Does combined assurance contribute to higher quality integrated reports by South African listed companies?

A research submitted by
Mathew Abraham
Student Number: 1434343
Cell: 074 676 6392
Email: abin98abraham@gmail.com
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Abstract

Purpose

The purpose of this thesis is to evaluate whether or not combined assurance contributes to higher quality integrated reports by South African listed companies. It addresses the lack of previous research into the role assurance, especially combined assurance, plays as a credible enhancing mechanism for better report quality. This research was conducted using a quality schematic which deals with different assurances of integrated and sustainability reports.

Design/methodology/approach

Content analysis was conducted on 30 companies out of the top 100 companies listed on the JSE in which data was collected and aggregated from annual/integrated reports which were dealing with assurance. The data was then analysed using a regression model and different test statistic performed to determine any association between combined assurance and integrated reporting.

Findings

The statistical evidence from the research supports the use of combined assurance by an entity as it is associated with higher quality reporting. The different various aspects of combined assurance that led to the association included the types of procedures performed by assurance providers, as well as the source of assurance whether external or internal. The level of assurance and the responsibility and compliance statements both negatively affect the quality of integrated reports and thus serves to indicate that too much emphasis should not be placed on these aspects.

Research limitations/implications

There are several limitations of this research which include the use of content analysis and, specifically, manual coding. This results in subjectivity and the possibility of errors. The data collected was also restricted to a single jurisdiction which limited the findings only to a South African context.

Originality/value

Integrated reporting has been adopted far greater than in earlier years and it is important that companies perform the report in a concise effect manner. This study provides insights on the role a combined assurance can play in ensuring and improving the quality of integrated reports produced. It is imperative that further guidance is provided on making an integrated or a sustainability report the subject matter of a combined assurance to ensure entities obtain the benefit of better report quality.

1. Introduction

This research is motived by the significant demand for mechanisms which enhance the trust and reliability of non-financial reporting. It responds directly to the calls by De Villiers, Venter and Hsiao (2017b) and Rinaldi, Unerman and De Villiers (2018b) and to determine the role which corporate governance infrastructure (such as a combined assurance model) can play in ensuring high-quality integrated reporting.

There have been increased calls by stakeholders to improve the credibility and reliability of reporting by having non-financial disclosures assured (Junior, Best and Cotter, 2014; Crotty, 2007; IAASB, 2016; Simnett, 2015). These calls are not only by stakeholders but by reporting organisations as well, such as the IIRC, King IV and the GRI (Kolk and Perego, 2010). The IIRC does not mandate the use of external assurance but it does state:

> *the reliability of information is affected by its balance and freedom from material error. Reliability (which is often referred to as faithful representation) is enhanced by mechanisms such as robust internal control and reporting systems, stakeholder engagement, internal audit or similar functions, and independent, external assurance (IIRC, 2013b, par 3.40).*

The GRI (2016) also recommends that the sustainability reports should be independently assured to ensure the accuracy, completeness and reliability of the disclosure:

> *external assurance or verification can provide both report readers and internal managers with increased confidence in the quality of sustainability performance data, making it more likely that the data will be relied on and used for decision making (GRI, 2013a, p.g. 5).*

These pressures by stakeholders and reporting organisations originate from the fact that many of the content elements of the integrated reports are qualitative and forward-looking, something which makes it difficult to report accurately. Given this, management may simply be using integrated reporting as a tool for "greenwashing" (Zhou, Simnett and Green, 2017) and stakeholders cannot determine the creditability and reliability of the information disclosed in order to base decisions (Cho, Michelon, Patten and Roberts, 2014). A solution to improve the credibility and reliability of information within an integrated report is to obtain some form of

assurance. The exact means by which the assurance is to be provided and its impact is still to be determined.

In light of this problem, the purpose of this study is to evaluate whether or not combined assurance contributes to higher quality integrated reports by South African listed companies.

1.1. Significance of the study

Since the release of the IIRC (2013b), there has been increasing research, looking at integrated reporting (Dumay, Bernardi, Guthrie and Demartini, 2016). There however, is very little research that has been conducted on the role assurance plays in contributing to high-quality reporting. While the quality of financial statement audits has been studied in detail, relatively little is known about the assurance of integrated and sustainability reports (Prinsloo and Maroun, 2020).

With entities obtaining different singular forms of assurance on different parts of information, existing literature has primarily identified only combined assurance as a potentially vital way to improve report quality (Barac and Forte, 2015). With regulatory frameworks (IIRC, 2013b) and codes of best practice (IOD, 2016) recommending entities use of combined assurance models, little to no research has looked at whether this helps improve the quality of reporting.

Combined assurance, also known as the "three lines of defence", is about bringing closely together different assurance providers to provide a structured approach to assuring an organisation's information, which should improve the quality of reports (Barac and Forte, 2015). The study adds to earlier research by Zhou, Simnett and Hoang (2019) which focuses on whether a combined assurance improves the quality of South African integrated reports. The results of this study will be relevant for various parties. These include companies which seek to implement ways to enhance the credibility of their integrated reports, assurance practitioners aiming to ensure higher quality assurance, as well as regulators and standard-setters finding mechanisms to ensure that integrated reporting delivers its aim and purpose in a cost-effective but credible way.

1.2. Limitations, delimitations and assumptions

The underlying assumption used throughout the thesis is that the different assurance practices stated within the corporate reports are accurate and in line with the actual assurance practices used by the entities. This paper can be further developed by a more rigorous research and design which relies on the direct engagement with the organisations of interests, assurance providers and relevant stakeholders in order to provide more definite data points.

As in any study of this nature, this research is not without limitations. The use of content analysis and, specifically, manual coding has several drawbacks which impact the research. There is always a degree of subjectivity inherent in content analysis (Krippendorff, 2018). This has been criticised as it can affect the validity and reliability of the results if not carefully managed (Brennan, Guillamon-Saorin and Pierce, 2009; Clatworthy and Jones, 2003).

The research has several delimitations which require additional research. Firstly, the study is based on combined assurance practice within a single jurisdiction. Secondly, the research lacks reliable measures of evaluation report quality with only one model being used to test any relationship between combined assurance and integrated report quality. Thirdly, no interviews were conducted with specialists to try and explain how combined assurance affects report quality as this was beyond the scope of the research. The research was focused on a quantitative analysis with qualitative aspects to be possibly considered in future studies.

1.3. Definitions

Assurance engagement: an engagement in which a practitioner expresses a conclusion designed to enhance the degree of confidence of the intended users, other than the responsible party, about the outcome of the evaluation or measurement of a subject matter against criteria. The outcome of the evaluation or measurement of a subject matter is the information which results from applying the criteria (also see Subject matter information).

Combined assurance: the process of internal and external parties working together and combining their activities to reach the goal of communicating information [on a subject matter] to management (IIA, 2017a). This concept is derived from the notion that collaboration across assurance providers is key (Mutevhe, 2019).

1.4. Hypothesis

The hypothesis tested by this study is:

H1. The use of combined assurance by South Africa listed companies is associated with higher quality integrated reports.

2. Literature review

Farooq and De Villiers (2017a) defined sustainability assurance as an engagement in which a third-party sustainability assurance provider (SAP) is recruited to undertake assurance over a sustainability report.

Companies voluntarily engage independent experts to attest disclosures made in their sustainability reports (Ackers and Eccles, 2015). AccountAbility (2008a) describes this assurance as:

> *[. . .] the methods and processes employed by an assurance provider to evaluate an organization's public disclosures about its performance as well as underlying systems, data and processes against suitable criteria and standards to increase the credibility of public disclosure. Assurance includes the communication of the results of the assurance process in an assurance statement (AccountAbility, 2008a, p.g. 23).*

The aim of an assurance engagement is for an assurance provider to express an opinion on the report, either at a high or moderate level, based on the level of assurance obtained. This requires a practitioner to "obtain an understanding of the underlying subject matter" to "identify and assess the risks of material misstatement". The practitioner would then respond to those risks by planning the "nature, timing and extent" of the required procedures to collect sufficient appropriate evidence on a subject matter's conformance to defined criteria (IAASB, 2015b).

While the IIRC (2013b), GRI (2016) and South Africa's codes of corporate governance (IOD, 2016) recommend that integrated and sustainability reports be subject to, at least, some type of assurance, they do not mandate the assurance. Similarly, at the time of conducting this research, there were no laws nor regulations which compel companies to have integrated or sustainability reports assured (Simnett, Vanstraelen and Chua, 2009b). As a result, academic research has considered several possible drivers of the decision to have integrated or sustainability reports assured or not.

2.1. Drivers of sustainability assurance based on prior research

Many prior studies highlight the determinants of sustainability assurance for an organisation. These determinants can be categorised as external or firm-specific (Farooq and De Villiers, 2017a; Farooq and De Villiers, 2017b) and are outlined in Table 1:

Table 1: Determinants of sustainability assurance	
Indicator	**Summary**
Governance and regulatory environment	Simnett, Vanstraelen and Chua (2009a) found that an organisation's operation of either a shareholder or stakeholder centric governance system based on its shareholders, influence the decision to have corporate social responsibility (CSR) information assured. A stakeholder-orientated system recognises the fact that a sustainability report has multiple users who are not only focused on a firm's financial performance (Solomon, 2010). Stakeholder-centric companies, therefore, provide more detailed CSR information to ensure that stakeholders' information needs are satisfied. This increase in information reporting leads to organisations more likely obtaining independent assurance (Simnett et al., 2009a; Cho et al., 2014) to ensure the accuracy and completeness of the information.
Organisation's operating context	Companies operating in an environmentally sensitive industry (like mining) are more likely to use CSR assurance (Cho et al. 2014). Perego and Kolk (2012), however, noted that there has been a shift of sustainability assurance from environmentally sensitive industries (e.g., oil and gas) to industries which are perceived to be environmentally less sensitive (e.g. banking and finance). The findings though are mixed and are not consistent throughout countries, with some still finding environmentally sensitive industries obtaining the greatest CSR assurance.
Technology and media	The growth of information availability has resulted in societies being more informed and aware of the social, economic and environmental impacts of a companies operations. This is leading to growing expectations for greater information (King, 2016) and assurance of related disclosures (Cho et al., 2014). Gillet-Monjarret (2015) found that higher levels of negative media publicity influence the demand for sustainability assurance as companies seek to repair their reputations through credible disclosures.

Table 1: Determinants of sustainability assurance	
Indicator	**Summary**
Organisational determinants	Organisational determinants such as the size of firms and profitability have been found to have a positive association with sustainability assurance. The results are, however, mixed for this determinant. For example, Kend (2015) found that in the UK and Australia, the size of firms is not a driver of CSR assurance while more profitable firms are more likely to engage an external assurance provider. In contrast, Branco, Delgado, Gomes and Eugenio (2014) found that the size and profitability of organisations in Portugal are related to whether assurance is obtained.
Organisations attitude to CSR Reporting	Even though there has only been one paper that has considered this aspect, there is some evidence that 'active and more diligent' audit committees will play an important role in the decision to ensure the sustainability report comes with assurance from an independent provider, indicating that these committees are more than just symbolic' (Kend, 2015, p.g. 72). This plays an important role when recommended by The Codes of Best Practice of Corporate Governance (IOD, 2016) in which the value relevance of CSR reporting increases (Churet and Eccles, 2014).
Investor protection and perceived need for credibility	Generally, stakeholders require, at least, some guarantee that CSR disclosures are credible. This is typically provided by a legal framework which protects the users of the annual/sustainability report. Kolk and Perego (2010) focuses on investor protection, defined according to anti-director or non-controlling shareholder rights (see La Porta, Lopez-de-Silanes and Shleifer (1999)). As protection decreases, the use of independent assurance increases, which suggests that assurance substitutes for the lost confidence usually provided by the legal system.
Sustainability frameworks and policies	Both the IIRC (IIRC, 2013a), as well as the GRI (2013b) standards, recommends the use of independent assurance to ensure the accuracy, completeness and reliability of sustainability reports.

As noted in Table 1, there are several determinants for an entity to obtain sustainability assurance with the main driver being the company's stakeholders. These drivers have resulted in a shift in which information, both financial and non-financial, is no longer being reported in silo's but rather being reported into a single document known as integrated reports. This paper's aim, is to provide an evaluation of this shift as well as the role assurance plays as a mechanism to improve the credibility of these reports is considered.

2.2. Prior research on integrated reporting and the benefits of assurance

According to O'Dwyer and Owen (2005), the practice of voluntarily engaging independent assurance providers to attest to certain sustainability report disclosures began in 1997/1998. Since then, the market for assurance of non-financial information has grown rapidly because of the increased information which the organisation presents to their users due to their demands (O'Dwyer and Owen, 2005).

The series of corporate collapses over the past decade has led many stakeholders to question the relevance and reliability of annual financial reports as a base for decision making about an organisation (IRC, 2011). Reports have predominantly been based around financial information which does not help stakeholders form a comprehensive picture of an organisation's performance and its ability to create and sustain value. This has led to calls by all stakeholders, for more comprehensive reporting on social and environmental issues to complement reporting on economic performance. Integrated reports is an example of how companies are attempting to provide a more complete account of their performance by reporting on both financial and non-financial matters which are relevant for understanding the long-term sustainability and value creation of an organisation (De Villiers and Maroun, 2017).

The IIRC defined integrated reporting as:

> *a concise communication about how an organisation'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 […] An integrated report may be prepared in response to existing compliance requirements. […] If the report is required to include specified information beyond that required by this Framework, the report can still be considered an integrated report (IIRC, 2013b, p.g. 7-8).*

The framework requires integrated reports to disclose both financial and non-financial information. The IIRC framework states that the main purpose of the integrated reports is to explain to providers of financial capital how an organisation creates value over time using multiple types of resources (IIRC, 2013b, p.g. 5).

These include financial, manufactured, intellectual, human, social and relationship and natural capital (IIRC, 2013b). Eccles, Krzus and Ribot (2015) states that integrated reports should be for all stakeholders, not only for shareholders, as the reports will tend to be over quantified and will dominate financially if created for only shareholders (Cheng, Green, Conradie, Konishi and Romi, 2014).

To ensure the report caters for all stakeholders, the concept of integrated thinking, which is the component of value creation for integrated reports, needs to be achieved. The IIRC defines integrated thinking as:

> *the active consideration by an organization of the relationships between its various operating and functional units and the capitals that the organisation uses or affects (IIRC, 2013b, p.g. 2).*

Integrated thinking practices allows organisations to address environmental, social and governance (ESG) issues in ways which allow the company to prosper in the long-term through the understanding and communication of future value creation plans (De Villiers and Maroun, 2017). Companies which previously prepared sustainability reports are now being encouraged to integrate their sustainability sections within their integrated report to the extent it relates to value creation within the organisation (Herbert and Graham, 2018).

As the demand for integrated and sustainability reporting grows (Gunarathne and Senaratne, 2017), more attention is being paid to how companies ensure that their reports are accurate, complete and reliable (Simnett, Zhou and Hoang, 2016). Focusing specifically on assurance, an organisation chooses either to obtain or not obtain assurance on the information it discloses (Zhou et al., 2019). There are two broad bodies of research dealing with the assurance of non-financial information. The first body of research deals with assurance as the dependent variable (Crotty, 2007; Barth, Cahan, Chen and Venter, 2017; Lee and Yeo, 2016), being the drivers of demand for assurance for both organisation-specific context and for the ESG context in which organisations operates (Maroun, 2020). The drivers of assurance are outlined in

Section 2.1 and Table 1. The second body of research examines whether or not assurance affects the quality of information reported in an integrated report.

