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Examining the association between quality of integrated reports and corporate characteristics

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ABSTRACT

This paper examines the quality of integrated reports of listed firms in South Africa and the associated factors. Data were obtained from a sample comprising 100 firm-year observations of 20 companies in Johannesburg Stock Exchange over the period (2013–2017). Analysis of data involves descriptive statistics, spearman rank correlation analysis and Kruskal-Wallis H test. The result shows a significant relationship between the quality and length of integrated reports. Firms vary in the level of quality of their integrated reports on the account of differences in profitability, board size, gender and firm size. No significant relationship was found between quality of integrated reports and leverage. The result of this study indicates that the length of the integrated report signals the level of quality of such report, which may be necessary in disclosing all material matters to satisfy the needs of a wide range of stakeholders.

1. Introduction

The emerging phenomenon in the field of corporate reporting is the concept of integrated reporting (IR). This reporting approach has created a paradigm shift from the disaggregated traditional reporting practice to a combined and more comprehensive reporting pattern. It involves a single set of report, which provides both financial and non-financial information in an integrated manner that enhances shareholders' understanding of the firm (Lee and Yeo, 2015). The Framework is not rigid in nature about how information should be disclosed; rather, it provides specific guidelines for quality reporting in line with guiding principles and content elements. However, preparing high-quality integrated report has proven challenging (Dude, 2017; de Villiers et al., 2017). Some of the available studies have shown that there is lack of quality in certain aspects of integrated reports produced by firms. For instance, a study by PWC, which reviewed the top 40 JSE companies with reference to quality of reporting found a striking weakness in the rate at which companies repeated information. The trend shows some sort of rephrasing or repetition of same piece of information while excluding certain items of social, environmental and ethical information (Frías-Aceituno et al., 2013; PwC, 2013, 2014; Solomon and Maroun, 2012).

Extensive studies have been conducted which focused on specific aspects of IR. There are studies that have explored IR as a concept, for instance, de Villiers et al. (2014) traced the early development and current state-of-play of IR, highlighted theoretical and empirical challenges accompanying its adoption and set out a comprehensive agenda for future research. Similar study by McNally et al. (2017) explored the challenges of preparing an integrated report. Rinaldi et al (2018) analysed the overall IR journey to highlight challenges, successes, strengths and weaknesses. There are papers also that have examined IR from the perceptive of preparers and other stakeholders (Adhariani and de Villiers, 2018). A few other studies have examined the quality of the content of the IR and the determining factors (Rivera-Arrubla et al., 2017); with limited focus on South Africa in this regard (Solomon and Maroun, 2012). The present research contributes to the streams of literature on the quality of integrated report prepared by listed firms in South Africa and the influencing factors.

Although both the King Reports on Corporate Governance and the International Integrated Reporting Framework (IIRF) became a listing requirement for all companies listed on the JSE (de Villiers et al., 2014; Barth et al., 2016; Melloni et al., 2017), yet the IIRF allows discretion in terms of what companies choose to disclose which results in different levels of alignment with the Framework. No integrated reports of two companies are the same in quality and length. In an attempt to include all material matters that affect the organization's ability to create value, some firms produce integrated reports that appear longer in length than others do. Specifically, there appear to be limited studies focusing on the relation between the length of such report and its quality in terms of

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ability to disclose matters that affect value creation. Given this background, the first research question that this paper seeks to find answers to is:

RQ1. Does any relationship exist between the lengths of integrated reports released by JSE listed firms and the quality of such reports?

Furthermore, based on existing literature, determinants of IR is one of the important variables in the conceptual model of the overall integrated reporting process (de Villiers et al., 2017). A number of external factors (legal, cultural, economic) as well as internal factors such as firm size, leverage, profitability and a host of other corporate governance characteristics may influence the quality of integrated reports produced. This leads to the second question in this study, which is:

RQ2. To what extent do corporate characteristics influence the quality of integrated reports (QIR) of JSE firms?

This paper contributes insights to IR literature is two ways. First, it establishes the link between the quality in terms of content and the length of integrated reports released by JSE listed firms. Second, it investigates the quality of integrated reports and its associated factors through the lens of contingency and agency theories. A study of this nature is important because of the relevance of high quality integrated reports in meeting the needs of a wide range of stakeholders who are interested in how firms create value overtime. Moreover, South Africa has contributed significantly to the development of integrated reporting worldwide. Now that the global community is recording more success in the adoption of IR, assessing the quality of integrated reports produced by listed firms in South Africa can help identify the current level of compliance with the Framework and create impetus for global adoption of the new reporting framework.

In answering the research questions, this paper utilizes the Ernst and Young (EY) Excellence in Integrated Reporting Awards rating to determine the quality of integrated reports of sampled firms. A number of studies have frequently utilized the IIRC pilot programme and the EY annual integrated reporting rating data to draw sample in integrated reporting-related studies (Barth et al., 2016; Rivera-Arrubla et al., 2017). The IIRC featured over 100 firms in the pilot programme, and only seven firms in South Africa participated in the programme. This study draws sample from the EY rating system because it focuses mainly on the top 100 firms that are listed on the JSE.

After this introduction, the paper proceeds as follows. Section 2 provides the background to the study including theoretical framework and hypotheses development. Section 3 outlines the methodology adopted in the study. Results and discussion are presented in Section 4 while Section 5 focuses on the conclusion to the study.

