



Quality of assurance on sustainability reports

A study on determinants of the quality of external sustainability assurance

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Abstract

Stakeholders are increasingly holding companies accountable for their impact on society and the environment. In response, companies increasingly publish sustainability reports. Due to its voluntary nature, however, the quality of these reports is not guaranteed. External assurance should improve the credibility of these sustainability reports. However, the quality of external assurance on sustainability reports varies considerably. This thesis identifies determinants of the quality of assurance on sustainability reports in order to explain its variation. Using a sample of 192 international companies for the year 2014, the results suggest that companies in countries that are stakeholder-oriented and companies with poor environmental performance are positively associated with sustainability assurance quality. These results suggest that higher quality sustainability assurance is used as a response to high stakeholder pressures these types of companies face due to sustainability concerns. The results also show support for the expectation that assurance providers from the non-auditing profession provide assurance on sustainability reports of higher quality than assurance providers from the auditing profession. Overall, the results suggest a need for a mandated sustainability disclosure and assurance regime.

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1. Introduction

Due to increased awareness of the impact that companies have on society and the environment, stakeholders are increasingly demanding companies to be accountable for their actions and to accept social and environmental responsibility. This has led to an increase in companies publishing sustainability reports over the last decades. In these reports, companies' positive and negative material impacts, from a stakeholder perspective, should be covered. Examples are information on greenhouse gas emissions and working conditions (Adams, 2004). However, current sustainability reporting experiences a credibility gap (Dando & Swift, 2003). This gap is demonstrated by evidence suggesting that stakeholders rarely use sustainability information, which is "*the key test of credible and useful communication*" (AccountAbility, 2003, p. 3). The credibility gap can exist because of the largely voluntary nature of sustainability reporting.

One of the problems identified with sustainability reporting is called "managerial capture", which refers to management's control over the sustainability reporting process, which includes defining what corporate social responsibility (CSR) entails. This results in a definition of CSR that is mainly concerned with corporate objectives such as enhancing reputation, assessing risk, managing stakeholders and maintaining legitimacy, instead of a definition that embraces the duty to act socially responsible, irrespective of economic consequences. Through management's control over the process, these social duties are translated into economic, risk-based language (O'Dwyer, 2003) and only the information that fits within management's interests, such as information that enhances reputation, is disclosed (O'Dwyer & Owen, 2005). Rather than feeling the obligation to be accountable and transparent to stakeholders, sustainability reporting is motivated by self-interest. The "reporting-performance portrayal gap" is a similar issue, which refers to the possible deviation between a company's reported social and environmental performance and the performance as portrayed in external sources such as the media. The gap was studied by Adams (2004), who found that the disclosure of a company's pollution incidents was limited to the disclosure of a fine. It is clear that the quality of information provided in sustainability reports is not guaranteed, which points to a need for external assurance on sustainability reports. External assurance can improve the credibility of these sustainability reports, however, it has been argued that this assurance may not be sufficient (Adams & Evans, 2004; Dando & Swift, 2003).

The quality of external assurance on sustainability reports is generally identified as poor, and the practice of external assurance, lacking a single robust framework due to its voluntary nature, has been criticized often in current literature. One of the key problems is

management's control over the assurance process, which poses restrictions on assurance providers, makes independent enquiry difficult, and makes assurance statements "virtually worthless" (Gray, 2000). For instance, management can control the scope of the assurance engagement, which makes it hard for readers of assurance statements to know if key aspects of the sustainability report are assured. Another issue is assurance providers' lack of identification of the reporting criteria that reporting companies use to produce sustainability reports, which makes it impossible to indicate if the report is in compliance with these criteria, and leaves assurance statements' conclusions open to readers' individual interpretation and possibly misunderstanding (Deegan, Cooper & Shelly, 2006). These problems undermine accountability and transparency to stakeholders. Moreover, great variation in quality of assurance statements on sustainability reports has been found (e.g. O'Dwyer & Owen, 2005). The potential for external assurance to be used as a strategic device instead of being motivated by accountability and transparency to stakeholders, calls to a need for research on the quality of assurance statements on sustainability reports.

This thesis investigates determinants of the quality of assurance statements on sustainability reports in order to explain the variation in their quality. Literature on assurance on sustainability reports is scarce (Zorio, Garcia-Benau & Sierra, 2013). Studies identified determinants of the choice of buying external assurance (e.g. Simnett, Vanstraelen & Chua, 2009), while others examined the quality of assurance statements by means of content analysis, comparing assurance statements with the advised content for these statements by guidelines such as the Global Reporting Initiative (GRI) guidelines (e.g. Perego & Kolk, 2012). Based upon disclosed information in assurance statements, they have been classified as of high or low quality. However, no studies have been found that identify determinants of the quality of sustainability assurance. To date, differences in quality of assurance statements have mostly been explained by the type of assurance provider (Simnett et al., 2009). Prior literature (e.g. Peters & Romi, 2015; Simnett et al., 2009) argues that assurance providers from the auditing profession, as opposed to for instance environmental consultants, increase the quality of external assurance on sustainability reports because of their independence and ethics requirements, maturity of standards, and quality control mechanisms in place. While these studies use assurance provider type as a proxy for assurance quality, they do not investigate this empirically but merely assume this as a reason for differences in quality.

There has been a call for future research not to focus on the choice of buying sustainability assurance, but on the quality (Kolk & Perego, 2010). This call has been expressed since there is only limited research on this topic available, and because of the lack of clear standards. Accounting policy makers and practitioners are likely to be interested

in this type of research, in order to increase reliability, comparability and homogeneity of the current practice of assurance on sustainability reports. Kolk and Perego (2010) particularly highlight the need for research on the effects of different types of assurance providers on the quality of assurance on sustainability reports. The scientific contribution of this thesis lies in the lack of literature on the quality of assurance on sustainability reports. While several studies have investigated the choice of buying assurance and the quality of assurance statements, no studies have been found that investigated determinants of this quality. Being able to explain variation in assurance quality may provide useful insights into the credibility of sustainability disclosures. Another contribution is the development of an adjusted research instrument for measuring the quality of assurance on sustainability reports, which uses weighted scores for determining assurance statement quality instead of regular scores. The practical relevance of this thesis lies in explaining variation in quality of assurance statements, which possibly undermines the credibility of the assurance practice and accountability and transparency to stakeholders. Explaining the variation in assurance quality may be of interest to reporting companies, as it can help them with providing high quality information, but also to standard setters, as calls have been made to regulate sustainability reporting and assurance (Owen, Swift & Hunt, 2001), as well as to investors demanding credible sustainability information (Herda, Taylor & Winterbotham, 2014).

The previous discussion leads to the following research question: *What are determinants of the quality of external assurance on sustainability reports?* In order to explain the variation in quality of external sustainability assurance, this thesis investigates which companies from a global sample of 192 companies produce sustainability reports, and do or do not buy external assurance. The research question is answered by collecting data from several databases, which are an important source of information for this thesis. Content analysis is used to measure the quality of external assurance on sustainability reports, and regression analysis is used to test the hypotheses.

The remainder of this thesis is organized as follows. The next chapter presents a theoretical framework, followed by the literature review and hypotheses development. Chapter 3 explains the research method, and the results are presented in chapter 4. The thesis ends with a discussion and conclusion in chapter 5.

2. Literature review and hypotheses development

2.1 Theoretical framework

Research on external assurance on sustainability reports has often taken an agency theory perspective (Zorio et al., 2013). This theory considers relationships between a principal and an agent, in which the principal engages the agent to perform work on his behalf. An example of an agency relationship is one between shareholders (principals) and managers of a company (agents), as the theory has often been applied in organizational settings. The theory assumes self-interested behavior, which implies that the agent, who has decision-making authority, will not always act in the principals' best interests. When it is hard or expensive for the principal to monitor the agent and there are conflicting interests, the agency problem can occur, which is the problem that the principal cannot know whether or not the agent has been behaving appropriately (Eisenhardt, 1989; Jensen & Meckling, 1976). The agency problem covers two aspects: moral hazard (hidden action) and adverse selection (hidden information), which both involve unobservable behavior by the agent (Eisenhardt, 1989).

