



**An empirical study of sustainability reporting assurance:  
current trends and new insights**

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3 *An empirical study of sustainability reporting assurance: current trends and new*  
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9 **ABSTRACT:**

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11 **Purpose:** This study aims to examine trends in the global assurance practices of sustainability  
12 reports, updating and broaden the extant literature and proving new insights that could guide future  
13 research.  
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16 **Design/methodology/approach:** The data were collected for 12,783 companies and exploratory  
17 descriptive analyses of sustainability reporting assurance practices were undertaken.  
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20 **Findings:** The study shows that assurance growth is lagging behind the growth in sustainability  
21 reporting. It reveals that assurer switching is a common practice among companies. There is an  
22 increasing trend towards the use of the ISAE 3000 by non-accounting assurers. Additionally, in  
23 terms of assurance providers, the study finds that accounting firms are dominating the market,  
24 however engineering firms are fast increasing their share of the sustainability assurance market,  
25 while consulting firms share is decreasing. However, the switch towards consulting firms is higher  
26 than the switch towards accounting firms in the last switch period.  
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29 **Originality/value:** Prior studies on the assurance practices of sustainability reports are limited in  
30 scope (concentrate on large companies) and depth (examine accounting vs non-accounting assures  
31 and consider the evolving patterns at the institutional rather than firm-level). This study presents  
32 developments and trajectories of assurance practices to inform researchers and practitioners on the  
33 global trends by bringing an updated and broader perspective on the topic.  
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36 **Practical implications:** Overall, the results of this study provide insights about companies'  
37 assurance practices for regulators, assurance providers and companies interested in assuring their  
38 sustainability reports.  
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41 **Social implications:** This study is relevant for companies' stakeholders, including investors, to  
42 enhance their understanding of companies' current assurance practices.  
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54 **KEYWORDS:** sustainability reporting, assurance, non-financial reports, assurance switching  
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## 1. INTRODUCTION

The issuance of sustainability reports has grown rapidly over the past two decades. Despite being currently a voluntary practice in most countries, 96% of the world's 250 largest global companies (G250) produce sustainability reports (KPMG, 2020). Lately, there has been a trend towards mandating such reports. In 2010, the Johannesburg Securities Exchange (JSE), following the King III report (IoDSA, 2009), required all listed companies to produce an integrated report (ACCA, 2015). In addition, the European Parliament in 2011 called on the European Commission to make a legislative proposal on disclosing non-financial information (European Parliament, 2012). The European Parliament agreed in 2014 to issue the EU Non-Financial Reporting Directive. The Directive required large European companies to provide sustainability reports, beginning in 2018 (European Parliament, 2014). Furthermore, the European Commission has recently adopted a proposal for a Corporate Sustainability Reporting Directive (CSRD) which requires limited external assurance over reported information (European Commission, 2021). This proposal reinforces the need to understand the competitive assurance market.

The voluntary and unregulated practice of sustainability reporting has raised concerns about the reliability and credibility of the information provided (Boiral, 2018; Bouten *et al.*, 2011). To address this issue, external independent verifications have grown considerably in the last decade. Among the world's largest companies, third-party assurance of sustainability reports has become standard practice, with most companies assuring their reports (e.g., 71% of the G250) (KPMG, 2020).

Unlike a statutory financial audit, in which the market is controlled by accounting firms, the assurance of sustainability reports is a less mature and less organised market in which types of assurance providers compete for a share (Cohen and Simnett, 2014). The existence of this open,

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3 competitive and still-emerging market for the assurance of sustainability reports makes it an  
4 important area for research (Cohen and Simnett, 2014). Events – including mandating  
5 sustainability reporting in South Africa, Europe and Singapore as well as the United Nations  
6 Sustainable Development Conference in 2012 (United Nations Conference on Sustainable  
7 Development - Rio+20, 2012) – developed a pathway for a more sustainable world, which  
8 reinforced the need to investigate further the worldwide assurance practice of sustainability  
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20 Prior studies of the assurance practices of sustainability reports are limited in scope and  
21 depth. First, most prior research concentrated on examining the assurance of sustainability reports  
22 in small samples of large global companies (Junior *et al.*, 2014; Perego and Kolk, 2012). Further  
23 analysis is needed to allow researchers and practitioners to understand the global trends beyond  
24 this small group of companies. Assurance practices over sustainability reporting can vary  
25 considerably in terms of the assurance provider type, the scope and level of assurance and the  
26 standards used in the assurance engagement. Incomparability is a relevant concern because of the  
27 lack of clear guidance and the availability of different assurance standards (ACCA, 2015). The  
28 absence of unified standards for the assurance of sustainability reports has resulted in variations in  
29 assurance scope and in the methods used to perform the engagement (Cohen and Simnett, 2014).

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43 Second, only a few prior studies have investigated the types of sustainability report  
44 assurance providers and they are not considering patterns at firm-level (e.g., firm type and listed  
45 status). Those studies mainly compared the sustainability reporting assurance practices between  
46 accounting and non-accounting firms (e.g., Clarkson *et al.*, 2019; Farooq and de Villiers, 2019b;  
47 Hodge *et al.*, 2009; Larrinaga *et al.*, 2020; Peters and Romi, 2015). A more specific differentiation  
48 between the types of non-accounting assurers is central to allowing a much clearer overview of  
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3 actual market practices. According to the Global Reporting Initiative (GRI) (2013b), accounting  
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5 firms are currently the dominant sustainability assurance providers, mainly through Big-4 firms.  
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7 Their global networks and their experience in financial auditing allow them a broad reach in the  
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9 market. Other important assurance providers include engineering and consulting firms.  
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11 Engineering firms are well known for their technical expertise and their understanding of complex  
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13 processes. Consulting firms are generally smaller than other assurance providers and are usually  
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15 locally-based with more subject-matter expertise to assure sustainability reports (GRI, 2013b).<sup>[1]</sup>  
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17 This distinction between the different types of non-accounting firms is crucial to (i) allow a better  
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19 understanding of the current assurance market, and (ii) provide a base for future studies.  
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21 Additionally, prior research has studied the practice of assurance at the institutional level by  
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23 analysing the increase in assurance practice and type of assurance provider by country (e.g., Junior  
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25 *et al.*, 2014) and in this study, we present the analysis of assurance practices consolidated by  
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27 institutional-level factors (e.g., country and industry) and by firm-level factors (e.g., type and listed  
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29 status). Finally, this study contributes to prior literature by performing a longitudinal analysis.  
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36 Using data from 12,783 companies globally from 1999 to 2017, this study provides an  
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38 exploratory overview of the market and the practices of sustainability assurance around the world,  
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40 adding to the literature reviews in this area, which have emphasised advances in research (Cohen  
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42 and Simnett, 2014; Gillet-Monjarret and Rivière-Giordano, 2017; Gold and Taib, 2020; Maroun,  
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44 2018). The study concentrates on emerging trends from 2012, given the rise in the mandatory  
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46 issuance of stand-alone sustainability reports by companies that emerged during this period. The  
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48 study compares assurance providers' practices with respect to the standards used as well as the  
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50 scope and level of assurance. Furthermore, it investigates companies' assurance practices in terms  
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52 of consistency in providing an annual assurance over their sustainability reports.  
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3 The contribution of this study is threefold. First, it provides an updated and broader  
4 mapping of sustainability reporting assurance practices globally. While prior research has  
5 concentrated on investigating sustainability practices on large companies (Junior *et al.*, 2014;  
6 Perego and Kolk 2012) operating in specific jurisdictions (Reimsbach *et al.*, 2017), this study  
7 examines a large sample of companies operating in several different countries and analyzing  
8 assurance practices at institutional-level (e.g., country and industry) and firm-level (e.g., type and  
9 listed status). This approach is important considering the recent significant increase in  
10 sustainability reports and mandatory requirements around the world (KPMG, 2020). A better  
11 understanding of how companies assure their sustainability reports is pivotal to support the  
12 development of practices and policies on external sustainability assurance. Second, this paper  
13 unveils hitherto unacknowledged companies' assurance patterns. The observed inconsistency in  
14 terms of the adoption of external assurance led us to find assurer switching to be a common practice  
15 among the examined companies<sup>[2]</sup>. These findings bring the attention of researchers and  
16 practitioners to assurance switching as a key aspect of the sustainability assurance market. Third,  
17 this study applies a unique classification for types of assurance providers that goes beyond the  
18 traditional accounting versus non-accounting assures. Prior studies suggest that assurance  
19 engagement, assurance quality and perceived assurance value might vary between different  
20 assurance providers (Michelon *et al.*, 2019; Perego, 2009; Pflugrath *et al.*, 2011). Without  
21 exploring those different non-accounting providers (i.e., engineering and consulting firms), results  
22 might be affected by a less refined classification of the assurance provider type. Our findings  
23 propose a classification of assurance providers that could be insightful in exploring those research  
24 questions.  
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3 The remainder of this study is structured as follows. The next section reviews prior  
4 literature to provide an insight into sustainability report assurance and assurance providers. Section  
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8 three discusses the research method used in the study. Section four presents data analysis and  
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10 findings. Section five discusses our findings and provides suggestions for further research. Finally,  
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12 section six concludes the study and presents some of its limitations.  
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## 14 **2. PRIOR LITERATURE**