2. Background

2.1. An overview of integrated reporting

Integrated reporting started in practice in the early years of the millennium (de Villiers et al., 2017). It has gained significant importance in recent years, and especially since the formation of the International Integrated Reporting Council (IIRC) and the adoption of mandatory IR for listed companies in the Johannesburg Stock Exchange (JSE) in March 2010 (Rivera-Arrubla et al., 2017). It has since become a global language for reporting. In 2011, IIRC began a pilot study, which involved more than 100 organizations in its business network spanning over 20 countries around the world. The purpose is to develop and share "best practices" in drawing integrated reports according to the IIRC's framework (de Villiers et al., 2014).

The Framework aims to provide insight on the fundamental concepts of the six capitals, which are financial, manufacture, intellectual, human, social and relational and natural capital, including how the organization interacts with the external environment and the capitals to create value over the short, medium and long term. These capitals therefore, become inputs to the organization's business model. Going forward, it also provides seven guiding principles to underpin the preparation of an integrated report, informing the content of the report and how the information is presented. These are strategic focus and future orientation, connectivity of information, stakeholder responsiveness, materiality and conciseness, reliability and completeness and consistency and comparability [International Integrated Reporting Council (IIRC), 2011, 2013]. In addition, an integrated report includes eight content elements that are fundamentally linked to each other and are not mutually exclusive. These are organizational overview and external environment, business model, opportunities and risks, strategy and resources allocation, governance, performance, future outlook and basis of presentation [International Integrated Reporting Council (IIRC), 2011, 2013].

The whole essence of adoption of <IR> is more critical than mere merging of financial and non-financial information into one report, but to push for integrated thinking throughout the organization. Enhancing the quality of the integrated report will help to increase the readability and usability of the report by a wide range of stakeholders.

2.2. Theoretical perspectives

A number of studies have investigated the determinants of IR from institutional perspective (Jensen and Berg, 2012; Fasan et al., 2016; Camilleri, 2018). The institutional factors commonly referred to include legal, financial, cultural, economic, educational and labour system. However, this study is not focused on the relationship between QIR and institutional determinants, but on the influence of organizational characteristics on the level of quality of the integrated report. Agency theory and contingency theory appear to explain this relationship better.

From the agency theory perspective, firms with certain characteristics such as size, board composition are more likely to have higher agency problem and as a result, they are more likely to disclose more information because of greater problem of information asymmetry (Frías-Aceituno et al., 2014). Information asymmetry exists when managers have insider information about investment opportunities, of which the outsiders who are the providers of capital are not aware. It therefore becomes difficult for the providers of capital to make informed assessment of the attractiveness of investment opportunities. This lack of adequate information is highly likely to create problem of market failure or inefficient market. When this happens, capital providers under-value highly profitable investments and over-value poorly profitable investments. Preparation of quality integrated reports therefore contributes in lowering the information asymmetry between managers and capital providers (Van der, 2016).

The application of contingency theory may explain why firms may differ in the quality of integrated reports. Firms may be subject to the same level of regulatory requirements such as the mandatory compliance with integrated reporting by all JSE listed firms, but respond to this regulation differently based on individual firm-based characteristics. Contingency theory therefore becomes relevant because it advocates for what fits an organization given the circumstance it find itself. In line with this, Otley (1980, p. 413) states that, "a contingency theory must identify specific aspects of an accounting system which are associated with certain defined circumstances and demonstrate appropriate matching". Integrated reporting is regarded as an aspect of accounting and has become a listing requirement for all companies listed on the JSE. Despite this, the Framework does not prescribe specific key performance indicators (KPIs), measurement methods or the disclosure of individual matters. Those responsible for the preparation and presentation of the reports need to exercise judgement, given the specific circumstances of the organisation, to determine which matters are material, and how these are disclosed on the integrated reports (IIRC, 2013). It is on this basis that this study in addition utilised the contingency theory approach to further provide theoretical foundation for this research, and predicts that QIR is

influenced by individual company attributes such as profitability, leverage, board size, gender diversity and firm size.

2.3. Hypotheses development

In concept, quality of integrated reports (QIR) refers to the degree of compliance of integrated reports with the provision of relevant framework. Therefore, a high degree of compliance can be translated as a high-quality integrated reports and a low degree of compliance can be translated as a low-quality integrated reports (Dude (2017); Barth et al. (2016). Baboukardos and Rimmel (2016) noted that the structure of the integrated report is not important, rather, the crucial aspect is the content and quality of information provided. Materiality and conciseness form part of the 6 guiding principles that inform the content and presentation of an integrated report, as well as the process through which it is prepared. Materiality plays a crucial role in determining the matters to be included in an integrated report and ensuring conciseness of the report. According to the Framework:

> *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* (IIRC, 2013 p.18).

The principle of conciseness states that an integrated report should include sufficient context to understand the organization's strategy, governance, performance and prospects without being burdened with less relevant information. In addition, the organisation must seek a balance in its integrated report between conciseness and the other guiding principles, in particular completeness and comparability. These require that:

> *An integrated report should include all material matters, both positive and negative, in a balanced way and without material error* (IIRC, 2013 p.21)

In complying with these principles, the relationship between the length and quality of integrated report becomes relevant. Ernst and Young, in their *Excellence in Integrated Reporting Award Report* stated that the average length of the reports that titled as integrated report was 144 pages. Average length of reports in the 2018 survey was 151 pages and 149 in 2017. In the 2018 survey, the longest and shortest integrated reports were 297 and 56 respectively. Many of the firms that ranked in the excellent categories in their integrated reporting quality had the longest integrated reports (EY, 2018). There is therefore a need to provide insight through empirical analysis on the relationship between quality and length of integrated report. The first hypothesis of this study is stated as follows:

H1. *There is a significant relationship between quality and length of integrated reports.*

The study proceeds to examine the relationship between quality of integrated reports quality (IRQ) and the following organizational factors: Profitability, leverage, board size, gender diversity and firm size. These factors influence the second hypothesis of this study.