Agency theory can also be applied in the context of sustainability reporting and assurance. Then, society, including organizational stakeholders, represents the principal, and the reporting company represents the agent. Society receives information through sustainability reports and assurance statements, which should reduce information asymmetry (Power, 1991). However, it is unclear whether these sustainability disclosures indeed reduce information asymmetry. Companies' performance and behavior can never be fully monitored. Literature has ascertained the existence of an information gap between companies and society on sustainability topics. Companies are the first to know the environmental and social consequences of their actions, and can determine whether or not to disclose this information (Comyns, Figge, Hahn & Barkemeyer, 2013). This can result in companies taking actions in their self-interest. Agency theory states that only when it increases their welfare, managers will disclose sustainability information (Ness & Mirza, 1991), and it has been found that the benefits from reducing information asymmetry are a determinant of sustainability reporting strategies (Comyns et al., 2013). Adams (2004) found that a company with significant environmental and social impacts limited the disclosure of pollution incidents to the disclosure of a fine. Moreover, issues that were covered in the media and were likely to be regarded as material to stakeholders, such as many deaths through pesticide use, animal testing, working in countries with poor human rights, and environmental pollution, were not reported. This illustrates information asymmetry between the company and its stakeholders, the use of sustainability information in the company's self-interest ("managerial capture"), and the "reporting-performance portrayal gap".

The self-interested behavior can be explained by legitimacy theory. Legitimacy theory provides a theoretical point of view for understanding companies' actions, and has often been used to explain companies' choices on sustainability disclosures (Spence, Husillos & Correa-Ruiz, 2010). Organizational legitimacy has been explained as follows: *"Organisations seek to establish congruence between the social values associated with or implied by their activities and the norms of acceptable behaviour in the larger social system in which they are a part. In so far as these two value systems are congruent we can speak of organisational legitimacy. When an actual or potential disparity exists between the two value systems there will exist a threat to organisational legitimacy"* (Mathews, 1993, p. 350).

Legitimacy theory assumes implicit social contracts between society and companies. Companies do not have an inherent right to resources or to exist, but only have these rights when society considers the company as legitimate, which is the case when society regards companies as acting in an acceptable (legitimate) way. Therefore, legitimacy can be described as society's acceptance of companies' behavior. When this behavior deviates from societal values and norms, organizational legitimacy is threatened, which means that the existence of the company might be at stake. This can be evidenced through consumers who stop purchasing products of a company and shareholders who eliminate the supply of capital. Sustainability disclosures play a role in maintaining or enhancing organizational legitimacy, and its role has been emphasized due to society's increasing awareness and concerns with companies' social and environmental impacts. Different types of companies, such as poor environmental performers, face threats to organizational legitimacy. These threats may have financial consequences, regulatory consequences, and a negative influence on their reputation (Comyns et al., 2013; Deegan, 2002).

Legitimacy is regarded as a resource necessary for a company's survival, which a company can impact and/or manipulate. When organizational legitimacy is threatened, due to for instance increased community concerns, the theory predicts that management will undertake remedial strategies. To maintain, enhance or establish organizational legitimacy, society has to know what actions companies have undertaken. The only way to change society's perceptions about the company's legitimacy is to provide them of information. Even when companies' actions are in line with society's norms and values, not communicating these actions can lead to a threatened legitimacy. Disclosures, such as sustainability reports and assurance, thus play a crucial role (Deegan, 2002). Under legitimacy theory, Lindblom (1994) identifies four legitimation strategies companies can use to obtain or maintain organizational legitimacy and to respond to societal pressures, all relying on disclosures. Research with a legitimacy theory perspective on the use of sustainability disclosures has often used the insights from these strategies (Tilt, 2009). The first strategy is informing

society about (actual) changes in performance and/or activities. This implies that a company tries to close the legitimacy gap by changing behavior, and by aligning behavior with society's values and expectations. The second strategy is changing perceptions of society without changing behavior, a strategy that can be used when a company believes that society has the wrong perceptions about the company's (appropriate) actions, which can be caused by a lack of disclosed information. These two strategies point to the need for high quality information. The third strategy is manipulating society's perceptions by taking attention away from issues of concern, and the fourth strategy involves changing society's expectations of companies' performance. This strategy can be used when a company regards society's expectations as unreasonable. Most sustainability disclosure choices can be explained through these strategies (Spence et al., 2010), and some of these strategies can lead to biased information (Kamp-Roelands, 2002).

Legitimacy theory explains sustainability reporting and assurance as strategic, organizational tools for influencing society's (and stakeholders groups therein) perceptions of a company's legitimacy and for reducing and responding to stakeholder pressures and concerns, by demonstrating that the company's behavior is acceptable. Therefore, they can also be considered as communication tools (Brammer & Pavelin, 2006; Cohen & Simnett, 2015; Comyns et al., 2013; Deegan, 2002; Patten, 2002). In line with this, a global survey by KPMG (2011) indicated that enhancing reputation is a key driver for any sustainability efforts. Furthermore, legitimacy theory explains sustainability disclosures as a function of societal pressures a company faces (Patten, 2002). External assurance on sustainability reports can be explained as a managerial device to reduce these social pressures, thus for closing legitimacy gaps by influencing society's perceptions of a company's legitimacy. External assurance is then linked to issues such as managing stakeholders, increasing reputation and maintaining legitimacy. This contradicts another way in which sustainability reporting and assurance can be used; for accountability reasons. Then, companies accept accountability and responsibility, and have the duty to report credible information to the ones who have a "right-to-know", even when it is not in the best interests of the company (Deegan, 2002).

Using sustainability disclosures to maintain or enhance organizational legitimacy instead of for accountability reasons is in line with the self-interested behavior as predicted by agency theory. Problems with sustainability reporting, such as "managerial capture" and the "reporting-performance portrayal gap" can be explained by this theory, which implies self-interested behavior and information asymmetry. Since companies' actions cannot be fully monitored and self-interested behavior is assumed, companies might not disclose

negative information. This behavior can further be explained by legitimacy theory, which implies that companies undertake strategies, such as sustainability disclosures, to maintain or enhance legitimacy. One of the possible strategies as identified by Lindblom (1994) is manipulating society's perceptions, such as reporting only positive information.

A company can be operating in different phases with respect to its organizational legitimacy. It may need to *establish legitimacy*, when the company is in a stage of development and has to show its competences. Most companies however are in the phase of *maintaining legitimacy*. In order to maintain legitimacy, companies can conduct activities aiming at preventing potential risks that may threaten legitimacy. The difficulty in maintaining legitimacy lies in the ever-changing expectations from stakeholders; activities regarded earlier as acceptable might not be regarded as acceptable anymore. A third phase of legitimacy is the phase of *extending legitimacy*, which may be necessary when a company enters a new market. The fourth and last phase of legitimacy is *defending legitimacy*. Incidents, such as oil spills, can lead to a threatened legitimacy and require a defense (Tilling, 2004).

Stakeholder theory is intertwined with legitimacy theory, and they provide overlapping perspectives. While legitimacy theory's focus is on society in general, stakeholder theory extends legitimacy theory by focusing on groups of stakeholders that are influential to a company, and on how relationships with these stakeholders can be managed. The focus is on critical stakeholders because they are powerful in the sense that they control resources necessary for the company to survive (Deegan, 2002). According to stakeholder theory, disclosures can be used to "*manage (or manipulate) the stakeholder in order to gain their support and approval, or to distract their opposition and disapproval*" (Gray, Owen & Adams, 1996, p. 45), which explains disclosures for strategic reasons as opposed to for accountability reasons. Since stakeholders may have different positions with respect to sustainability topics than companies, companies need to respond to their concerns and demands. In order to show that companies are acting in accordance with stakeholder expectations and to respond to their concerns and demands, managers have the incentive to disclose sustainability information (Deegan, 2002; Liesen, Hoepner, Patten & Figge, 2015). Both theories explain sustainability disclosures as tools for influencing stakeholder perceptions and establishing organizational legitimacy (Brammer & Pavelin, 2006).

What stakeholder theory adds to legitimacy theory is the recognition that there are different stakeholder groups with different views and organizational impacts that companies have to take into account, and whose concerns and pressure they have to respond to. Whether or not stakeholders are supportive of a company depends on whether or not they

consider the company as legitimate, which is why legitimacy is important. Researchers discussing legitimacy theory often use these insights from stakeholder theory, whilst not always acknowledging it. This however does make sense since society consists of different stakeholder groups with a different view and influence on companies (Deegan, 2002). Since stakeholders influence the flow of resources to companies, needed for their survival, models in legitimacy theory should examine stakeholders relevant to the company (Hybels, 1995).