### 15 *2.1 Assuring sustainability reports*

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20 To improve the credibility of sustainability information, reliance on independent assurance has  
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22 been growing (Edgley *et al.*, 2010; Jones and Solomon, 2010). Managers can use sustainability  
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24 reports to promote a more sustainable image of their companies (i.e., greenwashing) (Lyon and  
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26 Maxwell, 2011; Walker and Wan, 2012). The assurance of sustainability reports increases users'  
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28 confidence and their perceptions of information credibility (Boiral, 2018; Du and Wu 2019) and  
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30 therefore engaging in sustainability assurance is believed to reduce greenwashing (Lyon and  
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32 Maxwell, 2011). While assurance over sustainability report is still at an early stage and there are  
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34 some questions raised about its reliability (Farooq and De Villiers, 2019a), studies suggest that  
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36 assurance is essential to ensure a certain level of reliability, and stakeholders perceived assured  
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38 report as more reliable than non-assured once (Cheng *et al.*, 2015; Reimsbach *et al.*, 2017).  
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44 In addition to increasing reliability, prior studies found other factors to be associated with  
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46 the voluntary adoption of assurance over sustainability reports. Simnett *et al.* (2009) indicate that  
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48 companies with a higher need to build their corporate reputation are more likely to have their  
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50 sustainability reports assured. Kolk and Perego (2010) examine the effect of country-level  
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52 institutional factors on the voluntary adoption of assurance over sustainability reports by a sample  
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54 of G250 companies from 1999 to 2005. Their findings indicate that companies in stakeholder-  
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oriented countries are more likely to assure their sustainability reports than companies in shareholder-oriented countries. Shareholder-oriented countries are those in which companies are seen as instruments for shareholder value creation; other stakeholders are less relevant. Liao *et al.* (2018) find that some board characteristics, such as board size, the presence of a female director and separation between the chairperson and the CEO position, increase the likelihood of companies assuring their sustainability reports.

In order to obtain an overview of the current trends in the assurance of sustainability reports, we first analyse institutional and firm-level characteristics in terms of assurance adoption. Second, we analyse market distribution among different assurance providers and their practice in terms of scope, level of assurance and standards used. Finally, we document companies' consistency in term of assurance adoption and their choice of assurance provider.

The main concern in the assurance process of sustainability reports is the absence of a generally accepted standard to guide practitioners. The standard frameworks mostly used by assurance providers are the International Standard for Assurance Engagements (ISAE 3000) issued by The International Auditing and Assurance Standards Board (IAASB), and the AA1000 AccountAbility Standard (AA1000 AS), issued by AccountAbility (Fuhrmann *et al.*, 2017).

The adoption of these different standards has been associated with variations in assurance engagement. During an assurance engagement, an agreement must be made regarding the scope and level of assurance. Scope indicates which part of the report is covered in the assurance engagement (e.g., the entire report or sections) (AccountAbility, 2008b; IAASB, 2013). The level of assurance indicates the degree of certainty the assurance provider has that the report is free from error (e.g., limited/moderate or reasonable/high) (AccountAbility, 2008b; IAASB, 2013).



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3 Both standards involve a risk assessment process and a test procedure to support an opinion  
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5 on the subject matter of the engagement. Unlike the ISAE 3000, the AA1000 AS provides two  
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7 types of assurance engagements. A type 1 engagement evaluates the extent of the organisation's  
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9 adherence to all AA1000 AccountAbility Principles (AA1000 APS) <sup>[3]</sup> to ensure the way an  
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11 organisation manages sustainability performance but it does not verify the reliability of the  
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13 reported information (AccountAbility, 2008a). A type 2 engagement extends type 1 by including  
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15 an evaluation of the organisation's adherence to AA1000 APs and an evaluation of the reliability  
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17 of the information provided (AccountAbility, 2008a).  
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22 Both standards have two levels of assurance, namely, reasonable/high or limited/moderate.  
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24 A reasonable/high assurance requires a higher extent of investigation and evidence than a  
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26 limited/moderate assurance. However, the difference in the extent needed for an assurance  
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28 engagement to be considered reasonable/high rather than limited/moderate is unclear (Farooq and  
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30 de Villiers, 2019b), and assurance providers rely significantly on their professional judgement to  
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32 determine materiality (Moroney and Trotman, 2016). Additionally, the differences between  
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34 assurance providers' definition of materiality have been recognised as a major concern (Edgley *et*  
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36 *al.*, 2015).  
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41 The absence of a single set of generally accepted standards has resulted in inconsistent  
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43 sustainability reporting assurance engagements, including the scope and level of assurance  
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45 provided (Manetti and Becatti, 2009). Therefore, in this paper, we also examine the adoption of  
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47 different standards by sustainability reporting assurers and the effects of such adoption on the  
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49 assurance practices.  
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## 2.2 Types of assurance providers

The lack of specific legislation on assurance engagement and the competencies required from the assurance providers of sustainability reporting has resulted in different types of firms providing assurance services. Previous studies have broadly classified assurance providers into two groups: accounting firms and non-accounting firms (Manetti and Toccafondi, 2012; O'Dwyer *et al.*, 2011). The main accounting providers are the Big-4 accounting firms, which have experience and competence in providing financial assurance services globally (Simnett *et al.*, 2009). However, several researchers argue that social and environmental specialists have a better understanding of the subject matter (Cohen and Simnett, 2014). According to Perego (2009), an assurance statement issued by one of the Big-4 accounting firms ranks lower in terms of the quality of the recommendations and the opinions provided than one issued by non-accounting assurers. Therefore, companies issuing sustainability reports are left to choose between accounting firms, which provide high-quality assurance in terms of procedures and reporting format and social and environmental experts, who provide high-quality assurance in terms of recommendations.

Following the prior classification of assurance providers (CorporateRegister 2008), Perego and Kolk (2012) briefly address different types of assurance providers including accounting firms, consulting firms, specialists, certification bodies, academic institutions and stakeholder panels. Perego and Kolk (2012) examines accounting versus non-accounting firms where non-accounting include engineering firms, specialist consulting firms and certificate. Other studies have considered the same classification of accounting versus non-accounting firms, where the non-accounting category includes only engineering and certification firms (Liao *et al.*, 2018). GRI is also highly used among researchers as a reference for the type of assurance provider (e.g., Simnett *et al.*, 2009). GRI only considers independent third-party assurance types and it classifies them

