents the criteria and the amount of points that can be earned per subject.

Content-oriented Framework of Standards							100
1. Company and Business model	33	2. Policy and Results			34	3. Management approach	33
1A. Profile and value chain	10	2A. Policy and (self-imposed) obligations			5	3A. Governance and remuneration	10
1B. Proces of value chain	10	2B. Objectives			5	3B. Steering and Control	8
1C. Analysis f the operating context (including risks and opportunities)	8	2C. Economic aspects of business practice — 8	2D. Environmental aspects business practice — 8	2E. Social aspects of business practice — 8		3C. Future expectations	5
1D. Strategic context	5					3D. Reporting criteria	10

Quality-oriented Framework of Standards							100
4. Relevance	20	5. Claerness	20	6. Reliability	20	7. Responsiveness 20	8. Coherence 20
Materiality	8	Claerness	6	Accuracy, Completeness and true view	17	Focus on stakeholders 13	Strategic focus 5
Scope and demarcation	6	Conciseness	4	Prudence	3	Contribution to social debate 2	Contextual coherence 6
Timeliness	6	Insightfull	7			Audacity 5	Integration 6
		Accesibility	3				Comparability 3

Figure 1 Assessment criteria Transparency Benchmark (Ministry of Economic affairs and Climate Policy, 2017, p.12)

The content should provide information about the company and business model, the policy and results and the management approach. The quality is measured by five indicators: relevance, clearness, reliability, responsiveness and coherence. The way these scores are comprised is a process including six steps. The first step in the process is the self assesment. Firms assess their own reports based on the criteria provided by the transparancy benchmark. Firms can do so by filling in a questionnaire. Secondly, the self assessment will be reviewed by a team of independent researchers, to remedy interpretation differences. If a firm has chosen not to fill in the self assessment a provisional score has been provided by the team of independent researchers, based on publicly available documents. Thirdly, firms can comment on the provided score by the independent team per criteria, and state why they do not agree on the score. The comments will be reviewed and an explanation will be provided to the firms. After this process, the final score will be communicated to the participants. Fourthly, after the final score is provided, some firms still disagree with the score that was provided. A panel of experts will then decide the final score in case of a disagreement between a firm and the reviewing team. Fifthly, the 21 highest scoring firms were separately evalueated by the panel of experts. Sixthly, the jury determines who scores the best with

regard to transparancy in corporate repsonsibility reporting. (Ministry of Economic affairs and Climate Policy, 2017)

Financial reporting quality

The measure to define financial reporting quality is the degree of earnings management, since earnings management is considered to be the inverse of financial reporting quality (Dechow & Dichev, 2002). Earnings management is measured using accruals, specifically the absolute discretionary accruals. As Choi et al. (2018) describe it, "discretionary accruals are the practice of using tricks to misrepresent or reduce transparency of the financial reports without involving the changes of cash flows in the future". Dechow et al. (2010) state that there is no universally accepted measure for earnings management, but this study applies this definition because of two reasons. Firstly, by using absolute discretionary accruals, there is the advantage that it can capture the net effects of both income increasing and income decreasing reporting choices (Beuselinck et al., 2018). Secondly, there are several influential studies that use absolute discretionary accruals as a proxy for earnings management (Warfield et al., 1995; Dechow and Dichev, 2002; Klein, 2002; Beuselinck et al., 2018).

In this study, the modified Jones model (Dechow et al. , 1995) is used. In order to determine the discretionary accruals, the total accruals have to be calculated. Total accrual are defined as:

$$TA_{it} = NI_{it} - COA_{it} \tag{1}$$

Where TA are the total accruals; NI is the Net Income of a firm and COA is the cash from operating activities. (Braam et al., 2015)

Furthermore, the discretionary accruals need to be seperated from the non-discretionary acrruals by using the modified Jones model (Dechow et al. 1995):

$$\frac{TAit}{A_{i,t-1}} = \alpha_{1,t}\left(\frac{1}{A_{i,t-1}}\right) + \alpha_{2,t}\left(\frac{\Delta(SALES - AR)_{it}}{A_{i,t-1}}\right) + \alpha_{1,t}\left(\frac{PPE_{it}}{A_{i,t-1}}\right) + \varepsilon_t \tag{2}$$

Where $A_{i,t-1}$ are the lagged total assets; PPE is the property, plant and equipment; ΔSales is the change in sales; ΔAR is the accounts receivable, and the other variables are as defined. The non-discretionary accrual adjustments are $\alpha_{1,t}\left(\frac{1}{A_{i,t-1}}\right) + \alpha_{2,t}\left(\frac{\Delta(SALES-AR)_{it}}{A_{i,t-1}}\right) + \alpha_{1,t}\left(\frac{PPE_{it}}{A_{i,t-1}}\right)$ and ε_t is equal to the discretionary accrual adjustments. The non-discretionary accrual adjustments are

calculated by performing an Ordinary Least Squares (OLS) regression and replacing the coefficient with the obtained values. The discretionary accruals are the residual.

Corporate reporting quality

Corporate reporting quality will be measured by combining the sustainability reporting quality and the financial reporting quality. The variables of absolute discretionary accruals and of the transparency benchmark cannot be combined in the form that they are presented. By standardizing the variables, it is possible to create a comparable value. Standardization can be performed by subtracting the mean from every separate observation and dividing it by the standard deviation of a variable. The standardized value of financial reporting quality will be divided by minus one in order to inverse the values, since high absolute discretionary accruals are equal to lower financial reporting quality. By inversing the values, financial reporting quality and sustainability reporting quality can be added up. The variables will then be added and divided by two, to get an overall score for corporate reporting quality. This new score will represent a Z-score, and indicates how many standard deviations an observation differs from the mean.

3.2.2   Independent variable

The first independent variable used to analyse the effect of the adoption of integrated reporting will be captured by a dummy variable, with a value of 0 if the firm does not use integrated reporting and a value of 1 if it did publish an integrated report. This is in line with prior research (García-Sánchez & Noguera-Gámez, 2017; Frias-Aceituno et al., 2014). This information was gathered manually by looking at the year end reports of every company. A report is perceived as an integrated report if it adheres to the following criteria: (1) if it is stated in the report that it follows the principles of the International Integrated Reporting Framework as presented by the IIRC, (2) if the term 'integrated' is specifically mentioned in the title of the report and (3) if there is a specific section that has the term 'sustainability' or 'corporate social responsibility' in the title of a subsection of the report. Firms that produce a separate corporate social responsibility report or sustainability report are by definition not reporting based on the integrated reporting principles.

3.2.3   Control variables

In order to control for various factors that could have an effect on sustainability reporting quality and financial reporting quality several control variables are included in this research. Following prior

research (Choi et al., 2018; Roychowdhury, 2006; Wang, Cao, & Ye, 2018) this study incorporates firm characteristics that have a known effect on a firms discretionary accruals.

The first control variable is firm size, which is measured as the total assets of a firm. Prior literature suggests that there is a positive relation between company size and financial reporting quality (e.g. Beuselinck et al., 2014; Braam et al., 2015; Choi et al., 2018; Kim et al., 2012; Prior et al., 2008). Brammer & Pavelin (2006) show that there is a positive relation between voluntary sustainability disclosure and firm size. The reason firm size has a positive effect is because large firms tends to be more visible for the public, and are more subject to pressure from external parties. Dechow & Dichev (2002) state that larger companies have more stable and predictable operations than small companies, and are therefore expected to have better corporate reporting quality.

To measure profitability the accounting measure of Return On Assets (ROA) is used. Based on the study by Dechow et al (1995), profitability is expected to be correlated with discretionary accruals. Firms with higher earnings are expected to have lower discretionary accruals.

Growth opportunities are included in the analysis in the form of the market-to-book value ratio. Cohen & Zarowin (2010) do not find a significant relation between market to book value and earnings management activities. However, Braam et al. (2015) do find a positive significant relationship between growth opportunities and discretionary accruals, as do Choi et al. (2018). Following the research of Braam et al. (2015), a positive relation is expected between growth opportunities and the dependent variable.

Leverage is calculated as the debt-to-equity ratio. Defond & Jiambalvo (1994) state that a higher debt to equity ratio leads to a higher likelihood for managers to use accounting procedures to manipulate earnings.

In addition, this study also controls for industry and year-fixed effects.

Table 1 summarizes the definitions of the variables used in the regression analysis.