2.2.1. Assurance and the quality of sustainability reporting

As stated in Section 1, both the IIRC and the GRI standards recommend the use of independent assurance as it can add to the credibility of CSR disclosures (Cho et al., 2014; Simnett et al., 2009b); identify weaknesses in processes and controls (Maroun, 2017); promote active involvement of and coordination with key stakeholders (Morimoto, Ash and Hope, 2005) and assist with refining sustainability policies (GRI, 2013a). This is valid if the assurance provider, working with key stakeholders, can raise 'the critical consciousness of [CSR reporting] rather than accepting information in a passive, unquestioning manner' (Edgley, Jones and Solomon, 2010, p.g. 554). This is further highlighted by the fact that auditing can highlight weaknesses in reporting and operating practices, paving the way for managers to be held accountable and remedial action to be taken (O'Dwyer and Owen, 2005).

As explained by Power (1997, p.g. 124), assurance can 'enlighten, inform, and enable criticism and substantive change' and so improve the quality of sustainability reports as found by Moroney, Windsor and Aw (2012), in which environmental audits had a positive impact on the quality of environmental disclosures.

To obtain assurance on sustainability reports, there are two main standards used: ISAE 3000 and the AA1000 (Farooq and Villiers, 2019b). The assurance of sustainability information involves verifying the data disclosed by organisations. The majority of SAP limit their assurance work to the verification of the data and prefer not to review the internal controls and systems (Ball, Owen and Gray, 2000). A reason for this could be that management restricted the type of procedures to be undertaken by SAP because of limiting costs or the lack of apparent value benefit seen (Patel, 2020).

When reviewing the literature on sustainability assurance services, Farooq and De Villiers (2017) note the difference in the approach adopted by ASAP (Accounting Sustainability Assurance Provider) and NASAP (Non-Accounting Sustainability Assurance Provider). NASAP view suitability assurance as a means to drive sustainability in organisations and to promote accountability and improve society (Farooq and De Villiers, 2017a). Given this, NASAP prefers to use AA1000AS (Farooq and Villiers, 2019a). This allows them to be more creative in their assurance methodology and provide greater assurance over the "soft" and "hard" data in a sustainability report. On the other hand, ASAP (usually, the Big 4) use ISAE 3000 and follow a similar approach to their financial audits (Patel, 2020). They ensure the

accuracy and reliability of “hard data” and restrict their assurance opinion to a limited assurance (Farooq and Villiers, 2019b). There however, is no significant difference in the quality of the environmental report when the audit is performed by either ASAP or NASAP as found by Moroney et al. (2012).

Similar to an audit of financial statements, the practitioners gain an understanding of the subject matter in order to assess the risk of material misstatement. Based on the assessed level of risk and quantified materiality, test procedures are performed to support an opinion on the subject matter in which a reasonable or limited assurance is expressed. Prior research suggests that limited/moderate assurance has, over time, become more prominent than reasonable/high assurance engagement with the large accounting firms more likely to issue the former type of assurance opinion given the difficulty in verifying sustainability information (Mock, Rao and Srivastava, 2013).

A review of sustainability reports by a panel of stakeholders or other specialists may also be done to add to the quality and reliability of the report. This can form part of a combined assurance model which involves the use of independent assurance providers, internal auditors, CSR experts and those charged with an organisation's governance to ensure that integrated or sustainability reports are accurate, complete and reliable (IOD, 2016; Junior et al., 2014). Whether this constitutes to assurance is debatable given that the process doesn’t always involve expressing an opinion based on tests (IOD, 2016; Junior et al., 2014).

It is seen that assurance on sustainability reports has been in practice for a long time and specific standards have been in use in order to ensure that the information disclosed within them are accurate, complete and reliable. With the different reports being tied into one integrated report, a closer look at whether the same practice of assurance can be used to ensure the same level of accuracy and reliability as that of sustainability reports.

2.2.2. Integrated report assurance

South Africa is regarded as a pioneer in integrated reporting, being the first country to introduce the requirement to prepare an integrated report in its Codes on Corporate Governance in 2009 (Setia, Abhayawansa, Joshi and Huynh, 2015). Since then, integrated reporting has yielded several benefits, including integrated thinking. This has resulted in improvements in intra-company communication (Vitolla and Raimo, 2018), improvements in the informational environment (Lee and Yeo, 2016) and better resource allocation decisions and cost reductions (James, 2015). Several limitations of integrated reporting have also been noted. Examples include transitioning a traditional annual report which is focused on financial

metrics and related detailed disclosures to a broader report which tells the value creation story of an organisation in an understandable (IIRC, 2013a) and reliable (Zhou et al., 2019) manner through the reporting of financial and ESG aspects (Eccles and Krzus, 2010).

A detailed review of the integrated reporting literature is beyond the scope of this thesis. (Refer to Appendix A for a summary of the prior research done on integrated reporting). Of particular concern for this research, is the relationship between integrated reporting and assurance based on the assumption that integrated reporting provides useful information to financial capital providers and other stakeholders.

Integrated reporting, as defined in Section 2.2, is about providing users with a concise report. There has been very little research on the relationship between assurance and integrated reporting (Adams, 2015). However, research performed in this area by Maroun (2019) found that external assurance does improve the quality of integrated reporting. This is done through elements of the integrated report, especially those covering disclosures dealing broadly with social and environmental sustainability and compliance with the AccountAbility principles of materiality, inclusivity and responsiveness, being verified for their accuracy, reliability and completeness. Zhou et al. (2019) found that a combined assurance model implemented by an entity improves the credibility of integrated reports released by organisations. This is because of the cohesive collaboration of the internal auditor, the external auditor, the effectiveness of risk management and internal controls which allow information to be of the highest standard when reported.

Despite the calls by the IIRC and King IV for assurance of integrated reports, none of the reporting organisations goes into any detail about how the integrated report should be assured. Despite the publication of ISAE 3000 and AA1000AS, a gap is still present and leads to many challenges being faced when trying to assure integrated reports:

- Most of the disclosures included in an integrated report cannot be the subject of an assurance engagement in terms of existing standards issued by the International Auditing and Assurance Standards Board (IAASB) as the standard can only give assurance over disclosures which are objective, require little application of management's judgement and do not include material forward-looking information.
- The need for a different range of skills to provide assurance compared with traditional audits must be considered. The IIRC framework touches on six different capitals with each requiring its own set of competencies. As a result, even if a clear standard is

provided, training of existing and new accountants will be imperative to ensure the highest compliance with these standards.

- Cost is also seen as a barrier in obtaining sustainability assurance for organisations. That is the reason why the IIRC does not require, but only recommends independent assurance on integrated reports. Given the complexities and need to use experts, issuing a limited assurance is unlikely to add greater value than with the cost of the engagement.
- The potential litigation and reputational risk to which an audit firm can face in expressing an opinion on the integrated report. This is one of the major reasons why firms are only issuing limited assurance, over sustainability information, in order to protect themselves from litigation and reputational risk.
- The determination of material matters within the report is complex as assurance providers need to ensure matters which have a material impact on the entities' value creation is assured.
- The types of tests and procedures on integrated reports, that are mainly qualitatively in nature, make it difficult for assurance providers to obtain 'comfort' over the disclosures through the usual audit procedures.

(IIRC, 2015; Jones and Solomon, 2010; Maroun and Atkins, 2015; Simnett and Huggins, 2015)

To meet the above challenges and maintain sufficient audit coverage, a combined assurance may be the most effective solution to ensure the validity, accuracy and completeness of the information disclosed. A look at how combined assurance overcomes these challenges follows.

2.3. Combined assurance

As explained by King-IV, a combined approach to assurance is as follows :

> *[. . .] incorporates and optimises all assurance services and functions so that, taken as a whole, these enable an effective control environment; support the integrity of information used for internal decision-making by management, the governing body and its committees; and support the integrity of the organisation's external reports (IOD, 2016, p.g. 10 emphasis added).*

2.3.1. The functioning of combined assurance

Organisations have traditionally used numerous providers to help their boards fulfil their responsibilities for the control and effective methods of management, legal departments, compliance, health and safety, corporate social responsibility and internal and external audits (Bui and De Villiers, 2017). As assurance providers carry out measures in isolation, governing bodies may suffer from fatigue and assurance gaps which lead to inefficient reporting (Manetti and Becatti, 2009).

Now that integrated reporting is about including all information into one report, bringing many assurance providers together to perform assurance activities helps to rationalise combined assurance. This makes the process of reporting more efficient as the parties involved in the provision of assurance and their activities will require congruency and co-ordination as seen in Figure 1. Each providers' accountability, however, needs to be clearly defined in order for every person to know his/her responsibilities (Dmitrenko, 2017).

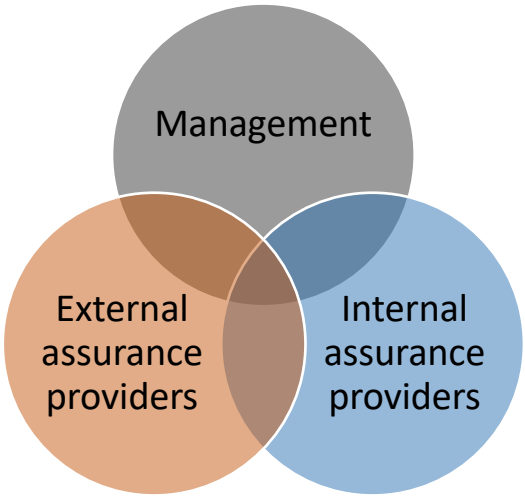


Figure 1: Inter-connection between assurance providers (Dmitrenko, 2017)

In the management zone, people are responsible for ensuring risk management and control systems, so deviations are identified in time and are adequately fixed. Risk management has been regarded as a fundamental component of an organisations' control environment and sound corporate governance (Spira and Page, 2003). These help organisations manage risk, as well as provide monitoring and assurance which give management and the boards re-assurance that processes are operating as intended.

Barac and Forte (2015) found that there is a dependency on the Enterprise Risk Management (ERM) process as a prerequisite for the implementation of a combined assurance process.

This has led to the implementation of ERM tools which help predict and manage an array of risks which may impact an organisation's long term sustainability (Barac and Forte, 2015).

ERM is defined by the Committee of Sponsoring Organisations (COSO) as:

> *a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives (COSO, 2004, p.g. 8).*

A PwC (2012) report revealed that of the 74% organisations with formal ERM frameworks, only 45% were satisfied with their management of significant risks. Some have recommended that the focus of monitoring and control functions moves from assuring the effectiveness of internal controls to assuring the effectiveness of risk management processes for a combined assurance to be effective (Fraser and Henry, 2007).

The combined assurance model was aimed at improving the quality and credibility of assurance through the better co-ordination of assurance providers. Even though a combined assurance does reduce many challenges of independent assurance, many organisations which have implemented/tried to implement a combined assurance have run into other difficulties when executing (ECIIA, 2009) because of the complexities of coordinating the assurance.

To help overcome these difficulties, IIA (2012a) suggests performing an assurance mapping exercise as this will be a valuable means for co-ordinating risk management and assurance activities. To evaluate combined assurance, a model is needed to gauge the design and implementation of combined assurance.

2.3.2. Gauging combined assurance

There is no generally accepted basis for measuring combined assurance. O'Dwyer and Owen (2005) and Mock et al. (2013) have developed a quality schematic which deals with external assurance for sustainability reports. This has been modified by Prinsloo and Maroun (2020) to evaluate combined assurance and it provides the basis for measuring combined assurance for this research. The elements of the combined assurance model are summarised in Table 2.

Table 2: Elements of combined assurance quality	
Indicator	**Summary**
The addressee of the assurance and the restriction of use	As per the IAASB (2009), every external engagement opinion must be addressed to a specified recipient. In the case of integrated and sustainability reporting, the reports disclose various information of the different capitals to various parties. In this case, assurance opinions on these reports will probably be addressed to stakeholders given the various users of the reports (Mock et al., 2013). For the assurance to have the maximum benefit, the objective of the assurance should be disclosed and the report must be free of any restrictions.
The responsibilities of each party to the assurance engagement	Per King IV, the governing body needs to ensure that reports issued by the organisation enable stakeholders to make informed assessments of the organisation (IOD, 2016). To achieve this, a sound control environment and a effective risk management which supports the integrity of the information reported is needed. The board needs to ensure that the company has complied with relevant legislation, regulations or guidelines (FRC, 2016).
The level of assurance provided	There are two levels of assurance which can be proved in line with AA1000AS and ISAE 3000, namely, reasonable and limited assurance. Reasonable assurance is less than absolute assurance (Arens, Elder and Beasley, 2006) and entails an "extensive depth of evidence gathering, including corroborative evidence and sufficient sampling" (AccountAbility, 2008a). Limited assurance provides a moderate level of assurance which is less than the level of assurance provided by a reasonable assurance engagement.
The type of tests and procedures performed by the assurance provider	An audit of financial statements consists of tests of controls and substantive testing. With regards to substantive testing, a substantive test of detail provides more persuasive audit evidence compared with analytical reviews and inquires (IAASB, 2009). With a combined assurance model, a combination of different procedures, based on the different frameworks, can be performed which will increase the probability of detecting material errors and control weaknesses (Zhou et al., 2019).

Table 2: Elements of combined assurance quality	
Indicator	**Summary**
The coverage of assurance procedures and the final opinion	Through the combination of multiple assurance providers, a combined assurance should result in an effective control environment because the number of processes, controls and disclosures verified by the different providers will be increased (Zhou et al., 2019). This enables valid, accurate and complete reporting (IOD, 2016).

2.4. On the relationship between assurance and integrated reporting quality

External assurance can be a substitute for weakness in corporate governance systems and legal mechanisms intended to protect investors (Maroun, 2019). Having sustainability reports tested by an independent expert, against defined criteria, can drive compliance with reporting guidelines and promote more complete and accurate reporting on material ESG considerations (Adams and Evans, 2004). Companies must be more willing to invest in formal systems and processes for verifying the information included in their integrated reports.

These formal systems include strong corporate governance mechanisms such as internal audit, system and report reviews by ESG specialists and the monitoring by independent directors (Junior et al., 2014). Kend (2015) found that the existence of an active and diligent audit committee and sustainability committee plays a significant role in explaining the decision to assure a sustainability report.

The main component of an assurance engagement is the risk assessment process (Arens, Elder and Mark, 2012) which allows the assurance provider to gain an understanding of the entity and its environment, including its internal controls, in order to identify and assess the risks of material misstatement in sustainability or integrated reports, whether due to fraud or error (Accountants, 2009).

The risk assessment process allows assurance providers to determine the type of tests to perform on the engagement (IAASB, 2009). Testing performed by assurance providers results in better accountability and responsibility from management and the organisation as a whole (OECD, 2014). The effective implementation and operating effectiveness of the controls to avoid any negative assurance opinions is confirmed through a test of control, substantive approach or both (Accountants, 2009). The assurance helps ensure that the information reported within the reports contains relevant, reliable information leading to better quality reporting for the user.