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3 into three different types of assurance providers: accounting, engineering and consulting. As  
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5 observed in previous literature, the research practice of examining the classification of assurance  
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7 providers is not consistent. Figure 1 depicts the different types of assurance providers.  
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13 Research evidence has produced mixed results about the perceived credibility of assurance  
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15 providers. For example, Hodge *et al.* (2009) find weak evidence that users of sustainability reports  
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17 place greater reliance on an assurance opinion provided by professional accounting firms than that  
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19 provided by consulting firms. Pflugrath *et al.* (2011) examine a sample of 106 financial analysts  
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21 from Australia, the UK and the US, and find that financial analysts from the US perceive  
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23 accounting firms as more credible assurers, whereas analysts from Australia and the UK show  
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25 little difference in the perception of enhanced credibility between different types of assurers.  
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27 Clarkson *et al.* (2019) suggest that the capital market only values assurance when it is provided by  
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29 Big-4.  
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34 While the literature recognises the factors associated with companies' decisions to  
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36 voluntarily assure their sustainability reports (Darnall *et al.*, 2009; Herda *et al.*, 2014), there is  
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38 weak evidence on the factors associated with companies' decisions over which type of assurance  
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40 provider to select. Among such factors are the legal environment and the industry. Simnett *et al.*  
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42 (2009) find that companies operating in weak legal environmental countries (e.g., Mexico, China  
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44 or Turkey) or in environmental risk industries (e.g., mining, production or utilities) do not  
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46 necessarily appoint a member of the auditing profession to assure their sustainability reports.  
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48 Hence, the researchers suggest that the decision to assure sustainability reports is an important one  
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50 for companies in industries needing to enhance their credibility and the decision about the type of  
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52 assurance provider to employ is less important. Additionally, they find that companies operating  
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3 in stakeholder-oriented jurisdictions are more likely to choose an accounting firm as their  
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5 assurance provider than companies operating in shareholder-oriented jurisdictions (Simnett *et al.*,  
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7 2009). Contrarily, Kolk and Perego (2010) find that companies operating in shareholder-oriented  
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9 countries usually choose large accounting firms as their assurance providers.  
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13 The lack of significant findings in the literature regarding the main determinants of the  
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15 choice of assurance provider could be explained by the limited classification used in prior research  
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17 (grouping different types under non-accounting groups). The non-accounting category includes  
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19 both engineering and consulting firms (GRI, 2013a). Engineering firms have a global network and  
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21 have been at the top of the list for providing sustainability reports assurance. For example, DNV  
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23 GL is a leading assurance provider operating in more than 100 countries (World Business Council  
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25 for Sustainable Development, 2016). Contrarily, consulting firms, generally smaller in size than  
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27 other assurer types, are mostly local and have a greater knowledge of the respective local  
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29 stakeholders (GRI, 2013a). The distinction between engineering and consulting firms is crucial for  
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31 explaining companies' choices between different types of assurance providers. The choice  
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33 between engineering and consulting firms could be driven by different reasons. By applying the  
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35 three classifications of assurance providers, instead of the dichotomous approach (e.g., accounting  
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37 versus non-accounting), this study is able to reveal patterns not previously observed. In this study,  
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39 we adopt GRI classification by considering three types of independent external assurance (i.e.,  
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41 accounting, engineering and consulting). We consider these three types as they are under the same  
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43 level and we do not consider subtypes under each group (e.g., Big-4 under accounting group) as  
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45 we do not have further details of what subgroups are under engineering and consulting firms.  
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### 51 52 53 *2.3 Trend analysis of assurance practices*

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3 While most studies have examined the demand for sustainability reports assurance and the quality  
4 of the assurance provided, little research has considered patterns or performed trend analyses.  
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6 Junior *et al.* (2014) provide a descriptive analysis of global companies' (G500) assurance practices  
7 and suggest a steady increase in their issuance of sustainability reports over the past decade.  
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9 However, their study suggests that the number of assured sustainability reports has not increased  
10 significantly, which may indicate little change in the perceived value of assuring those reports.  
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12 Additionally, the authors argue that a more comprehensive view of the practices would require  
13 extending the analysis to a much larger sample of companies and countries (Junior *et al.*, 2014).  
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22 Perego and Kolk (2012) analyses how patterns of sustainability report assurance by  
23 multinational corporations have evolved by examining a panel of the G250. Their findings show  
24 that institutional forces (e.g., legal, environmental and stakeholder pressures) appear to control  
25 multinational corporations' activities. However, their assurance adoption patterns and adherence  
26 to standards vary considerably. Perego and Kolk (2012) classify the adoption patterns of assuring  
27 sustainability reports into categories: early adopters, late adopters, followers, laggards and non-  
28 adopters. Within each group, they differentiate between consistent and non-consistent adopters.  
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30 Perego and Kolk (2012) find that early adopters relied on accounting assurers and had a  
31 diminishing reliance on non-accounting assurers. Finally, their study indicates a consistent pattern  
32 in the choice of assurance provider in which switches from assurance providers were unusual.  
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45 In this study, we concentrate on exploring the consistency of providing assured  
46 sustainability reports at two levels. First, we determine whether the company assures its reports  
47 over the tested periods. Second, we determine whether the company hires the same assurer over  
48 the tested period. If the company changes its assurer, an assurer switch results. Assurer switch  
49 refers to the situation in which companies change their assurance provider over the tested period.  
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3 The practice of changing the assurance provider needs to be investigated, as assurance switching  
4 might prevent a clear picture of companies' performance from emerging over time (Ball *et al.*,  
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8 2000). Such an analysis will lay the groundwork for future research.  
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10 The limited sample used in prior studies and their concentration on large companies (e.g.,  
11 G500) (Junior *et al.*, 2014; Manetti and Toccafondi, 2012; Perego and Kolk, 2012) motivated our  
12 study to consider a holistic approach. New developments including the mandatory reporting  
13 requirement in different countries (e.g., European Union, South Africa and Singapore) call for a  
14 broad and updated mapping of the current practices in this area. Hence, a more profound and  
15 updated examination of the current assurance practices should include different types of  
16 companies: large, small and medium-sized enterprises, listed and non-listed companies and non-  
17 profit organisations. Additionally, in this study, we are performing a longitudinal analysis.  
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### 29 **3. METHODOLOGY**

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32 The study uses the GRI database obtained in September 2020. The GRI database stores and tracks  
33 companies' sustainability reports and associated organisational data for reports published after  
34 1999. Given the scope of our research, which is restricted to the assurance practices and trends of  
35 companies that produce sustainability reports, we believe the GRI data to be adequate as it allowed  
36 us to access companies that are assuring their sustainability reports. GRI data is self-reported by  
37 companies. To examine the reliability of the data, we cross-reference a sample of 1,388 companies  
38 in GRI with the Thomson Reuters Asset4 database. Companies reporting that they provide  
39 assurance in GRI are a 98.6% match with the observations in the Asset4 database. <sup>[4]</sup> We also  
40 worked on reviewing the data to ensure consistency in companies' reported information.  
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54 The analysis of the time difference between companies' first sustainability reports and their  
55 first adoption of external assurance relies on a sample including a panel of 13,028 companies that  
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3 issued sustainability reports during the period 1999 to 2017. All other analyses are applied to a  
4 panel of 12,783 companies over a six-year period (2012-2017). Chi-square tests have been  
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6 conducted to examine the significance of the change between periods.  
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10 The sample (2012-2017) represents companies from different regions, with different listed  
11 status and size. The companies are from Africa (6%), Asia (30%), Europe (36%), Latin America  
12 and the Caribbean (13%), Northern America (11%) and Oceania (3%). The sample includes listed  
13 (67%) and non-listed (33%) companies of three sizes: large companies (65%), multinational  
14 enterprises (MNEs) (28%) and small and medium-sized enterprises (SMEs) (7%). [5]  
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#### 23 **4. DATA ANALYSIS**

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25 This section presents the main findings of this study. First, it presents the current sustainability  
26 assurance trends at the institutional and firm levels. Next, it examines the market distribution for  
27 types of assurance providers, assurance standards, assurance scope and the level of assurance.  
28 Finally, it analyses the issue of consistency in the assurance of sustainability reports and the  
29 practice of assurance switching.  
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##### 37 *4.1 Sustainability assurance trends*