Variable name	Definition	Source
abs_DACC	The absolute discretionary accruals, calculated using the Modified Jones Model (Dechow et al., 1995)	ASSET4
TB	Sustainability reporting quality, measured as the transparency benchmark score, ranging from zero to 200	Dutch ministry of economic affairs
CRQ	Corporate reporting quality, calculated by standardizing abs_DACC and TB. The sum of these standardized variables is divided by two.	Based on the combination of

		abs_DACC and TB
IR	Dummy variable with a value of 0 if a firm does not publish an integrated report, or a value of 1 if it does	Year-end reports
SIZE	Firm size measured as total assets	ASSET4
ROA	Return on assets as proxy for profitability, measured as net income divided by total assets	ASSET4
MB	Market to book value ratio as proxy for growth opportunities, measured as the market value of the firm divided by the book value of the firm	ASSET4
LEV	Leverage, measured as total liabilities divided by total equity	ASSET4
IND	Industry, included as a dummy variable for nine industries	ASSET4
YEAR	Year, included as a dummy variable to control for time-fixed effects	ASSET4

Table 1: Variable description

3.3 Regression model

In order to test the hypotheses, this study uses the following two panel data regression models.

Formula 3 presents the functional form of the panel data regression model with sustainability reporting quality as the dependent variable:

$$TB_{it} = \beta0 + \beta1\,IR_{it} + \beta2\,SIZE_{it} + \beta3\,ROA_{it} + \beta4\,MB_{it} + \beta5\,LEV_i + \beta6\,IND_i + \beta7\,YEAR_{it} \tag{3}$$

Formula 4 presents the functional form of the panel data regression model with financial reporting quality as the dependent variable:

$$abs\_DACC_{it} = \beta0 + \beta1\,IR_{it} + \beta2\,SIZE_{it} + \beta3\,ROA_{it} + \beta4\,MB_{it} + \beta5\,LEV_{it} + \beta6IND_i + \beta7\,YEAR_{it} \tag{4}$$

Formula 5 presents the functional form of the panel data regression model with corporate reporting quality as the dependent variable:

$$CRQ_{it} = \beta0 + \beta1\,IR_{it} + \beta2\,SIZE_{it} + \beta3\,ROA_{it} + \beta4\,MB_{it} + \beta5\,LEV_{it} + \beta6IND_i + \beta7\,YEAR_{it} \tag{5}$$

4. Results

4.1   Descriptive statistics

In order to understand the data that is used in this study, the following tables with the descriptive statistics are presented. Table 2 shows the descriptive statistics for the overall sample and the subsamples of poor performing firms and well performing firms. The subsamples have been divided based on their profitability, measured as return on assets. All abbreviations used can be found in table 1 with the variable descriptions. The descriptive statistics per firm can be found in appendix 2.

Regarding the total sample, the absolute discretionary accruals have a mean of 0.050. The values of the absolute discretionary accruals are an indication of the level of earnings management, and can be compared between observations, but the value by itself cannot be interpreted separately. The firms in the sample have a mean score of 108.85 on the transparency benchmark, of a total score of 200. This means that the mean of the total sample is just above the average score that can be achieved on the benchmark. Integrated reporting has been adopted for 35 percent of the observations in the sample.

The subsample of poor performing firms, based on return on assets, shows that the absolute discretionary accruals have a mean of 0.056, indicating that on average poor performing firms have lower financial reporting quality. The average score on the transparency benchmark is 104.29 for this subsample, which is also lower than the overall sample. Integrated reporting has been adopted in 36 percent of the observations.

The subsample of superior performing firms, based on return on assets, shows that the average for absolute discretionary accruals is 0.043, which is lower than both the whole sample and the subsample of poor performing firms. This indicates that superior performing firms on average have a higher financial reporting quality in comparison to poor performing firms. The average score for the transparency benchmark is 113.63, which is again higher than both the whole sample and the subsample of poor performing firms, indicating that the sustainability reporting quality is on average higher for superior performing firms. The adoption rate of integrated reporting is however slightly lower, with an adoption rate of 34 percent.

| Variable | Total sample | | | Subsamples | | | | | |
| | | | | Poor performing firms | | | Superior performing firms | | |
	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.
CRQ	285	0.181307	0.7629563	146	-0.0646806	0.7940555	139	0.1051124	0.721503
abs_DACC	285	.0505314	.0690642	146	.0568922	.0683165	139	.0438503	.0694592
TB	285	108.85	64.29	146	104.29	65.71	139	113.63	62.63
IR	285	0.35	0.48	146	0.36	0.48	139	0.34	0.47
TA	285	34627616	80642771	146	50147098	102804157	139	18326577	41907745
ROA	285	5.16	5.95	146	1.06	4.50	139	9.46	3.90
MB	285	2.15	4.07	146	1.60	2.44	139	2.73	5.22
DE	285	0.78	1.93	146	0.76	2.23	139	0.79	1.56

Table 2 Descriptive statistics

Table 3 shows the descriptive statistics per industry. The mean of transparency benchmark is the highest in the industry 'health care', and the lowest in the industry 'technology'. The average absolute discretionary accruals are the lowest for the industry 'health care' and highest for 'technology'. This indicates that industry 'health care' has the highest financial- and sustainability reporting quality. This could be due to the public nature of the health care industry, and the service it provides. The adoption of integrated reporting is the highest in the 'health care' industry since it is adopted in all observations. In the industry 'consumer services' the adoption percentage is the lowest with only five percent of observations having used integrated reporting.

| Variable | Industry | | | | | | | | |
| | Oil and gas | | | Basic materials | | | Industrials | | |
	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.
CRQ	30	-.0935687	0.6400443	46	-.003858	.688993	65	-.0069481	.590194
abs_DACC	30	.060793	.0728957	46	.0335869	.034508	65	.057201	.0498468
TB	30	104.37	44.50	46	89.24	82.88	65	112.15	62.58
IR	30	0.40	0.50	46	0.46	0.50	65	0.48	0.50
TA	30	103128152	125692680	46	23035773	30722720	65	5953698	6317230
ROA	30	4.00	3.23	46	3.84	5.19	65	7.26	5.48
MB	30	1.80	0.83	46	1.49	0.79	65	2.68	7.58
DE	30	1.46	1.02	46	0.35	0.21	65	1.07	2.25

Variable	Industry							
	Consumer goods			Health care			Consumer services		
	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.
CRQ	50	.0703918	0.9880761	6	.5905245	.3933374	20	.2984162	.4192768
abs_DACC	50	.0622503	.0972239	6	.0178765	.0209756	20	.0331396	.019343
TB	50	127.26	57.05	6	151.50	58.57	20	128.35	43.09
IR	50	0.26	0.44	6	1.00	0.00	20	0.05	0.22
TA	50	15076768	17667863	6	5291327	3037391	20	9104950	2306675
ROA	50	4.36	7.97	6	4.83	1.70	20	5.55	2.11
MB	50	2.33	1.78	6	3.70	1.00	20	2.36	1.19
DE	50	0.83	0.62	6	2.50	1.66	20	0.97	0.57

Variable	Industry							
	Telecommunications			Utilities			Technology		
	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.
CRQ	13	.2568399	.7739199	21	.1520155	.5585882	34	-.3223208	1.03328
abs_DACC	13	.0374374	.0190199	21	.0314488	.0240355	34	.0672034	.1156875
TB	13	127.15	88.16	21	107.52	60.19	34	80.76	53.16
IR	13	0.38	0.51	21	0.19	0.40	34	0.21	0.41
TA	13	38173723	19870874	21	170666190	182866070	34	8248712	11804638
ROA	13	2.99	2.76	21	1.49	2.81	34	8.03	7.92
MB	13	1.53	7.17	21	1.28	1.72	34	2.47	1.15
DE	13	-1.13	6.80	21	0.83	0.19	34	0.39	0.33

Table 3 Descriptive statistics per industry

Table 4 shows the descriptive statistics per year. The mean per year of absolute discretionary accruals has diminished over time, indicating that financial reporting quality has increased. This could be the result of the financial scandals in 2008 and the call for more transparent reporting. The score for the transparency benchmark has also increased from 41.73 in 2008 to 131.38 in 2017, where the possible scores range from zero to 200. The average score was however at its peak in 2013, with an average score of 134.85. The amount of firms that have adopted integrated reporting over the years has been growing steadily each year. The biggest step was from 2013 where 23 percent of the firms have adopted integrated reporting, to 2014, where 50 percent of the firms have adopted integrated reporting. This can be explained by the issuance of the integrated reporting framework by the IIRC in 2013, after which firms were inclined to switch to integrated reporting. The percentage of firms that have adopted integrated reporting now stands at 68 percent in 2017. Figure 4 shows the percentage of adoption of integrated reporting over the years. As can be seen in the line graph in figure 2, the adoption of integrated reporting has been increasing steadily over the years, with the biggest growth from 2013 to 2014.