2.3.1. Profitability

The preparation of integrated report comes with cost implications. Frías-Aceituno et al. (2014) noted that hiring of qualified personnel and the process of gathering the right information could be financially demanding, especially, if the organization is particular about the quality of the report. A more profitable firm therefore has more resources to spend in preparing such report. From the agency theory perspective, managers of highly profitable firms may use the company's information for personal advantage such as increasing the level of revenue, thereby creating agency conflict. However, there appears to be a mixed result on the relationship between QIR and profitability. Majority of empirical research found no statistically significant relationship (Eng and Mak, 2003; Lai, Melloni and Stacchezzini, 2017; Meuleman, 2018). In some other studies, the relationship is negative (Prencipe, 2004). In the case of Frías-Aceituno et al. (2014), a positive relationship was established.

Taking into account the above arguments, and the results obtained in previous studies, we tested the following hypothesis.

H2a. *There is a significant difference in quality of integrated reports on the account of difference in profitability.*

2.3.2. Leverage

The more the stakeholders in a firm, the more the need to report on all aspects of the business. Part of the stakeholders which a firm will be accountable to is its creditors. This is because of their financial investment in sustaining the business. In line with the agency theory, a higher degree of financial leverage within the company can lead to more agency costs since there can be conflicts between shareholders and the creditors (Ahmed and Courtis, 1999; Depoers, 2000). This agency cost can be minimised when firms report more. It is on this basis that the agency theory provides the theoretical basis for quality of integrated reports in corporate organisations. The result of the influence of leverage on the QIR appears to be inconclusive. While there is empirical evidence that there is no significant relationship between the two variables (Lai et al. (2017), other studies have found a positive relationship (Ahmed and Courtis, 1999; Broberg et al., 2010). Eng and Mak (2003) found a significantly negative relationship. The mix result on this variable informed the following hypothesis:

H2b. *There is a significant difference in quality of integrated reports on the account of difference in leverage.*

2.3.3. Board size

There are two schools of thought on the relationship between board size and quality of integrated reports. First, is the notion that a large board size is needed to handle the complexity involved in preparing and supervising the preparation of quality integrated report that will meet the needs of a wide range of stakeholders. This is because the complexity of the information content of the integrated report demands intellectual competence. Hence, a large board that consists of appropriate mix of experts in relevant discipline is crucial in this approach (Fasan and Mio, 2017; Meuleman, 2018). The second school of thought argued that a board made up of small size might be more effective than large board. There may be difficulty in reaching a consensus because of the divergent views of a large board thereby reducing effectiveness (Lipton and Lorsch, 1992). Given these two conflicting views, the present study regards board size as a contextual element that is crucial for testing the following hypothesis based on contingency theory approach.

H2c. *There is a significant difference in quality of integrated reports on the account of difference in board size.*

2.3.4. Gender diversity

Gender diversity refers to the disparity of the characteristics presented by the board members in terms of fraction of women in the board (Frías-Aceituno et al., 2012). Gender diversity promotes problem solving, increases leadership effectiveness and more effectively facilitates global relationships. Due to certain inherent qualities in women such as sensitivity and transparency, including them on the board can enhance the company to publish more voluntarily integrated information. This sensitivity and transparency as noted by Bear et al. (2010) influence the communication style of women and also cause women to have a better relationship with all the stakeholders of the company. As a result, they want to keep the stakeholders posted and give them information about what is happening in the company. In addition, women think differently compared to men, and they have a different work ethic and different perspectives due to their role of mother and wife (Frías-Aceituno et al., 2013). Fasan and Mio (2017) and Meuleman (2018) have found a positive relationship between the two variables. A formulation of a testable hypothesis to confirm the assertion is hereby stated:

H2d. *There is a significant difference in quality of integrated reports on the account of difference in gender.*

2.3.5. Firm size

Large firms are differentiated from small firms by certain characteristics. One of such characteristics is more need for capital. It therefore has to supply the providers of capital adequate information about the organization. This it does through the annual integrated reports, which should be comprehensive enough to satisfy the information needs of the financiers. This is in line with the agency theory. According to the theory, with increasing company size, comes a greater need for external funds and thus an increased likelihood of conflicts of interest between shareholders, creditors and managers (Frías-Aceituno et al., 2014). In general, it can be concluded that large firms have more stakeholders to satisfy, who are all interested in diverse types of information and how these information types can create value. Many studies have supported the claim that a positive relation exists between firm size and quality of integrated reports produced (Frías-Aceituno et al., 2014; García Sanchez et al., 2011). In line with the above submissions, we hypothesize that:

H2e. *There is a significant difference in quality of integrated reports on the account of difference in firm size.*

3. Methodology

3.1. Sample and data

The population consists of the top 100 listed companies in JSE based on their market capitalization as at 31 December 2017. The top 100 companies were the focus of attention because they represent 93% of the market capitalization of the JSE (EY, 2018). The activities of these companies influence the practice of other companies, and can have greater impact on the capital market and the economy as a whole. Data were obtained from the annual integrated reports of 20 companies over the period (2013–2017), giving rise to a total firm-year observations of 100. These form the sample for this study of which the Ernst and Young *Excellence in Integrated Reporting Awards* (2011–2018) guided the sample selection process. Integrated reports for 2010 were awarded in 2011 and so on. Companies that ranked in the "excellent" and "good" categories from the integrated reports released between 2010 and 2017 were rated as firms with high quality integrated reports (hereafter referred to as group 1). Also, firms that ranked in the "average" and "poor/more progress to be made" were regarded as firms with low quality integrated reports (hereafter referred to as group 2). The year 2013 was chosen as the base year for this study because majority of the companies that ranked within group 1 in 2017 did not qualify for inclusion in group 1 until 2013. The integrated reports of eleven (11) firms were consistently ranked in either "excellent" or "good" between 2013 and 2017, while only ten (10) firms were consistently ranked as either "average" or "poor/more progress to be made" categories during the period. A matching criterion based on the number of firms in group 2 was used to standardize the number of firms from each group. This process gave rise to an equal number of firms resulting in 10 sampled firms in each group. Table 1 presents the sectorial representation in the sample.