For management to fulfil its responsibilities, it will have to pro-actively monitor controls and implement further controls to prevent any deficiencies that result in misstatements (Krishnan, 2005). To avoid adverse findings by assurance providers, management can implement an internal audit function (IAF) to ensure no control deficiencies are present. Testing of controls by an IAF can also determine mistakes made during the operating process leading to management re-assessing and implementing further actions to prevent these errors from re-occurring (ICAEW, 2015).

Internal and external sources of assurance are expected to result in better quality integrated reports for the following reasons:

1. Previous research reveals that high quality audits increase reporting reliability by reducing both intentional and un-intentional measurement errors (Watkins, Hillison and Morecroft, 2004). As integrated reports make more value-relevant information publicly available, the uncertainty surrounding the lack of information is reduced (Zhou et al., 2019).
2. Combined assurance brings together many different providers, resulting in audit coverage being expanded (Barac and Forte, 2015). This ensures that every function of the organisation is assured, in one form or another, leading only to reliable value-relevant information reported throughout the integrated report (IOD, 2016).
3. The external assurance provider (as part of the combined assurance model) issues a report on the subject of the assurance engagement (IAASB, 2013). Management will ensure that they act diligently to make sure the information reported within the integrated report is reliable (valid, accurate and complete) to avoid any embarrassment and push-backfrom any adverse reports or opinions. This is one of the tools used by shareholders to address the agency theory.

According to agency theory, agents (managers) act on the instructions of and in the interests of the principal (shareholder) (De Villiers and Maroun, 2017). However, principal-agent relationships result in conflict because the agent will act in his interest to maximise his wealth and not the wealth of the principle (de Villiers and Hsiao, 2018). Managers generally know more about the company's performance and operation than their shareholders (owners) do and is thus managements responsibility for disclosures within integrated reports will 'lead' and 'determine' the narrative they want to get across within the report. Institutional pressures due to investor sophistication and information needs (Latif, Mahmood, Tze San, Mohd Said and Bakhsh, 2020) may also pressurise managers to disclose information they otherwise would

not have or are reluctant to disclose bad news because it may lead to job losses, questions that cannot be answered or decreased remuneration. Good news, on the other hand, has an opposite effect and will be disclosed (de Villiers and Hsiao, 2018). This asymmetry and lack of disclosure creates an expectation gap between preparers and stakeholders (Naynar, Ram and Maroun, 2018) which require investors to obtain some sort of assurance to ensure that the information disclosed is reliable, credible and complete. Watts and Zimmerman (1983) explained how independent external audit contributes to a reduction of information symmetry between managers and principals by enhancing the accuracy, completeness and reliability of financial statements.

The same analogy applies to an assurance of integrated reports as the report combines financial and non-financial information. When applying agency theory to non-financial reporting, prior studies consider companies disclosing CSR as 'dangerous' (Levitt, 1958) and the existence of CSR to be a signal of an agency problem within the company (Masulis and Reza, 2015). Users of the reports need to be able to be sure, through assurances, that the information disclosed within the reports about an entities value creation process is reliable to make decisions.

With the above points in the mind, the hypothesis tested by this study is:

H1. The use of combined assurance by South African listed companies leads to higher quality integrated reports.

3. Methodology

Data was collected from 30 companies listed on the JSE. The 30 companies were limited to the top 100 companies on the JSE because these include the largest and most prominent South African organisations. This ensures that lack of resources or technical expertise is less likely to affect their corporate governance and reporting systems (Hahn and Kühnen, 2013). Companies from a range of different sectors was also selected, which included property, financial, clothing, mining and health care, to avoid any skewness of the data to a specific industry.

The focus period of the data is for integrated reports from 2013 to 2019. This period was chosen as combined assurance was referred to in King III which was released on 1 September 2009 with an effective date 1 March 2010 (Africa, 2009). This selection period allows companies sufficient time to have developed their combined assurance models. The data

period also covers the release of the IIRC framework and King IV which expanded on combined assurance as part of an integrated reporting and thinking philosophy. From the period under review, companies which had consistently prepared integrated reports were considered. Cross-sectional links between reports were also considered.

3.1. Data collection

Content analysis was conducted to collect, aggregate and analyse data from reports dealing with the assurance of any information or content other than financial statements. Content analysis was used to analyse data because combined assurance disclosures vary in format, style and content from company to company (Guthrie, Petty, Yongvanich and Ricceri, 2004; Krippendorff, 2018).

Each report's table of contents was analysed to ensure that each part of the integrated or sustainability report relating to combined assurance has been covered. A search for keywords within the reports was also performed to ensure that all relevant disclosures were covered. Examples of keywords are "assurance", "combined", "audit", "procedures".

Each instance of an assurance was analysed to determine its scope and objectives. The assurance was then recorded in an Excel spreadsheet according to the different "elements" in Table 2. No inferences were drawn about the appropriateness of any information based on factors such as tone, layout or the use of infographics. This was to limit the researcher's subjectivity when coding data.

3.2. Relationship between integrated report quality and combined assurance

An ordinary least square regression is used to determine the relationship between combined assurance quality (CAQ) and integrated report quality (IRQ). This approach is consistent with prior research by Zhou et al. (2019), Maroun (2019), O'Dwyer and Owen (2005). The regression model which is based on Zhou et al (2019) and Maroun (2019) is as follows:

Equation 1

$$IRQ_{i,t} = \beta_1 CAQ_{i,t} + \beta_2 Size_{i,t} + \beta_3 Density_{i,t} + \beta_4 Impact_{i,t} + e_{i,t}$$

The regression model cannot prove that combined assurance results in changes in integrated report quality. This is an inherent limitation of the chosen method. The regression is, however, useful for testing the relationship between the application of combined assurance and report quality while controlling for different variables.

3.3. Measuring integrated report quality

There have been many approaches to gauging integrated report quality. Michelon, Pilonato and Ricceri (2014), for example, developed a quality measure based on the number of disclosures whether or not disclosures are generic and the mix between qualitative and quantitative information. Borghei, Leung and Guthrie (2015) differentiated between symbolic and substantive disclosures and determined the steps companies were taking to reduce greenhouse emissions. While these approaches are useful with sustainability or specific aspects of environmental reporting, they were not developed to evaluate the quality of the information in an integrated report (Maroun, 2019). As a result, this thesis uses scores from the *EY Excellence in Integrated Reporting Awards* to measure integrated report quality (refer to Appendix B on how the companies are scored and ranked).

The EY evaluation recognises that quality is not just a function of the quantity of information being disclosed. EY focuses on the guiding principles in the IIRC's framework including the strategic focus of the reports and future orientation, connectivity of information, stakeholder relationships, materiality, conciseness, reliability and completeness and consistency and comparability (see IIRC, 2013).

EY does not publish scores for each company but it does make a ranking of companies' available integrated reports. These range from 1 (progress to be made) to 5 (for the top 10 reports). The scores are widely used by practitioners as an indication of the quality of South African integrated reports (King, 2016) and have also been tested by the academic community (Zhou et al., 2017).

Zhou et al. (2017) found the scores to be consistent with an independent quality measurement scale. Barth et al. (2017) confirmed that the scores were aligned with the IIRC framework and that features of high-quality reporting were found to be consistent with the EY rankings. As a result, the EY scores provide a consistent and reliable measure of integrated report quality (Malola and Maroun, 2019). For additional detail on the EY scores, refer to Appendix B.

3.4. Defining the independent variable

Combined assurance quality (CAQ) is a composite score made up of several assurance quality indicators as per the research. The components of the quality score are outlined in Table 3 below. To ensure validity and reliability, each component is measured in the same way as in O'Dwyer and Owen (2005), Mock et al. (2013) and Prinsloo and Maroun (2020).

Table 3: Outline of the elements of combined assurance	
Indicator	**Summary**
Responsibility and compliance	$$RESP = \frac{1}{3}\sum_{it=1}^{it=n}(RESP\ STATEMENT + ASSURANCE\ STATEMENT + COMPLIANCE\ STATEMENT)_{it}$$ Where for the company i in year t: RESP statement = 1 if the board of directors of company i has made a clear statement that it takes responsibility for the preparation of integrated or sustainability report in year t and 0 in all other instances. Assurance statement = 1 if there is a clear statement that the integrated and/or sustainability report of the company i has been prepared under a combined assurance model in year t and 0 in all other instances and Compliance statement = 1 if the company i states that its integrated and sustainability report has been prepared in compliance with the King Codes, JSE requirements, GRI principles, IIRC framework and 0 in all other instances
Sources of assurance	$$SOURCES = \frac{1}{T_{it}}\sum_{it=1}^{it=n}(EXTERNAL + INTERNAL)_{it}$$ Where for the company i in year t: External is the number of assurance engagements executed by an independent external expert according to one or more assurance standards issued by an independent standard setter. Internal is the number of engagements executed under the direction of those charged with the organisation's governance rather than an external assuror. These include engagements dealing with internal controls and/or reporting policies, conventions or guidelines used to ensure the accuracy, completeness and reliability of the disclosures included in integrated and/or sustainability reports. T is the total number of identified internal and external engagements for the sample of companies under review (n) Internal and external sources of assurance are weighted equally.

Table 3: Outline of the elements of combined assurance	
Indicator	**Summary**
	Prior research has produced mixed results on the differences between external assurance engagements performed by audit firms and consultants (Farooq and De Villiers, 2017b) suggesting that the decision to have an integrated or a sustainability report independently verified is more relevant than the identity of the assurance provider (Simnett et al., 2009b). As a result, the type of assurance provider is not taken into consideration.
Level of assurance	$Level\ of\ Ass_{it} = \frac{1}{K_{it}} \sum_{it=1}^{it=n} (K.ASSURANCE\ ENGAGEMENT)_{it}$ Where for the company i in year t: Assurance engagement is the number of engagements performed on different subject matters by internal or external assurance providers. For reasonable assurance engagements, K = 2 for reasonable assurance engagements, K = 1 for limited assurance engagements, K = 0 for when the level of assurance cannot be discerned.
Assurance coverage	$COVERAGE_{it} = \frac{1}{C_{it}} \sum_{it=1}^{it=n} (SYSTEMS + ACCOUNTABILITY + CAPITAL)_{it}$ For each company i in year t: Systems = 3 if an engagement covers systems, processes and controls in addition to specific disclosures, 2 if only systems and controls are addressed and 1 if only specific disclosures are covered. Accountability = the number of reporting principles identified by AccountAbility (2008a) which are covered by the respective assurance engagement. Capitals = the number of capitals identified by the IIRC (2013b) framework covered by the respective assurance engagement. C is the maximum aggregated score.
Test procedures	$PROCEDURES = \frac{1}{P_{it}} \sum_{it=1}^{it=n} (TEST1_{it} + TEST2_{it} + .. + TESTN_{it})_{it}$

Table 3: Outline of the elements of combined assurance	
Indicator	**Summary**
	For each company i in year t: $TESTN_{it}$ represents different types of test procedures performed to collect evidence for either an internal or external engagement. The sum of the types of tests is factored by the total type of procedures (P) carried out at the sample of companies (n). Some procedures may be designed to provide more persuasive evidence than others (IAASB, 2009). Not all companies provide sufficient information to conclude on the design and purpose of test procedures and, as a result, this is not taken into account when calculating the final score.
Addressee and restrictions on use	$$ADDRESSEE = \frac{1}{A_{it}} \sum_{it=1}^{it=n} (ADDRESS - RESTRICTION)_{it}$$ Where for the company i in year t: Addressee = 3 when the assurance opinion/conclusion is addressed to stakeholders (including shareholders), 2 to those charged with governance, 1 to management and 0 when there is no addressee. Restriction = 1 when there is a restriction on the use of the assurance report/conclusion and 0 when this is not the case. A is a constant with a value of 3.

3.5. Control variables

Consistent with the prior research, this study controls for the fact that larger firms may be subject to greater stakeholder scrutiny, necessitating better quality reporting (SIZE) (Hąbek and Wolniak, 2016). Financial resources, accounting infrastructure and expertise of larger organisations also play a key role in preparing high-quality reports. It is expected that larger companies will more have resources at their disposal to prepare higher-quality reports (Simnett et al., 2016). Companies with more complex business models and operations will have more information to report to their stakeholders. As a result, control for the quantity of disclosures is introduced (DENSITY). It is also possible that companies which have a material effect on society or the environment need to provide more detail on ESG metrics than other organisations do in order to manage their legitimacy or because of the increased public

attention (see Section 2.1). As a result, a control variable is introduced for the sector in which each sampled company is located (IMPACT). These variables are controlled within the regression model to prevent any influence which the variables may have on report quality.

Table 4 below summarises the dependent variable, the independent variable and the control variables:

Table 4: Summary of dependent and control variables

Indicator	Summary
QUALITY	The quality of integrated reports is measured according to the EY Excellence in Integrated Reporting (2013 – 2019).
CAQ	A composite score measured as indicated in Table 3
SIZE	The size of each of the companies is measured according to its market capitalisation as at the end of a company's reporting period in South African Rands (Maroun, 2019)
DENSITY	The extensiveness of a company's sustainability or integrated reports is measured as the ratio of the total number of pages in an integrated report to the number of sections in the report (adapted from Michelon, Pilonato and Ricceri (2015)). The measure is designed to provide a sense of the amount of detail included in each part of the report, rather than as a measure of its total length. The variable controls for the fact that more complex groups will have more information to report to their stakeholders and so a more detailed integrated or sustainability report.
IMPACT	Impact is measured according to a dummy variable (IMPACT) which is 1 if the company is in an environmentally sensitive industry and 0 if this is not the case. Environmentally sensitive industries include extraction/mining, paper production, petro-chemicals and basic materials/industrials (Cho et al., 2014; Simnett et al., 2009b).

3.6. Validity and reliability

Several steps were taken to ensure the reliability of the research and data collected was accurate, valid and complete. These steps include:

- The data collection instrument was piloted with 5 companies to ensure that the data were available, and each measure of the regression model could be computed.
- The research focused on the largest listed companies (the Top 100) to control for differences in factors such as trade volumes, analyst coverage and availability of financial resources to prepare integrated reports. The sample was selected randomly from the Top 100 companies.

Further steps were taken based on the regression model to ensure the validity and reliability of the research including:

- An approximately linear relationship between IRQ and each driver was confirmed using scatter plots (un-tabulated).
- The dependent variable (IRQ) should be, at least, ordinal, which is the case for the EY scores. Some researchers have argued that the dependent variable should be continuous. As a result, findings from the OLS regression were corroborated using a logistic regression model.
- The independent variable (CAQ) was, at least, ordinal and was sufficient for the OLS model.
- The Durbin Watson statistic was used to test for independence of the OLS residuals. Variance Inflation Factor (VIF) scores and univariate Pearson correlations were used to test for material multicollinearity problems. Normality of the distribution of the error terms and the consistency of their variances (homoscedasticity) were confirmed using the Shapiro-Wilk and Breusch-Pagan test, respectively.

(Cahan, De Villiers, Jeter, Naiker and Van Staden, 2016; De Villiers, Venter and Hsiao, 2017a)

Where necessary, variables were transformed into their natural log variants and results were tested for robustness using bootstrapping. While a departure from one or more of the assumptions discussed above will not automatically invalidate the model presented in Equation 1: they may result in an increase in standard errors and wider confidence intervals. Any inferences drawn concerning companies outside of the sample were interpreted with caution. This was an inherent limitation of the research. The data was also reduced using a factor analysis, to provide further insights, on the core subject matters association with integrated report quality.