Even though various theories have been addressed for explaining sustainability disclosures, there is no generally accepted theory in current literature. This thesis takes the viewpoint of using sustainability disclosures in line with legitimacy- and stakeholder theory, justified by the fact that *“more often than not, corporate social and environmental disclosure strategies have been linked to legitimising intentions”* (Deegan, 2002, p. 297), which was also found by Tilt (2009), who argued that the results of the majority of studies reviewed supported the view that companies use sustainability disclosures to defend or maintain perceived legitimacy by society and stakeholder groups therein.

2.2 Literature review

2.2.1 External assurance on sustainability reports

The credibility gap that sustainability reporting¹ experiences can be reduced through external assurance (Dando & Swift, 2003). The goal of this assurance should be increasing the quality of information provided, as stakeholders must be able to rely on this information to make decisions (Adams & Evans, 2004). Assurance statements should answer two questions, namely: *“Does this report give an account of the company and its performance that readers can rely on?”* and *“Is the report complete, accurate, honest and balanced in its portrayal of the organisation?”* (Adams & Evans, 2004, p. 101). Assurance quality thus refers to the reassurance of the completeness, accuracy, honesty and balance of the information provided in the reports, where organizational stakeholders can rely on. Therefore, assurance statements on sustainability reports that fully answer these questions can be regarded as of high quality.

¹ As sustainability reporting is voluntary in many countries, companies use different labels for these reports, such as corporate (social) responsibility report, sustainability report, and sustainable development report. Forms of reporting differ as well; a distinction can be made between integrated reporting, sustainability reporting, and environmental/social reporting. Integrated reports cover all three sustainability dimensions, which are the financial, ecological, and social dimensions. Sustainability reports cover ecological and social dimensions, and the environmental/social reports cover one dimension. The latter can thus be regarded as sustainability-related (Hahn & Kühnen, 2013).

Little is known about the practice of external assurance on sustainability reports, as there is little research on this topic available (Kolk & Perego, 2010; Simnett et al., 2009; Zorio et al., 2013). KPMG has provided the most extensive research surveys, with nine surveys from 1999 up to 2015. In their surveys, the current state of sustainability reporting is described, including the practice of external assurance. KPMG (2015) has found that in 2015, more than 90% of the biggest 250 companies in the world (the G250) reported on corporate responsibility, and almost two thirds of those companies buy external assurance. Also, auditing companies are found to be the providers of assurance most often. With respect to the scope of assurance, KPMG has found that from a sample of more than a thousand N100 companies, which are the 100 largest companies in several countries, 50% chooses to assure the whole report, 34% specific indicators, 5% specific chapters, and 11% chooses to assure a combination of chapters and indicators.

In current literature, studies have tried to explain why companies buy external assurance on sustainability reports. From a study using a sample of over 2.000 companies from 31 countries, it has been found that companies that want to enhance credibility of their sustainability reports tend to buy assurance most often, and it was expected that *“companies belonging to industries having a greater environmental or social impact are more exposed to environmental or social risks and will have a greater need to manage these risks by purchasing assurance to increase user confidence in the credibility of the information contained in the sustainability reports they produce”* (Simnett et al., 2009, p. 943). These industries are the mining, utilities, and finance industry (Simnett et al., 2009). Another study has found that companies in countries that are stakeholder-oriented and have weak legal systems are more likely to buy external assurance (Kolk & Perego, 2010). The reasoning is that in countries with weak legal systems, assurance can play a substitutive role in controlling credibility and quality of sustainability reports, and that companies in stakeholder-oriented countries are more likely to buy assurance as a way to manage stakeholder relationships. However, a country's stake- or shareholder orientation did not have a significant association with buying assurance in the study by Simnett et al. (2009), who also found that companies in countries with strong legal systems had a *positive* significant association with buying external assurance. Thus, the evidence can be regarded as exploratory in nature, reflecting the formative stage of the current practice of external assurance on sustainability reports.

Many problems have been identified regarding the quality of external assurance on sustainability reports. Assurance on sustainability reports can only be effective and valuable when the assurer is independent, has expertise, and has quality controls in place over the assurance process. Otherwise, assurance is not substantively effective (Cohen & Simnett,

2015). Research has, through an experimental questionnaire, examined whether external assurance on sustainability reports increases report users' perceptions of reliability of the reports. It was found that assurance indeed improves this perceived reliability (Hodge, Subramaniam & Stewart, 2009). The same results have been found for a behavioral experiment amongst financial analysts (Pflugrath, Roebuck & Simnett, 2011). External assurance on sustainability reports has the potential to positively affect stakeholders' perspectives of companies' activities, and it can enhance the credibility of the information disclosed in sustainability reports. Therefore, in line with legitimacy theory, assurance can be a tool for establishing legitimacy with organizational stakeholders (Alon & Vidovic, 2015). However, in a study examining the effects of external assurance on sustainability reports on potential employees' decisions, assurance did not affect perceptions of organizational legitimacy nor reputation (Kuruppu & Milne, 2010). The conflicting perspectives may be due to the earlier mentioned problems with external assurance on sustainability reports, which can lead to low quality assurance. The added value of sustainability assurance has been questioned due to the lack of global standards and different types of assurance providers, which leads to inconsistent approaches to assurance (Alon & Vidovic, 2015). Furthermore, Perego and Kolk (2012), for instance, showed preliminary evidence that quality of assurance on sustainability reports is in general higher for companies in more polluting industries. Thus, factors such as different types of industries and assurance providers may be an explanation for the differences in quality of assurance and therefore differences in consequences of sustainability assurance.

2.2.2 Quality of external assurance on sustainability reports

Various studies have examined the quality of external assurance on sustainability reports. These studies used content analysis, and compared assurance statements to the key elements for high quality assurance statements as suggested by international organizations such as the GRI², FEE³, AccountAbility⁴ and IFAC⁵.

² The Global Reporting Initiative (GRI) is a global non-profit organization that has developed guidelines for sustainability reporting and assurance. Their guidelines are regarded as the most important guidelines, as 82% of the world's 250 largest companies that report on sustainability use their standards (GRI, n.d.).

³ Fédération des Experts Comptables Européens (FEE) is a European organization that represents the accountancy profession. It has provided guidance on sustainability assurance, including minimum required content for an assurance statement.

⁴ AccountAbility is a global non-profit organization, and it has developed international assurance standards for sustainability reporting, namely the AA1000AS2008.

⁵ The International Federation of Accountants (IFAC) is an organization for the accounting profession, and it has developed ISAE3000, which is an international standard for assurance engagements other than audits and reviews of financial information.

The first wave of the assurance practice has been studied by Ball, Owen and Gray (2000) and by Kamp-Roelands (2002), both examining assurance statements on sustainability reports up to 1998. Already in this first wave of assurance statements, question marks have been raised about inconsistencies with respect to the scope of the assurance engagement, criteria used, assurance procedures, assurance providers' independence, and management control over the process.

More recently, assurance statements on sustainability reports from 2000-2003 for a sample of Australian companies have been examined by Deegan et al. (2006). Their results are similar to those from Kamp-Roelands (2002), which indicates minor change from 1998. In their study, great variation in quality and content of assurance statements has been found. Among the problems are a lack of information on the coverage of the assurance engagement and a lack of identification of reporting criteria employed. The assurance statements were compared to the key elements suggested for high quality assurance statements by the GRI and FEE and often do not seem to be in line with those suggestions. The authors conclude that there are many areas of concern that can be improved, and that readers of assurance statements will likely experience difficulty with understanding how the engagement was undertaken, what the scope of the engagement was, and what the conclusion means. The authors plea for guidance in form of "best practices" or regulation.

For a sample of European companies that published sustainability reports, O'Dwyer and Owen (2005) examined assurance statements in order to examine if assurance enhances both transparency and accountability to a company's stakeholders. They find that to a large degree management controls the assurance process, and stakeholder engagement is mostly absent. Some results of their study are that only in 46% of the assurance statements the assurance provider referred to its independence, and only in 29% of the assurance statements the assurance provider mentioned which particular standards were used for the assurance engagement. Moreover, only in 32% of the assurance statements references were made to materiality issues, completeness of reporting was referred to in 34% of the statements, and stakeholder responsiveness was referred to in 29% of the assurance statements.