Year	Mean values							
	CRQ	abs_DACC	TB	IR	TA	ROA	MB	DE
2008	-.6344765	0.069038	41.73	0.00	30207252	4.97	3.24	1.09
2009	-.5413049	0.0568481	41.88	0.12	30040491	3.58	1.40	0.90
2010	-.0279027	0.0452552	97.62	0.19	33857533	7.48	1.78	0.79
2011	.0518167	0.0568535	119.50	0.23	35132430	5.66	2.66	1.00
2012	.1669655	0.0486654	126.48	0.22	34899484	4.10	1.60	0.91
2013	.1393377	0.0608025	134.85	0.26	33605118	5.71	1.44	0.61
2014	.1657937	0.0457677	123.47	0.50	35381759	4.68	1.86	0.71
2015	.192815	0.0434133	124.68	0.52	36779293	4.69	2.33	1.01
2016	.254588	0.0390725	128.47	0.59	39767930	5.31	1.49	0.13
2017	.227911	0.0455526	131.38	0.68	34839448	5.46	3.51	0.75

Table 4 Descriptive statistics per year
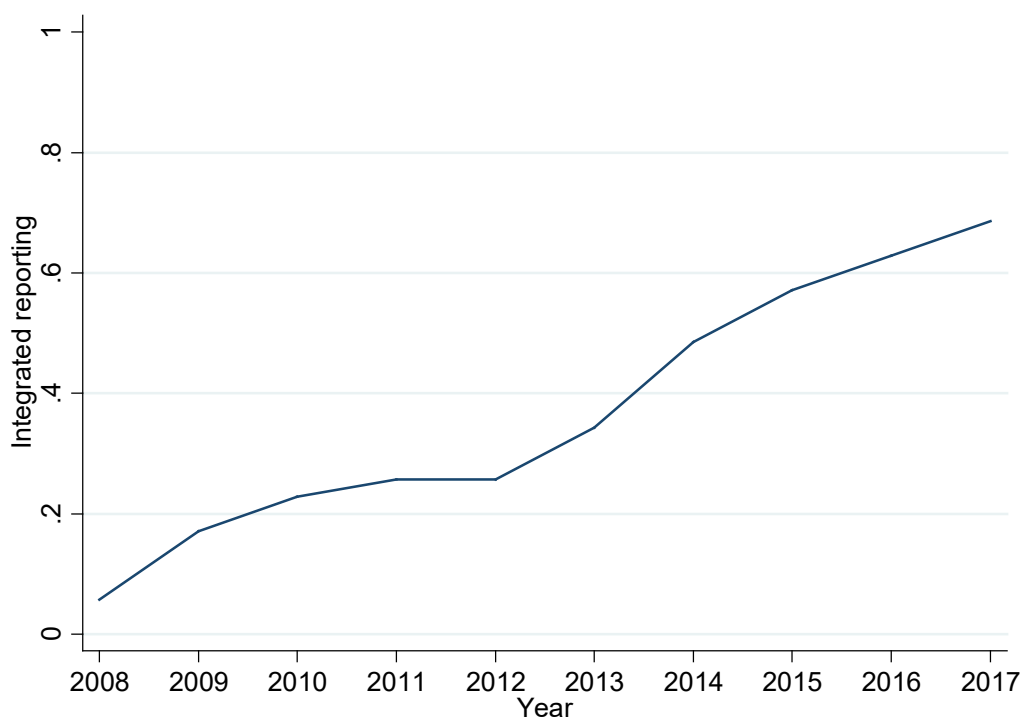
Figure 2 Integrated reporting per year

4.2   Test of assumptions

In order to make sure the model that is used in the panel data regression analysis, the variables should adhere to the assumptions of OLS regression analysis. The first assumption that is being tested is that there is no multicollinearity present in the model. This means that no independent variable is linearly related to one or more of the other independent variables. In order to determine if there is multicollinearity in the model, a Pearson correlation matrix is generated and analysed. A correlation value of higher than 0.8 indicates that the variables are strongly correlated (Hawn & Ioannou, 2016). A value between 0.5 and 0.8 are moderately correlated and a value lower than 0.5

indicates there is no strong correlation. As can be seen in table 5, there are no correlation coefficients higher than 0.8, which indicates there is no multicollinearity in the model.

	1.	2.	3.	4.	5.	6.	7.
1. abs_DACC	1.0000						
2. TB	-0.1349	1.0000					
3. IR	-0.0107	0.2538	1.0000				
4. TA	-0.1456	0.1317	-0.2093	1.0000			
5. ROA	-0.1812	0.1310	0.0060	-0.1325	1.0000		
6. MB	0.0579	0.0362	0.0818	-0.0872	0.0953	1.0000	
7. DE	0.0637	0.0606	0.0491	-0.0332	-0.0242	0.6968	1.0000

Table 5 Pearson correlation matrix

As an additional test to control for multicollinearity, a Variance Influence Factor (VIF) test will be performed. The results of both the VIF test and tolerance (TOL) test are presented in table 6. The TOL score is equal to: one, divided by the score of the VIF test. A VIF test score of five to ten indicates there is multicollinearity in the model (Hair et al., 1995). Since all values of the VIF test are lower than five, the assumption that there is no multicollinearity in the model holds.

Variable	VIF	TOL
MB	1.43	0.699103
DE	1.28	0.783766
ROA	1.17	0.845273
IR	1.09	0.919663
TA	1.09	0.921115
Mean	1.21	

Table 6 Variance influence factor test

Another assumption of OLS regression is that the residuals of the variables are homoscedastic. This means that the variance of all the observations should be approximately the same. In order to test this, a Breusch-Pagan/Cook-Weisberg test has been performed for every model as presented in the regression analysis in table 7 and 8 (Breusch & Pagan, 1979). The test results indicate that the residuals are homoscedastic for model one, three and four. The Breusch-Pagan/Cook-Weisberg test indicates that the residuals are heteroscedastic in model two, three, six, seven and eight. To correct for heteroscedasticity robust standard errors will be used in model two, five and six, by clustering the results per firm. The models are presented in table 7 and table 8, and the results of the Breusch-Pagan/Cook Weisberg test can be found in appendix 3.

4.3   Test of model

Since the dataset consists of observations that cover a timespan of more than one year, and there are multiple firms in the dataset that do not change over time, panel data regression analysis seems to be the best fit to analyse the variables. When using panel data analysis, a test should be performed to determine whether a fixed effects or random effects model should be applied. A Hausman test is the common practice to determine whether fixed effects or random effects should be used. However, since the variable industry is included as a control variable, a random effects model should be used. This is due to the fact that a fixed effects model cannot capture the effects of a time-invariant variable such as industry (Bell & Jones, 2015). Therefore, a random effects panel data analysis will be used.

Subsequently, a test can be performed to determine whether a random effects model is truly the best fit, or that a pooled OLS regression can be used. A Breusch and Pagan Lagrangian multiplier test for random effects will be used (John & ZImmerman, 1994). This test confirmed that a random effects panel data regression analysis can be used for models one through nine. The results of the Breusch and Pagan Langrangian multiplier test can be found in appendix 4.

4.4   Regression analysis

Table 7 shows the panel data regression analysis for model 1, model 2 and model 3. Model 1 shows the relation between integrated reporting and sustainability reporting quality. The adoption of integrated reporting has a positive non-significant effect (β=1.154, p=n.s.) on the sustainability reporting quality. Hypothesis one does not hold based on these results. Even though the results are not significant, the relation as described is in line with prior research of Barth et al. (2008), Cortesi & Vena (2019) and Eccles & Krzus (2014), who found that the quality of information, as well as transparency, increases with integrated reporting. The control variable *'profitability'* (β=1.01, p<0.01), measured as return on assets, has a positive significant effect on sustainability reporting quality. The other control variables do not show a significant effect and there are no significant differences per *'industry'* (p=n.s.). The time effects show that from 2010 to 2017, there is a significant difference with the reference year of 2008. This indicates that the scores of the transparency benchmark have been increasing every year and that this growth is attributable to a general trend, rather than to an increase in the adoption of integrated reporting. This could also explain why the variable *'Integrated reporting'* does not have a significant effect, since the effects are captured in the year dummy.