As the decision to include control variables is informed by prior research, the inclusion of irrelevant variables or omission of key variables was not considered to be a material threat to

the validity and reliability of findings. Nevertheless, a linked variable and Ramsey Reset test was used to test that the model is specified correctly. In addition, several sensitivity tests were run as suggested by Zhou et al. (2019), Maroun (2019) and O'Dwyer and Owen (2005):

- Fixed-year and firm effects were used to control for the effect of the passage of time and unobserved firm-specific characteristic on report quality (see Section 4.2.1, 4.2.2 and 4.4.5).
- The model was tested using alternate measures for the control variables. For example, firms' size was measured by total sales, rather than by/on market capitalisation (see Section 4.3).
- A control for sustainability performance was introduced (using the scores awarded per the Carbon-disclosure project) to address the possibility that only firms with better sustainability performance engage an assurance provider and have higher integrated report quality scores (see Section 4.3 and 4.4).
- Finally, the CAQ was separated into its components. Each was tested individually using Equation 1 to identify features of combined assurance which have the strongest association with IRQ. Results were corroborated using hierarchical regression. Control variables were added in stage 1 of the regression and the CAQ components were added in stage 2 using both the enter and stepwise methods (see Section 4.2.2)

(Cahan et al., 2016; De Villiers et al., 2017a)

4. Results

Figure 2 shows the combined assurance scores, as well as the average for the period under review. CAQ scores increased from 2013 to 2019. This is consistent with expectations as the results are post the issuance of the IIRC Draft Consultation Paper(IIRC, 2014), King III (Africa, 2009) and GRI standards GRI (2013b). The average CAQ dropped in 2014 and 2015 to a low of approximately 2.20 and then increased to approximately 2.52 in 2019. The decline may be as a result of poor management compliance with a combined assurance framework and a perception of compliance as a "mere tick box exercise" as noted in Seele (2016)The increase of combined assurance quality from 2016 may be attributed to the release of King IV in 2016 with companies implementing policies to comply with the required combined assurance model (Zhou et al., 2019).

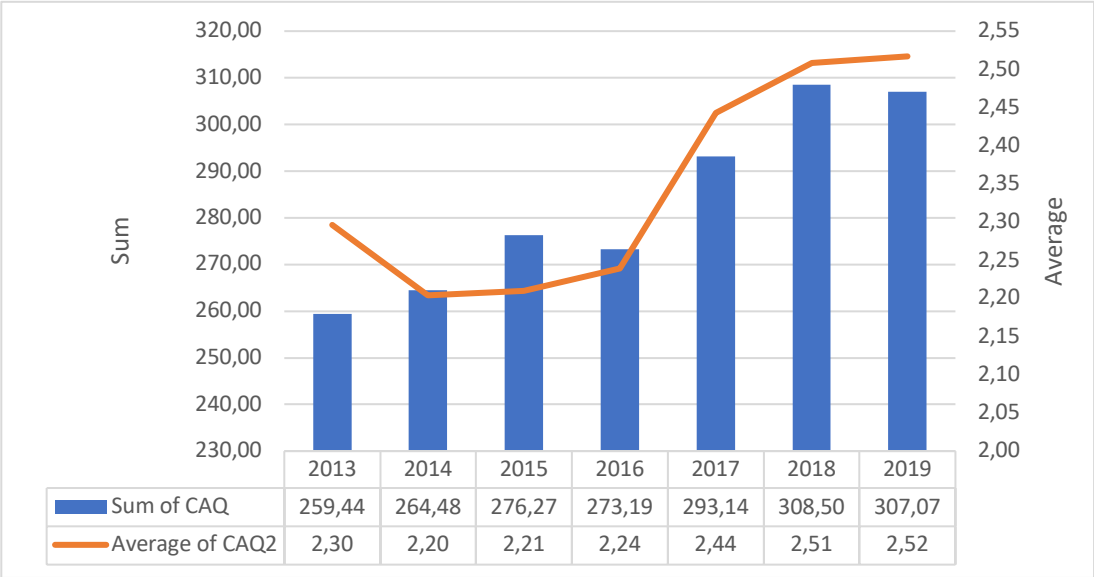


Figure 2: CAQ scores 2013 - 2019

In addition to changes in CAQ, the research considers the use of external assurance and the type of assurance provider. Details are presented in Table 5.

Table 5: Internal and external assurance providers[1]

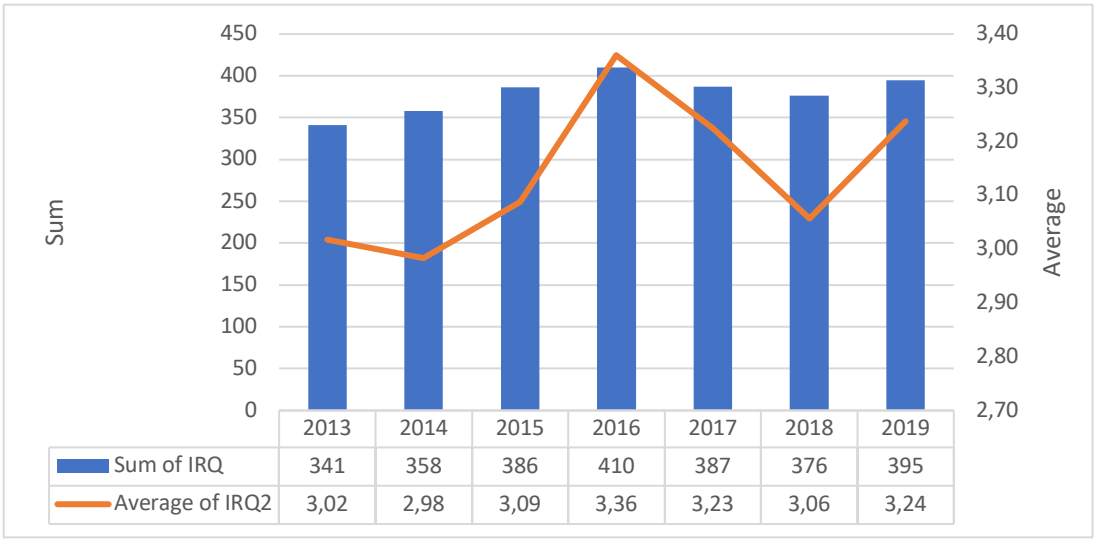
	2013	2014	2015	2016	2017	2018	2019	Total	Prop (%)
No. of external engagements	73	78	83	81	86	87	86	574	100
External engagements executed by:									
Big 4	34	35	39	39	40	38	39	264	46%
Consultant	5	6	6	6	7	7	4	41	7%
Joint auditors	2	1	2	1	1	1	2	10	2%
Joint Big 4	3	4	4	4	4	4	4	27	5%
Other audit firm	4	4	5	4	1	1	2	21	4%
Review panel	-	1	1	1		-	-	3	1%
Verification agency	25	27	26	26	33	36	35	208	36%
No. of internal engagements	40	42	42	41	34	36	36	271	100
Internal engagements executed by:									
Audit committee	17	20	19	18	21	20	21	136	50%
Big 4	-	1	1	1	-	-	-	3	1%
Consultant	1	1	1	1	1	1	1	7	3%
Internal auditor	15	14	14	15	11	11	10	90	33%
Sustainability committee or equivalent	7	6	7	6	1	4	4	35	13%
Total number of all engagements:	113	120	125	122	120	123	122	845	
Proportion external assurance	65%	65%	66%	66%	72%	71%	70%	68%	
Proportion internal assurance	35%	35%	34%	34%	28%	29%	30%	32%	

[1] Notes: The table refers to the number of engagements where each engagement is performed by a different service provider and/or according to external or internally generated guidelines/standards. Companies can have several engagements completed during each reporting period. There were no instances of an external engagement completed concurrently with an internal assurance provider

Per Table 5, Big 4 firms and consultants are providing most external assurance with 332 engagements (including joint Big 4). Their engagements represent 58% of all external assurances on integrated and sustainability reports. In comparison only 10% (10 engagements) of internal assurance were provided over these documents. This is probably because, as integrated reporting matures, internal auditors and audit committees have the necessary expertise and resources to assure their companies' integrated reports without having to engage third parties to operate on their behalf (Prinsloo and Maroun, 2020). This can be seen through audit committees providing most internal assurance with 136 engagements representing 50% of the 271 assurance engagements on integrated reports. This is in keeping with the fact that King-III and King-IV (IOD, 2016; IOD, 2009) vest responsibility for an organisation's internal controls with the audit committee.

It can be noted that the results in Table 5 are in line with assurance practices found by SAICA (2019) (technical report) in which 60% of the TOP 40 companies on the JSE sought after assurance of sustainability information. Of assurances obtained 75% were conducted by registered auditors while 25% by other assurance providers.

Figure 4 shows the average IRQ scores from 2013 – 2019. IRQ scores were improving from 2013 with a high of 3.30 in 2016. However, IRQ scores decreased between 2016 - 2018 and may be a result of the issuance of King IV as stated above. King III had a "apply or explain" culture while King IV needed entities to "apply and explain" (Padayachee, 2017). This difference may have resulted in companies needing to change and update their policies, which takes time, to ensure they comply and report quality information which may explain the increase in 2019.



	2013	2014	2015	2016	2017	2018	2019
Sum of IRQ	341	358	386	410	387	376	395
Average of IRQ2	3,02	2,98	3,09	3,36	3,23	3,06	3,24

Figure 4: IRQ scores 2013 - 2019

4.1. Univariate analysis

Table 6 summaries the main variables used in the study for a total of 205 observation for the period under observation.

Table 6: Descriptive statistics

	Range	Mean	SD
SIZE	1505.46	117.81	186.41
QUALITY	5.00	3.12	1.17
DENSITY	496.00	155.29	74.64
CAQ	2.40	2.11	0.43
IRQ	5.00	3.12	1.17

The seven-year average report quality (QUALITY) and combined assurance quality (CAQ) was 3.12 and 2.11 respectively. The average market capitalisation (SIZE) of the companies was R117.81 million while the average DENSITY of pages dealing with assurance was 155.

Table 7 provides the Spearman correlation matrix among all variables in the study[2].

Table 7: Correlation matrix

	SIZE	IMPACT	DENSITY	QUALITY	CAQ
SIZE	1	0.023	0.017	0.065	0.040
IMPACT	0.023	1	0.037	0.210***	-0.111
DENSITY	0.017	0.037	1	-0.273***	-0.145**
QUALITY	0.065	0.210***	-0.273***	1	0.088
CAQ	0.040	-0.111	-0.145**	0.088	1

Spearman's rho test
*** Significant at 1% level.
** Significant at 5% level.

From the correlation matrix above, it can be noted that SIZE (r_s = 0.065), IMPACT (r_s = 0.210) AND CAQ (r_s = 0.088) are positively associated with reporting quality, with IMPACT being significant at the 1% level ($p < 0.01$), lending support to our hypothesis. DENSITY, meanwhile, has a negative association (r_s = -0.145) with report quality which is statistically significant at the 1% level ($p < 0.01$) and this is in line with findings by Maroun (2019).

[2] A Spearman correlation is used as not all of the variables are normally distributed.

4.2. Multivariate results

Section 4.1 showed an analysis of the model in its simplest form which showed that SIZE, IMPACT and CAQ all were determinants of better report quality (QUALITY). To understand the drivers of improved report quality and the components of each driver which improves its quality, a multiple, PROBOT and hierarchical regression is used.

4.2.1. OLS and Probit regressions

An OLS and Probit regression was used to determine the relationship between the variables of the model. SIZE, IMPACT, DENSITY and CAQ were added as the constant variables while QUALITY is the dependent variable. Significance at the 1%, 5% and 10% level is denoted by *** and ** and * respectively. Results are presented in Table 8.

Table 8: Regression analysis on assurance on QUALITY

	A: Multiple Regression[3] N=205		**B: PROBIT N=205**		
	Coefficients	**t**	**Coefficients**	**z**	
SIZE	-0.001	-1.712*	0.000	-0.36*	
IMPACT	0.397	3.938***	0.369	3.07***	
DENSITY	-0.003	-3.022***	-0.008	3.77***	
CAQ	0.225	1.215**	0.097	0.45*	
Model summaries					
	R2	**Adj R2**	**R2**	**Log-likelihood**	***X*²**
Stage 1	0.135	0.118	0.116	-119.913	31.54
Durbin-Watson	0.717				

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table 8 shows the coefficient estimates and associated t-statistics for all observations from 2013 to 2019 (n = 205). The model accounts for 13.5% (r^2 = 0.135) of the total variance in QUALITY and 11.8% of the variance after adjusting for shrinkage. While not directly comparable, the R^2 is consistent with that reported by Cho et al. (2014); Maroun (2019), Michelon et al. (2015) respectively.

[3] An un-tabulated ANOVA confirmed that the proposed regression model provides a more accurate prediction of IRQ than the average assurance score does.

The results based on the OLS regression model are consistent with the expectation that the use of a combined assurance model is contributing to higher quality reporting (β = 0.225, p < 0.05). The industry in which the company operates is also having a positive effect on QUALITY (β = 0.397, p < 0.01) which is in line with Cho et al. (2014) who found that companies in environmentally sensitive industries are more likely to use CSR assurance given their impact on society.

Contrary to the earlier research, SIZE (β = 0.001, p < 0.1) is not a good predictor of QUALITY. The amount of information which companies have to report (DENSITY β = 0.003, p < 0.01) is also not having a significant effect on report quality (see, for example, Simnett et al. (2009b); Cho et al. (2014); Maroun (2019). This is probably the relative maturity of different types of non-financial reporting in South Africa and that the country's codes on corporate governance and listing requirements have been emphasising the importance of sustainability and integrated reporting since 2012 (Maroun, 2019). As a result, these types of reporting are not exclusive to the largest organisations, those with the greatest social or environmental impact or companies which have the most information to report to stakeholders

Similar findings emerge when using a probit model. For this purpose, the companies were ranked according to their EY score with those with a score above the median assigned a CAQ value of 1 and those below the median assigned a score of 0.

Both CAQ (β = 0.097, p < 0.1) and IMPACT (β = 0.369, p < 0.01) increase the likelihood of report quality being higher while DENSITY (β = 0.008, p < 0.01) decreases the likelihood of better report quality. Size does not affect report quality (β = 0.000, p < 0.01). These findings provide evidence which supports the hypothesis stated in Section 4, that a combined assurance approach adopted by South Africa listed companies leads to higher quality integrated reports.

The regression model was tested for independent errors using the Durbin-Watson test and the test results (Table 8) were within the tolerable range of -2 and 2. VIF scores (refer to Appendix C, Table 17) are well below the recommended threshold of 10. All scores for the individual variables are approximately 1. The average VIF is also approximately 1. This suggests that there is no material multicollinearity. This was confirmed by collinearity diagnostics (Appendix C, Table 17) which indicate that each of the variables loads on a different axis.

A histogram was generated for standardised residuals versus combined assurance quality and it was seen that the errors were approximately normal (un-tabulated). This was confirmed by the Shapiro-Wilk and Breusch-Pagan test which showed the data are approximately normal (refer to Appendix E, Table 21).