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39 Table 1 depicts the relationship between the issuance of sustainability reports and assurance  
40 growth. As shown in the table, from 2012 to 2017, the number of companies issuing sustainability  
41 reports increased by 56.2%. Additionally, the number of assured sustainability reports increased  
42 by 20.1%. The growth of the sustainability reports is greater than the growth of the assured reports,  
43 which suggests that companies are less likely to assure their sustainability reports when they issue  
44 them for the first time.  
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3 Table 2 depicts the number of sustainability reports and the number of assured  
4 sustainability reports by region. The growth of sustainability reports and assured sustainability  
5 reports varies considerably across regions. The increase in those reports is significant in Africa,  
6 which is expected as the JSE requires all listed companies to produce an integrated report (ACCA,  
7 2015). In addition, there is a significant increase in report numbers in Asia, Europe and Latin  
8 America and the Caribbean. Assured sustainability reports have not increased substantially in  
9 numbers among regions except for Asia. Therefore, the demand for assured sustainability reports  
10 is still in its early stages. The significant increase in Asia might be explained by the sustainability  
11 programme presented by the Association of Asian Academics of Science “Toward a Sustainable  
12 Asia” (AASA, 2010).  
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27 [Insert\_Table\_2\_about\_here]  
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29 Table 3 presents the number of sustainability reports issued and the number of assured  
30 sustainability reports among industries. The financial services industry leads in the production of  
31 sustainability reports, followed by energy and food and beverage. However, the number of assured  
32 sustainability reports has not increased significantly for any specific industry.  
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39 [Insert\_Table\_3\_about\_here]  
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42 Table 4 depicts the number of sustainability reports and the number of assured  
43 sustainability reports by company type, listed status and size. The results show a significant  
44 increase in the production of sustainability reports among private and state-owned companies.  
45 Additionally, the results show a significant rise in assured sustainability reports by private  
46 companies and a decrease among state-owned companies. Sustainability reports increased  
47 substantially for both listed and non-listed companies. However, a significant increase in assured  
48 reports is observed only among listed companies. Furthermore, the increase in the number of  
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3 sustainability reports among large companies, MNEs and SMEs is significant. Assured reports  
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5 increased very significantly only among MNEs.  
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8 [Insert\_Table\_4\_about\_here]  
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#### 10 *4.2 The time companies take to issue their first sustainability reports*

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12 Table 5 shows the time difference between companies' first sustainability reports and their first  
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14 external assurance by region and company size. The time difference between the issuance of the  
15  
16 first sustainability report and the first assurance is 2 years, on average. The time difference varies  
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18 within both regions and company size. For example, Latin American and Caribbean companies,  
19  
20 on average, assure sustainability reports in less than 2 years, whereas Northern American  
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22 companies take nearly 4 years to assure their sustainability reports. Additionally, Table 5 shows  
23  
24 that SMEs, on average, assure sustainability reports in less time than larger companies and MNEs.  
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30 [Insert\_Table\_5\_about\_here]  
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#### 33 *4.3 Market distribution for types of assurance providers*

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35 Table 6 presents the growth of sustainability report assurance by types of assurance providers. As  
36  
37 observed in the table, accounting firms dominate the market. This result is expected, given that  
38  
39 accounting firms are usually large-sized firms with global networks. These considerations play a  
40  
41 significant role in companies' choice to assure financial and non-financial reports. The number of  
42  
43 sustainability reports assured by engineering firms has significantly grown in recent years. In  
44  
45 comparison with the two other assurer types, assurance of sustainability reports by consulting firms  
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47 presented a decrease.  
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52 [Insert\_Table\_6\_about\_here]  
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3 Table 7 presents the market distribution between assurance providers of assured  
4 sustainability reports by region, company type and industry. Assurance provided by accounting  
5 firms presents an increase in most regions with a significant increase only in Asia. In Asia,  
6 assurance by engineering firms has increased substantially. Consulting firms have reduced their  
7 market share in all regions except Latin America and the Caribbean. Thus, the results suggest that  
8 region is a relevant factor in the distribution of the sustainability reports assurance market. In terms  
9 of the choice of assurance provider by type of company, Table 7 depicts a statistically significant  
10 increase in the number of private companies assured by accounting and engineering firms, while  
11 the number of private companies assured by consulting firms has decreased. Finally, as observed  
12 in Table 7, accounting firms have a higher market share in all industries. Their presence has  
13 increased mainly in food and beverage, financial services and real estate. The market share  
14 controlled by engineering firms is higher in the financial services and chemical industries. The  
15 market share controlled by consulting firms has decreased among most industries.

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34 [Insert\_Table\_7\_about\_here]

#### 35 36 *4.4 Assurance standards, assurance scope and level of assurance*

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39 Table 8 depicts the use of assurance standards, scope and level of assurance. Table 8 Panel A  
40 shows that the use of the ISAE 3000 and AA1000 has increased significantly. Table 8 Panel B  
41 shows the use of assurance standards by the type of assurance provider. The results confirm  
42 previous literature indicating that the ISAE 3000 is the standard preferred by accounting firms  
43 (Mock *et al.*, 2007; O'Dwyer and Owen, 2007; Perego, 2009). There is a difference in the standard  
44 used by non-accounting firms. The use of the AA1000 and ISAE 3000 among engineering firms  
45 has increased substantially. However, the use of AA1000 decreased and the use of ISAE 3000  
46 increased among consulting firms.

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3 Table 8 Panel C displays the assurance scope and the level of assurance by the type of  
4 assurance provider. The results show that 39% of accounting firms provide an assurance that  
5 applies to the entire report. Additionally, the results reveal that 61% of engineering and 54% of  
6 consulting firms provide an assurance that covers the entire sustainability report. These results  
7 might indicate that accounting firms are more cautious about providing assurance over the entire  
8 report while engineering firms are more likely to do so. Additionally, accounting firms are less  
9 likely to provide a reasonable/high level of assurance. Only 8% of the assurance provided by  
10 accounting firms is reasonable/high, while the level of reasonable/high assurance provided by  
11 engineering and consulting firms was 16% and 12%, respectively.  
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24 [Insert\_Table\_8\_about\_here]  
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#### 27 *4.5 Consistency in assuring sustainability reports*

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30 Figure 2 depicts a tree-map for companies' classification based on their issuance of sustainability  
31 reports and assurance of reports. Out of the 12,783 companies in our sample, 15.2% issued an  
32 annual report every year over the examined period. Those companies are consistent reporters. The  
33 majority of consistent reporters (46.5%) are consistent non-assurers. Consistent non-assurers are  
34 companies that did not assure their reports during the same six-year period. The second highest  
35 group is non-consistent assurers (36.2%). Non-consistent assurers are companies that assured their  
36 report in one or more years but not in a subsequent period. The lowest group is consistent assurers  
37 (17.3%). Consistent assurers are companies that assured all of their reports over the examined  
38 period. Finally, 63.0% of consistent assurers have the same assurance provider during the period,  
39 which means 37.0% of the consistent assurers subgroup underwent an assurance provider switch.  
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53 [Insert\_Figure\_2\_about\_here]  
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#### 4.6 Assurer switch

In this paper, we define assurer switch as a company's change of assurance provider from one type to another. For example, if a company issues a sustainability report assured by an accounting firm in 2013 and issues a sustainability report assured by an engineering firm in 2014, the assurance provider has been switched. We also consider a switch to have occurred if a company issues an assured sustainability report in one year and issues another sustainability report in the following year that is not assured.<sup>[6]</sup>

Table 9 shows the percentage of switches happening in 2012/2013, 2013/2014, 2014/2015, 2015/2016 and 2016/2017. Each year offers five possibilities for a switch. First, the company switches from having assurance to no assurance. Second, a company changes their assurance provider to the accounting type. Third, a company changes their assurance provider to the engineering type. Fourth, a company changes their assurance provider to the consulting type. Fifth, a company switch from no assurance to having an assurance.