Model 2 shows the relation between integrated reporting and financial reporting quality. The adoption of integrated reporting has a positive non-significant effect (β=0.000182, p=n.s.) on financial reporting quality, measured as the absolute discretionary accruals. The effect is positive, which indicates that there are more discretionary accruals and financial reporting quality is lower. The relation as hypothesized in hypothesis two is not correct. This is again in contrast with research of Barth et al. (2008), Cortesi & Vena (2019) and Eccles & Krzus (2014)., who state that information quality increases with integrated reporting, while the results as presented in table 7 suggest that financial reporting quality decreases with the adoption of integrated reporting. This could be the result of a trade-off between financial reporting quality and sustainability reporting quality, as found by Salewski & Zulch (2014). The control variables *'size'* (β=-0.0101, p<0.01) and *'profitability'* (β=-0.00388, p<0.05) show a negative significant relation, which means they have a positive effect on financial reporting quality. The effect of *'size'* was also found by Dechow & Dichev (2002) and the effect of *'profitability'* by Dechow et al. (1995). *'Leverage'* shows a positive significant relation (β=0.0164, p<0.01), which means higher leverage has a negative effect on financial reporting quality. This result is supported by the study of Defond & Jiambalvo (1994). The effects per industry differ significantly from each other in model 2. In comparison to the oil and gas industry, which is the reference group, health care, consumer services and utilities all show a negative significant effect, indicating that the financial reporting quality in these industries is significantly higher than the reference group which could be due to the public nature of these industries.

Model 3 shows the relation between corporate reporting quality and integrated reporting. The adoption of integrated reporting has a positive non-significant effect (β=0.0196, p=n.s.) on corporate reporting quality, which is a combination of financial reporting quality and sustainability reporting quality. The relation as found is in line with prior research of Barth et al. (2008), Cortesi & Vena (2019) and Eccles & Krzus (2014), although this study fails to find a significant relation. The control variables *'size'* (β=-0.0754, p<0.10) and *'profitability'* (β=-0.0359, p<0.01) show a positive significant relation, which means they have a positive effect on corporate reporting quality. The control variable *'Leverage'* shows a negative significant relation (β=-0.162, p<0.01), indicating that firms with a higher debt-to equity ratio provide lower corporate reporting quality. The year effects show again that the years 2010 to 2017 have a significantly higher corporate reporting quality in comparison to the reference year of 2008. This can be explained by the increased focus on corporate reporting by society and the trend of increased transparency in general.

The overall R-squared of the model with sustainability reporting quality as the dependent variable is 0.293, which indicates that this model has an explanatory power of 29.3% for the value of sustainability reporting quality. The overall R-squared is slightly lower in the model with financial reporting quality as the dependent variable, with a value of 0.279. The explanatory power of this model is therefore 27.9%. The overall R-squared for corporate reporting quality is 0.442, so the explanatory power is 44.2%. The R-squared in the models 1 through 3 are sufficient for a regression analysis. It indicates that certain effects are captured in the model. However, the value of R-squared could be increased by adding more control variables.

These results do not indicate that integrated reporting is an effective tool at improving corporate reporting quality. When looking at sustainability reporting quality, it seems that the quality is increasing because of a trend in the reporting landscape, which is not necessarily connected to the adoption of integrated reporting. Additionally, the results do not provide evidence that integrated reporting reduces the level of earnings management, and thus increase financial reporting quality. This could be due to the fact that the rules and standards that are in place regarding financial reporting are sufficient to ensure high quality financial information. For non-financial information these standards do not exist and therefore a reporting tool such as integrated reporting, which puts more emphasis on non-financial information, could be of great influence on the quality of non-financial information. What this study confirms, is that firms which are bigger and more profitable provide higher corporate reporting quality, while firms with a higher debt-to-equity ratio provide less corporate reporting quality. This can be explained by expanded focus on bigger firms and their role in society. In addition, firms with higher profitability could be inclined to signal this superior performance to the public while firms with a high debt-to-equity ratio could be attempting to hide or withhold this information, resulting in a decline of corporate reporting quality.

Panel data regression

Dependent variable	SRQ	FRQ	CRQ
	Model 1	Model 2	Model 3
Independent variable:			
Integrated reporting	1.154	0.000182	0.0196
	(0.845)	(0.982)	(0.802)
Control variables:			
Size	-3.082	-0.0101***	0.0754*
	(0.537)	(0.000)	(0.063)
Profitability	1.006***	-0.00388**	0.0359***
	(0.003)	(0.033)	(0.004)
Growth opportunities	6.125	0.00543	-0.000466
	(0.174)	(0.765)	(0.998)
Leverage	3.888	0.0164***	-0.162***
	(0.187)	(0.000)	(0.000)

Industry:

Oil and gas	0	0	0
	(.)	(.)	(.)
Basic materials	-16.12	-0.0168	-0.0604
	(0.699)	(0.135)	(0.815)
Industrials	-8.381	-0.0132	0.0709
	(0.833)	(0.320)	(0.652)
Consumer goods	18.71	-0.00667	0.197
	(0.654)	(0.736)	(0.482)
Health care	-9.389	-0.0705***	0.551
	(0.861)	(0.000)	(0.188)
Consumer services	18.00	-0.0332***	0.412***
	(0.728)	(0.001)	(0.000)
Telecommunications	-32.38	-0.0246	0.129
	(0.540)	(0.126)	(0.772)
Utilities	-14.04	-0.0333***	0.171
	(0.762)	(0.001)	(0.501)
Technology	-34.89	-0.00931	-0.202
	(0.429)	(0.498)	(0.178)
Year:			
2008	0	0	0
	(.)	(.)	(.)
2009	7.046	-0.00925	0.109
	(0.367)	(0.435)	(0.289)
2010	57.90***	-0.00455	0.458***
	(0.000)	(0.728)	(0.000)
2011	79.83***	-0.00152	0.615***
	(0.000)	(0.908)	(0.000)
2012	91.50***	-0.0137	0.781***
	(0.000)	(0.334)	(0.000)
2013	98.17***	-0.0178*	0.846***
	(0.000)	(0.074)	(0.000)
2014	88.06***	-0.00936	0.710***
	(0.000)	(0.586)	(0.000)
2015	92.07***	-0.0122	0.750***
	(0.000)	(0.333)	(0.000)
2016	96.04***	-0.0177	0.832***
	(0.000)	(0.119)	(0.000)
2017	98.40***	-0.0187	0.867***
	(0.000)	(0.176)	(0.000)
Constant	79.47	0.259***	-2.151***
	(0.389)	(0.000)	(0.001)
Observations	271	284	271
R-squared_within_groups	0.703	0.247	0.519
R-squared_between_groups	0.0315	0.431	0.359
R-squared_overall	0.293	0.279	0.442

p value in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 7 Panel data regression

Table 8 presents the panel data regression analysis per subsample. The subsamples were created based on the categorization of poor performing firms and superior performing firms. This categorization was based on the return on assets per firm. As shown in model 4 and model 5, the adoption of integrated reporting has a negative non-significant effect on the sustainability reporting quality for poor performing (β=-2.475, p=n.s.), while it has a positive non-significant effect for superior performing firms (β=10.23, p=n.s.). This relation is in line with prior research of Barth et al. (2008), Cortesi & Vena (2019) and Eccles & Krzus (2014) regarding the subsample of superior performing firms. The control variable *'leverage'* has a negative significant effect (β=-8.215, p<0.10) on sustainability reporting quality (Defond & Jiambalvo, 1994) and *'profitability'* has a positive significant effect (β=1.748, p<0.05), but only for the group of superior performing firms. The same effect as found in model 1 can be seen in model 4 and 5, where the time-fixed effects are significant. In the light of these results, hypothesis 4a and 4b do not hold. In order to test hypothesis 4c, a two-sample t-test has been performed to test if the means of the subsamples differ significantly from each other. The results of the t-test can be found in appendix 5, and suggest that there is a significant difference (t(295)=-1.40, p<0.10) between the sustainability reporting quality of poor performing firms (mean=102.76, standard deviation=67.42) and superior performing firms (mean=113.39, standard deviation=62.67) . Therefore, this study accepts hypothesis 4c.

Model 6 and 7 show the relation between integrated reporting and financial reporting quality per subsample. The adoption of integrated reporting has a negative non-significant effect (β=-0.00442, p=n.s.) on the financial reporting quality for poor performing firms while it has a positive non-significant effect (β=0.00155, p<n.s.) for superior performing firms. For the subsample of poor performing firms (model 6), the relation is the same as in prior research by Barth et al. (2008), Cortesi & Vena (2019) and Eccles & Krzus (2014). In the subsample of superior performing firms however, financial reporting quality is lower with the adoption of integrated reporting, which is suggested by Pavlopoulos et al. (2017) and Pistoni et al (2018). In the subsample of poor performing firms, the control variables *'size'* (β=-00763, p<0.01) and *'profitability'* (β=-0.00787, p<0.01) show a negative significant relation, indicating that financial reporting quality is higher for bigger and more profitable firms (Dechow & Dichev, 2002; Dechow et al., (1995)). *'Leverage'* has a positive significant effect (β=1.0109, p<0.50) on financial reporting quality in the subsample of poor performing firms, indicating that a higher debt-to-equity ratio results in lower financial reporting quality.