A test for homoscedasticity and heteroskedasticity was also performed using the White's and Breusch-Pagan test. These tests generated a significant test statistic at the 5% level suggesting that heteroskedasticity is having some effect on the findings. The test statistic was, however, only significant at the 5% level (refer to Appendix E, Table 21). Nevertheless, the results per Table 8 were found to be qualitatively similar when the regression was reperformed using bootstrapping with 10 000 reiterations. The generalisation of findings to a broader sample should, however, be done with caution.

Finally, the model was tested with fixed firm and year effects (Appendix F, Table 22). Findings are qualitatively similar to those reported in Table 8. A Ramsey Rest test was also performed on the OLS regression to evaluate whether there were any omitted variables. The results suggest no omitted variables exist (refer to Appendix G).

4.2.2. Regression analysis with components of CAQ as the dependent variables

For robustness, the regression was repeated using the assurance quality components (as in Section 3.4) which allows us to determine which of the components are significant and have a positive impact on CAQ. Hierarchical regression was used. Control variables were entered in Step 1 and the combined assurance quality variables (as per Table 2 and Table 3) were added in Step 2 using the enter method[4].

Table 9: Model summary CAQ components

Model	R Squared	Adjusted R Squared	Std. Error of the Estimate	F Change
Controls only	0.129	0.116	1.108	9.880***
Full model	0.326	0.302	0.984	64.482**

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

[4] Qualitatively similar findings are generated using the stepwise method and, as a result, these are un-tabulated.

When analysing the model summary at the first stage of the analysis, DENSITY, SIZE and IMPACT are included in the regression. Approximately 12.9% of the total variance in the model is accounted for. The model statistics show that the model including only the control variables ($F\Delta = 9.880$, $p < 0.01$) improves the prediction of IRQ.

The CAQ components are added using a hierarchical regression with stepwise entry. PROCEDURES, RESP AND COMP, SOURCE, are added while COVERAGE and ADDRESSEE are excluded. The addition of the components' final model makes a statistically significant contribution to the model's explanatory power ($F\Delta = 64.482$, $p > 0.01$). The R^2 of the model increases as each audit quality element is added and results in a final R^2 of 0.326 which indicates that the model accounts for approximately one-third of the total variance in the model (32.6%). The final OLS regression model is presented in Table 10 (Panel A). The results are corroborated by using the same controls and independent variables in a PROBIT regression where report quality is measured on a binary scale (high- or low-quality reporting). Refer to Table 10 (Panel B).

Table 10: Regression analysis with components

	A: Multiple Regression[5]		**B: PROBIT**		
	Coefficients	**t**	**Coefficients**	**z**	
SIZE	-0.001	-1.392	0.000	-0.16	
IMPACT	0.397	4.110***	0.499	3.46***	
DENSITY	-0.003	-4.359***	-0.010	-4.28***	
PROCEDURES	3.511	5.216***	3.969	2.46***	
RESP AND COMP	-1.706	3.741***	-2.966	-3.97***	
SOURCE	2.244	2.816**	3.700	2.52***	
LEVEL	-0.496	-1.984	-0.676	-1.75*	
Model summaries					
	R2	**Adj R2**	**R2**	**Log-likelihood**	**X^2**
Stage 1	0.326	0.302	0.2846	-97.066	77.24

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

[5] An un-tabulated ANOVA test confirmed that the proposed regression model provides a more accurate prediction of IRQ than the average assurance scores.

Table 10 (Panel A), based on the OLS regression, shows that the type of procedures performed by assurance providers (β = 3.511, p < 0.01) and the source of assurance obtained (β = 2.244, p < 0.05), whether external or internal, are the main contributing factors that result in better-combined assurance quality. This is consistent with the findings of Wallage (2000); Zhou et al. (2019) that different procedures by assurance providers improve the overall combined assurance quality leading to better quality reporting. Level of assurance (β = -0.496, p > 0.1) and responsibility and compliance statement (β = -1.706, p < 0.01) are found, however, to decrease the overall combined assurance quality. This is inconsistent with the findings reported by Gray (2000); Maroun (2019); O'Dwyer and Owen (2005). Findings for the control variables are consistent with those reported in Table 8.

The PROBIT regression (Panel B) provided similar findings in which the PROCEDURES (β = 3.969, p < 0.01) performed and the SOURCE (β = 3.700, p < 0.01) obtained improved the combined assurance quality. Both responsibly and compliance statement, as well as the level of assurance obtained, was found to have a significant but negative effect on combined assurance quality.

The findings above support the hypothesis that a combined assurance approach does improve the quality of integrated reports but the components which are expected to result in a strong association with IRQ are not as expected. The coverage of combined assurance, which is expected to improve combined assurance quality, given the combination of different assurance providers, should improve the control environment (Zhou et al., 2019). However, this was not the case. The level of assurance (reasonable or limited) also had a negative effect on CAQ showing that “the more extensive depth of evidence gathering, including corroborative evidence and sufficient sampling" (AccountAbility, 2008a) plays no role in improving reporting quality.

The regression model was tested for independent errors using the Durbin-Watson test and it was found that the test results were within the tolerable range of -2 and 2. VIF scores (refer to Appendix C, Table 18) are well below the recommended threshold of 10. All scores for the individual variables are approximately 1. The average VIF is also approximately 1. This suggests that there is no material multicollinearity. This was confirmed by collinearity diagnostics (Appendix C, Table 18) which indicates that each of the variables loads on a different axis.

A histogram was also generated for standardised residuals versus combined assurance quality (un-tabulated). The data appeared approximately normal with slight skewness. This was confirmed by the Shapiro-Wilk and Breusch-Pagan test (refer to Appendix E). A test for heteroskedasticity was also performed, using the Breusch-Pagan test in which there was some indication of heteroskedasticity (Appendix E), but the result was significant at the 1% level. As a result of a possible indication of heteroskedasticity, the results were found to be qualitatively similar using bootstrapping with 10 000 iterations (un-tabulated). Nevertheless, the generalisation of findings to a broader sample should be done with caution.

Given the unexpected finding when the CAQ is disaggregated and each component is tested for the impact on IRQ, several sensitivity tests were performed. These are detailed in Section 4.3. Finally, the model was tested with fixed firm and year effects (refer to Appendix F, Table 23). A Ramsey Rest test was also performed on the OLS regression with components to evaluate if there were any omitted variables. The results (Appendix G) suggest no omitted variables.

4.3: Sensitivity tests

A range of sensitivity tests (Table 11) was performed to determine whether different variables of the independent variable affect the dependent variable (IRQ).

- Following similar approaches conducted by Crotty (2007); Cahan et al. (2016) controls for financial performance and leverage are introduced. Financial performance is measured based on the return on assets (ROA). Leverage (LEV) meanwhile is measured by the total debt divided by total equity of the entity (Model 1, Table 11).
- It is possible that companies already have systems and procedures in place to support good social and environmental performance resulting in better quality reporting (Maroun, 2019), controls for the Carbon disclosure project (CDP) and Socially Responsible Investment (SRI) are introduced (Model 2 & 3, Table 11).
- The use of alternate measures for the control variables was introduced in Model 4 (Table 11), to control for different factors which may influence companies to produce better quality reporting. These include whether the company is in the banking sector (BANK), mining sector (MINE), the solvency (SOLV) and headline earnings (HEADEARD) of the company.

Table 11: Sensitivity test [6]

	Model 1		Model 2		Model 3		Model 4	
Independent	**Stand coeff.**	**T**	**Stand coeff.**	**t**	**Stand coeff.**	**t**	**Stand coeff.**	**t**
SIZE	-0.001	-1.781*	-0.001	-2.035**	-0.001	-1.254	-	-
IMPACT	0.397	3.829***	0.339	3.449***	0.400	3.975***	-	-
DENSITY	-0.003	-2.450**	-0.004	-3.722***	-0.004	-3.222***	-0.004	-3.067***
CAQ	0.221	1.119**	0.115	0.634*	0.188	1.006	0.001	0.007**
ROA	0.516	0.462	-	-	-	-	-	-
LEV	-0.008	-0.332	-	-	-	-	-	-
SRI	-	-	0.769	4.021***	-	-	-	-
CDP	-	-	-	-	-0.036	1.006**	-	-
BANK	-	-	-	-	-	-	-0.323	-1.026
MINE	-	-	-	-	-	-	1.061	3.472***
SOLV	-	-	-	-	-	-	0.849	1.526
HEADEARD	-	-	-	-	-	-	-0.003	-0.218
Model Summaries								
	R^2	**Adj R^2**	**R^2**	**Adj R^2**	**R^2**	**Adj R^2**	**R^2**	**Adj R^2**
Stage 1	0.134	0.107	0.200	0.180	0.142	0.120	0.122	0.090
Durbin-Watson	0.723		0.770		0.725		0.714	

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level

[6] Qualitatively similar findings are generated when the natural log SIZE and DENSITY is used in the OLS regression. Consequently, these tests are not reported.

4.3.1. ROA and Leverage (Model 1)

The results in Table 10 show that the addition of ROA and Leverage as control variables results in approximately 13.4% of the total variance of the model. The statistics also show that the model makes a statistically significant contribution to the model's explanatory power ($F\Delta = 5.014$, $p < 0.01$). ROA ($\beta = 0.516$, $p > 0.1$) was found to have positive association with quality while LEV ($\beta = -0.08$, $p > 0.1$) had a negative association. CAQ was still found to have positive an association when ROA and Leverage were added ($\beta = 0.221$, $p < 0.05$).

4.3.2. Sustainability performance (Model 2)

When sustainability performance scores are added to model 2, SRI ($\beta = 0.769$, $p < 0.01$) was found to have a significant positive association. The model showed that the R^2 (14.2%) resulted in a greater % of the variance being accounted for. The model further shows a greater statistically significant contribution to the model's explanatory power ($F\Delta = 9.943$, $p < 0.01$).

SRI takes into account whether or not a company is included in the FTSE/JSE Responsible Investment Index Series. The results indicate that sustainability performance does influence CAQ but not as strongly as ROA and LEV as the association with CAQ decrease ($\beta = 0.115$, $p < 0.1$).

4.3.3. Carbon Disclosure Project (Model 3)

The Carbon Disclosure Project assesses environmental performance in terms of the systems and processes in place to manage greenhouse gas emissions. They also provide

> *"an indication of a company's awareness of climate change issues, management methods and progress towards action taken on climate change as reported in the response [to the CDP]" (CDP, 2017)."*

When the carbon disclosure scores are added to the model, 14.2% of the variance of the model is accounted for. The addition of the CDP scores still makes a statistically significant contribution to the model's explanatory power ($F\Delta = 6.565$, $p < 0.01$). CDP was found to have a negative association with quality ($\beta = -0.036$, $p < 0.05$) while CAQ had a positive association ($\beta = 0.188$, $p > 0.1$).

4.3.4. Additional control variables (Model 4)

Additional control variables sensitivity tests were run. The tabulated results (Table 11) show that companies in the mining sector (β = 1.061, p > 0.1), combined assurance quality (β = 0.001, p < 0.05) and the solvency of the company (β = 0.849, p > 0.1) improved the quality of integrated reports with combined assurance quality being significant at the 5% level. Banking sector companies' (β = -0.323, p > 0.1), headline earnings (β = -0.003, p > 0.1) and density (β = -0.004, p < 0.01) had a negative correlation with quality with Density have significance at the 1% level. The model accounted for 12.2% of the total variance of the model, with the model explanatory power providing a significant contribution (FΔ = 3.833, p < 0.01). The significance level and relationship of DENSITY and CAQ with QUALITY are in line with the findings in Section 4.2 (Table 8).

The regression model was tested for independent errors using the Durbin-Watson test and it was found that the test results (Table 11) were within the tolerable range of -2 and 2. VIF scores (refer to Appendix D) are well below the recommended threshold of 10. All scores for the individual variables are approximately 1. The average VIF is also approximately 1. This suggests that there is no material multicollinearity. This was confirmed by collinearity diagnostics (Appendix D) which indicates that each of the variables loads on a different axis.

4.4. Evaluating the components of CAQ

Given the unexpected results reported in Section 4.2.2, the sensitivity tests in Section 4.3 were repeated using the components of CAQ instead of the total quality score. A further breakdown of each model is analysed in Table 12.

Table 12: Sensitivity tests based on CAQ components

	Model 1		Model 2		Model 3		Model 4	
Independent	**Stand coeff.**	**T**	**Stand coeff.**	**t**	**Stand coeff.**	**t**	**Stand coeff.**	**t**
SIZE	-0.001	-1.533	-0.001	-1.456	-0.001	-1.612	-	-
IMPACT	0.381	3.915***	0.328	3.483***	0.370	3.872***	-	-
DENSITY	-0.003	-3.039***	-0.005	-4.731***	-0.004	-4.169***	0.003	-2.876***
ADDRESSEE	-0.059	-0.008	-0.411	-0.691	-0.018	-0.030	-0.409	-0.633
DATA AND SYSTEMS	-0.725	-0.862	-0.763	-0.981	-0.436	-0.521	-1.484	-1.745*
RESP AND COMP	-1.804	-3.749***	-1.576	-3.366***	-1.916	-3.926***	-1.765	-3.478***
LEVEL	-0.472	-1.788*	-0.577	-2.248**	-0.524	-2.003**	-0.574	-2.118**
SOURCE	2.531	2.590***	2.052	2.160**	2.768	2.639***	1.323	1.337
PROCEDURES	3.229	3.045***	3.301	3.175***	3.294	3.099***	3.595	3.215***
COVERAGE	1.633	1.072	0.367	0.258	0.849	0.587	1.243	0.804
ROA	-0.025	-0.023	-	-	-	-	-	-
LEV	-0.048	-2.097**	-	-	-	-	-	-
SRI	-	-	0.545	2.967***	-	-	-	-
CDP	-	-	-	-	0.035	1.125	-	-
BANK	-	-	-	-	-	-	-0.290	-0.957
MINE	-	-	-	-	-	-	0.702	2.431**
SOLV	-	-	-	-	-	-	0.410	0.766
HEADEARD	-	-	-	-	-	-	-0.002	-0.160
Model Summaries								
	R^2	**Adj R^2**	**R^2**	**Adj R^2**	**R^2**	**Adj R^2**	**R^2**	**Adj R^2**
Stage 1	0.344	0.302	0.359	0.322	0.334	0.296	0.303	0.255
F Change	8.208***		9.806***		8.784***		6.265***	
Durbin-Watson	0.930		0.929		0.927		0.889	

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

4.4.1. ROA and Leverage (Model 1)

Based on the sensitivity tests performed, it can be noted that when the return on assets (ROA) and Leverage (LEV) are added to the model, the results of the components are in line with the multiple regression results in Table 9. PROCEDCURES (β = 3.229, p < 0.01) and SOURCE (β = 2.531, p < 0.01) are found to have a positive association with report quality while RESP AND COMP (β = -1.804, p < 0.01) and LEVEL (β = -0.472, p < 0.1) had a negative association.