Differences in assurance practices were also found for the G250 companies. Perego and Kolk (2012) analyzed the content and quality of assurance statements and found that the quality of sustainability assurance has been increasing over time, studying statements from 1999 to 2008. Even though quality has been increasing, the average quality was found to be rather low. Also, high country specific variation in quality was found, as well as industry variation, and variation dependent on the assurance provider.

What can be concluded from these studies is that the practice of assurance on sustainability reports can be subject to managerial capture, mainly due to its voluntary nature (O'Dwyer & Owen, 2005). Management of the reporting company can control sustainability practices in order to achieve corporate objectives. The problems with sustainability assurance can undermine the credibility of the practice of assurance on sustainability reports, as well as the credibility of sustainability reports (Perego & Kolk, 2012). What the previous studies do not explain is the variation in quality of assurance statements. Literature has not been clear about when high quality assurance can be expected. Most often, it is assumed that differences in assurance quality are caused by the type of assurance provider (Peters & Romi, 2015; Simnett et al., 2009).

2.3 Hypotheses development

In order to explain the variation in quality of assurance statements on sustainability reports, several hypotheses have been developed, focusing on external stakeholder pressure and assurance providers.

2.3.1 Stakeholder pressure

Legitimacy- and stakeholder theory explain sustainability disclosures as tools for influencing society's perceptions of a company's legitimacy (Brammer & Pavelin, 2006). Furthermore, sustainability reporting and assurance can be used as communication tools to reduce and respond to stakeholder concerns and pressure by demonstrating that a company's behavior is acceptable (Brammer & Pavelin, 2006; Cohen & Simnett, 2015; Comyns et al., 2013; Deegan, 2002; Patten, 2002). Tying legitimacy and stakeholder theory arguments together, this implies that sustainability disclosures are a function of external pressure companies face from different stakeholders (Patten, 2002).

Society, and stakeholder groups therein, is becoming more concerned with and aware of environmental and social issues, as well as with companies' impacts on the environment and society. These concerns lead to higher stakeholder pressure and increases in demand for high quality sustainability reports and assurance in order to increase the credibility of the reports (Comyns et al., 2013; Herda et al., 2014; Kolk & Perego, 2010; Zorio et al., 2013). In line with this, KPMG (2002) found that the demand for external assurance on sustainability reports arises from stakeholders that want assurance that these reports truly represent the efforts and achievements of a company. Following stakeholder theory, these stakeholder demands and concerns have to be addressed, since the resources of stakeholders are necessary for a company to survive (Deegan, 2002). Moreover, following legitimacy theory, these concerns lead to threats to organizational legitimacy, which a company is expected to respond to (Brown & Deegan, 1998). Therefore, it is expected that

external stakeholder pressure plays an important role in explaining the variation in quality of external assurance on sustainability reports.

Several types of companies, such as companies with significant environmental impact or companies that face high media coverage, experience high external stakeholder concerns and pressure as well as threatened legitimacy, and have to respond to this. It is expected that these types of companies are associated with higher quality assurance, since they have to meet the information demands and concerns of stakeholders, which are a threat to organizational legitimacy. Furthermore, the effectiveness of sustainability disclosures depends on the credibility of the information provided (Simnett et al., 2009). Disclosing high quality sustainability information is more likely to be effective in maintaining or defending legitimacy, since this demonstrates the efforts to be socially and environmentally responsible. Moreover, low quality information may give rise to increased stakeholder concerns and pressure because of the companies' visibility (Sulaiman, Abdullah & Fatima, 2014). Thus, companies that experience high stakeholder pressure and are highly visible, and therefore under high scrutiny by stakeholders, are expected to be associated with higher quality assurance to ensure organizational legitimacy and to respond to external stakeholder concerns and pressures. Therefore, it is examined which variables can be regarded as reliable indicators of a company's vulnerability to external stakeholder pressure.

A stakeholder is *"any group or individual who can affect or is affected by the achievement of the firm's objectives"* (Freeman, 1984, p. 25) and can include investors, governmental bodies, employees, suppliers, and public interest groups, among others (Roberts, 1992). Stakeholder groups may have different goals than companies regarding social and environmental responsibility topics, which is why companies have to respond to their concerns (Liesen et al., 2015). It has been shown that indeed meeting stakeholder demands is a driver for companies' decisions, and that it is needed for the achievement of strategic objectives. The more power the stakeholder has, the more important meeting their demands is, since their resources are needed for the success of the company (Roberts, 1992). Since sustainability activities can be an effective strategy of addressing stakeholder demands, a way of responding to legitimacy threats and stakeholder pressure is using sustainability disclosures and assurance (Liesen et al., 2015). Many studies have documented that concerns and pressure from specific groups of stakeholders influence sustainability disclosure choices, such as choices on the extensiveness and completeness (Liesen et al., 2015). Those stakeholders are for instance the state, NGOs, shareholders, and the public (e.g. Brammer & Pavelin, 2006; Deegan & Blomquist, 2006; Freedman & Jaggi, 2005; Reid & Toffel, 2009; Roberts, 1992). Furthermore, research has found that the quality of voluntary disclosed environmental information is demand-driven in the sense that

companies facing stakeholders concerned with environmental performance are likely to be associated with high quality disclosures (Brammer & Pavelin, 2006).

Following this line of reasoning, it can be expected that the focus of a country, being more stakeholder- or shareholder-oriented, is associated with the quality of sustainability assurance. A stakeholder-oriented country is a country in which society considers that many different stakeholder groups have a legitimate interest in companies' activities and therefore can influence these activities, whilst in a shareholder-oriented country shareholders are regarded as most important, since the function of a company is regarded to be creating shareholder value. In these countries, other stakeholder groups have less influence on companies' activities since they have less interest in these activities (Simnett et al., 2009). This focus of a country is a broad measure of external stakeholder pressure. Earlier research has found that companies in countries with a stakeholder orientation tend to disclose higher quality sustainability reports than companies in countries with a shareholder orientation (Smith, Adhikari & Tondkar, 2005) and are more likely to buy external assurance, as it can be a tool for strategically managing relationships with stakeholders (Kolk & Perego, 2010). It is expected that, since in countries with a stakeholder-orientation many stakeholders have interest in, and influence on companies' activities, companies in stakeholder-oriented countries face more external pressure by stakeholders who demand credible information on sustainability performance and high quality sustainability assurance. This leads to the following hypothesis:

H1: Reporting companies in countries that are stakeholder-oriented are more likely to be associated with higher quality assurance on sustainability reports than reporting companies in countries that are shareholder-oriented.

A company's vulnerability to external pressure by stakeholders has often been measured by industry variation. Different types of industries have different inherent environmental impacts, and industries with a significant environmental impact are associated with visible environmental problems such as global warming. Due to the nature of the activities of companies in these industries, and their association with environmental problems that are becoming increasingly urgent, they are under high scrutiny and pressure by external stakeholders. Therefore, these companies are incentivized to disclose information on their sustainability performance (Brammer & Pavelin, 2006; Liesen et al., 2015). Using these disclosures can reduce social pressures and maintain or defend

organizational legitimacy. Industry variation has indeed found to be a determinant of sustainability reporting, as companies in certain industries face industry-specific pressure by stakeholders due to their potential great environmental impact. Companies need to respond to this pressure by disclosing sustainability information (Hahn & Kühnen, 2013).

When high-profile industries were used as a proxy for stakeholder pressure from the public, Roberts (1992) found that this proxy had a positive association with the level and reliability of sustainability reporting. Earlier research has also focused on patterns of assurance on sustainability reports, paying attention to variation at industry level (Perego & Kolk, 2012). Companies in polluting industries were traditionally found to be more active in both publishing and assuring sustainability reports than companies in less polluting industries. Perego and Kolk (2012) also documented evidence that the quality of sustainability assurance is higher for companies in more polluting industries, even though great variation has been found. Moreover, it has been found that companies in more polluting sectors generally produce higher quality sustainability reports (Comyns, 2012; Tilt, 2009). These results can be explained by both stakeholder- and legitimacy theory. Companies may experience high stakeholder pressure as a result of their (potential) great impact on the environment. Therefore, these companies may undertake strategies to maintain or defend organizational legitimacy, such as addressing stakeholder demands and concerns by high quality sustainability reporting and high quality assurance. This leads to hypothesis 2:

H2: Reporting companies in industries associated with visible environmental issues are more likely to be associated with higher quality assurance on sustainability reports than reporting companies in industries less associated with visible environmental issues.