In the subsample of superior performing firms (model 7), the variable *'size'* no longer has a significant effect (β=-0.00241, p=n.s.), indicating firm size has a significant effect at a cap after which *'size'* no longer influences financial reporting quality. The control variables *'profitability'* (β=0.00362, p<0.01) and *'leverage'* (β=0.0153, p<0.05) show a positive significant relation, while *'growth opportunities'* shows a negative significant relation (β=-0.0324, p<0.01) with financial reporting quality. In contrast to the subsample of poor performing firms, the relation of *'profitability'* shows a positive relation, indicating that financial reporting quality initially increases when *'profitability'* increases, but at a certain point financial reporting quality will decrease when profitability increases. The effect of *'growth opportunities'* shows a change in the opposite direction. The effect is positive in the poor performing subsample, while it is negative and significant (β=-00349, p<0.01), for the superior performing subsample. This indicates that more *'growth opportunities'* have a negative effect on financial reporting quality to a certain extent, after which the relation changes and more *'growth opportunities'* have a positive effect on the financial reporting quality. The industry and year dummies show no significant differences. The results of model 6 and 7 lead to the rejection of hypothesis 5a and 5b. Hypothesis 5c has been tested by using a two-sample t-test, which can be found in appendix 5. The results suggest that there is a significant difference (t(328)=2.04, p<0.05) between the financial reporting quality of poor performing firms (mean=0.058, standard deviation=0.067) and superior performing firms (mean=0.043, standard deviation=0.065). Therefore, hypothesis 5c holds.

Model 8 and 9 show the relation between integrated reporting and corporate reporting quality per subsample. The adoption of integrated reporting has a positive non-significant effect on the corporate reporting quality for both poor performing firms (β=0.0502, p=n.s.) and superior performing firms (β=0.0839, p<n.s.). In the subsample of poor performing firms, the control variable *'profitability'* (β=0.0551, p<0.01) shows a positive significant relation, indicating that corporate reporting quality is for more profitable firms (Dechow et al., (1995)). *'Leverage'* has a negative significant effect (β=-0.196, p<0.01) on financial reporting quality in the subsample of poor performing firms, indicating that a higher debt-to-equity ratio results in lower corporate reporting quality.

In the subsample of superior performing firms (model 9), the variable *'profitability'* no longer has a significant effect (β=-0.0131, p=n.s.), indicating firm size has a significant effect at a cap after which *'profitability'* no longer significantly influences corporate reporting quality. The effect of *'growth opportunities'* is negative in the poor performing subsample, while it is positive and

significant (β=-00349, p<0.01), for the superior performing subsample. This indicates that more *'growth opportunities'* have a negative effect on corporate reporting quality to a certain extent, after which the relation changes and more *'growth opportunities'* have a positive effect on the corporate reporting quality. *'Leverage'* shows a negative significant relation for both poor performing firms (β=-0.196, p<0.01) and superior performing firms (β=-0.227, p<0.01). In both model 8 and 9, the same trend per year can be perceived as in model 1, 4 and 5. The years 2010 to 2017 differ significantly from the reference year of 2008. The results of model 8 and 9 lead to the rejection of hypothesis 6a and 6b. Hypothesis 6c has been tested by using a two-sample t-test, which can be found in appendix 5. The results suggest that there is a significant difference (t(295)=-2.04, p<0.05) between the financial reporting quality of poor performing firms (mean=-.078, standard deviation=0.783) and superior performing firms (mean=.010, standard deviation=0.714). Therefore, hypothesis 6c holds.

These results provide support for both signalling and legitimacy theory. For both sustainability reporting quality and financial reporting quality, there is a significant difference between the quality of poor performing firms and superior performing firms, while there is no significant difference between the percentage of adoption of integrated reporting between poor and superior performing firms. This suggests that both theories provide a basis to understand as to why firms disclose information, either to legitimize their actions or to signal superior performance.

Dependent variable:	SRQ		FRQ		CRQ	
	Poor performing	Superior performing	Poor performing	Superior performing	Poor performing	Superior performing
	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Independent variable:						
Integrated reporting	-2.475	10.23	-.00442	0.00155	0.0502	0.0839
	(0.797)	(0.186)	(0.683)	(0.880)	(0.736)	(0.395)
Control variables:						
Size	0.527	-1.274	-.00763***	-0.00241	0.0690	0.0396
	(0.947)	(0.850)	(0.000)	(0.472)	(0.255)	(0.474)
Profitability	1.075	1.748**	-.00787***	0.00362***	0.0551***	-0.0131
	(0.149)	(0.029)	(0.000)	(0.000)	(0.000)	(0.224)
Growth opportunities	5.013	12.16*	0.0293	-0.0349***	-0.239	0.405***
	(0.486)	(0.066)	(0.135)	(0.001)	(0.226)	(0.000)
Leverage	8.254	-8.215*	.0109**	0.0153*	-0.196***	-0.227***
	(0.101)	(0.092)	(0.032)	(0.097)	(0.004)	(0.000)
Industry:						
Oil and gas	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
Basic materials	-11.95	-21.53	-.00836	-0.0156	-0.300	-0.124
	(0.812)	(0.642)	(0.518)	(0.435)	(0.382)	(0.681)
Industrials	7.502	-3.733	-0.00951	-0.000454	0.0664	-0.0313

	(1)	(2)	(3)	(4)	(5)	(6)
	(0.881)	(0.934)	(0.320)	(0.986)	(0.709)	(0.915)
Consumer goods	25.91	10.21	-0.00722	-0.0239	0.0969	0.271
	(0.629)	(0.831)	(0.814)	(0.223)	(0.790)	(0.367)
Health care	-3.587	72.23	-.0616***	0.0115	0.537	0.481
	(0.956)	(0.334)	(0.000)	(0.714)	(0.326)	(0.369)
Consumer services	26.33	27.90	-.0281**	-0.0184	0.457***	0.333
	(0.675)	(0.621)	(0.045)	(0.429)	(0.000)	(0.338)
Telecommunications	-38.07	51.80	-.0371**	.000656	0.307	0.294
	(0.546)	(0.470)	(0.044)	(0.978)	(0.245)	(0.527)
Utilities	12.82	-75.41	-0.0188	0.0171	0.119	-0.744
	(0.835)	(0.307)	(0.118)	(0.492)	(0.704)	(0.130)
Technology	-25.68	-40.27	-0.0335**	-0.00912	-0.0563	-0.287
	(0.638)	(0.410)	(0.048)	(0.645)	(0.829)	(0.368)
Year:						
2008	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
2009	11.77	7.247	-0.0101	-0.00941	0.0767	0.140
	(0.362)	(0.515)	(0.656)	(0.543)	(0.658)	(0.355)
2010	65.24***	61.33***	-0.0267	0.00849	0.652***	0.413***
	(0.000)	(0.000)	(0.319)	(0.376)	(0.008)	(0.000)
2011	80.78***	78.36***	-0.0196	-0.00491	0.679***	0.666***
	(0.000)	(0.000)	(0.539)	(0.494)	(0.006)	(0.000)
2012	98.18***	87.67***	-0.0286	0.00189	0.833***	0.623***
	(0.000)	(0.000)	(0.230)	(0.825)	(0.000)	(0.000)
2013	104.4***	98.13***	-0.0240	-0.00685	0.882***	0.822***
	(0.000)	(0.000)	(0.279)	(0.253)	(0.000)	(0.000)
2014	98.84***	74.52***	-0.0335	0.0235	0.896***	0.389***
	(0.000)	(0.000)	(0.181)	(0.379)	(0.000)	(0.006)
2015	98.30***	83.77***	-0.0307	0.00753	0.858***	0.582***
	(0.000)	(0.000)	(0.268)	(0.300)	(0.000)	(0.000)
2016	101.8***	93.07***	-0.0353	0.00111	0.931***	0.708***
	(0.000)	(0.000)	(0.163)	(0.873)	(0.000)	(0.000)
2017	104.4***	92.04***	-0.0410	0.00127	1.026***	0.694***
	(0.000)	(0.000)	(0.144)	(0.849)	(0.000)	(0.000)
Constant	15.10	28.54	0.226***	0.0866	-2.001**	-1.410
	(0.916)	(0.816)	(0.000)	(0.155)	(0.036)	(0.158)
Observations	142	129	145	139	142	129
R-squared within groups	0.667	0.735	0.513	0.255	0.702	0.503
R-squared between groups	0.234	0.445	0.668	0.323	0.414	0.711
R-squared overall	0.302	0.479	0.557	0.289	0.504	0.583

p value in parentheses

* p<0.10. ** p<0.05, *** p<0.01

Table 8 Panel data regression subsamples

5. Conclusion & discussion

5.1 Conclusion

Due to the increased need for transparent and high quality reporting this study examined the relationship between integrated reporting and corporate reporting quality. In order to do so, a distinction has been made between sustainability reporting quality and financial reporting quality to represent corporate reporting quality. The aim of this study was to provide new insights about the effects of the adoption of integrated reporting and explore whether it is an effective reporting tool. Additionally, the information provided might help reduce information asymmetry between shareholders and firms, by determining if an integrated report increases the quality of information.