4.4.2. Sustainability performance (Model 2)

Sustainability performance scores (SRI) within the model were found to have a significant positive association (β = 0.545, p < 0.01) with IMPACT (β = 0.328) and DENSITY (β = -0.005) being significant, as well with the latter having a negative association. The model showed that the R^2 (35.9%) resulted in a greater % of the variance being accounted for when compared with ROA and LEV. The model further shows a greater statistically significant contribution to the model's explanatory power (FΔ = 9.806, p < 0.01). When looking at the different CAQ elements it can be noted that the results are in line with regression analysis in Section 4.3 in which the source of assurance (β = 2.052, p < 0.05), the procedures performed by assurance providers assurance (β = 3.301, p < 0.01), and COVERAGE (β = 0.367, p > 0.1) having a positive association with quality. ADRESSEE (β = -0.411, p >0.1), DATA AND SYSTEMS (β = -0.763, p > 0.1), RESP AND COMP (β = -1.576, p < 0.01) and LEVEL (β = -0.577, p < 0.05) all having negative relationships with quality.

4.4.3. Carbon Disclosure Project (Model 3)

When the carbon disclosure scores are added to the model, 33.4% of the variance of the model is accounted for. CDP, however, was found to have a weak, positive association with report quality (β = -0.035, p > 0.1) in contrast with section 4.3.3. The addition of the CDP scores was found to have a statistically significant contribution to the model's explanatory power (FΔ = 8.784, p < 0.01). As with model 2 (Section 4.4.3) the CAQ elements showed similar findings in which SOURCE (β = 2.768, p < 0.01), the PROCEDURES (β = 3.294, p < 0.01), and COVERAGE (β = 0.849, p > 0.1) having a positive association with quality. ADRESSEE (β = -0.018, p > 0.1), DATA AND SYSTEMS (β = -0.436, p > 0.1), RESP AND COMP (β = -1.916, p < 0.01) and LEVEL (β = -0.524, p < 0.05) all having negative relationships with quality. This indicates that the carbon disclosure scores do not have a significant effect on findings of the study.

4.4.4. Additional control variables (Model 4)

Table 12 shows similar results to Section 4.3.4. BANK (β = -0.290, p > 0,1) and HEADEARD (β = -0.002, p > 0,1) was found to have negative association with quality. MINE (β = 0.702, p < 0.05) and SOLV (β = 0.410, p > 0,1) however, showed a positive association. The strength of the relationships was weak in comparison. When looking at combined assurance, SOURCE (β = 1.323, p > 0.1), PROCEDURES (β = 3.595, p < 0.01) and COVERAGE (β = 1.243, p > 0.1) having a positive association with quality. ADRESSEE (β = -0.409, p > 0.1), DATA AND SYSTEMS (β = -1.484, p < 0.1), RESP AND COMP (β = -1.765, p < 0.01) and LEVEL (β = -0.574, p < 0.05) all having negative relationships with quality. The findings are consistent with those reported in Section 4.2.2.

The sensitivity test performed was tested for independent errors using the Durbin-Watson test and it was found that the test results (Table 12) were within the tolerable range of -2 and 2. Our VIF scores (refer to Appendix D) are well below the recommended threshold of 10. They are all below 4 and suggests that there is no material multicollinearity. The multi-collinearity plots were not generated.

4.4.5. Factor analysis

To provide additional insights, principal components were conducted on the 8 subject matter types with orthogonal rotation (varimax method) to aggregate subject matters. To balance ease of interpretation with exploratory power, only components with an eigenvalue greater than 1 are retained. The result is 5 components accounts for 70.31% of the total variance in report quality[7].

The Kaiser-Meyer-Olkin measure suggests that the sample size is adequate (KMO = 0.634) and, based on the result of Bartlett's test of sphericity, the null hypothesis that the variables included in the analysis are uncorrelated is rejected (X^2 = 541.507 p < 0.01). Table 13 shows component loadings after rotation[8]. The clustering of subject matter (as well as relative loadings) is used to label the components. Component 1 comprise of the different capitals as per the IIRC framework, as well as key elements of combined assurance. Component 2 is made up primarily of data systems and internal controls of an organisation, as well as the IIRC capitals. Component 3 specifically links to the level of assurance and compliance.

[7] Using an eigenvalue cut-off greater than 1 is consistent with the approach generally followed in the social science literature.

[8] A correlation matrix based on the final model (un-tabulated) reports only residuals with absolute values greater than 0.05. Loadings of less than 0.4 have been excluded.

Table 13: Rotated Component Matrix[9]

Subject Matters	Component		
	1: Integrated reporting and assurance	2: Integrated reporting and internal controls	3: Level of assurance and compliance
LEVEL	-0.600		
ACCOUNTABILITY	0.851		
PROCEDURES	0.868		
ADDRESEE	0.827		
IIRC CAPITALS	0.526	0.528	
DATA AND SYSTEMS		0.853	
SOURCE		-0.556	0.675
RESP AND COMP			0.917

From the regression analysis (Table 14), it can be noted that the reporting of different capitals as per the IIRC framework (IIRC, 2013b), as well as different characteristics of an assurance, has a positive association with integrated report quality (β = 0.376, p < 0.1). The data and systems of an entity (internal controls) (β = -0.071, p > 0.1), as well as the type of assurance (β = -0.066, p > 0.1), have a negative association with neither being significant.

Table 14: Factor analysis regression model

Independent	Stand coeff.	T
SIZE	-0.001	-1.930*
IMPACT	0.251	2.677***
DENSITY	-0.004	-3.873***
SRI	0.576	3.075***
Comp 1: Capitals and assurance	0.376	5.038***
Comp 2: Capitals and internal controls	-0.071	-0.983
Comp 3: Assurance providers	-0.066	-0.873

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

[9] Rotation converged in 5 iterations

5. *Discussion and Conclusion*

This research provides an account of the role combined assurance plays as a driver of integrated report quality. The data from this study come from a range of different sectors of companies listed on the Johannesburg Stock Exchange (JSE) in which integrated reporting has, in practical terms , become mandatory for companies to comply with. The EY integrated report scores gauge companies' report quality based on the guiding and content principles of the IIRC's framework.

For our sample of analysis for the period 2013 – 2019, the empirical evidence supports the suggestion in favour of the hypothesis in Section 2.4 that the use of combined assurance by South African listed entities is associated with higher quality reporting. The environmental impact of a company's operations is a further driver that results in better reporting quality.

Financial resources, accounting infrastructure and the expertise of larger organisations were expected to play a key role in preparing high-quality reports because of the resources at their disposal to prepare higher-quality reports (Simnett et al., 2016) but, this was not the case. A possible explanation may be the fact that combined assurance has been a recommended practice since the release of KING III in 2013. Companies whether, big or small, have had the necessary time to implement controls and procedures to ensure an effective combined assurance model.

The saying "less is more" (Melloni, Caglio and Perego, 2017) is an indication of why the density of the integrated reports did not affect the quality of reports. There comes a point where an additional page within the report provides no more value and useful information to the users of the reports. Organisations need to ensure that they strike the balance between useful information and number of disclosures.

Not all components of combined assurance resulted in this association. Responsibility and compliance statements, as well as the level of assurance, were found to have a negative association with report quality. The level of assurance is particularly intriguing given that a reasonable assurance provides a more "extensive depth of evidence gathering, including corroborative evidence and sufficient sampling" (AccountAbility, 2008a) which should, but does not, result in better reporting.

The results are unaffected by firm size, the extensiveness of reporting, financial performance and ESG performance (Simnett et al., 2009b). They are also robust to fixed year and firm effects. This is in keeping with the fact that the use of ESG assurance is widespread in South

Africa, with 62% of companies relying on, at least, some external assurance for their 2016 integrated reports.

5.1. Table 15: Summary

Analysis Performed	**Discussion**
Base regression	The IMPACT of an organisation's operation and Combined Assurance Quality (CAQ) was found to have a positive association with quality with both being significant at the one per cent and five per cent level. The SIZE of the organisation and DENSITY of companies' integrated reports played no role in improving report quality were negatively associated with quality. Both were significant at ten per cent and one per cent respectively.
Base regression with components	With Combined Assurance Quality (CAQ) being broken down into its components, types of PROCEDURES performed by assurance providers, as well as the SOURCE of assurance whether external or internal were contributing factors to higher quality reporting. The variables were significant at one per cent and five per cent respectively. The LEVEL of assurance and the responsibility and compliance statements (significant at one per cent level) negatively affect the quality of integrated reports. IMPACT was seen to improve quality with SIZE and DENSITY having a negative association.
Sensitivity tests	Several sensitivity tests were performed based on the base regression and base regression with CAQ components. Return on Assets (ROA) and leverage (LEV) were found to have a positive and negative association with quality, respectively, on the base regression. When looking at it with the components both variables were negatively correlated. Socially Responsible Investment scores were positively associated with quality based on both regression models with significance at the one per cent level. On the other hand, the Carbon Disclosure Project scores were negatively associated with quality on the base regression, with significance at the five per cent level but positively associated with the regression with components. Additional controls for whether the company is in the banking (Bank) or mining sector (MINE) were introduced. Companies within

	the banking sector had a negative relationship with quality while the mining sector had a positive relationship with significant at the five per cent level. This is expected from the environmental impact mines have and so require better quality disclosures. Financial indicators, solvency (SOLV) and headline earnings (HEADREARD) were also tested and found the solvency has a positive relationship with quality while headline earnings had a negative association.

5.2. Contribution and implications

This study emphasizes the role assurance plays in improving the quality of integrated reports as seen with Crotty (2007); Maroun (2019); Zhou et al. (2019). The study has some important implications for policymakers and organisations which include:

- First, this research provides empirical evidence that a combined assurance model has benefits in improving integrated report quality. These address the lack of research into the role assurance, especially combined assurance, plays as a credible enhancing mechanism for better report quality.
- Second, for entities which want to improve their entities' credibility of integrated reports, combined assurance provides an alternative to obtaining external assurance on the whole integrated report.
- Third, the benefit combined assurance has evinced in improving integrated report quality has important regulatory and standard-setting implications on the journey and further development of the IR framework. This should interest both the IIRC and the IIASB to further integrate combined assurance within their frameworks and standards given its benefits.

5.3. Limitations and areas for future research

As with any study of this nature, this research is not without its limitations. Further research is required as the chosen sample is limited to the largest listed entities within a single jurisdiction. Future research can extend the study to include integrated reports from different countries to determine if the same association applies.

As in any quantitative research, the results are inherently reductionist (Maroun, 2019). While this study shows that combined assurance contributes to higher integrated report quality, exactly how and why this is the case cannot be determined. This opens opportunities for more work. For example, what is the role of combined assurance engagements in revealing weaknesses in companies' reports and identifying areas for improvement: what is the best assurance approaches for narrative, forward-looking and combined financial and non-financial information; how a combined assurance affect investors judgements; the role combined assurance plays in mitigating significant risks.

Finally, the study provides insights that a combined assurance does improve the quality of integrated reports thus further guidance on making an integrated or a sustainability report the subject matter of a combined assurance in its entirety must be made.

6. Appendix

6.1. Appendix A

The literature of the main aspects of integrated reporting

Integrated reporting has been researched extensively by researchers. Rinaldi et al. (2018a) conceptualized and analysed the development of IR as an 'idea journey'. The 'idea journey' is "the path followed by a novel idea from its conception to its successful dissemination" (Perry-Smith and Mannucci, 2017, p.g. 55). Figure 5 provides a broad summary of the IR journey and locates the prior and contemporary IR literature within the appropriate idea journey phases. Reference to some papers is placed between two boundary phases, this is intentional and illustrates that the paper contributes to more than one phase of the idea journey. Based on the main literature identified by Rinaldi et al. (2018a) which describes integrated reporting idea journey, the key aspects which resulted in the formation and the development of integrated reports is discussed in table 16.

Generation		Elaboration		Championing		Production		Impact
Gonzalbez and Rodriguez (2012)		Atkins et al. (2015a)		Owen (2013)		Adams (2017)		Atkins and Maroun (2015)
	Beattie and Smith (2013)	Atkins et al. (2015b)	Brown and Dillard (2014)	Bernardi and Stark (2018)	Stubbs and Higgins (2014)	du Toit et al. (2017)	Zhou et al. (2017)	Barth et al. (2017)
	de Villiers et al. (2014)	Haller and van Staden (2014)	van Bommel (2014)	de Villiers and Sharma (2016)	Ballou et al. (2012)	Dumay and Dai (2017)	Robertson and Samy (2015)	Lee and Yeo (2016)
	Cheng et al. (2014)	Chaidali and Jones (2017)	Coulson et al. (2015)	Baboukardos and Rimmel (2016)	Steyn (2014)	Guthrie et al. (2017)	Cohen et al. (2015)	Maroun and Mcnally (2018)
	Flower (2015)	Maroun (2017)	Rambaud and Richard (2015)	Dumay et al. (2016)	Ahmed Haji and Anifowose (2016)	Lai et al. (2017)	Setia et al. (2015)	Gibassier et al. (2018)
	Thomson (2015)		Simnett and Huggins (2015)		Roslender and Nielsen (2017)	Segal et al. (2017)	Haji and Anifowose (2016)	Lai et al. (2018)
	Adams (2015)		Humphrey et al. (2017)		Reimsbach et al. (2017)	Silvestri et al. (2017)	Gunarathne and Senaratne (2017)	Vesty et al. (2018)
	Reuter and Messner (2015)				Del Baldo (2017)	du Toit (2017)	Venter et al. (2017)	
	Tweedie and Martinov-Bennie (2015)					Adams et al. (2016)	Melloni et al. (2017)	
	Vinnari and Dillard (2016)					Higgins et al. (2014)	de Villiers et al. (2017a)	
	Rowbottom and Locke (2016)					Stent and Dowler (2015)	Lodhia and Stone (2017)	
						Macias and Farfan-Lievano (2017)	McNally et al. (2017)	
						Haji (2015)	Haji and Hossain (2016)	
							Oliver et al. (2016)	

Figure 5: Integrated Reporting idea journey: locating the IR literature (Rinaldi, Unerman and de Villiers, 2018a)

Table 16: Literature of the main aspects of Integrated reporting

Lack of interconnectivity in annual reports	The IRCSA (2011) and IOD (2009) criticised annual reports for lack of describing relationships within the organisation which includes the relationships between organisational strategy, financial performance and key non-financial metrics. At the same time, sustainability reports lacked focus (Gray, 2012, 2013), frequently failing to highlight the interconnection between ESG issues and strategic objectives (IRCSA, 2011).
Release of IIRC framework	To try and overcome the divide, the IIRC released its integrated reporting framework in 2013. Even though the framework was only released in 2013, it retained many of the essential principles in the IIRC (2011) and IRCSA (2011) discussion papers released during 2011. In particular, the framework emphasises the importance of cohesive, yet multidimensional, reporting which communicates the factors which influence organisational value over time (Atkins and Maroun, 2015).
IIRC Objective	The release of an international framework for integrated reporting by the IIRC (2013b) can be interpreted as the most recent development in an effort to integrated financial and non-financial measures for stakeholders. According to the IIRC, the objective is: *"a world in which integrated thinking is embedded within the mainstream business practice in the public and private sectors, facilitated by Integrated Reporting (IR) as the corporate reporting norm" (IIRC, 2013b, p.g. 2)*
Integrated thinking	The framework focuses on increased accountability and stewardship concerning the "financial, manufactured, intellectual, human, social and relationship and natural capital" *(IIRC, 2013b, p.g. 2)*. As in the earlier discussion papers, “integrated thinking” which explains the interconnections between key financial and non-financial metrics is at the heart of the current shift in corporate reporting mindsets (Solomon and Maroun, 2012).