[Insert\_Table\_9\_about\_here]

Over the tested period, 1,525 switches occurred, including the switch from assured report to non-assured and from non-assured to an assured report (see Table 9). Four hundred and eighteen switches occurred between the three types of assurance providers, including switches from one type of assurance provider to another. Table 9 shows a decrease in the switch to accounting firms in the last switch period, but an increase in the switch to engineering firms. Additionally, the highest percentage of switches in the last switch period is to engineering and consulting firms, which is surprising considering the scant increase of the consulting market share (see Table 5). These results might indicate that consulting firms are more likely to assure the reports of

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3 companies that had prior assurance than they are to assure reports of companies that are assuring  
4 their reports for the first time.  
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## 8 **5. DISCUSSION**

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10 Sustainability reports are becoming a common practice among companies, and many countries  
11 mandate their issuance. Nevertheless, the results of this research show a significant variation in  
12 the growth of the assurance of sustainability reports among different regions, industries, company  
13 types, listed status and size. For instance, prior studies suggest companies' size is associated with  
14 companies' voluntary decision to assure their sustainability report (Simnett *et al.*, 2009). Perego  
15 and Kolk (2012) find that assured sustainability reports among MNEs increased significantly from  
16 1999 to 2008. Our results extend those findings by showing a significant increase in the assurance  
17 of sustainability reports among MNEs for the period from 2012 to 2017. However, the results  
18 reported in this research do not show a significant increase in assurance among large companies  
19 and SMEs. The growth in assuring sustainability reports lags behind the growth in issuing  
20 sustainability reports. This finding indicates that the practice of assuring sustainability reports is  
21 still emerging, and our understanding of the practice is incomplete. The perceived value of  
22 assurance seems to be questioned, as suggested by a few researchers (Birkey *et al.*, 2016; Boiral  
23 *et al.*, 2018; Coram *et al.*, 2009). We still know little about the extent to which different groups of  
24 stakeholder value assurance and whether its perceived value is affected by who provides the  
25 service (e.g., accounting or engineering firms). Furthermore, it is unclear whether the perceived  
26 value differs across regions, industries, company types, status and company size. Assimilation–  
27 contrast theory suggests that individuals (e.g., stakeholders) use their current beliefs as internal  
28 reference points to which the actual organisation's attempt is compared (De Bruyn and Prokopec,  
29 2017; Sherif *et al.*, 1958). Maroun (2019) suggests that assurance is important for meeting  
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3 stakeholders' expectations of external verification. If intended users of sustainability reports  
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5 believe that a company of certain characteristics (e.g., large or operating in an environmentally  
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7 sensitive industry) should provide external assurance and the company does not provide it,  
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9 credibility concerns might arise (e.g., greenwashing). While there are some experimental studies  
10  
11 focusing on behavioural aspects (e.g., Vazquez *et al.*, 2018), more behavioural studies that  
12  
13 investigate such phenomena would be helpful.  
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17 Additionally, studies could expand the understanding of the role of external factors on  
18  
19 internal assurance practices. In this vein, consideration of different institutional factors (e.g.,  
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21 country-level factors and institutional investors) could provide fruitful insights. A recent study by  
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23 Isidro *et al.* (2020) investigates new factors that "illustrate one method to deal with the observed  
24  
25 co-dependency's of countries' economic, political, regulatory, and social characteristics". Their  
26  
27 results show that institutional factors are positively and significantly associated with accounting  
28  
29 outcomes (i.e., financial report quality). The consideration of such factors might contribute to  
30  
31 extending our limited understanding of companies' assurance practices. The same factors could  
32  
33 also be applied to investigating companies' choice of assurance provider. The relationship between  
34  
35 firms and stakeholders that are for instance examined by the stakeholder (Darnall *et al.*, 2009) or  
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37 agency (Liao *et al.*, 2018) theories, could provide the necessary framework for studies in this area.  
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43 The time difference between a company's first sustainability report and its first assured  
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45 sustainability report indicates that companies are unlikely to assure their reports when they are  
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47 first issued. The results of our study reveal that the time companies take to assure their  
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49 sustainability reports after they are first issued varies based on region and company size.  
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51 Companies located in Africa, Northern America and Oceania are more likely to take longer to  
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53 assure their reports (see Table 5). Additionally, the result shows that SMEs take a shorter time to  
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3 assure their reports in comparison with large companies and MNEs. Previous research has shown  
4 that assuring a sustainability report is a way of validating the information provided in the report  
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6 (Simnett *et al.*, 2009), which might affect investors' and other stakeholders' decisions (Cheng *et*  
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8 *al.*, 2015; Reimsbach *et al.*, 2017). However, research has not addressed the timing for assurance  
9  
10 decisions. It is still unclear why certain companies take longer than others to assure sustainability  
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12 reports and how this decision affects companies and stakeholders. Assurance is used as a  
13  
14 credibility-enhancing mechanism (Maroun, 2019; Pflugrath *et al.*, 2011; Wong and Milington,  
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16 2014). Thus, providing a sustainability report without an external assurance might lead intended  
17  
18 users to believe that such a report is used as an impression management tool to communicate a  
19  
20 more sustainable image. Studies that investigate the time taken to assure a sustainability report  
21  
22 would assist companies to understand its effect on stakeholders' perceptions and performance.  
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24 Legitimacy theory has the potential to contribute to this stream of research as it provides a  
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26 framework that explains how companies can use external assurance to meet stakeholders'  
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28 perceptions of what they understand to be a legitimate practice.  
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36 Our results suggest that the choice of an assurance provider is not random. The distribution  
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38 among the three types of assurance providers differs by region, industry and type of corporation.  
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40 The regional differences could be the result of the assurance provider's presence in the region. For  
41  
42 example, Big-4 accounting firms are well known and have international branches, while consulting  
43  
44 firms are mostly local businesses. Engineering firms, on the other hand, are more likely to compete  
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46 with Big-4 accounting firms, as the former are growing significantly in the market: see, for  
47  
48 example, DNV GL and Bureau Veritas. The significant increase in the assurance provided by  
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50 accounting and engineering firms could raise questions about the perceived value of the assurance  
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52 provided by consulting firms. However, a more careful analysis of the market shows that in recent  
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3 years several of these smaller consulting firms have been acquired by larger accounting and  
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5 engineering firms. For instance, in 2015 KPMG Australia acquired the human rights consultancy  
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7 Banarra. Despite those events, the observed patterns in the market share among different types of  
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9 assurance providers indicate that the choice of assurance provider is an important decision for  
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11 companies.  
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15 The finding of the study reveals the importance of non-accounting assurance providers,  
16  
17 including engineering and consulting firms. The fast growth of engineering firms signals high  
18  
19 competition in the assurance market. The increase in consulting firms' assurance is scant; however,  
20  
21 the switch towards consulting firms is higher than the switch towards accounting firms in the last  
22  
23 switch period. This finding might indicate a preference for consulting firms. Additionally, the  
24  
25 variation in the result between engineering and consulting firms shows the importance of  
26  
27 considering three types of assurance providers instead of grouping engineering and consulting  
28  
29 firms into one type (i.e., non-accountant), which has historically been the practice in academic  
30  
31 studies (Simnett *et al.*, 2009; Manetti and Toccafondi, 2012; Perego, 2009). Future qualitative  
32  
33 studies could provide fruitful insights by analysing how companies make their assurance provider  
34  
35 choice. Interview approach with decision-makers in companies could also yield valuable insights.  
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37 The effect of the cost of sustainability assurance is one of the ambiguous areas, thus a study  
38  
39 investigating the impact of cost considerations on the assurance decision and the choice of  
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41 assurance providers could potentially provide a better understanding. Furthermore, companies'  
42  
43 assurance provider choice might be influenced by the quality of the assurer or its availability.  
44  
45 Therefore, there are different motives for addressing the question of why companies choose a  
46  
47 certain type of assurance provider over others. Stakeholder, agency, institutional and contingency  
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3 theories could be suitable theoretical perspectives with which to explore the factors that influence  
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5 companies' decisions regarding assurance and the choice of assurance provider.  
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8 We observe that switching is a common practice. Switching from assured to non-assured  
9  
10 reports could lead to the risk of discontinuation. Such change and variation might have negative  
11  
12 implications for companies, as they provide mixed signals to stakeholders (Reimsbach *et al.*,  
13  
14 2017). Additionally, the practice of switching assurance providers in consecutive years may limit  
15  
16 the possibility of companies acting on recommendations given by previous assurance providers  
17  
18 (Ball *et al.*, 2000). Companies' decision to switch is an under-researched practice. During the  
19  
20 period examined in this study, the percentage of companies switching from assured to non-assured  
21  
22 reports increased from 19% to 41%, while the switch from non-assured to assured reports  
23  
24 decreased from 52% to 34%. Despite the different initiatives promoting external assurance (e.g.,  
25  
26 IIRC and GRI), further emphasis is needed on the value of assurance. If the perceived value of  
27  
28 assurance among intended users is affected by who provides such a service, then what impact  
29  
30 could the practice of changing assurance provider over time impose? Or if the switch is from an  
31  
32 assured to a non-assured report, what kind of signal could this send to stakeholders and how will  
33  
34 they interpret such a signal (risk of discontinuation)? Signalling theory is helpful to address such  
35  
36 questions as it provides a framework for understanding how two parties (e.g., organisation and  
37  
38 intended users) address information asymmetries. For example, management may signal their  
39  
40 higher reputation through hiring a high-reputation auditor (Bavlers *et al.*, 1988).  
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48 We observe a variation in the assurance standard used as well as in the assurance scope  
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50 and level among the three types of assurance providers. The results indicate an increasing trend  
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52 towards the use of the ISAE 3000 by non-accounting assurers. Michelon *et al.* (2019) find that  
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54 assurance providers use sustainability restatement as a mechanism to legitimise the sustainability  
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3 assurance market. Therefore, the use of the ISAE 3000 by non-accounting firms might be an  
4  
5 attempt to legitimise their services. The variation in assurance practices increases the need to  
6  
7 regulate the external assurance market by setting clear guidelines and standards that define the  
8  
9 required skills and backgrounds of external assurers. Additionally, the study reveals that  
10  
11 engineering firms are more likely to provide assurance over the entire report and to provide  
12  
13 reasonable/high levels of assurance, compared to accounting and consulting firms. Future studies  
14  
15 could also investigate why there is a significant increase in the number of non-accounting firms  
16  
17 using the ISAE 3000 standard. Prior research suggests that accounting firms provide higher quality  
18  
19 in terms of the reporting format and assurance engagement procedure (Perego, 2009) and  
20  
21 accounting firms are more likely to use ISAE 3000 standards (O'Dwyer and Owen, 2007; Mock  
22  
23 *et al.*, 2007; Perego, 2009). Therefore, it might be that the increase in the use of the ISAE 3000 by  
24  
25 non-accounting assurers is an attempt by those firms to improve the perception of the quality of  
26  
27 their assurance engagement and the reliability of their services. This could convert into increased  
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29 legitimacy.  
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36 Kolk (2010), while examining a sample of large companies, suggests that companies that  
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38 consistently provide sustainability reports are leading in the adoption of assurance. However, our  
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40 results show that the majority of companies that provide sustainability reports consistently do not  
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42 provide any assurance over the tested period. This result shows the importance of examining  
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44 assurance practices from a broader perspective, which includes a larger sample containing  
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46 companies with different characteristics. Additionally, these findings raise questions about the  
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48 reasons underlining the lack of assurance among companies that are committed to providing a  
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50 sustainability report. External assurance is one way to ensure sustainability report reliability and it  
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52 might be the case that those companies are using different credibility-enhancing mechanisms (e.g.,  
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3 internal audit or stakeholder panel). Companies could use such mechanisms to create trust between  
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5 companies issuing sustainability reports and the intended users of those reports. Do such  
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7 mechanisms act as a substitute or are they complementary to independent external assurance?  
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9 Signalling theory might be helpful for addressing such questions by providing a framework to  
10  
11 understand how companies might use certain mechanisms to signal the reliability of their  
12  
13 sustainability reports (Balvers *et al.*, 1988). Table 10 summarizes the issues discussed above.  
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17 [Insert\_Table\_10\_about\_here]  
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## 19 20 **6. CONCLUSION**