The results of this study show that the adoption of integrated reporting does not have a significant effect on sustainability reporting quality. Profitability does have a significant effect on sustainability reporting quality, indicating more profitable firms produce higher quality sustainability information. The adoption of integrated reporting also does not have a significant effect on financial reporting quality however. Financial reporting quality is higher for bigger and more profitable firms. Higher leverage, on the other hand, decreases financial reporting quality. Corporate reporting quality has no significant relation with integrated reporting. Bigger and more profitable firms have a higher corporate reporting quality, while firms with a higher debt-to-equity have lower corporate reporting quality.

When assessing whether legitimizing and signalling theory as an incentive for voluntary disclosure, the results show that the quality of information is significantly higher for superior performing firms in comparison to poor performing firms when looking at sustainability reporting quality, financial reporting quality and corporate reporting quality. There is no significant relation between integrated reporting and the dependent variables in the subsamples of poor and superior performing firms.

This study adds to the literature in two ways. Firstly, this research contributes to the literature by adhering to the call of Cortesi & Vena (2019) for more research on the effect of the adoption of integrated reporting in a voluntary adoption context. Secondly, this study added to the understanding about whether integrated reporting is associated with lower levels of earnings management and higher quality of sustainability reporting, as requested by de Villiers et al (2017).

5.2   Discussion

In the light of the presented findings limitations of this study have to be addressed. Firstly, future research should consider performing such a study with a bigger scope. The results are only relevant in the Netherlands and make that the study has limited external validity. In addition, the effect of integrated reporting should be studied in the future since the phenomenon does not exist for that long. Since the integrated reporting framework was published in 2013 it might evolve and develop over the years. It is interesting to see whether integrated reporting is truly the reporting format of the future and if it becomes common practice.

Secondly, the measures that are used for both financial reporting quality and sustainability reporting quality could be interchanged by other proxies. Financial reporting quality is measured as the level of earnings management based on discretionary accruals. This can be substituted by earnings quality, audit fees or accounting conservatism for instance. The same can be said about sustainability reporting quality. The transparency benchmark is only applicable to Dutch firms, so if future research increases the scope, another definition of sustainability reporting quality should be used.

Thirdly, this study uses a construct for corporate reporting quality as a whole, but this is built upon two separate aspects of corporate reporting quality. An in depth analysis about integrated reporting and the effect on corporate reporting quality as a whole should be considered. There is prior research on the topic of integrated reporting quality, but these studies only uses a population of firms that have already adopted integrated reporting and do not compare the quality of reporting between firms that have adopted integrated reporting and firms that use other reporting formats.

Fourthly, future research could put more emphasis on the integrated reporting framework. Researchers could consider analysing the effects of adhering to specific parts of the integrated reporting framework like the content elements and guiding principles and consequently determine which aspects make it an effective reporting tool, or which elements contribute to higher quality of reporting. This could push the development of a better framework and it is interesting to see how this will develop in the future.

Bibliography

Ashford, B., & Gibbs, B. (1990). The double-edge of orgnaizational legitimation. *Organization science, 1*, 177-194.

Barth, M., Cahan, S., Chen, L., & Venter, E. (2017). The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, organizations and society, 62*, 43-64.

Bell, A., & Jones, K. (2015). Explaining fixed effests: Random effects modeling of time-series cross-sectional and panel data. *Political science research and methods, 3*(1), 133-153.

Beuselinck, C., Cascino, S., Deloof, M., & Vanstraelen, A. (2018). Earnings management within multinational corporations. *The accounting review*.

Braam, G., Nandy, M., Weitzel, U., & Lodh, S. (2015). Accrual-based and real earnings management and political connections. *The international journal of accounting, 50*, 111-141.

Brammer, S., & Pavelin, S. (2006). Voluntary environmental disclosures by large UK companies. *Journal of businesss finance and accounting, 33*(7), 1168-1188.

Breusch, T., & Pagan, A. (1979). A simple test for heteroscedasticity and random coefficient variation. *Econometrica*, 1287-1294.

Carrol, A. (1979). A three-dimensional conceptual model of corporate social performance. *Academy of management review*, 497-505.

Chih, H., Shen, C., & Kang, F. (2008). Corporate social responsibility, investor protection and earnings management: some international evidence. *Journal of business ethics, 79*, 179-198.

Cho, S., Lee, C., & Pfeiffer, R. (2013). Corporate social responsibility performance and information asymmetry. *Journal of Accounting and Public Policy, 32*(1), 71-83.

Choi, H., Choi, B., & Byun, J. (2018). The relationship between corporate social responsibility and earnings management: accounting for endogeneity. *Investment management and financial innovations, 15*(4), 69-84.

Choi, T., & Pae, J. (2011). Business ethics and financial reporting quality: evidence from Korea. *Journal of Business Ethics, 103*(3), 403-427.

Clarkson, P., Richardson, G., & Vasvari, F. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empiricial analysis. *Accounting, Organizations and Society, 33*(4/5), 303-327.

Cohen, D., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of accounting and economics, 50*(1), 2-19.

Cortesi, A., & Vena, L. (2019). Disclosure quality under Integrated Reporting: A value relevance approach. *Journal of Cleaner Production, 220*, 745-755.

Dawkins, C., & Ngunjiri, F. (. (2008). Corporate social responsibility reporting in South Africa: A descriptive and comparative analysis. *Journal of business communication, 45*(3), 289-307.

Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The accounting review, 77*, 35-59.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of proxies, their determinants and their consequences. *Journal of accounting and economics, 50*(2/3), 344-401.

Dechow, P., Sloan, R., & Sweeney, A. (1995). Detecting earnings management. *Accounting review, 70*(2), 193-225.

Deegan, C. (2000). *Financial Accounting Theory.* Sydney: Irwin McGraw-Hill.

Deegan, C. (2002). Introduction: the legitimizing effect of social and environmental disclosures - a theoretical foundation. *Accounting, Auditing and Accountability Journal, 15*(3), 282-311.

DeFond, M., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of accounting and economics, 17*, 145-176.

Dragu, I., & Tudor-Tiron, A. (2013). New corporate reporting trends. Analysis on the evolution of intgrated reporting. *Annals of the University of Oradeo, Economic Science Series, 22*(21), 1221-1228.

Dumay, J., Bernardi, C., Guthrie, J., & Demartini, P. (2016). Integrated reporting: A structured literature review. *Accounting Forum, 40*, 166-185.

Eccles, R., & Krzus, M. (2014). *The Integrated Reporting Movement: Meaning, Momentum, Motives, and Materiality.* John Wiley & Sons.

Eccles, R., & Saltzman, D. (2011). Achieving sustainability through integrated reporting. *Standford Soc. Innovat. Rev.*, 56-61.

Eccles, R., & Serafeim, G. (2011). Accelerating the adoption of integrated reporting. *CSR INDEX, Francesco de Leo, Matthias Vollbracht, eds., InnoVatio Publishing Ltd.*, 70-92.

Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st century business.* Oxford: Capstone Publishers.

Farvaque, E., Refait-Alexandre, C., & Saïdane, D. (2011). Corporate disclosure: A review of its (direct and indirect) benefits and costs. *International economics, 128*, 5-32.

Flower, J. (2015). The international integrated reporting council: a story of failure. *Critical Perspectives of Accounting, 27*, 1-17.

Frias-Aceituno, J., Rodriquez-Ariza, L., & Garcia-Sanchez, I. (2014). Explanatory factors of integrated sustainability and financial reporting. *Business Strategy and the Environment, 23*, 56-72.

Garcia-Ayuso, M., & Larrinaga, C. (2003). Environmental disclosure in Spain: Corporate characteristics and media exposure. *Spanish journal of finance and accounting, 115*, 1001-1034.

García-Sánchez, I., & Noguera-Gámez, L. (2017). Integrated reporting and stakeholder engagement: the effect on information asymmetry. *Corporate social responsibility and environmental management, 24*, 395-413.

Giner, B., & William, R. (2003). On the assymetric recognition of good and bad news in France, Germany and the United Kingdom. *Journal of Business, Finance and Accounting, 28*(9/10), 1285-1331.

Gray, R. (2006). Social, environmental and sustainability reporting and organisational value creation? Whose value? Whose creation? *Accounting, Auditing & Accountability Journal, 19*(6), 793-819.

Gugerty, M. (2009). Signalling virtue, voluntary accountability programs among nonprofit organizations. *Politcal Science, 42*, 234-273.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1995). *Multivariate data analysis.* New York: Macmillan.