6.2. Appendix B

EY Excellence in integrated reporting scores

EY has been evaluating the quality of South African integrated and sustainability reports for the full period under review. Like Michelon et al. (2015) and Borghei et al. (2015), the EY evaluation recognises that quality is not just a function of the quantity of information being disclosed. Companies are expected to provide a balanced account of how multiple types of capital are being managed which is context-specific and clearly linked to the organisation's strategy, business model and key risks (EY, 2016). EY focuses on the guiding principles in the IIRC's framework.

Individual score sheets of companies are not published but a ranking of the companies' integrated reports is made. These range from 1 (progress to be made) to 5 (for the top 10 reports). The scores are widely used by practitioners and users as an indication of the quality of South African integrated reports (King, 2016) and have also been tested by the academic community. Barth et al. (2017) confirmed that the EY scoring system is aligned with the IIRC's framework on integrated reporting and tested the inter-coder reliability of adjudicator scores. Also, EY's results are largely in line with an independent examination of report quality by (Zhou et al., 2017).

6.3. Appendix C

Collinearity diagnostics were performed to ensure near perfect linear combination and no multicollinearity exists. The diagnostics were performed on the base regression model (Table 17) and the regression model with the components on CAQ (Table 18). The analysis of the results is presented in Section 4.2.1 and 4.2.2.

Table 17: Collinearity diagnostics regression model

Model	Constant	SIZE	IMPACT	DENSITY	CAQ
1	0.00	0.02	0.01	0.01	0.00
2	0.00	0.94	0.01	0.00	0.00
3	0.00	0.01	0.35	0.64	0.00
4	0.02	0.03	0.48	0.21	0.13
5	0.98	0.00	0.15	0.14	0.87
Collinearity statistics tolerance		0.99	0.99	1.00	
VIF		1.01	1.01	1.00	

Table 18: Collinearity diagnostics regression model with components

Model	Constant	SIZE	IMPACT	DENSITY	PROCEDURES	RESP AND COMP	SOURCE	LEVEL
1	0.01	0.03	0.01	0.02				
	0.00	0.91	0.02	0.01				
	0.00	0.02	0.43	0.59				
	0.99	0.04	0.54	0.38				
Collinearity statistics tolerance		0.99	0.99	1.00				
VIF		1.01	1.01	1.00				
2	0.01	0.02	0.01	0.01	0.03			
	0.00	0.77	0.01	0.00	0.19			
	0.01	0.15	0.03	0.04	0.73			
	0.00	0.02	0.45	0.56	0.01			
	0.98	0.04	0.50	0.39	0.04			
Collinearity statistics tolerance		0.99	0.99	0.99	1.00			
VIF		1.01	1.01	1.01	1.00			
3	0.00	0.01	0.01	0.01	0.02	0.00		
	0.00	0.82	0.00	0.00	0.14	0.00		
	0.00	0.12	0.02	0.02	0.79	0.00		
	0.00	0.01	0.32	0.62	0.02	0.00		

	0.02	0.03	0.59	0.14	0.03	0.10		
	0.97	0.00	0.06	0.21	0.00	0.89		
Collinearity statistics tolerance		0.99	0.99	0.92	0.98	0.91		
VIF		1.01	1.01	1.09	1.02	1.10		
4	0.00	0.01	0.00	0.00	0.01	0.00	0.00	
	0.00	0.84	0.00	0.00	0.10	0.00	0.00	
	0.00	0.09	0.01	0.01	0.85	0.00	0.00	
	0.00	0.01	0.29	0.61	0.02	0.00	0.00	
	0.00	0.01	0.55	0.17	0.02	0.04	0.01	
	0.15	0.00	0.00	0.20	0.00	0.96	0.18	
	0.85	0.04	0.14	0.01	0.00	0.00	0.81	
Collinearity statistics tolerance		0.96	0.93	0.90	0.98	0.73	0.75	
VIF		1.04	1.07	1.12	1.02	1.36	1.34	
5	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
	0.00	0.77	0.00	0.00	0.13	0.00	0.00	0.00
	0.00	0.15	0.00	0.01	0.59	0.00	0.00	0.01
	0.00	0.02	0.42	0.46	0.02	0.00	0.00	0.01
	0.00	0.01	0.25	0.33	0.02	0.01	0.00	0.16
	0.01	0.00	0.16	0.00	0.22	0.09	0.02	0.66
	0.17	0.00	0.01	0.20	0.01	0.89	0.25	0.15
	0.82	0.04	0.15	0.01	0.00	0.00	0.73	0.00
Collinearity statistics tolerance		0.95	0.91	0.89	0.82	0.72	0.71	0.76
VIF		1.05	1.10	1.12	1.22	1.39	1.42	1.31

6.4. Appendix D

Collinearity diagnostics were performed to ensure that two variables from the sensitivity test on a regression model (Table 19) and CAQ components (Table 20) is a near perfect linear combination and it was found that no multicollinearity exists in which more than 2 variables are in combination with each other. Analysis of the findings is found in Section 4.3.

Table 19: Collinearity diagnostics on the sensitivity test of the regression model

Sensitivity Test		SIZE	IMPACT	DENSITY	CAQ	ROA	LEV	SRI	CDP	ASSETS	BANK	MINE	SOLV	HEADEARN	DENSITY
1	Collinearity statistics tolerance	0.972	0.946	0.802	0.874	0.765	0.692								
	VIF	1.028	1.057	1.247	1.144	1.307	1.445								
2	Collinearity statistics tolerance	0.981	0.947	0.949	0.932			0.941							
	VIF	1.019	1.056	1.053	1.073			1.063							
3	Collinearity statistics tolerance	0.894	0.967	0.929	0.931				0.864						
	VIF	1.119	1.034	1.076	1.074				1.157						
4	Collinearity statistics tolerance				0.926					0.311	0.587	0.726	0.472	0.602	0.782
	VIF				1.080					3.214	1.704	1.377	2.117	1.662	1.279

Table 20: Collinearity statistics on sensitivity test of the regression model with components

Sensitivity Test		SIZE	IMPACT	DENSITY	RESP AND COMP	SOURCE	LEVEL	DATA AND SYSTEMS	COVERAGE	PROCEDURES	ADDRESEE	ROA	LEV	SRI	CDP	ASSETS	BANK	MINE	SOLV	HEADEARN
1	Collinearity statistics tolerance	0.909	0.839	0.740	0.694	0.495	0.698	0.507	0.267	0.337	0.466	0.656	0.609							
	VIF	1.100	1.192	1.351	1.442	2.022	1.433	1.973	3.748	2.964	2.144	1.525	1.642							
2	Collinearity statistics tolerance	0.924	0.852	0.874	0.661	0.483	0.703	0.568	0.290	0.334	0.455			0.845						
	VIF	1.083	1.174	1.145	1.513	2.070	1.422	1.762	3.454	2.998	2.200			1.184						
3	Collinearity statistics tolerance	0.840	0.859	0.612	0.632	0.411	0.704	0.510	0.292	0.331	0.448				0.870					
	VIF	1.191	1.164	1.634	1.582	2.431	1.421	1.962	3.430	3.017	2.231				1.149					
4	Collinearity statistics tolerance			0.708	0.665	0.514	0.706	0.529	0.276	0.324	0.433					0.277	0.520	0.666	0.417	0.580
	VIF			1.412	1.504	1.945	1.416	1.889	3.617	3.089	2.311					3.610	1.923	1.502	2.398	1.723

6.5. Appendix E

Several different tests were performed to determine if the data set was well-modelled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed.

Table 21: Test for normality of residual errors

	Base regression model	**Regression with components (full model)**	**Regression with different factors**
Shapiro-Wilk test			
z	2.652*		
White's test			
chi^2	23.98**	36.54	71.60
Breusch-Pagan test			
chi^2	3.76*	184.98***	217.74***
Cameron & Trivedi's decomposition of IM-test			
Heteroskedasticity			
chi^2	23.98**	36.54	71.60
Skewness			
chi^2	8.29*	16.74**	20.09**
Kurtosis			
chi^2	10.78***	2.34	2.32

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level

6.6. Appendix F

The regression model (Table 22), a regression model with CAQ components (Table 23) and regression model with factors (Table 24), was reperformed to control for fixed year effects and to determine if the results are consistent with the normal regression model. Analysis of the results is present in Section 4.2.1, Section 4.2.2 and Section 4.4.5.

Table 22: Base regression model based on fixed year effects

	Multiple regression		Multiple regression with fixed year effects	
	Coefficients	**t**	**Coefficients**	**z**
SIZE	-0.001	-1.712*	-0.115	-0.726*
IMPACT	0.397	3.938***	0.262	3.916***
DENSITY	-0.003	- 3.022***	-0.198	-2.947***
CAQ	0.225	1.215**	0.078	1.150**

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level.

Table 23: Regression model with components based on fixed year effects

	A: Multiple regression		B: Multiple regression with fixed year effects	
	Coefficients	**t**	**Coefficients**	**t**
SIZE	-0.001	-1.392	-0.001	-1.450
IMPACT	0.397	4.110***	0.374	4.049***
DENSITY	-0.003	-4.359***	-0.004	-4.204***
PROCEDURES	3.511	5.216***	3.561	5.280***
RESP AND COMP	-1.706	3.741***	-1.701	-3.731***
SOURCE	2.244	2.816**	2.116	2.627***
LEVEL	-0.496	-1.984	-0.499	-1.998*

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level

Table 24: Regression with factor based on fixed year effects

	A: Multiple regression		B: Multiple regression with fixed year effects	
	Coefficients	**t**	**Coefficients**	**t**
SIZE	-0.001	-1.930*	-0.001	-1.935**
DENSITY	-0.004	-3.873***	-0.004	-3.782***
IMPACT	0.251	2.677***	0.254	2.734***
SRI	0.576	3.075***	0.514	2.725***
A-R factor score 1 for analysis 1	0.376	5.038***	0.388	5.242***
A-R factor score 2 for analysis 1	-0.071	-0.983	-0.072	-0.994
A-R factor score 3 for analysis 1	-0.066	-0.873	-0.072	-0.966

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level

6.7. Appendix G

Ramsey Rest test was performed to determine if there are any omitted variables from the regression model.

Table 25: Ramsey Rest test

	Base Regression model	**Regression with components (full model)**	**Regression with different factors**
F	0.87	1.15	1.53

*** Significant at 1% level.
** Significant at 5% level.
* Significant at 10% level

7. References

ACCOUNTABILITY 2008a. AA1000 ACCOUNTABILITY PRINCIPLES STANDARD 2008.

ACCOUNTANTS, I. F. O. International standard on auditing (ISA) 315: Identifying and assessing the risks of material misstatement through understanding the entity and its environment. 2009. IFAC New York.

ACKERS, B. & ECCLES, N. S. 2015. Mandatory corporate social responsibility assurance practices. *Accounting, Auditing & Accountability Journal*.

ADAMS, C. A. 2015. The international integrated reporting council: a call to action. *Critical Perspectives on Accounting,* 27**,** 23-28.

ADAMS, C. A. & EVANS, R. 2004. Accountability, completeness, credibility and the audit expectations gap. *Journal of corporate citizenship***,** 97-115.

AFRICA, I. O. D. I. S. 2009. King Code on Governance for South Africa (King III).

ARENS, A. A., ELDER, R. J. & BEASLEY, M. S. 2006. *Auditing and Assurance Services: An Integrated Approach*, Prentice Hall.

ARENS, A. A., ELDER, R. J. & MARK, B. 2012. *Auditing and assurance services: an integrated approach*, Boston: Prentice Hall.

ATKINS, J. & MAROUN, W. 2015. Integrated reporting in South Africa in 2012: Perspectives from South African institutional investors. *Meditari Accountancy Research,* 23**,** 197-221.

BALL, A., OWEN, D. & GRAY, R. 2000. External transparency or internal capture? The role of third-party statements in adding value to corporate environmental reports1. *Business Strategy and The Environment,* 9**,** 1-23.

BARAC, K. & FORTE, J. 2015. Combined assurance: A systematic process. *Southern African Journal of Accountability and Auditing Research,* 17**,** 71-83.

BARTH, M. E., CAHAN, S. F., CHEN, L. & VENTER, E. R. 2017. The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, Organizations and Society,* 62**,** 43-64.

BORGHEI, Z., LEUNG, P. & GUTHRIE, J. 2015. The Nature of Voluntary Greenhouse Gas Disclosure by Non-GHG Registered Australian Companies An Explanation of the Changing Rationale. *SSRN Electronic Journal*.

BRANCO, M., DELGADO, C., GOMES, S. & EUGENIO, T. 2014. Factors influencing the assurance of sustainability reports in the context of the economic crisis in Portugal. *Managerial Auditing Journal,* 29**,** 237-252.

BRENNAN, N. M., GUILLAMON-SAORIN, E. & PIERCE, A. 2009. Methodological insights. *Accounting, Auditing & Accountability Journal*.

BUI, B. & DE VILLIERS, C. 2017. Management control systems to support sustainability and integrated reporting. *Sustainability Accounting and Integrated Reporting.* Routledge.

CAHAN, S. F., DE VILLIERS, C., JETER, D. C., NAIKER, V. & VAN STADEN, C. J. 2016. Are CSR Disclosures Value Relevant? Cross-Country Evidence. *European Accounting Review,* 25**,** 579-611.

CDP. 2017. *Climate Change* [Online]. [Accessed 10 August 2020].

CHENG, M., GREEN, W., CONRADIE, P., KONISHI, N. & ROMI, A. 2014. The International Integrated Reporting Framework: Key Issues and Future Research Opportunities. *Journal of International Financial Management & Accounting,* 25**,** 90-119.

CHO, C. H., MICHELON, G., PATTEN, D. M. & ROBERTS, R. W. 2014. CSR report assurance in the USA: an empirical investigation of determinants and effects. *Sustainability Accounting, Management and Policy Journal*.