Data on QIR is based on the result of the Ernst and Young annual rating of quality of the integrated reports of the top 100 firms that are listed on the JSE. Since 2011, Ernst and Young has ran a process that evaluates the IRs of the top 100 firms on the JSE against a list of criteria based on the IIRF (EY, 2014, 2015, 2016, 2017, 2018). The scoring criteria covers the entire seven guiding principles and the eight content elements of the IIRC framework. Firms were ranked into four categories, namely; excellent, good, average and poor/progress to be made. In the study, a score was allocated accordingly; excellent – 4; good – 3; average – 2; and poor/progress to be made - 1. In addition to the dependent variable, which is the QIR, the study examined the influence of five independent variables, which influence the quality of the integrated reports. These are: profitability (ROA), computed as Income (after tax) before extraordinary item divided by total assets, leverage (LEV), computed as ratio of total debt to sum of total debt and book value of common shareholders' interest in the company, board size (BS), measured as number of directors making the board, gender diversity (GEN), measured as percentage of women in the board, and firm size (SIZE), measured as log of total assets. Codes were assigned to each variable based on the number of groupings as follows; profitability (0–5); leverage (1–5); board size (1–5); gender diversity (1–4) and firm size (1–11) (See Table 4). The purpose of using each of the corporate characteristics to create group is to observe variation in the mean scores across each of the variable groupings. The variability of mean scores at each level of variable groupings are matched with the QIR mean scores.

Table 1
Sectorial distribution of firms in both group.

Industry	Total no of Companies	Firm year Observation
Industrial metal & mining	2	10
Tobacco	1	5
Life insurance	1	5
Non-life Insurance	1	5
Mining	2	10
Healthcare equipment & services	2	10
General industrial	1	5
General retailer	1	5
Chemical	1	5
Food producer	2	10
Financial services	6	30
	20	100

Descriptive statistics (frequency count, mean, standard deviation, minimum and maximum values) and non-parametric inferential statistics (Spearman rank correlation and independent sample Kruskal-Wallis H test) were applied in the analysis. The choice of non-parametric statistics became necessary following the nature of the dependent variable, which is in ordinal form. Normality of the data remains a factor in deciding on the use of parametric or non-parametric statistics for inferential analysis. Generally, it is recommended that normally distributed data should be analysed using parametric inferential statistics, but data violating the normality assumption should be analysed using non-parametric statistics. In this situation, the dependent variable for this study is not normally distributed. Data analysis was aided with the use of Microsoft *Excel (2013*) edition and IBM *SPSS* version 21.

4. Results and discussions

4.1. Descriptive analysis

The descriptive statistics for all the variables utilised in the study are presented in Table 2. In line with the scoring criteria for QIR, the mean value for group 1 (3.2600) for the 50 firms over the period of 2013–2017 is higher than the value for group 2 (1.4600). This implies that firms in group 1 have a higher integrated reporting quality than the firms in group 2. Based on the result of the descriptive analysis, firms in group 2 appear to achieve higher profitability (1.4000) than the first group (1.1400). The same holds for firm size. The mean value for the firm size in group 2 is (5.6000) compared to group 1 (3.7200). On the other hand, group 1 has a higher leverage (2.2600), board size (2.8800) and gender (2.6800) compared to group 2 where leverage is (2.1000), board size (2.3600) and gender shows a mean score of (1.7800).

In general, the values of the standard deviation show that there are no extreme deviations from the mean values that could affect the reliability of the result of further analysis. Apart from BS and GEN, the mean scores for other independent variables are closer to the minimum values, indicating low scores for those variables. Having employed descriptive statistics to provide *prima facie* evidence that the quality of integrated reports differed between firms from the two groups, and the meaningful descriptions of all the determinants of QIR, the result in Table 6 shows

Table 2
Descriptive statistics for QIR and its determinants.

Variable	Group 1	Mean	Std. dev.	Min.	Max.	Group 2	Mean	Std. dev.	Min.	Max.
	N					N				
QIR	50	3.2600	0.4431	3.00	4.00	50	1.4600	0.5035	1.00	2.00
ROA	50	1.1400	0.8808	0.00	3.00	50	1.4000	1.3401	0.00	5.00
LEV	50	2.2600	0.8526	1.00	5.00	50	2.1000	1.0546	1.00	5.00
BS	50	2.8800	0.8723	2.00	5.00	50	2.3600	0.6627	1.00	3.00
GEN	50	2.6800	0.7677	1.00	4.00	50	1.7800	0.8640	1.00	4.00
Insize	50	3.7200	2.0106	1.00	9.00	50	5.6000	3.4047	1.00	11.00

further analysis of how firms differ in terms of quality of integrated reports on account of these determinants.

4.2. Relationship between quality and length of integrated reports

Analysis on the quantum of pages of integrated reports released by all the firms in group 1 and 2 is presented in Table 3. The result shows that the number of pages of the annual integrated report released by firms in group 1 ranges between 80 to 348, while firms in group 2 released integrated reports as low as 54 pages and maximum of 300. The mean score for group 1 is 196.7 while group 2 had a mean score of 126.08. This analysis shows that firms with high QIR, referred to as group 1 released integrated reports with higher length in terms of number of pages than those with low QIR, referred to as group 2.