Companies' vulnerability to external stakeholder pressure has also often been captured by environmental performance, besides the industry classifications (Brammer & Pavelin, 2006). Companies with poor environmental performance and high pollution levels face threats to organizational legitimacy (Comyns et al., 2013), high stakeholder pressure and concerns, as well as demands for high quality disclosures compared to companies with good environmental performance (Brammer & Pavelin, 2006; Patten, 2002). It is expected that, as companies with poor environmental performance face higher stakeholder pressure than companies with good environmental performance, since companies with poor environmental performance cause more environmental externalities, high quality assurance

on sustainability reports is demanded in order to address this stakeholder pressure, and to either maintain or defend organizational legitimacy.

The results of the study by Brammer and Pavelin (2006) support this expectation with respect to the quality of sustainability reports, who argue that poor environmental performers face pressure to disclose high quality information due to high stakeholder scrutiny, and are incentivized to accurately disclose how the company manages its environmental risks. Patten (2002) has showed that poor environmental performers experienced higher stakeholder pressure than good environmental performers, which led to more extensive sustainability reporting for poor performers. These results were explained by Patten (2002) through legitimacy theory, claiming that companies with poor environmental performance face high stakeholder pressure and threatened legitimacy, which gives an incentive for companies to report extensively to limit any damage. Furthermore, there is a risk of threatened legitimacy for poor environmental performers when they neglect to report bad news in a true manner (Brammer & Pavelin, 2006). This leads to hypothesis 3:

H3: Reporting companies with poor environmental performance are more likely to be associated with higher quality assurance on sustainability reports than reporting companies with good environmental performance.

Another proxy for companies' vulnerability to stakeholder pressure is media attention (Brammer & Pavelin, 2006). Media attention is a factor that has been neglected in earlier literature examining voluntary disclosures, even though more recently its importance has been recognized (Brammer & Pavelin, 2006; Dawkins & Fraas, 2011). The media has the power to identify environmental and social issues, and to affect stakeholders' perceptions of a company. This perception can lead to higher pressure from these stakeholders, meaning that a company's organizational legitimacy might be threatened. As legitimacy theory posits that disclosure policies are a function of external stakeholder pressure, it can be expected that these policies are affected when companies face high media attention (Dawkins & Fraas, 2011; Patten, 2002). Stakeholder pressure and demands on sustainability disclosures are therefore expected to be influenced by media visibility. Literature has consistently shown a link between media coverage and corporate visibility, in the sense that companies that face high media coverage also face higher pressure by stakeholders (Brammer & Pavelin, 2006). The increased pressure for companies due to media coverage can come from different sources, such as dissatisfaction of the public (Patten, 2002). Media coverage can

change the attitude and perceptions of stakeholders towards companies through its “priming and framing effects” (Dawkins & Fraas, 2011).

Studies have found that increased media coverage drives environmental disclosures (Brown & Deegan, 1998; Deegan, Rankin & Voght, 2000), which can be a means of responding to stakeholder pressures (Patten, 2002). This supports legitimacy theory and stakeholder theory, which argue that disclosure is a means of addressing the stakeholder pressure a company faces, in order to maintain or defend organizational legitimacy. These arguments are extended to assurance on sustainability reports. Since companies facing increased media coverage are likely to experience increased pressure by the public (Brammer & Pavelin, 2006; Dawkins & Fraas, 2011), it is expected that as a response high quality assurance is demanded in order to address the pressure and maintain or defend organizational legitimacy. Earlier research by Comyns (2012) indeed found that companies that are highly visible in the media produce sustainability reports of highest quality, to meet the information needs of stakeholders and to maintain legitimacy. Comyns (2012) concluded that reporting quality increases when legitimacy is threatened. Since it is more likely that negative media coverage influences companies’ legitimacy and stakeholder pressures in a negative way than merely positive media coverage, it seems necessary to distinguish between negative and positive media coverage. This leads to the following hypothesis:

H4: Reporting companies with more negative media coverage are more likely to be associated with higher quality assurance on sustainability reports than reporting companies with more positive media coverage.

Furthermore, the extent of ownership concentration is expected to influence stakeholder pressure and the quality of assurance on sustainability reports. Ownership structures are another frequently used proxy for companies’ vulnerability to external stakeholder pressure (Brammer & Pavelin, 2006). When ownership of a company becomes more dispersed, shareholder demands become broader, and pressures to disclosure credible sustainability information increase (Roberts, 1992). Moreover, shareholders only have minor authority over managers (Brammer & Pavelin, 2006).

Sustainable investing has experienced high growth over the last years, as investors are becoming increasingly concerned with sustainability issues. This has led to a demand for high quality sustainability reporting as well as for high quality assurance in order to increase the credibility of the reports (Herda et al., 2014). Brammer and Pavelin (2006) found that environmental disclosures differ across ownership patterns, with companies with more

dispersed ownership more likely to make these disclosures as well as more likely to make high quality disclosures. A possible explanation is that when ownership is more concentrated, dominating owners often receive information directly from companies and are less reliant on reported information. This means that dominated owners are often not interested in (sustainability) reports (Jensen & Berg, 2012). Since investors are becoming increasingly aware of sustainability issues, it is expected that many investors in companies with dispersed ownership exert pressure on companies and demand high quality assurance on sustainability reports, since non-dominating owners rely on information published in these reports. This leads to the following hypothesis:

H5: Reporting companies with dispersed ownership are more likely to be associated with higher quality assurance on sustainability reports than reporting companies with concentrated ownership.

2.3.2 Assurance providers

Aside from the influence of stakeholder pressure on the quality of assurance on sustainability reports, it is expected that different types of assurance providers can explain variation in quality of assurance statements, since they undertake the assurance engagement. For the audit of financial statements, the law mandates that audit firms have to conduct these audits. However, due to its voluntary nature, other assurance providers may also provide assurance on sustainability reports, such as environmental management companies (Simnett et al., 2009). For G250 and N100 companies, audit firms have found to be the assurance provider most often in 2015, covering respectively 65 and 64% of the assurance engagements (KPMG, 2015).

Several studies assume that assurance providers from the auditing profession provide assurance of the highest quality because of their well-developed standards, independence requirements, and quality control mechanisms in place (Peters & Romi, 2015; Simnett et al., 2009). Only one study has been identified that empirically found that auditors provide higher quality assurance on sustainability reports (Zorio et al., 2013). However, this result only holds for a sample of 130 Spanish companies, and the only distinction that was made was between auditors and consultants. Contrary to most studies, this thesis expects that assurance providers from the non-auditing profession provide higher quality assurance.

Assurance providers specialized in CSR, such as environmental consultants, have higher subject matter expertise, and have a competitive advantage over auditors because of their specific set of skills and knowledge. On the other hand, auditors often seem to rely on their reputation. Instead of conducting extensive assurance procedures, reliance on the brand name has been identified in order to give report users an impression of assurance (O'Dwyer & Owen, 2005). The qualitative nature of sustainability audits (e.g. opinions and concerns of stakeholders) may be problematic for assurance providers from the auditing profession due to a lack of experience and expertise with these aspects. This has led to suspicion on the competences of these assurance providers (O'Dwyer, 2001).

There is evidence supportive of the expectation that assurance providers from non-auditing professions provide higher quality assurance than assurance providers from the auditing profession. Deegan et al. (2006) for instance, illustrated the difference in assurance work by assurance providers from the auditing profession and other organizations as illustrated by European evidence. Assurance providers from the auditing profession seemed to be neutral, meaning that no opinion was expressed. Also, they seem to make use of standardized conclusions and are uniform in structure, neglect to give the reporting company recommendations, and include detailed disclaimers. On the other hand, assurance providers from the non-auditing profession do express opinions and recommendations, and in contrast to assurance statements from providers from the auditing profession, statements are "custom-made" for their clients. Consistent with this, O'Dwyer and Owen (2005) argue that auditors adopt a more cautionary approach to assurance, neglecting to refer to completeness of reporting and to provide high-level assurance. Auditors have been accused of merely "data-checking". Consultant assurance providers however were found to have an evaluative approach, focusing on issues of completeness and balance, and are actively involved as the reporting process takes place, instead of only "data-checking".