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22 Overall, the results of this study provide insights that regulators can employ to develop future  
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24 regulations on sustainability reports. For example, the EU Non-Financial Reporting Directive  
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26 mandates that companies provide a stand-alone sustainability report, but it does not mandate the  
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28 assurance of the report (European Parliament, 2014). The success of such regulation relies upon  
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30 companies providing valid and reliable information that can be trusted by stakeholders. Assurance  
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32 might assist regulators in influencing companies to provide useful information for decision making  
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34 rather than using sustainability reports as tools for impression management (Walker and Wan,  
35  
36 2012).  
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42 Research on the assurance of sustainability reports is still emerging, and further studies are  
43  
44 needed to explore and examine the practice of assurance. The results of the market distribution  
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46 among the three types of assurance providers reveal the importance of considering a specific  
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48 classification rather than grouping different types under the collective heading of non-accountant  
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50 firms. Further research could examine the differences in assurance engagement among these  
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52 assurance providers. Our results depict differences in the standard use, the scope and the level of  
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3 assurance between engineering and consulting firms. By considering different types of assurers  
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5 within the non-accounting group, future research might extend previously reported results.  
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8         In this study, we examine independent, third-party assurance, which is similar to traditional  
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10 financial auditing but not yet at the same level of maturity. However, other forms are available for  
11  
12 the assurance of sustainability reports. The other two most common forms are stakeholder panel  
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14 and expert opinion (De Beelde and Tuybens, 2015). Although previous studies have included  
15  
16 stakeholder panels and expert opinion as forms of assurance (Perego and Kolk, 2012), those studies  
17  
18 have not examined qualitatively the process of those forms of assurance. Additionally, the extent  
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20 to which companies use these different forms of assurance as complements or substitutes for  
21  
22 independent, third-party assurance remains unclear. One of the limitations of this study is that it  
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24 relies on GRI data and its report on companies' formalised sustainability practices. The study does  
25  
26 not consider companies use different forms of communication and media channels (e.g., social  
27  
28 media) to inform and legitimise their sustainability practices. Future studies examining different  
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30 ways companies use to communicate their sustainability performance will complement our  
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32 findings on the mechanisms used to ensure information reliability and credibility. Another  
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34 limitation of this study is the methodology. Using descriptive analysis allows us to understand the  
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36 assurance market trends, however, it does not allow us to examine associations between  
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38 institutional / firm level factors and companies' choice of assurance provider or their decision to  
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40 change the assurance provider. Therefore, further studies exploring such associations will  
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42 complement our findings and enhance our understanding of companies' choice of assurance  
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44 provider. Finally, in this study, we observe the practice of assurer switching. Our exploratory study  
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46 allows us to investigate switching trends. Further studies could expand our findings by  
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52         Finally, in this study, we observe the practice of assurer switching. Our exploratory study  
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54 allows us to investigate switching trends. Further studies could expand our findings by  
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3 investigating the drivers of switching. Prior studies have investigated the factors driving  
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5 companies' decisions to voluntarily assure their sustainability reports (Kolk and Perego, 2010;  
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7 Liao *et al.*, 2018; Simnett *et al.*, 2009), but there is a lack of understanding about the choices of  
8  
9 assurance providers and the consistency of the assurance decisions across years. Prior studies  
10  
11 examine the factors influencing companies to change their auditor, in a phenomenon known as  
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13 “auditor switch” (Chen and Zgou, 2007; Hudaib and Cooke, 2005); the same factors could be  
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15 applied to examining assurer switch.  
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26 <sup>1</sup> The typology of accounting (e.g., Ernst & Young and KPMG), engineering (e.g., Bureau Veritas and DNV) and  
27 consultancy (e.g., Net Balance) firms does not imply that such firms only dedicate their activities to the specific  
28 activities of accounting, engineering and consulting respectively. For instance, it is well recognised that a significant  
29 part of the revenues of Big-4 accounting firms comes from consulting activities. However, the above classification  
30 allows us to examine market preferences and trends by understanding the specificities of these different types of firms.

31 <sup>2</sup> We consider assurance switch when companies change their assurance provider from one type to another or when  
32 change their assurance status from assured to non-assured. This definition does not account for switch that occur  
33 within the same type.

34 <sup>3</sup> The three principles are “Inclusivity (People should have a say in the decisions that impact them), Materiality  
35 (Decision makers should identify and be clear about the sustainability topics that matter), [and] Responsiveness  
36 (Organisations should act transparently on material sustainability topics and their related impacts)” (AccountAbility,  
37 2008a), and a fourth principle was recently added: “Impact (Organisations should monitor, measure and be  
38 accountable for how their actions affect their broader ecosystems)” (AccountAbility, 2018).