4.3. Determinants of quality integrated reports

The result in Table 4 present the QIR index for all the sampled companies across all the characteristics examined in the study. Analysis in the Table shows that different pattern of variations in mean score are observed for all the variables. By using profitability as a basis for creating groups, the minimum, maximum and mean scores of firms differ across the six classes of profitability. Firms with ROA ranging from *21-30%* have the highest mean score of 3.250 and with 4 observations, whereas on the one hand, firms with ROA ranging between *0-0.99%* and with 20 observations have a mean score of 2.650 while those having ROA above *41%* on the other depict a lower mean score of 1.500. The standard deviation scores in each of the profitability levels established that there are no marked fluctuations from the mean score in each stratum. However, this analysis indicates that there is evidence of fluctuation in mean scores across profitability levels.

Result of analysis on QIR index using leverage of firms as a basis for creating groups shows that firms in the *0 to 30%, 31–60%, 61–90%, 91–120%* and *121% and above* categories have mean scores of 2.130, 2.375, 2.800, 1.833 and 2.000 respectively. There is no significant deviation between the mean and the standard deviation values. By this result, there is no evidence of fluctuation in mean scores across leverage categories.

For board size, firms that have board size from *0 to 5, 6 to 10, 11 to 15, 16 to 20 and 20 and above* categories have mean scores of 1.000, 2.154, 2.580, 3.000 and 3.000 respectively with no marked deviation from the mean. This is indicative of fluctuation in mean scores across levels of board sizes. Statistics on dispersion (standard deviation, standard error, lower class and upper class boundaries) was not generated for the firm in the board size category as it was only one observation that was in that category. Gender has a mean score of 1.471, 2.063, 2.406, 2.727 and 3.154 where the numbers of women in the board were *0, 1, 2, 3* and *4* respectively. Like other determinants, this result indicates that there is fluctuation in mean scores across levels of gender representations. Finally, the result in Table 4 indicates that there is evidence of fluctuation across levels of firm sizes. Examination of the total asset in its log form shows that the sizes range from 8.0 + to 18.0 +. Hence, the categorisation covers from 8.0 to 18.99. Firms with sizes from *10.0 to 10.99* have the highest mean score of 3.045. The least mean score are firms with asset sizes ranging from *14.0 to 14.99* and *18.0 to 18.99* and have equal mean scores of 1.000 respectively.

From the analysis above, there appear to be significant fluctuations in the mean scores for all the variables across all levels, except leverage. While four of the variables have mean scores ranging from *1.000 + to 3.000 +*, the mean scores for leverage across all levels ranges from *1.000 + to 2.000 +*. This is a *prima facie* evidence of significant fluctuation in profitability, board size, gender and firm size that may not hold for leverage. Further analysis utilising non-parametric inferential statistics, which is intended to draw a conclusion whether these happened by chance or not is presented in Table 6.

Table 3
Descriptive statistics on the length of integrated reports.

	N	Minimum	Maximum	Mean	Std. Deviation
Group 1	50	80	348	196.7	64.425
Group 2	50	54	300	126.08	49.597

4.4. Inferential statistics

From results in Table 2, it was established that firms in group 1 had a higher QIR given the mean score. Result in Table 3 also established that the same firms that had higher QIR had the integrated reports with the highest number of pages. The result in Table 5 therefore, is to investigate whether the quality of integrated report is congruous with length in terms of number of pages of the integrated report.

The result in Table 5 shows a positive and statistically significant relationship ($r = .487$, $p = .001 < .05$) between quality and length of integrated reports released by the two groups. This positive association indicates that quality integrated reports are characterised by their length. Firms with higher quality integrated reports release more lengthy reports and vice versa. This is because more space is dedicated to reporting information about matters that substantively affect the organization's ability to create value over the short, medium and long term. It can be deduced therefore, that the difference in the quality of integrated reports between firms in group 1 and group 2 could be adduced to the length in terms of the number of pages of their annual integrated reports.

4.5. Test of hypotheses

The result of the descriptive statistics in Table 3 and the inferential statistics in Table 5 ($P = 0.001 \leq 0.05$) support the conclusion that there is a significant relationship between quality and length of integrated reports released by firms. It is on this basis that Hypothesis 1, stated in alternate form is accepted. The possible explanation for this result is that a major guiding principle in reporting is to ensure conciseness of the integrated report. However, the Framework emphasised that firms should disclose information about matters that substantively affect the organization's ability to create value over the short, medium and long term. While attempting to include all material matters and provide sufficient context to understand the organization's strategy, governance, performance and prospects, the length of the integrated report gets longer. It is therefore logical to conclude that the providers of capital for

Table 4
Descriptive statistics of QIR in relation to Firm characteristics.