An explanation for the cautionary approach by assurance providers from the auditing profession can be their larger responsibility in terms of codes of professional conduct, meaning that they have more social and legal responsibilities. Because of these responsibilities, auditors face larger litigation risks. This however does not change the expectation that assurance providers from the non-auditing profession provide assurance of higher quality. This leads to the following hypothesis:

H6: Assurance providers from the non-auditing profession are associated with higher quality assurance on sustainability reports than assurance providers from the auditing profession.

3. Research method

3.1 Sample

To explain the variation in quality of assurance statements on sustainability reports and test the hypotheses, a sample of 192 global companies that are included in the Climate Performance Leadership Index (CPLI) in 2014 was used. Those are companies that have demonstrated a superior approach to climate change, according to the Carbon Disclosure Project (CDP), based upon companies' performance indicators such as greenhouse gas (GHG) reductions (CDP, 2014). Choosing companies that have a superior approach to climate change was likely to result in a sample of companies that report on sustainability and possibly buy external assurance on their sustainability reports. Table 1 shows summary statistics for the sample companies. The high standard deviations for company size illustrate the variety of companies included in the CPL Index, as for example the financials industry includes companies as HSBC Holdings, one of the world's largest bank, and Host Hotels & Resorts, a much smaller real estate investment trust. Table 2 shows statistics for the sample companies by country.

Table 1
Summary statistics of sample companies across industry

Industry	Number of observations (in %)	Company size in total assets (in \$ m)			
		Mean	Std.Dev.	Min	Max
Consumer discretionary	19 (9.90)	122.75	145.77	.55	426.40
Consumer staples	21 (10.94)	39.89	44.43	.02	203.49
Energy	4 (2.08)	13.76	13.91	2.39	34.04
Financials	37 (19.27)	516.27	624.40	2.54	2634.14
Healthcare	7 (3.65)	24.20	33.58	2.73	85.27
Industrials	39 (20.31)	24.75	23.54	1.78	131.97
Information technology	30 (15.62)	45.35	64.85	.30	231.84
Materials	12 (6.25)	12.96	9.47	3.85	36.84
Telecommunication services	11 (5.73)	61.88	57.82	2.72	172.36
Utilities	12 (6.25)	44.53	34.26	4.31	113.85
Total	192 (100)	136.42	334.90	.02	2634.14

Due to its voluntary nature, for each company in the CPL Index it was examined whether it publishes a sustainability report. A broad definition of sustainability reporting was used, meaning that integrated reports, sustainability reports, and/or environmental/social reports were included. To determine if a company publishes a sustainability report, the GRI database was consulted. This database includes all sustainability reports whose existence the GRI is aware of. This is not restricted to reports based on the GRI standards. However, this means that not all existing reports are included and therefore companies are also able to voluntarily add their report to the database. A sole reliance on the GRI database is not

sufficient since some companies' reports might be omitted. Therefore, when the GRI database did not provide search results for any of the 192 companies, the company website was consulted in order to see if the company publishes sustainability reports. Due to data availability, reports of 2014 were used. The same database by the GRI was consulted to examine which companies from the CPL Index that report on sustainability buy external assurance on sustainability reports, as the database includes this information. In addition, due to the possible omission of information in the GRI database, for each company that reports on sustainability the company's website was consulted to double-check whether it has bought external assurance on its sustainability report. All assurance statements were retrieved from the company websites.

Table 2
Summary statistics of sample companies across country

Country	Freq.	Percent	Country	Freq.	Percent
Australia	5	2.60	Japan	24	12.50
Austria	2	1.04	Netherlands	5	2.60
Belgium	3	1.56	Norway	3	1.56
Canada	4	2.08	Portugal	2	1.04
China	1	0.52	South Africa	8	4.17
Denmark	3	1.56	South Korea	14	7.29
Finland	5	2.60	Spain	12	6.25
France	10	5.21	Sweden	6	3.12
Germany	13	6.77	Switzerland	5	2.60
India	5	2.60	Turkey	2	1.04
Ireland	2	1.04	USA	34	17.71
Israel	1	0.52	United Kingdom	19	9.90
Italy	4	2.08	Total	192	100.00

3.2 Operationalization

3.2.1 Quality of external assurance on sustainability reports

Following prior research (e.g. Fonseca, 2010; O'Dwyer & Owen, 2005; Perego & Kolk, 2012), the quality of assurance statements was determined by means of content analysis. The measurement by Perego and Kolk (2012) was used, which is the most recent instrument for measuring the quality of assurance statements on sustainability reports, and can be found in appendix A. It includes minimal requirements for high quality assurance statements as prescribed by the GRI, IFAC and AccountAbility. Content analysis through these types of research instruments is the most common method for defining quality of sustainability assurance in current literature, even though there is variation in guidelines that are used to define the minimal required content for sustainability assurance (Zorio et al., 2013). Examples of ranking criteria for minimal requirements are statements on the

responsibilities of the reporting company and the assurance provider, statements on the independence of the assurance provider from the reporting company, references to the objective of the assurance engagement, references to the assurance standard used, and conclusions on materiality, stakeholder responsiveness, and completeness.

The measurement by Perego and Kolk (2012) was adjusted in two ways. As indicated, assurance statements should answer the questions whether the sustainability report gives an account of the company and its performance that report users can rely on, and whether the report is complete, accurate, honest and balanced in its representation of the company (Adams & Evans, 2004). Assurance quality thus refers to the reassurance of the accuracy of the provided information as well as its completeness, honesty and balance. Perego and Kolk (2012) give each ranking criteria a similar weight, such as a reference to the location of the assurance provider (criteria 4) and a statement on completeness of reporting (criteria 17). However, several ranking criteria are regarded as more representative of the quality of assurance on sustainability reports than other criteria, such as the aforementioned criteria of completeness of reporting. Therefore, this thesis employed an additional measurement of the quality of assurance on sustainability reports, which is a weighted score. The amount of points achieved for the following ranking criteria were doubled: 11) objective of the assurance engagement; 16) materiality; 17) completeness; 18) responsiveness to stakeholders; 19) general conclusion/opinion. Those ranking criteria clearly reflect the two questions assurance statements should answer.

The second way in which the measurement by Perego and Kolk (2012) was adjusted is by updating the minimal content requirements for assurance statements through the most recent versions of GRI (2013), IFAC (2013) and AccountAbility (2008). Appendix A shows the adjusted research instrument, with grey highlights indicating that an adjustment to the original research instrument has been made. Each company's assurance statement, for a total of 23 criteria, could achieve a total score ranging from 0 to 35 points for the non-weighted measure, and a total score ranging from 0 to 45 points for the weighted measure. Thus, this thesis employs two dependent variables: assurance quality (AQ), which is the unweighted score, and the weighted assurance quality (wAQ).

3.2.2 Independent variables

Stakeholder- or shareholder orientation (STAKE). For the broad measure of stakeholder pressure, a distinction was made between companies in countries that are stakeholder-oriented and shareholder-oriented. Countries with an Anglo-Saxon legal background were classified as shareholder oriented. Those are the following countries: USA, UK, Canada and Australia. All other countries were classified as stakeholder-oriented (Garcia-Castro, Arino,

Rodriguez & Ayuso, 2008). A dummy variable was used for the stake- or shareholder orientation of a country, taking the value of '1' if the company is located in a country that is stakeholder-oriented, and the value of '0' if it is located in a shareholder-oriented country.

Industry associations (IND). For the vulnerability to stakeholder pressure captured by industry associations, a distinction was made based upon the classification of the CPL Index, which are the following ten industries: financials, health care, telecommunication services, information technology, energy, consumer discretionary, consumer staples, materials, industrials, and utilities. As found by the CDP (2014), the sector utilities is the most polluting industry, followed by respectively the industrials, materials, consumer staple, and consumer discretionary industry. The five least polluting industries are the energy, information technology, telecommunication services, health care, and financials industry. This classification was used to make a distinction between companies in industries associated with visible environmental issues and companies in industries less associated with these issues.