39 <sup>4</sup> To further examine the reliability of GRI data, we randomly selected 20 companies in our sample and checked the  
40 information on their sustainability reports with the information in GRI. Manually collecting information for several  
41 years, with special attention to the type of assurance provider, we found 94.0% match with GRI data.

42 <sup>5</sup> Companies are considered as SME if headcount is less than 250 and as large enterprise if the headcount is equal to  
43 or more than 250. MNE are companies that have a headcount equal to or more than 250 and are multinational.

44 <sup>6</sup> Such definition excludes switches within assurers of the same type (e.g., different accounting firms).  
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**Table 1. Sustainability reports and assurance growth**

	<b>Sustainability reports</b>	<b>Not assured</b>	<b>Assured</b>	<b>Percentage assured (%)</b>
2012	4,637	3,422	1,212	26.1
2013	5,229	3,858	1,370	26.2
2014	5,812	4,315	1,496	25.7
2015	6,195	4,664	1,530	24.7
2016	6,870	5,280	1,587	23.1
2017	7,244	5,788	1,456	20.1
<b>Percentage of increase (%)</b>	<b>56.2</b>	<b>69.1</b>	<b>20.1</b>	<b>-23</b>

**Table 2. Sustainability reports and assured sustainability reports over a six-year period by region**

Region	Sustainability reports		Assured sustainability reports		Δ Sustainability reports	Δ Assured sustainability reports
	2012	2017	2012	2017	2012-2017	2012-2017
Africa	330	442	57	47	112**	-10
Asia	1,242	2,930	278	567	1,688***	289***
Europe	1,732	2,173	570	532	441**	-38
Latin America and the Caribbean	567	889	157	182	322***	25
Northern America	588	641	85	95	53	10
Oceania	175	168	65	33	-7	-32
<b>Total</b>	<b>4,634</b>	<b>7,243</b>	<b>1,212</b>	<b>1,456</b>	<b>2,609***</b>	<b>244**</b>

Chi-square tests, \* p<0.10, \*\* p<0.05, \*\*\*p<0.01

**Table 3. Sustainability reports and assured sustainability reports over a six-year period by industry<sup>†</sup>**

Industry	Sustainability reports		Assured sustainability reports		Δ Sustainability reports	Δ Assured sustainability reports
	2012	2017	2012	2017	2012-2017	2012-2017
Chemicals	164	268	41	67	104**	26
Construction	159	206	42	40	47	-2
Energy	292	439	105	103	147**	-2
Energy Utilities	200	209	72	58	9	-14
Financial Services	539	1034	178	229	495***	51
Food and Beverage	286	426	61	82	140**	21
Mining	192	216	56	58	24	2
Real Estate	153	284	28	52	131***	24
Retailers	129	191	14	33	62	19
Telecommunications	150	199	56	62	49	6
Other	2,291	3,772	559	672	1481***	113
<b>Total</b>	<b>4,555</b>	<b>7,244</b>	<b>1,212</b>	<b>1,456</b>	<b>2,689***</b>	<b>244**</b>

Chi-square tests, \* p&lt;0.10, \*\* p&lt;0.05, \*\*\*p&lt;0.01

<sup>†</sup> Industries with highest numbers of companies.



**Table 4. Assured sustainability reports by company type, listed status and size**

Company type	Sustainability reports		Assured sustainability reports		$\Delta$ Sustainability reports	$\Delta$ Assured sustainability reports
	2012	2017	2012	2017	2012-2017	2012-2017
Cooperative	45	93	12	15	48	3
Non-profit organization	133	173	21	26	40	5
Partnership	37	33	6	6	-4	0
Private company	3,367	5,435	903	1,179	2,068***	276**
Public institution	155	189	38	24	34	-14
State-owned company	505	844	148	135	339***	-13
Subsidiary	392	474	84	69	82	-15
<b>Total</b>	<b>4,634</b>	<b>7,241</b>	<b>1,212</b>	<b>1,454</b>	<b>2,607***</b>	<b>242**</b>
<b>Listed status</b>						
Listed	2,744	5,032	761	1,084	2,288***	323***
Non-listed	1,845	2,168	446	368	323***	-78
<b>Total</b>	<b>4,589</b>	<b>7,200</b>	<b>1,207</b>	<b>1,452</b>	<b>2,611***</b>	<b>245**</b>
<b>Size †</b>						
Large	2,819	4,404	884	869	1,585***	-15
MNE	1,183	2,012	275	511	829***	236***
SME	465	828	93	76	363***	-17
<b>Total</b>	<b>4,467</b>	<b>7,244</b>	<b>1,252</b>	<b>1,456</b>	<b>2,777***</b>	<b>204**</b>

Chi-square tests, \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

† Companies are considered SMEs if the headcount is less than 250 and as large enterprises if the headcount is equal to or greater than 250. MNEs are companies that have a headcount equal to or greater than 250 and are multinational.

**Table 5. Time difference between first sustainability reports and first assured sustainability reports**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>
Time difference	3,302	2.05	2.76
<b>Region</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>
Africa	128	3.25	3.10
Asia	1,048	1.69	2.74
Europe	1,340	1.99	2.62
Latin America and the Caribbean	427	1.77	2.33
Northern America	233	3.64	3.45
Oceania	126	2.45	2.70
<b>Total</b>	<b>3,302</b>	<b>2.05</b>	<b>2.76</b>
<b>Company Size</b>	<b>Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>
Large	2,083	2.08	2.74
MNE	908	2.35	3.00
SME	311	0.97	1.81
<b>Total</b>	<b>3,302</b>	<b>2.05</b>	<b>2.76</b>

**Table 6. Sustainability report assurance by type of assurer**

<b>Assurance provider</b>	<b>2012</b>	<b>2017</b>	<b>Δ 2012-2017</b>
Accounting	717	899	182*
Engineering	196	320	124**
Consulting	289	224	-65
<b>Total</b>	<b>1,202</b>	<b>1,443</b>	<b>241**</b>

Chi-square tests, \* p<0.10, \*\* p<0.05, \*\*\*p<0.01

**Table 7. Assured sustainability reports by region, company type, industry, and type of assurance provider**

Region	Accounting		Engineering		Consulting		Δ	Δ	Δ
	2012	2017	2012	2017	2012	2017	Accounting	Engineering	Consulting
Africa	36	37	4	0	17	9	1	-4	-8
Asia	93	238	79	230	103	94	145***	151***	-9
Europe	406	424	75	45	80	59	18	-30	-21
Latin America and the Caribbean	111	130	11	9	33	40	19	-2	7
Northern America	39	41	19	32	27	22	2	13	-5
Oceania	30	29	6	4	28	0	-1	-2	-28
<b>Total</b>	<b>715</b>	<b>899</b>	<b>194</b>	<b>320</b>	<b>288</b>	<b>224</b>	<b>184*</b>	<b>126**</b>	<b>-64</b>
<b>Company type</b>									
Cooperative	9	10	1	2	2	3	1	1	1
Non-profit organization	14	13	2	4	6	9	-1	2	3
Partnership	2	4	1	0	3	2	2	-1	-1
Private company	524	711	143	283	231	174	187**	140**	-57
Public institution	15	13	13	6	10	5	-2	-7	-5
State-owned company	105	101	19	18	20	15	-4	-1	-5
Subsidiary	48	46	17	6	17	16	-2	-11	-1
<b>Total</b>	<b>717</b>	<b>898</b>	<b>196</b>	<b>319</b>	<b>289</b>	<b>224</b>	<b>181*</b>	<b>123**</b>	<b>-65</b>
<b>Industry</b>									
Chemicals	22	36	9	19	10	11	14	10	1
Construction	20	23	12	7	10	9	3	-5	-1
Energy	69	77	17	11	14	15	8	-6	1
Energy Utilities	51	44	9	6	12	8	-7	-3	-4
Financial Services	127	153	12	37	36	38	26	25	2
Food and Beverage	33	67	5	10	23	5	34	5	-18
Mining	37	39	9	10	9	9	2	1	0
Real Estate	16	36	5	6	7	10	20	1	3
Retailers	7	26	3	5	4	2	19	2	-2
Telecommunications	37	40	8	15	11	7	3	7	-4
Other	296	358	105	194	152	110	62	89	-42
<b>Total</b>	<b>715</b>	<b>899</b>	<b>194</b>	<b>320</b>	<b>288</b>	<b>224</b>	<b>184*</b>	<b>126*</b>	<b>-64</b>