	N	Mean	S.D	SE	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Profitability								
≤0.99%	20	2.6500	0.9881	0.2209	2.188	3.112	1.0	4.0
1–10%	53	2.2080	1.0069	0.1383	1.930	2.485	1.0	4.0
11–20%	17	2.5880	1.0641	0.2581	2.041	3.135	1.0	4.0
21–30%	4	3.2500	0.5000	0.2500	2.454	4.046	3.0	4.0
31–40%	2	1.5000	0.7071	0.5000	-4.853	7.853	1.0	2.0
41% and above	4	1.5000	0.5774	0.2887	0.581	2.419	1.0	2.0
Total	100	2.3600	1.0202	0.1020	2.158	2.562	1.0	4.0
Leverage								
0–30%	23	2.1300	0.8689	0.1812	1.755	2.506	1.0	4.0
31–60%	48	2.3750	1.1416	0.1648	2.044	2.706	1.0	4.0
61–90%	20	2.8000	0.7678	0.1717	2.441	3.159	1.0	4.0
91–120%	6	1.8330	0.9832	0.4014	0.802	2.865	1.0	3.0
121% & above	3	2.0000	1.0000	0.5774	-0.484	4.484	1.0	3.0
Total	100	2.3600	1.0202	0.1020	2.158	2.562	1.0	4.0
Board size								
0–5	5	1.0000	0.0000	0.0000	1.000	1.000	1.0	1.0
6–10	39	2.1540	0.9608	0.1538	1.842	2.465	1.0	4.0
11–15	50	2.5800	1.0319	0.1459	2.287	2.873	1.0	4.0
16–20	1	3.0000	-	-	-	-	3.0	3.0
20 and above	5	3.0000	0.0000	0.0000	3.000	3.000	3.0	3.0
Total	100	2.3600	1.0202	0.1020	2,158	2.562	1.0	4.0
Gender diversity								
0–10%	24	1.5420	0.5882	0.1201	1.293	1.790	1.0	3.0
11–20%	39	2.4620	0.9416	0.1508	2.156	2.767	1.0	4.0
21–30%	27	2.6670	0.9608	0.1849	2.287	3.047	1.0	4.0
31–40%	10	3.1000	1.1972	0.3786	2.244	3.956	1.0	4.0
Total	100	2.3600	1.0202	0.1020	2.158	2.562	1.0	4.0
	N	Mean	S.D	SE	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Firm size								
8.0–8.99	11	1.9090	1.0445	0.3149	1.207	2.611	1.0	3.0
9.0–9.99	12	2.4170	1.0836	0.3128	1.728	3.105	1.0	4.0
10.0–10.99	22	3.0450	0.7854	0.1675	2.697	3.394	2.0	4.0
11.0–11.99	25	2.9200	0.5705	0.1143	2.684	3.156	1.0	4.0
14.0–14.99	2	1.0000	0.0000	0.0000	1.000	1.000	1.0	1.0
15.0–15.99	9	1.1110	0.3330	0.1110	0.855	1.367	1.0	2.0
16.0–16.99	13	2.3077	0.8623	0.2392	1.556	2.598	1.0	3.0
17.0–17.99	4	1.2500	0.5000	0.2500	0.4540	2.0460	1.0	2.0
18.0–18.99	2	1.0000	0.0000	0.0000	1.0000	1.0000	1.0	1.0
Total	100	2.3600	1.0202	0.0000	2.1580	2.5620	1.0	4.0<

Table 5
Correlation between quality and length of integrated reporting.

		Length of integrated report
Quality of Integrated report	Spearman Correlation	0.487**
	Sig. (2-tailed)	0.001
	N	100

** Significance level at 5%.

which the integrated reports are relevant will place greater value on such detailed report than the shorter ones. This result contradicts that of Rivera-Arrubla et al. (2017), which could not establish a significant relationship between the length and quality of disclosure in the integrated reports.

The result of the Kruskal-Wallis H test in Table 6 shows the result of the hypotheses on the influence of five firm characteristics on the QIR released by firms. The result of the descriptive statistics on the fluctuations in profitability is supported by the result of the inferential statistics, which shows a statistically significant [$T = 11.320, p < .05$] difference in QIR at the various profitability levels. Thus, Hypothesis 2a is supported. The result is in line with the report of Frías-Aceituno et al. (2014).

Hypothesis 2b is not supported on the basis that the inferential statistics in Table 6 shows that the difference in QIR is non-statistically significant [$T = 6.917, p > .05$] at the various levels of leverage. This is in line with the result of the descriptive statistics in Table 4. Lai, Melloni and Stacchezzini, (2017) support this result in a study, which also showed empirical evidence that there is no significant relationship between the two variables. In relation to board size, the result of the descriptive statistics, which showed fluctuation across different board sizes, is hereby supported by the result of the inferential statistics as presented in Table 6. It shows a statistically significant [$T = 14.937, p < .05$] difference in QIR at the various level of board sizes. In Table 4, firms with large board sizes have higher mean scores indicating a positive association between QIR and BS in line with Fasan and Mio (2017) and Meuleman (2018).

Similarly, evidence of fluctuation in the percentage of women in the board as represented by gender diversity is hereby supported. The analysis shows a statistically significant [$T = 24.371, p < .05$] difference in QIR at different gender levels. Previous studies by Fasan and Mio (2017) and Meuleman (2018) found similar result. This can be due to certain inherent qualities in women, which promotes better innovations sometimes. Finally, the inferential statistics also supports the result of descriptive statistics, which showed fluctuation across firm sizes. It shows a statistically significant [$T = 45.163, p < .05$] difference in QIR at the different level of firm sizes. This is in line with Frías-Aceituno et al. (2014) and García Sanchez et al. (2011).

Table 6
Kruskal-Wallis H test for hypothesis testing.

Hypotheses	Proposition	T- Stat.	P-value	Decision @5% sig
$H_1$2a	There is a significant difference in quality of integrated reports on the account of difference in profitability	11.320	0.045	Supported
$H_1$2b	There is a significant difference in quality of integrated reports on the account of difference in leverage	6.917	0.140	Not supported
$H_1$2c	There is a significant difference in quality of integrated reports on the account of difference in board size	14.937	0.005	Supported
$H_1$2d	There is a significant difference in quality of integrated reports on the account of difference in gender diversity	24.371	0.001	Supported
$H_1$2e	There is a significant difference in quality of integrated reports on the account of difference in firm size	45.163	0.001	Supported

5. Conclusion

This paper assessed the overall integrated reporting quality of JSE listed firms and the associated corporate characteristics. This was necessary because integrated reports should disclose material information that impacts positively or otherwise on the ability of the firm to create value. The result of this study indicates a positive significant relationship between the length and quality of integrated reports released by sampled firms. Profitability, board size, gender diversity in terms of percentage of women representation on the board, and firm size were found to influence the quality of integrated reports. The findings of the study indicates no association between QIR and leverage.