Hawn, O., & Ioannou, I. (2016). Mind the gap: The interplay between external and internal actions in the case of corporate social responsibility. *Strategic management journal, 37*(16), 2569-2588.

Healy, P., & Palepu, K. (2001). Information assymetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting & Economics, 31*(1-3), 405-440.

Hummel, K., & Schlick, C. (2016). THe relationship between sustainability performance and sustainability disclosure - Reconciling voluntary disclosure theory and legitimacy theory. *Journal of Accounting for Public Policy, 35*, 455-476.

International Integrated Reporting Council. (2011). *Towards integrated reporting: Communicating value in the 21st century.* London: International Integrated Reporting Council.

International Integrated Reporting Council. (2013). *The international <IR> framework.* London: International Integrated Reporting Council.

Jensen, M. (2001). Value macimization, stakeholder theory and the corporate objective function. *Journal of applied corporate finance, 14*(3), 8-21.

John, P., & ZImmerman, K. (1994). Native wage impacts of foreign labor: A random effects wage panel analysis. *Journal of population economics, 7*(2), 177-192.

Jones, J. (1991). Earnings management during import relief investigations. *Journal of accounting research, 29*(2), 193-228.

Kim, Y., Park, M., & Wier, B. (2011). Is earnings quality associated with corporate social responsibility? *The accounting review, 87*(3), 761-796.

Kirmani, A., & Rao, A. (2000). No pain, no gain: A critical review of the literature on signalling unobservable product quality. *Journal of marketing, 64*(2), 66-79.

Klein, A. (2002). Audit committee, board of director characteristics and earnings management. *Journal of Accounting and Economics, 33*, 375-400.

KPMG. (2008). *KPMG international survey of corporate responsibility reporting.* Amsterdam: KPMG global sustainability services and University of Amsterdam.

KPMG. (2013). *Integrated Reporting: Addressing the reporting gap.*

KPMG. (2017). *The road ahead, the KPMG survey of Corporate Responsibility Reporting.* KPMG.

Lee, K., & Yeo, G. (2015). The association between integrated reporting and firm valuation. *Review of Quantitative Finance and Accounting, 47*, 1221-1250.

Lindblom, C. (1994). The implicatons or organizational legitimacy for corporate social performance and disclosure. *Critical Persepectives on Accounting Conference.* New York.

Mahoney, L. (2012). Standalone CSR reports: A Canadian analyses. *Social and Environmental Accounting, 6*(1/2), 4-25.

Makar, S., Alam, P., & Pearson, M. (1996). Earnings management: The case of political costs over business cycles. *Business & professional ethics journal, 15*(2), 33-50.

Martínez-Ferrero, J., Garcia-Sanchez, I., & Cuadrado-Ballesteros, B. (2015). Effect of financial reporting quality on sustainability information disclosure. *Corporate social responsibility and environmental management, 22*, 45-64.

Mervelskemper, L., & Streit, D. (2016). Enhancing market valuation of ESG performance: is integrated reporting keeping its promise? *Business Strategy and the environment, 26*(4), 536-549.

Middleton, A. (2015). Value relevance of firms' integral environmental performance: evidence from Russia. *Journal of Accounting and Public Policy, 34*(2), 204-211.

Milgrom, P. (1981). Good news and bad news: Representation theorems and applications. *Bell Journal of economics, 12*(2), 380-391.

Ministry of Economic affairs and Climate Policy. (2017). *Transparancy benchmark.*

O'Donovan. (2002). Environmental disclosures in the annual report: Extending the applicability and predictive power of legitimacy theory. *Accounting, Auditing & Accountability Journal, 15*(3), 344-371.

Pavlopoulos, A., Magnis, C., & Iatridis, G. (2017). Integrated reportingL Is it the last piece of the accounting disclosure puzzle? *Journal of multinational financial management, 41*, 23-46.

Pistoni, A., Songini, L., & Bavagnoli, F. (2018). Integrated Reporting Quality: An Empirical Analysis. *Corporate Social Responsibility and Enviromental Mangement, 25*, 489-507.

Prior, D., Surroca, J., & Tribó, J. (2008). Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility. *Corporate governance: an international review, 16*(3), 160-177.

Romero, S., Ruiz, S., & Fernandez-Feijoo, B. (2019). Sustainability reporting and stakeholder engagement in spain: different instruments, different quality. *Business, Strategy and the Environment, 28*, 221-232.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics, 42*, 335-370.

Rupley, K., Brown, D., & Marshall, S. (2017). Evolution of corporate reporting: From stand-alone corporate social responsibility reporting to integrated reporting. *Research in accounting regulation, 29*, 172-176.

Salewski, M., & Zülch, H. (2014). THe association between corporate social responsibility and earnings quality. *HHL working paper series no. 112*. Retrieved from https://dx.doi.org/10.2139/ssrn.2141768

Serafeim, G. (2015). Integrated reporting and investor clientele. *Journal op Applied Corporate Finance*, 34-51.

Solomon, J., & Maroun, W. (2012). *Integrated Reporting: The Influence of King III on Social, Ethical and Environmental Reporting.* London: The Association of Chartered Certified Accountants.

Spence, M. (2002). Signalling in retrospect and the informational structure of markets. *American Economic review, 92*, 434-459.

Suchman, M. (1995). Managing legitimacy: strategic and institutional approaches. *Academmy of Management Review, 10*(3), 571-610.

Thomson Reuters. (2019, Febraury). *Thomson Reuters ESG scores.* Thomson Reuters.

Verrechia, R. (1990). Information quality and discretionary disclosure. *Journal of Accounting & Economics, 12*(4), 365-380.

Wang, X., Cao, F., & Ye, K. (2018). Mandatory Corporate Social Responsibility (CSR) reporting anf financial reporting quality: Evidence from a quasi-natural eperiment. *Journal of Business Ethics, 152*, 253-274.

Warfield, T., Wild, J., & Wild, K. (1995). Manegerial ownership. accounting choices, and informativeness of earnings. *Journal of Accounting and Economics, 20*, 61-91.

Appendix

1. The integrated reporting framework

Financial capital	• The pool of funds that is:
	  • Available to an organization for use in the production of goods or the provision of services
	  • Obtained through financing, such as debt, equity or grants, or generated through operations or investments

Manufactured capital	• Manufactured physical objects (as distinct from natural physical objects) that are available to an organization for use in the production of goods or the provision of services, including:
	  • Buildings
	  • Equipment

Intellectual capital	• Organizational, knowledge-based intangibles, including:
	  • Intellectual property, such as patents, copyrights, software, rights and licences
	  • "Organizational capital" such as tacit knowledge, systems, procedures and protocols

Human capital	• People's competencies, capabilities and experience, and their motivations to innovate, including their:
	  • Alignment with and support for an organization's governance framework risk management approach, and ethical values
	  • Ability to understand, develop and implement an organization's strategy
	  • Loyalties and motivations for improving processes, goods and services, including their ability to lead, manage and collaborate

Social and relationship capital	• The institutions and the relationships within and between communities, groups of stakeholders and other networks, and the ability to share information to enhance individual and collective well-being. Social and relationship capital includes:
	  • Shared norms, and common values and behaviours
	  • Key stakeholder relationships, and the trust and willingness to engage that an organization has developed and strives to build and protect with external stakeholders
	  • Intangibles associated with the brand and reputation that an organization has developed
	  • An organization's social licence to operate

Natural capital	• All renewable and nonrenewable environmental resources and processes that provide goods or services that support the past, current or future prosperity of an organization. It includes:
	  • Air, water, land, minerals and forests
	  • Biodiversity and eco-system health

The capitals (IIRC, 2013, p. 11-12)

The value creation process (IIRC, 2013, p. 13)

Guiding principle	Definition
Strategic focus and future orientation	An integrated report should provide insight into the organization's strategy, and how it relates to the organization's ability to create value in the short, medium and long term and to its use of and effects on the capitals.
Connectivity of information	An integrated report should show a holistic picture of the combination, interrelatedness and dependencies between the factors that affect the organization's ability to create value over time.
Stakeholder relationships	An integrated report should provide insight into the nature and quality of the organization's relationships with its key stakeholders, including how and to what extent the organization understands, takes into account and responds to their legitimate needs and interests.
Materiality	An integrated report should disclose information about matters that substantively affect the organization's ability to create value over the short, medium and long term.
Conciseness	An integrated report should be concise.
Reliability and completeness	An integrated report should include all material matters, both positive and negative, in a balanced way and without material error.
Consistency and comparability	The information in an integrated report should be presented: • On a basis that is consistent over time • In a way that enables comparison with other organizations to the extent it is material to the organization's own ability to create value over time.