Chi-square tests, \* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.01

**Table 8. The use of assurance standards, scope and level of assurance****Panel A: The use of assurance standards**

Assurance Standards	2012	2017	Δ 2012-2017
AA1000	245	405	160**
ISAE 3000	290	735	445***
AA1000 and ISAE 3000‡	98	115	17
<b>Total</b>	<b>633</b>	<b>1,255</b>	<b>622***</b>

**Panel B: The use of assurance standards by type of assurer**

Assurance Standards	Δ AA1000 2012-2017	Δ ISAE 3000 2012-2017	Δ AA1000 and ISAE 3000 2012-2017
Accounting	-11	268***	8
Engineering	99**	46*	-5
Consulting	-23	24	14
<b>Total</b>	<b>65</b>	<b>338**</b>	<b>17</b>

**Panel C: Assurance scope and level of assurance by type of assurance provider (%)†**

Assurance provider	Assurance scope		Level of assurance	
	entire report	sections	limited/moderate	reasonable / high
Accounting	39	51	78	8
Engineering	61	27	65	16
Consulting	54	29	57	12

Chi-square tests, \* p&lt;0.10, \*\* p&lt;0.05, \*\*\*p&lt;0.01

† The percentage is calculated based on the total assurance report provided by each type.

‡ Combined both AA1000 and ISAE 3000

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**Table 9. Assurer switch**

	<b>Switch 12/13 Number of switches (%)</b>	<b>Switch 13/14 Number of switches (%)</b>	<b>Switch 14/15 Number of switches (%)</b>	<b>Switch 15/16 Number of switches (%)</b>	<b>Switch 16/17 Number of switches (%)</b>	<b>Δ Switch 12/13 - Switch 16/17</b>
To no-assurance	49 (19)	81 (30)	124 (39)	135 (39)	137 (41)	88 ***
To accounting	28 (11)	24 (9)	31 (10)	30 (9)	21 (6)	-7
To engineering	23 (9)	32 (12)	26 (8)	19 (6)	31 (9)	8
To consulting	26 (10)	29 (11)	32 (10)	35 (10)	31 (9)	5
From no-assurance to assurance	134 (52)	100 (38)	107 (33)	126 (37)	114 (34)	-20

Chi-square tests, \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

**Table 10. Future research in sustainability assurance**

Research questions in this study	Our findings	Future research questions	Level of analysis	Main theories that could guide the research
Analyse institutional and firm-level characteristics in terms of assurance adoption	Significant variation in the growth of sustainability report assurance among different regions, industries, company types, listed status and size.	What is the perceived value of assurance across different regions, industries, company types, listed status and size?	Individual-level (or intended users)	Assimilation–contrast theory
		What institutional factors could explain variations in the assurance of sustainability reports (e.g., institutional investors or country factors)?	Market level	Agency theory Institutional theory
	The time companies take to assure their sustainability reports after they are first issued vary based on region and company size.	When is it the right time to assure a sustainability report? How this decision affects companies and stakeholders?	Individual and market-level (intended users)	Legitimacy theory
Analyse market distribution among different assurance provider and their practice in terms of scope, level of assurance and standards used	The number of sustainability reports assured by engineering firms has significantly grown in recent years in comparison with the two other assurer types, while assurance by consulting firms presented a decrease.	What factors drive companies to choose a particular assurance provider? How availability, service quality, reputation and/or price affect the choice of the type of assurer?	Organization level	Stakeholder theory Agency theory Institutional theory Contingency Theory
	An increase in the use of the ISAE 3000 by non-accounting assurance providers.	Why is there an increase in the use of ISAE 3000 by non-accounting assurance providers? Does the use of ISAE 3000 standard by non-accounting assurance providers increase the quality of their assurance, their reliability and comparability? Does	Market level	Legitimacy theory

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	it increase legitimacy over the assurance provided?			
Document companies' consistency in terms of assurance adoption and their choice of assurance provider.	Only a minority of consistent reporters are consistent assurers. The majority of companies that provide sustainability reports consistently do not provide any assurance over the tested period.	Why companies that consistently issue sustainability reports do not provide assurance? Are they using different credibility-enhancing mechanisms (e.g., internal audit or stakeholder panel)? Do such mechanisms act as a substitute for independent external assurance or complementary?	Organization level	Signalling Theory
	Switching is a common practice	Examine the mixed signals to stakeholders and the risk of discontinuation effect.	Organization and stakeholder level	Signalling theory



Figure 1: Assurance providers' classification

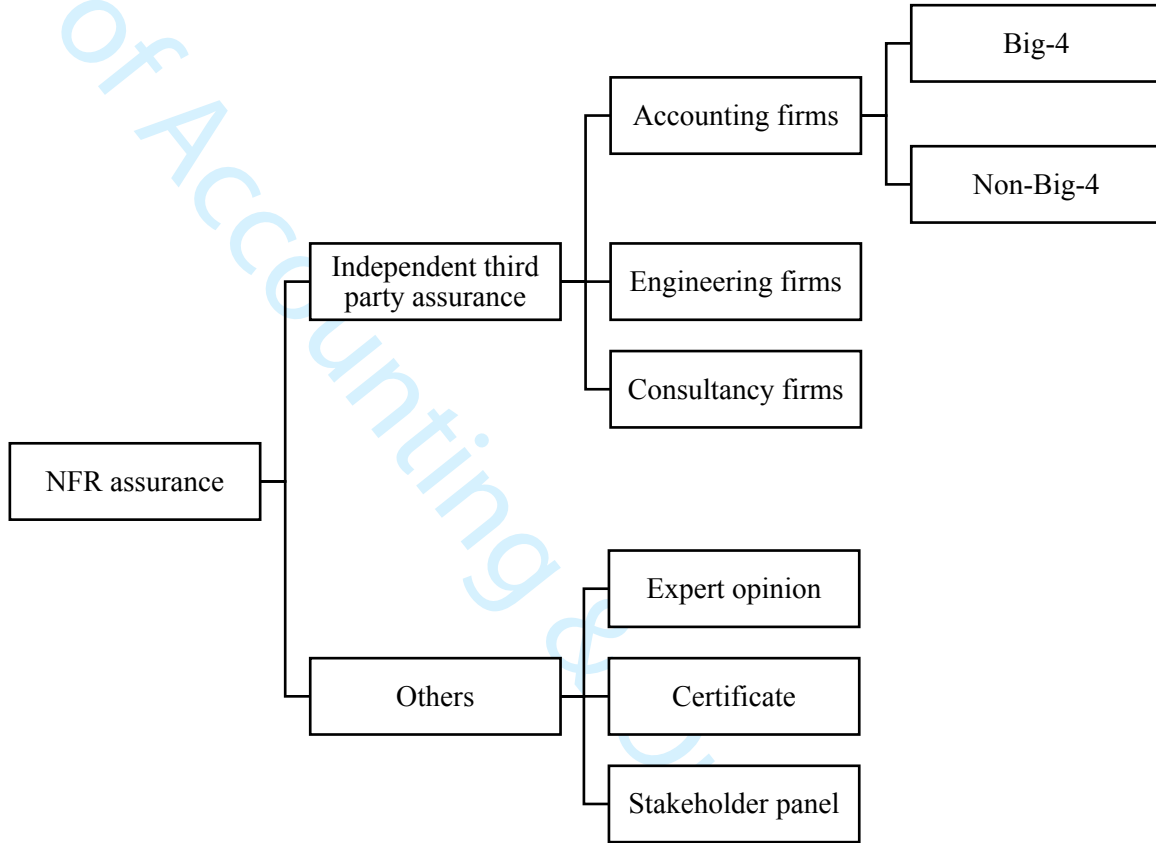


Figure 2: Tree map for companies' classification based on issuing sustainability reports and assurance