In terms of contribution, the present study provides empirical evidence on the relationship between length and quality of integrated reports released by JSE listed firms. It made theoretical contribution through the application of agency theory and contingency theory. The fact that the preparation of QIR contributes in lowering the information asymmetry between managers and capital providers, the four variables, which have significant influence on the QIR can therefore be regarded as parameters for lowering agency problem. A smaller firm comprising of only few stakeholders to report to may likely have lower agency problem. Similarly, a firm with large board comprising of directors who have the right mix of education, experience and diversity is in a better position to prepare higher quality integrated reports, which is useful in preventing market inefficiency and lowering information asymmetry. The same advantage holds for a firm, which has a higher percentage of women in the board who have the same requisite experience and diversity to prepare quality integrated reports – agency problem will reduce. The study makes additional theoretical contribution by identifying firm size, profitability, board size and gender diversity as the most significant contingent factors that accounts for variation in QIR.

A number of practical implications emanates from this study. First, it is clear from the positive relationship between the quality and length of integrated reports that emphasis should be placed on maintaining a balance between these two concepts in relation to the integrated reports released by firms. The quality of the integrated report is not only by its length, but also in its ability to disclose material information that influences the firms' ability to create value in the short, medium and long term. Lengthy integrated reports assist in achieving this objective by allowing for more material information to be disclosed. The reliability of the corporate reporting system depends entirely on this, being the only means to guarantee the confidence of investors who have provided capital for the organization. Regulatory authorities and companies therefore, should seek to specify the attributes of quality integrated reports in terms of its length and other characteristics.

Second, the influence of firm size on the quality of integrated reports has implications for policy makers. This study supports the notion that the on-going debate on the relevance of the current Framework for SMEs is valid. This is because firms differ in the quality of their integrated reports on account of firm size. It is expected therefore, that a revised Framework would be launched that would be adopted based on the size of the firm concerned. Third, since profitability influences the quality of integrated reports, expectation of stakeholders should be moderated by the level of profitability of the reporting entity. In essence, highly profitable firms should be expected to make a higher disclosure than less profitable firms. Fourth, empirical evidences on the variation in the quality of integrated reports on account of board size and gender diversity require that companies adopt appropriate policy that will ensure optimum benefits from the size of the board and by the percentage of women in the board. Consideration should be given to more individuals and women in the board with the right experience and expertise who will be able to make a difference in the complex changing business environment. The main limitation of the present study is the sample size. The small sample size appears to be unavoidable because it is a function of the number of firms that were consistently ranked in either group 1 or 2 from the year of inception of the award to the time of this study. However, this does not affect the reliability of the result. Further research in this area may use different criteria for sample selection that will give rise to larger sample size and larger data set.

Declarations

Author contribution statement

Oluwamayowa Iredele: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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References

Adhariani, D., de Villiers, C., 2018. Integrated reporting: perspectives of corporate report preparers and other stakeholders. Sustain. Account. Manag. Policy J. 10 (1), 126–156.

Ahmed, K., Courtis, J.K., 1999. Associations between corporate characteristics and disclosure levels in annual reports: a meta-analysis. Br. Account. Rev. 31 (1), 35–61.

Baboukardos, D., Rimmel, G., 2016. Value relevance of accounting information under an integrated reporting approach: a research note. J. Account. Public Policy 35 (4), 437–452.

Barth, M.E., Cahan, S.F., Chen, L., Venter, E.R., 2016. The Economic Consequences Associated with Integrated Report Quality: Early Evidence from a Mandatory Setting. Working paper. Available at SSRN 2699409.

Bear, S., Rahman, N., Post, C., 2010. The impact on board diversity and gender composition on corporate social responsibility and firm reputation. J. Bus. Ethics 97 (2), 207–221.

Broberg, P., Tagesson, T., Collin, S.O., 2010. What explains variation in voluntary disclosure? a study of the annual reports of corporations listed on the stockholm stock exchange. J. Manag. Gov. 14 (4), 351–377.

Camilleri, M.A., 2018. Theoretical insights on integrated reporting: the inclusion of non-financial capitals in corporate disclosures. Corp. Commun. Int. J. 23 (4), 567–581.