CHURET, C. & ECCLES, R. G. 2014. Integrated Reporting, Quality of Management, and Financial Performance. *Journal of Applied Corporate Finance,* 26**,** 56-64.
CLATWORTHY, M. & JONES, M. J. 2003. Financial reporting of good news and bad news: evidence from accounting narratives. *Accounting and Business Research,* 33**,** 171-185.
COSO 2004. Enterprise Risk Management — Integrated Framework.
CROTTY, A. 2007. Tiger-Brands price fixing scandal a drop in the ocean. *Business Report* [Online]. Available: http://www.busrep.co.za/index.php?fArticleId=4146875 [Accessed 1 June 2020].
DE LUCA, F. 2020. From Voluntary to Mandatory Non-financial Information: The Evolution Path. Mandatory and Discretional Non-financial Disclosure after the European Directive 2014/95/EU. *Emerald Publishing Limited.*
DE VILLIERS, C. & HSIAO, P.-C. K. 2018. Why organizations voluntarily report–agency theory. *Sustainability Accounting and Integrated Reporting.* ROUTLEDGE in association with GSE Research.
DE VILLIERS, C. & MAROUN, W. 2017. The future of sustainability accounting and integrated reporting. *Sustainability Accounting and Integrated Reporting.* Routledge.
DE VILLIERS, C., VENTER, E. R. & HSIAO, P.-C. K. 2017a. Integrated reporting: background, measurement issues, approaches and an agenda for future research. *Accounting & Finance,* 57**,** 973-959.
DE VILLIERS, C., VENTER, E. R. & HSIAO, P.-C. K. 2017b. Integrated reporting: background, measurement issues, approaches and an agenda for future research. *Accounting & Finance,* 57**,** 937-959.
DMITRENKO, M. 2017. Combined assurance as an element of effective corporate governance. *Scientific Journal of Polonia University,* 21**,** 84-90.
DRAGU, I.-M. 2018. Adoption of Integrated Reporting – An Attempt to Reduce the Gaps between CSR Discourse and Its Implementation. *Emerald Publishing Limited.*
DUMAY, J., BERNARDI, C., GUTHRIE, J. & DEMARTINI, P. Integrated reporting: A structured literature review. Accounting Forum, 2016. Taylor & Francis, 166-185.
ECCLES, R. G. & KRZUS, M. P. 2010. *One report: Integrated reporting for a sustainable strategy*, John Wiley & Sons.
ECCLES, R. G., KRZUS, M. P. & RIBOT, S. 2015. Meaning and momentum in the integrated reporting movement. *Journal of Applied Corporate Finance,* 27**,** 8-17.
EDGLEY, C. R., JONES, M. J. & SOLOMON, J. F. 2010. Stakeholder inclusivity in social and environmental report assurance. *Accounting, Auditing & Accountability Journal*.
EY 2016. EY's Excellence in Integrated Reporting Awards 2016.
FAROOQ, M. & VILLIERS, C. 2019a. The shaping of sustainability assurance through the competition between accounting and non-accounting providers. *Accounting Auditing & Accountability Journal,* 32**,** 307-336.
FAROOQ, M. & VILLIERS, C. 2019b. Sustainability Assurance: Who Are the Assurance Providers and What Do They Do?: Reporting, Taxation, Ethics and Governance.
FAROOQ, M. B. & DE VILLIERS, C. 2017a. Assurance of sustainability and integrated reports. *Sustainability Accounting and Integrated Reporting.* Routledge.
FAROOQ, M. B. & DE VILLIERS, C. 2017b. The market for sustainability assurance services. *Pacific Accounting Review,* 29**,** 79-106.
FRASER, I. & HENRY, W. 2007. Embedding risk management: structures and approaches. *Managerial Auditing Journal*.
FRC 2016. Guidance on Audit Committees. Financial Reporting Council
GILLET-MONJARRET, C. 2015. Assurance of sustainability information: A study of media pressure. *Accounting in Europe,* 12**,** 87-105.

GRAY, R. 2000. Current developments and trends in social and environmental auditing, reporting and attestation: a review and comment. *International journal of auditing,* 4**,** 247-268.
GRI. 2013a. *The external assurance of sustainability reporting* [Online]. Available: https://www.globalreporting.org/resourcelibrary/GRI-Assurance.pdf [Accessed].
GRI. 2016. *Annual report* [Online]. Available: https://www.globalreporting.org/resourcelibrary/GRI%20Annual%20Report%202016-2017.pdf [Accessed].
GRI, G. R. I. 2013b. Sustainability reporting.
GUNARATHNE, N. & SENARATNE, S. 2017. Diffusion of integrated reporting in an emerging South Asian (SAARC) nation. *Managerial Auditing Journal*.
GUTHRIE, J., PETTY, R., YONGVANICH, K. & RICCERI, F. 2004. Using content analysis as a research method to inquire into intellectual capital reporting. *Journal of intellectual capital*.
HĄBEK, P. & WOLNIAK, R. 2016. Assessing the quality of corporate social responsibility reports: the case of reporting practices in selected European Union member states. *Quality & Quantity,* 50**,** 399-420.
HAHN, R. & KÜHNEN, M. 2013. Determinants of sustainability reporting: A review of results, trends, and opportunities in an expanding field of research. *Journal of Cleaner Production,* 59**,** 5-21.
HERBERT, S. & GRAHAM, M. 2018. *The Relationship Between Sustainability Reporting and Integrated Reporting: A Literature Review*.
IAASB 2009. ISA 500 audit evidence. Pietermaritsburg: LexisNexis.
IAASB 2013. ISAE 3000 (Revised), Assurance Engagements Other Than Audits or Reviews of Historical Financial Information.
IAASB 2015b. At a Glance: ISA™
720 (Revised), The Auditor's Responsibilities Relating to Other Information.
IAASB 2016. Integrated Reporting Working Group Discussion Paper: Supporting Credibility and Trust in Emerging Forms of External Reporting: Ten Key Challenges for Assurance Engagements. International Auditing and Assurance Standards Board.
ICAEW 2015. Risk assessment and internal controls: continuing challenges for auditors.
IIA 2012a. International Standards for the Professional Practice of Internal Auditing. /The Institute of Internal Auditors.
IIA. 2017a. *In The 2017 Internal Audit Compensation Study* [Online]. Institute of Internal Auditors. [Accessed 20 May 2020].
IIRC 2011. TOWARDS INTEGRATED REPORTING Communicating Value in the 21st Century.
IIRC 2013a. IIRC's Discussion Paper.
IIRC 2013b. The International Integrated Reporting Framework. 08/12/2013 ed.
IIRC 2014. Consultation draft of the international <IR> Framework. IIRC.
IIRC 2015. Progress through reporting. International Integrated Reporting Council.
IOD 2009. King code of governance for South Africa 2009. *Institute of Directors in Southern Africa*.
IOD 2016. King IV Report on Corporate Governance in South Africa. Johannesburg: Lexis Nexus South Africa.
IRC 2011. Framework for Integrated Reporting and the Integrated Report - Discussion Paper.
IRCSA 2011. South Africa's world-first Integrated Reporting Discussion Paper attracts global attention.

JAMES, M. L. 2015. THE BENEFITS OF SUSTAINABILITY AND INTEGRATED REPORTING: AN INVESTIGATION OF ACCOUNTING MAJORS'PERCEPTIONS. *Journal of Legal, Ethical and Regulatory Issues,* 18**,** 1.
JONES, M. J. & SOLOMON, J. F. Social and environmental report assurance: Some interview evidence. Accounting forum, 2010. Taylor & Francis, 20-31.
JUNIOR, R. M., BEST, P. J. & COTTER, J. 2014. Sustainability reporting and assurance: a historical analysis on a world-wide phenomenon. *Journal of Business Ethics,* 120**,** 1-11.
KEND, M. 2015. Governance, firm-level characteristics and their impact on the client's voluntary sustainability disclosures and assurance decisions. *Sustainability Accounting, Management and Policy Journal,* 6**,** 54-78.
KING, M. 23 October 2016. *RE: Integrated reporting.*
KOLK, A. & PEREGO, P. 2010. Determinants of the adoption of sustainability assurance statements: an international investigation. *Business Strategy and the Environment***,** n/a-n/a.
KRIPPENDORFF, K. 2018. *Content analysis: An introduction to its methodology*, Sage publications.
KRISHNAN, J. 2005. Audit committee quality and internal control: An empirical analysis. *The accounting review,* 80**,** 649-675.
LA PORTA, R., LOPEZ-DE-SILANES, F. & SHLEIFER, A. 1999. Corporate ownership around the world. *The journal of finance,* 54**,** 471-517.
LATIF, B., MAHMOOD, Z., TZE SAN, O., MOHD SAID, R. & BAKHSH, A. 2020. Coercive, normative and mimetic pressures as drivers of environmental management accounting adoption. *Sustainability,* 12**,** 4506.
LEE, K.-W. & YEO, G. H.-H. 2016. The association between integrated reporting and firm valuation. *Review of Quantitative Finance and Accounting,* 47**,** 1221-1250.
LEVITT, T. 1958. The dangers of social-responsibility. *Harvard business review,* 36**,** 41-50.
MALOLA, A. & MAROUN, W. 2019. The measurement and potential drivers of integrated report quality: Evidence from a pioneer in integrated reporting. *South African Journal of Accounting Research,* 33**,** 114-144.
MANETTI, G. & BECATTI, L. 2009. Assurance services for sustainability reports: Standards and empirical evidence. *Journal of Business Ethics,* 87**,** 289-298.
MAROUN, W. 2017. Assuring the integrated report: Insights and recommendations from auditors and preparers. *The British Accounting Review*.
MAROUN, W. 2019. Does external assurance contribute to higher quality integrated reports? *Journal of Accounting and Public Policy***,** 106670.
MAROUN, W. 2020. A Conceptual Model for Understanding Corporate Social Responsibility Assurance Practice. *Journal of Business Ethics,* 161**,** 187-209.
MAROUN, W. & ATKINS, J. 2015. *The Challenges of Assuring Integrated Reports: Views from the South African Auditing Community*.
MASULIS, R. W. & REZA, S. W. 2015. Agency problems of corporate philanthropy. *The Review of Financial Studies,* 28**,** 592-636.
MELLONI, G., CAGLIO, A. & PEREGO, P. 2017. Saying more with less? Disclosure conciseness, completeness and balance in Integrated Reports. *Journal of Accounting and Public Policy,* 36**,** 220-238.
MICHELON, G., PILONATO, S. & RICCERI, F. 2014. CSR reporting practices and the quality of disclosure: An empirical analysis. *Critical Perspectives on Accounting,* 33.
MICHELON, G., PILONATO, S. & RICCERI, F. 2015. CSR reporting practices and the quality of disclosure: An empirical analysis. *Critical perspectives on accounting,* 33**,** 59-78.

MOCK, T., RAO, S. & SRIVASTAVA, R. 2013. The Development of Worldwide Sustainability Reporting Assurance. *Australian Accounting Review,* 23.
MORIMOTO, R., ASH, J. & HOPE, C. 2005. Corporate social responsibility audit: From theory to practice. *Journal of Business ethics,* 62**,** 315-325.
MORONEY, R., WINDSOR, C. & AW, Y. T. 2012. Evidence of assurance enhancing the quality of voluntary environmental disclosures: An empirical analysis. *Accounting & Finance,* 52**,** 903-939.
MUTEVHE, T. 2019. *Implementing combined assurance in organisations to enable boards to exercise risk oversight.* University of Pretoria.
NAYNAR, N. R., RAM, A. J. & MAROUN, W. 2018. Expectation gap between preparers and stakeholders in integrated reporting. *Meditari Accountancy Research,* 26**,** 241-262.
O'DWYER, B. & OWEN, D. L. 2005. Assurance statement practice in environmental, social and sustainability reporting: a critical evaluation. *The British Accounting Review,* 37**,** 205-229.
OECD 2014. *Risk Management and Corporate Governance*.
PADAYACHEE, V. 2017. King IV is here: corporate governance in SA revisted: South Africa. *New Agenda: South African Journal of Social and Economic Policy,* 2017**,** 17-21.
PATEL, C. 2020. *The evolution of sustainability assurance: The case of Fortune Global 500.* Auckland University of Technology.
PEREGO, P. & KOLK, A. 2012. Multinationals' accountability on sustainability: The evolution of third-party assurance of sustainability reports. *Journal of Business Ethics,* 110**,** 173-190.
PERRY-SMITH, J. E. & MANNUCCI, P. V. 2017. From creativity to innovation: The social network drivers of the four phases of the idea journey. *Academy of Management Review,* 42**,** 53-79.
POWER, M. 1997. *The audit society: Rituals of verification*, OUP Oxford.
PRINSLOO, A. & MAROUN, W. 2020. An exploratory study on the components and quality of combined assurance in an integrated or a sustainability reporting setting. *Sustainability Accounting, Management and Policy Journal,* ahead-of-print.
PWC 2012. Moving from principle to practice- Corporate reporting survey.
RINALDI, L., UNERMAN, J. & DE VILLIERS, C. 2018a. Evaluating the integrated reporting journey: insights, gaps and agendas for future research. *Accounting, Auditing & Accountability Journal,* 31**,** 1294-1318.
RINALDI, L., UNERMAN, J. & DE VILLIERS, C. 2018b. Evaluating the integrated reporting journey: insights, gaps and agendas for future research. *Accounting, Auditing & Accountability Journal*.
Roberts, Leigh , Wayne van Zijl and Dannielle Cerbone , "The Integrated Reporting Committee of South Africa" , in The Routledge Handbook of Integrated Reporting ed. Charl de Villiers , Pei-Chi Kelly Hsiao and Warren Maroun (Abingdon: Routledge, 27 May 2020), accessed 25 July 2020, *Routledge Handbooks Online.*
SAICA 2019. The Rational Purpose requirement - Impact on South Africa.
SEELE, P. 2016. Digitally unified reporting: how XBRL-based real-time transparency helps in combining integrated sustainability reporting and performance control. *Journal of Cleaner Production,* 136**,** 65-77.
SETIA, N., ABHAYAWANSA, S., JOSHI, M. & HUYNH, A. 2015. Integrated reporting in South Africa: Initial evidence. *Sustainability Accounting, Management and Policy Journal,* 6**,** 397-242.

SIMNETT, R. 2015. CSR and Assurance Services: A Research Agenda. *Auditing A Journal of Practice & Theory,* forthcoming.
SIMNETT, R. & HUGGINS, A. L. 2015. Integrated reporting and assurance: where can research add value? *Sustainability Accounting, Management and Policy Journal,* 6**,** 29-53.
SIMNETT, R., VANSTRAELEN, A. & CHUA, W. F. 2009a. Assurance on general purpose non-financial reports: An international comparison. *Accounting Review,* 84**,** 937-967.
SIMNETT, R., VANSTRAELEN, A. & CHUA, W. F. 2009b. Assurance on sustainability reports: An international comparison. *The accounting review,* 84**,** 937-967.
SIMNETT, R., ZHOU, S. & HOANG, H. 2016. Assurance and other credibility enhancing mechanisms for integrated reporting. *Integrated Reporting.* Springer.
SOLOMON, J. & MAROUN, W. 2012. Integrated reporting: the influence of King III on social, ethical and environmental reporting.
SPIRA, L. F. & PAGE, M. 2003. Risk management: The reinvention of internal control and the changing role of internal audit. *Accounting, Auditing & Accountability Journal*.
VITOLLA, F. & RAIMO, N. 2018. Adoption of integrated reporting: Reasons and benefits—A case study analysis. *International Journal of Business and Management,* 13**,** 244-250.
WALLAGE, P. 2000. Assurance on sustainability reporting: An auditor's view. *Auditing: A Journal of Practice & Theory,* 19**,** 53-65.
WATKINS, A. L., HILLISON, W. & MORECROFT, S. E. 2004. Audit Quality: A Synthesis of Theory and Empirical Evidence. *Journal of accounting literature,* 23**,** 153-193.
WATTS, R. L. & ZIMMERMAN, J. L. 1983. Agency problems, auditing, and the theory of the firm: Some evidence. *The Journal of Law and Economics,* 26**,** 613-633.
ZHOU, S., SIMNETT, R. & GREEN, W. 2017. Does integrated reporting matter to the capital market? *Abacus,* 53**,** 94-132.
ZHOU, S., SIMNETT, R. & HOANG, H. 2019. Evaluating combined assurance as a new credibility enhancement technique. *Auditing: A Journal of Practice & Theory,* 38**,** 235-259.