Guiding principles (IIRC, 2013, p. 16-23)

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

Content elements (IIRC, 2013, p. 16-23)

2. Descriptive statistics sample firms

Firm	Mean values								
	n	CRQ	abs_DACC	TB	IR	TA	ROA	MB	DE
Aalberts industries	10	-.0622959	.0145567	62.80	0.00	2171784	7.43	1.91	0.70
Aegon	10	.6061858	.0162063	151.90	0.00	354971600	0.29	0.65	0.96
Akzo Nobel	10	.5860173	.0328534	165.70	0.90	16724700	2.71	1.82	0.50
Altice	3	-.8907606	.0607384	0.00	0.00	72310467	3.01	0.73	-6.07
Aperam	6	.1404463	.0196245	94.33	0.00	4028624	3.55	0.77	0.24
ArcelorMittal	10	-.5300764	.0342114	21.00	0.00	79002535	1.68	0.81	0.52
ASM international	10	-1.048733	.1313918	49.10	0.10	1567340	8.53	1.62	0.24
ASML Holding	10	.272668	.0397412	131.50	0.20	10023910	12.15	3.83	0.24
BAM Groep	10	.2300388	.0742504	160.00	0.40	413102	9.34	1.23	0.24
BE Semiconductor industries	10	-.3657298	.0449406	53.10	0.00	1504270	4.38	1.82	0.44
Boskalis Westminster	10	-.2182013	.0940501	120.90	0.00	2893482	5.07	0.94	0.83
Corbion	10	-.2125689	.0807469	108.50	0.70	2918670	3.02	2.08	0.69
DSM Koninklijke	10	.5738078	.0359902	167.20	0.80	3048507	5.14	2.00	0.13
Eurocommercial	2	-.1438289	.0367019	74.00	1.00	2899514	8.35	6.29	0.96
Fugro	10	.11476	.056383	65.80	0.80	31044100	3.98	2.37	2.38
Gemalto	4	-.1802227	.0310449	102.25	1.00	37375250	5.56	2.83	1.03
Grandvision	2	.1089921	.0052271	76.00	1.00	1543668	5.69	2.71	0.51
Heineken	10	.5061368	.0345267	156.90	0.20	18300500	8.33	2.19	0.53
Heineken Holding	10	.5811309	.0245895	156.90	0.00	5723743	0.73	1.20	1.45
IMCD Group	10	-.7317631	.0396703	0.00	0.40	4771640	6.00	1.79	0.33

Koninklijke Ahold Delhaize	10	.4831167	.0247163	144.20	0.10	11104600	4.78	1.34	0.45
Koninklijke Vopak	10	-.2039	.0781805	107.10	0.40	19197600	6.87	4.63	3.79
KPN Koninklijke	10	.6011201	.0304471	165.30	0.50	27932700	2.98	1.77	0.35
OCI	10	-.2101503	.0196673	48.50	1.00	5378750	7.51	2.57	1.03
Philips Koninklijke	4	.8312906	.0242012	189.25	1.00	7165157	4.41	4.20	3.49
PostNL	10	.056374	.0612116	124.40	0.90	4228600	10.50	5.58	0.48
Randstad	10	.1456265	.0404738	115.60	0.90	7019170	4.52	1.96	0.42
Royal Dutch Shell	10	.3783211	.0246277	130.40	0.00	271969535	5.34	1.26	0.30
SBM Offshore	10	-.3040013	.1013684	116.90	0.40	6370821	2.69	1.77	1.70
Signify	1	.9125567	.0121672	188.00	1.00	6238000	4.89	1.58	0.58
TomTom	10	-1.116201	.1494455	58.10	0.40	1937128	-1.71	2.63	0.52
Unilever	10	.593461	.0219431	155.90	0.00	46503800	11.41	3.53	0.95
Wereldhave	9	-.286875	.0472176	65.67	0.22	3163884	1.29	0.86	0.65
Wolters Kluwer	10	.1137157	.0415629	112.50	0.00	7105300	6.32	3.37	1.48

3. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Model 1: dependent variable SRQ

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of TB

    chi2(1)   =   1.33
    Prob > chi2 = 0.2487

Model 2: dependent variable FRQ

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of abs_DACC

    chi2(1)   =   303.10
    Prob > chi2 = 0.0000

Model 3: dependent variable CRQ

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of abs_DACC

    chi2(1)   =   7.44
    Prob > chi2 = 0.0064

Model 4: dependent variable SRQ for the subsample of poor performing firms

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of TB

    chi2(1)   =   0.00
    Prob > chi2 = 0.9654

Model 5: dependent variable FRQ for the subsample of superior performing firms

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of TB

    chi2(1)   =   280.93
    Prob > chi2 = 0.0000

Model 6: dependent variable CRQ for the subsample of superior performing firms

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of TB

    chi2(1)   =   28.68
    Prob > chi2 = 0.0000

Model 7: dependent variable SRQ for the subsample of poor performing firms

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of abs_DACC

    chi2(1)   =   0.77
    Prob > chi2 = 0.3802

Model 8: dependent variable FRQ for the subsample of superior performing firms

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of abs_DACC

    chi2(1)   =   111.92
    Prob > chi2 = 0.0000

Model 9: dependent variable FRQ for the subsample of
superior performing firms

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
    Ho: Constant variance
    Variables: fitted values of abs_DACC

    chi2(1)   =   1.25
    Prob > chi2 = 0.2634

---

4. Breusch and Pagan Langrangian multiplier test

Model 1: dependent variable SRQ

    TB[ISIN,t] = Xb + u[ISIN] + e[ISIN,t]

    Estimated results:

	Var	sd = sqrt(Var)
TB	4087.674	63.93492
e	615.2623	24.80448
u	3017.753	54.93408

    Test: Var(u) = 0
            chibar2(01) = 444.16
          Prob > chibar2 = 0.0000

Model 2: dependent variable FRQ

    Asb_DACC[ISIN,t] = Xb + u[ISIN] + e[ISIN,t]

    Estimated results:

	Var	sd = sqrt(Var)
TB	0.0032933	0.057387
e	0.0021383	0.0462416
u	0.000443	0.0210475

    Test: Var(u) = 0
            chibar2(01) = 14.94
          Prob > chibar2 = 0.0001

Model 3: dependent variable CRQ

    CRQ[ISIN,t] = Xb + u[ISIN] + e[ISIN,t]

Estimated results:

```
        |     Var    sd = sqrt(Var)
 -------+----------------------------
     TB |  0.3819072     0.6179864
      e |  0.2254395     0.4748047
      u |  0.15819811    0.3898475
```

Test: Var(u) = 0

```
           chibar2(01) =   73.02
          Prob > chibar2 =   0.0000
```

5. Two sample t-test for equal means

T-test for equal means for sustainability reporting quality

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	152	102.7632	5.468291	67.41762	91.95891	113.5674
1	145	113.3931	5.204692	62.67279	103.1056	123.6806
combined	297	107.9529	3.786304	65.25199	100.5014	115.4043
diff		-10.62995	7.562257		-25.51276	4.252865

```
    diff = mean(0) - mean(1)                                 t =  -1.4057
Ho: diff = 0                              degrees of freedom =      295

   Ha: diff < 0                  Ha: diff != 0                  Ha: diff > 0
 Pr(T < t) = 0.0804       Pr(|T| > |t|) = 0.1609        Pr(T > t) = 0.9196
```

T-test for equal means for financial reporting quality

```
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	166	.0578979	.0052032	.0670385	.0476245	.0681713
1	164	.043103	.0050758	.0650019	.0330802	.0531258
combined	330	.0505453	.0036524	.0663487	.0433603	.0577303
diff		.0147949	.0072703		.0004927	.0290971

```
   diff = mean(0) - mean(1)                                    t =    2.0350
Ho: diff = 0                                   degrees of freedom =       328

   Ha: diff < 0                 Ha: diff != 0                  Ha: diff > 0
Pr(T < t) = 0.9787       Pr(|T| > |t|) = 0.0427          Pr(T > t) = 0.0213
```

T-test for equal means for corporate reporting quality

```
Two-sample t test with equal variances
```

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	152	-.078156	.0634866	.782716	-.2035928	.0472809
1	145	.0996579	.0592773	.7137937	-.0175082	.216824
combined	297	.0086555	.0437441	.7538725	-.0774334	.0947444
diff		-.1778138	.0870473		-.3491262	-.0065015

```
   diff = mean(0) - mean(1)                                    t =   -2.0427
Ho: diff = 0                                   degrees of freedom =       295

   Ha: diff < 0                 Ha: diff != 0                  Ha: diff > 0
Pr(T < t) = 0.0210       Pr(|T| > |t|) = 0.0420          Pr(T > t) = 0.9790
```