de Villiers, C., Rinaldi, L., Unerman, J., 2014. Integrated reporting: insights, gaps and an agenda for future research. Account. Audit. Account. J. 27 (7), 1042–1067.
de Villiers, C., Hsiao, P.K., Maroun, W., 2017. Developing a conceptual model of influences around integrated reporting, new insights and directions for future research. Meditari Account. Res. 25 (4), 450–460.
Depoers, F., 2000. A cost benefit study of voluntary disclosure: some empirical evidence from French listed companies. Eur. Account. Rev. 9 (2), 245–263.
Dude, V., 2017. The Association between Integrated Reporting and Company Financial Performance: A Graphical Time-Series Approach (Masters of Business Administration Project). Gordon Institute of Business Science, University of Pretoria, South Africa.
Eng, L.L., Mak, Y.T., 2003. Corporate governance and voluntary disclosure. J. Account. Public Policy 22 (4), 325–345.
Ernst and Young (EY), 2014. Excellence in Integrated Reporting Awards 2014: a Survey of Integrated Reports from South Africa's Top 100 JSE-Listed Companies and Top 10 State-Owned Companies. Johannesburg, EY, South Africa.
Ernst and Young (EY), 2015. Excellence in Integrated Reporting Awards 2015: a Survey of Integrated Reports South Africa's Top 100 JSE-Listed Companies and Top 10 State-Owned Companies. Johannesburg, EY, South Africa.
Ernst and Young (EY), 2016. Excellence in Integrated Reporting Awards 2016: a Survey of Integrated Reports from South Africa's Top 100 JSE-Listed Companies and Top 10 State-Owned Companies. Johannesburg, EY, South Africa.
Ernst and Young, 2017. Excellence in Integrated Reporting Awards 2017: a Survey of Integrated Reports from South Africa's Top 100 JSE-Listed Companies and Top 10 State-Owned Companies. Johannesburg, EY, South Africa.
Ernst and Young, 2018. Excellence in Integrated Reporting Awards 2018: a Survey of Integrated Reports from South Africa's Top 100 JSE-Listed Companies and Top 10 State-Owned Companies. Johannesburg, EY, South Africa.
Fasan, M., Mio, C., 2017. Fostering stakeholder engagement: the role of materiality disclosure in integrated reporting. Bus. Strateg. Environ. 26, 288–305.
Fasan, M., Marcon, C., Mio, C., 2016. Institutional Determinants of Integrated Reporting Disclosure Quality. Department of Management , Ca' Foscari University of Venice, Venice, Italy, pp. 181–203.
Frías-Aceituno, J.V., Rodríguez-Ariza, L., García Sánchez, I.M., 2012. The role of the board in the dissemination of integrated corporate social reporting. Corp. Soc. Responsib. Environ. Manag. 20 (4), 219–233.
Frías-Aceituno, J.V., Rodríguez-Ariza, L., García-Sánchez, I.M., 2013. Is integrated reporting determined by a country's legal system? An exploratory study. J. Clean. Prod. 23 (1), 45–55.
Frías-Aceituno, J., Rodríguez-Ariza, L., García-Sánchez, I., 2014. Explanatory factors of integrated reporting sustainability and financial reporting. Bus. Strateg. Environ. 23 (1), 56–72.
García-Sanchez, I.M., Rodríguez-Domínguez, L., Gallego-Alvarez, I., 2011. Corporate governance and strategic information on the internet. *Accounting*. Audit. Account. J. 24 (4), 471–501.
International Integrated Reporting Council (IIRC), 2011. Towards Integrated Reporting: Communicating- Value in 21st Century. Discussion paper. Retrieved from:www.theiirc.org: www.theiirc.org Path.
International Integrated Reporting Council (IIRC), 2013. The International Integrated Reporting Framework. Retrieved from. https://integratedreporting.org/wp-content/uploads/2013/12/13-12-08-the-international-ir-framework-2-1.pdf.
Jensen, J.C., Berg, N., 2012. Determinants of traditional sustainability reporting versus integrated reporting. an institutionalist approach. Bus. Strateg. Environ. 21 (5), 299–316.
Lai, A., Melloni, G., Stacchezzini, R., 2017. What does materiality mean to integrated reporting preparers? An empirical exploration. Meditari Account. Res. 25 (4), 533–552.
Lee, K.W., Yeo, G.H., 2015. The association between integrated reporting and firm valuation. Rev. Quant. Finance Account. 47 (4), 1221–1250.
Lipton, M., Lorsch, J.W., 1992. A modest proposal for improved corporate governance. Bus. Lawyer 48 (1), 59–77.
McNally, M., Cerbone, D., Maroun, W., 2017. Exploring the challenges of preparing an integrated report. Meditari Account. Res. 25 (4), 481–504.
Melloni, G., Caglio, A., Perego, P., 2017. Saying more with less? Disclosure conciseness, completeness, and balance in integrated reports. J. Account. Public Policy 36, 220–238.
Meuleman, M., 2018. Determinants of Integrated Reporting in Europe: an Empirical Study (Unpublished Master's Thesis). Faculty of Economics, University of Gent, Belgium.
Otley, D.T., 1980. The contingency theory of management accounting: achievement and prognosis. Account., Organ. Soc. 4, 413–428.
Prencipe, A., 2004. Proprietary costs and determinants of voluntary segment disclosure: evidence from Italian listed companies. Eur. Account. Rev. 13 (2), 319–340.
PricewaterhouseCoopers (PwC), 2013. Integrated Reporting Companies Struggle to Explain what Value They Create. Available at: www.pwc.nl/nl_NL/nl/assets/documents/ir-opmars-geintegreerde-verslaggeving-stagneert.pdf. (Accessed 17 June 2015).
PricewaterhouseCoopers (PwC), 2014. Value Creation: the Journey Continues: A Survey of JSE Top-40 Companies' Integrated Reports. Available at: www.pwc.co.za/en_ZA/za/assets/pdf/integrated-reporting-survey-2014.pdf. (Accessed 17 June 2015).
Rinaldi, L., Unerman, J., de Villiers, C., 2018. Evaluating the integrated Reporting journey: insights, gaps and agendas for future research. Account., Audit. Account. J. 31 (5), 1294–1318.
Rivera-Arrubla, Y.A., Zorio-Grima, A., García-Benau, M.A., 2017. Integrated reports: disclosure level and explanatory factors. Soc. Responsib. J. 13 (1), 155–176.
Solomon, J., Maroun, W., 2012. Integrated Reporting: the Influence of King III on Social, Ethical and Environmental Reporting: ACCA Research Report. The Association of Chartered Certified Accountants, London.
Van der, M., 2016. Value Relevance of Integrated Reporting: an agency Perspective (Unpublished Master's Thesis). Management, Science and Technology. Open Universiteit Nederland.