A dummy variable was used for the industry, taking the value of '1' for companies in more polluting industries, which are regarded to be associated with visible environmental issues (utilities, industrials, materials, consumer staple and consumer discretionary industries) and a value of '0' for companies in less polluting industries, which are regarded to be less associated with visible environmental issues (energy, information technology, telecommunication, health care, and financials industries).

Environmental performance (EP). For the vulnerability to stakeholder pressure due to a company's environmental performance, this performance was measured by adding companies' emissions of scope 1 (direct GHG emissions) and scope 2 (indirect GHG emissions) over 2013, both measured in tonnes of carbon dioxide equivalent (tCO₂e⁶), which is a standard measure for carbon footprints. The CDP database includes data on these emissions for companies included in the CPL Index. The year 2013 was chosen since not every company's 2014 performance has been included in the database yet.

⁶ CO₂e is "a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO₂e signifies the amount of CO₂ which would have the equivalent global warming impact" (Brander, 2012, p. 2)

Media coverage (MEDIA). The vulnerability to stakeholder pressure captured by the amount of media coverage was measured through the number of news articles covered for each company in the Orbis database from the period 01/01/2014 to 01/01/2015. The negative media coverage was also based upon the Orbis database, which distinguishes between positive and negative news by a sentiment analysis. This analysis uses an algorithm to find news with negative sentiment. For the media coverage hypothesis, the negative media coverage was divided by the total media coverage. Thus the variable indicates the percentage of negative media coverage.

Ownership concentration (OWN). Following the study by Brammer and Pavelin (2006), ownership concentration was measured through data on the largest shareholder, expressed as a percentage of a company's share capital. Data was retrieved from the Orbis database as of January 1st, 2015.

Assurance provider (AP). In order to test whether the type of assurance provider can explain variation in quality of assurance statements on sustainability reports, a classification of assurance providers was made. A distinction was made between assurance providers from the auditing profession and other assurance providers. The assurance provider variable is a dummy variable taking the value of '1' if the assurance provider does not belong to the auditing profession and '0' if the assurance provider does belong to the auditing profession.

3.2.3 Control variables

Several company variables have often found to be associated with decisions about voluntary disclosures and assurance, namely size, leverage and profitability. Earlier research has found that company size and leverage have a positive association with buying voluntary assurance (Simnett et al., 2009; Chow, 1982; Abdel-khalik, 1993; Blackwell, Noland & Winters, 1998; Carey, Simnett & Tanewski, 2000). Profitability was included as this factor indicates more flexibility in buying high quality sustainability assurance (Hahn & Kühnen, 2013). Profitability was measured by return on assets (ROA), assessed by net income divided by total assets, leverage was measured by long-term debt on total assets (Simnett et al., 2009), and company size was measured by the natural logarithm of the total asset value (Clarkson, Li, Richardson & Vasvari, 2008). All data on the control variables was extracted from the Orbis database and any missing information in Orbis was retrieved from the companies' annual reports. Data was retrieved as of December 31st, 2014.

3.3 Regression model

In order to analyze the collected data, the following ordinary least squares (OLS) regression equation was estimated:

$$AQ/wAQ = \beta_0 + \beta_1 STAKE + \beta_2 IND + \beta_3 EP + \beta_4 MEDIA + \beta_5 OWN + \beta_6 AP + \\ \beta_7 ROA_{CONTROL} + \beta_8 LEV_{CONTROL} + \beta_9 SIZE_{CONTROL} + \varepsilon$$

where AQ is the dependent variable, short for sustainability assurance quality, and wAQ is the weighted assurance quality. The independent variables include the country's stake-or shareholder orientation (STAKE), the industry (IND), environmental performance (EP), media coverage (MEDIA), ownership concentration (OWN) and the assurance provider (AP). Control variables include profitability (ROA), leverage (LEV) and company size (SIZE). The regression analyses were conducted through the statistical software Stata 13. Table 3 provides an overview of the definitions of the variables used in this thesis.

The regression models' underlying assumptions were tested and are described briefly, focusing on the companies in the sample that are included in the regression analyses, which are companies with publicly available assurance statements on sustainability reports. The possibility of multicollinearity between the independent variables was tested through the Pearson correlation coefficients and variance inflation factors (VIFs). Table 4 shows the VIFs for the independent variables and table 5 shows the correlation coefficients, which indicates no high correlation between the variables, as 0.2469 was the highest correlation coefficient found. The low values of the VIFs indicate no multicollinearity, since a VIF higher than 5 indicates severe multicollinearity and the highest VIF for the independent variables in this thesis was 1.28 (Studenmund, 2014).

Table 3
Definitions of the variables used in the analyses

Variable	Definition
AQ	AQ is the quality of assurance on sustainability reports as measured by the research instrument in appendix A, using non-weighted scores.
wAQ	wAQ is the quality of assurance on sustainability reports as measured by the research instrument in appendix A, using weighted scores.
STAKE	STAKE is a dummy variable that is equal to one if a company is located in a country that is stakeholder-oriented and zero if the company is located in a country that is shareholder-oriented (Garcia-Castro et al., 2008).
IND	IND is a dummy variable that is equal to one if a company belongs to an industry associated with visible environmental issues and zero if the company belongs to an industry less associated with visible environmental issues (CDP, 2014).
EP	EP is the environmental performance of a company, measured by adding scope 1 and scope 2 GHG emissions, measured in tonnes of carbon dioxide equivalent (tCO ₂ e) (CDP, n.d.).
MEDIA	MEDIA is the amount of negative media coverage for a company divided by the total media coverage, and indicates the percentage of negative media coverage, as found through the Orbis database.
OWN	OWN is the ownership concentration of a company as measured through data on the largest shareholder, expressed as a percentage of a company's share capital (Brammer & Pavelin, 2006).
AP	AP is a dummy variable that is equal to one if a company chose an assurance provider from the non-auditing profession and zero if the company chose an assurance provider from the auditing profession.
ROA	ROA is a measure of profitability, assessed by the return on assets, equal to net income divided by total assets (Simnett et al., 2009).
LEV	LEV is the leverage, which is measured by the long-term debt on total assets (Simnett et al., 2009).
SIZE	SIZE is the company size, measured by the natural logarithm of the total asset value (Clarkson et al., 2008).

Table 4
Variance inflation factors

Variable	VIF	1/VIF
SIZE	1.28	0.783428
STAKE	1.22	0.818209
OWN	1.14	0.878154
ROA	1.14	0.878961
MEDIA	1.11	0.898982
LEV	1.10	0.906322
AP	1.09	0.916302
EP	1.07	0.935942
IND	1.06	0.939795
Mean VIF	1.13	

See table 3 for the definitions of the variables.

The residuals were close to a normal distribution, only showing minor deviations from normality, as can be seen from the information in appendix B. Furthermore, the data was tested for any influential or unusual data, which can be caused by data errors or inherent variability in the data (Osborne & Overbay, 2004). Out of the 128 observations, 10 observations have found to be influential outliers for the AQ regression equation, and 11 observations have found to be influential outliers for the wAQ regression equation.⁷ Possibilities of data entry or coding errors were checked and excluded, thus any variability in the data points to variability in its measurement. This means that these observations might distort the results of the regression analyses. Three methods for reducing this impact on the results were identified, namely delete outliers, transform data, and obtain more observations (Chang-Tsun, 2009). Also, regression with robust standard errors is a technique that reduces the effect of influential outliers (Chen, Ender, Mitchell & Wells, 2003). Obtaining more observation was impossible since the sample of companies used in this thesis is fixed. Transforming variables means that extreme values can be kept in the data, however their variance is reduced, which seemed an appropriate approach for this thesis (Osborne & Overbay, 2004). The possible transformation of data was examined by Stata's ladder⁸ and qladder⁹ commands, which indicate the transformations which best resemble normal

⁷ Influential outliers are identified according to the difference-in-fits (Dfits), which combine information on residual size (whether an observation is an outlier) and leverage (whether an observation drives the regression results) (Chen et al., 2003).

⁸ Ladder "searches a subset of the ladder of powers for a transform that converts varname into a normally distributed variable" (Stata, n.d. p. 1)

⁹ Qladder "displays the quantiles of transforms of varname according to the ladder of powers against the quantiles of a normal distribution" (Stata, n.d., p.1)

distributions (Stata, n.d.). For all necessary variables, the ladder and qladder results can be found in appendix C. The following data transformations took place: OWN, LEV and MEDIA were transformed into their square root, and EP was transformed into the natural logarithm of EP. Furthermore, due to heteroskedasticity problems as identified by White's test for heteroskedasticity, which can be found in appendix B, regression analysis with robust standard errors was used to account for heteroskedasticity and for reducing the impact of outliers (Chen et al., 2003).

Table 5
Pearson correlations

	STAKE	IND	EP	MEDIA	OWN	AP	ROA	LEV	SIZE
STAKE	1.0000								
IND	0.0250	1.0000							
EP	0.0939	0.1727	1.0000						
MEDIA	-0.1009	-0.0033	0.1244	1.0000					
OWN	0.2280*	0.0771	0.0357	-0.0519	1.0000				
AP	-0.1331	-0.0888	-0.0962	-0.0853	0.0442	1.0000			
ROA	0.0114	-0.0489	-0.0407	0.1529	0.0619	0.1288	1.0000		
LEV	-0.1180	0.0958	0.0397	-0.1097	-0.0226	0.0526	-0.2057*	1.0000	
SIZE	0.2469*	-0.0927	0.0550	0.1368	-0.1909*	-0.2086*	-0.1550	-0.1450	1.0000

* Indicates statistical significance at the 5 percent level.

See table 3 for the definitions of the variables.

4. Results

4.1 Descriptive statistics

Figure 1 shows descriptive statistics for the sample companies. From the 192 companies in the CPL Index, 185 reported on sustainability in 2014, and 142 of those companies had their sustainability reports assured, which is 77% of the reporting companies. Since 14 companies did not make their assurance statement publicly available, which makes measuring assurance quality impossible, 128 companies were studied further.

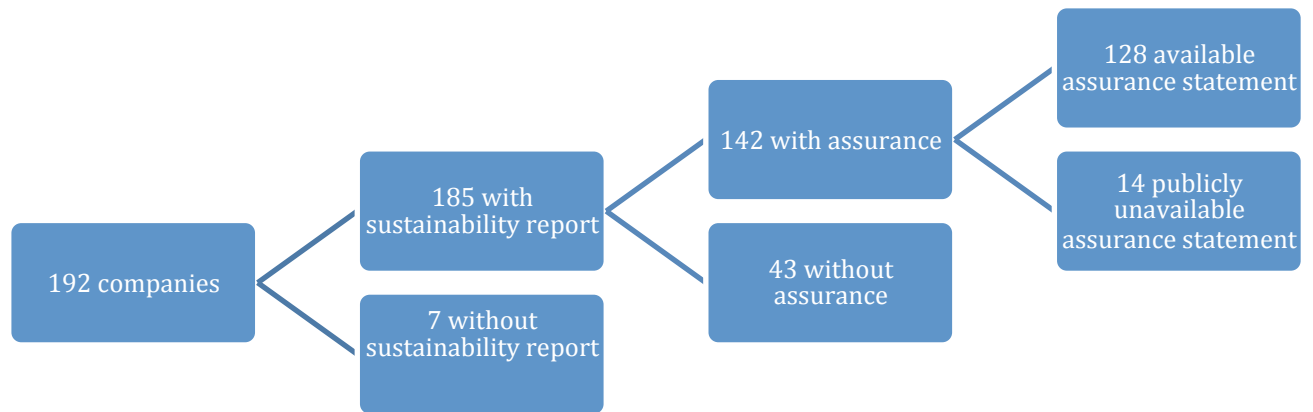


Figure 1. CPLI companies' sustainability reporting and assurance choices

All other discussed results will only consider the 128 companies that have publicly available sustainability assurance statements. Table 6 shows summary statistics for the employed (untransformed) variables, with the amount of observations, the variable mean, standard deviation, and minimum and maximum value given. The statistics show information on the unweighted quality of sustainability assurance statements (AQ), for which each reporting company could achieve a score varying from 0 to 35 points. For the sample of 128 companies, the mean score is 22.05, with the lowest score being 14 and the highest being 30. The standard deviation is 3.35, which implies variation in quality. For the weighted assurance quality (wAQ), companies could score between 0 and 45 points. Here, the average score is 25.89, with a minimum score of 16 and a maximum score of 37. Summary statistics for assurance quality are given in table 7, which shows that there is room for improvement, considering the maximum scores that could be achieved. In appendix D, detailed information on the quality of assurance statements per company can be found.

Table 6
Summary statistics for variables included in the analyses

Variable	Obs	Mean	Std. Dev.	Min	Max
AQ	128	22.05	3.35	14	30
wAQ	128	25.89	4.55	16	37
STAKE	128	.76	.43	0	1
IND	128	.57	.50	0	1
EP	128	4141202	1.62e+07	632	1.68e+08
MEDIA	128	8.23	10.11	0	50
OWN	128	28.13	27.63	.04	100
AP	128	.28	.45	0	1
ROA	128	4.31	6.76	-23.28	41.5
LEV	128	19.28	15.26	0	80.2
SIZE	128	17.21	3.98	6.32	26.82

See table 3 for the definitions of the variables.

The statistics in table 6 show that from the sample of companies, 76% is registered in a country that has a stakeholder-orientation, and 57% operates in an industry that is regarded as associated with visible environmental issues. Environmental performance shows large deviations, with a minimum of 632 tonnes of CO₂e and a maximum of 167.640.000 tonnes of CO₂e, and the average amount is 4.141.202 tonnes. The average amount of negative media coverage, as a percentage of total media coverage, is 8.23% for the 128 companies. Furthermore, the average ownership of the largest shareholder is 28.13%, and the return on assets is 4.31% on average. The companies' leverage is 19.28% on average, and the average size of the companies is 17.21, which is the natural logarithm of the total asset value, which comes down to an average asset value of approximately \$29.5 million. Finally, for 28% of the companies, the assurance provider was from the non-auditing profession and 72% of the companies chose a provider from the auditing profession. This is in line with earlier research by KPMG (2015), which indicated that assurance providers from the auditing profession dominate the practice of assurance on sustainability reports.

Table 7
Scores for (weighted) sustainability assurance quality

Assurance quality	Freq.	Percent	Weighted assurance quality	Freq.	Percent
14	3	2.34	16	2	1.56
16	5	3.91	17	1	0.78
17	2	1.56	18	2	1.56
18	4	3.12	19	2	1.56
19	10	7.81	20	6	4.69
20	11	8.59	21	2	1.56
21	26	20.31	22	12	9.38
22	19	14.84	23	9	7.03
23	11	8.59	24	22	17.19
24	10	7.81	25	15	11.72
25	5	3.91	26	11	8.59
26	8	6.25	27	4	3.12
27	6	4.69	28	5	3.91
28	1	0.78	29	5	3.91
29	5	3.91	30	7	5.47
30	2	1.56	31	4	3.12
Total	128	100.00	32	5	3.91
			33	6	4.69
			34	1	0.78
			35	3	2.34
			36	3	2.34
			37	1	0.78
			Total	128	100.00

4.2 Hypotheses testing

Table 8 shows the results of the regression analyses, distinguishing between regression analyses with robust standard errors (model 1 and 2) and regression analyses without influential outliers (model 3 and 4), as well as between weighted assurance quality (model 1 and 3) and assurance quality (model 2 and 4) as dependent variables. Model 3 and 4 do not include robust standard errors due to the exclusion of outliers and the absence of heteroskedasticity problems, as shown in appendix B.

Hypothesis 1 predicted that reporting companies in stakeholder-oriented countries are more likely to be associated with higher quality assurance on sustainability reports than companies in shareholder-oriented countries. The positive and significant coefficient for a countries' stakeholder orientation for all models indicates that companies in stakeholder-oriented countries are associated with higher quality assurance on sustainability reports than companies in countries with a shareholder orientation, which supports hypothesis 1. This suggests that companies in countries in which many stakeholders groups have a legitimate interest in, and influence on companies' activities, these companies might experience more external pressure by stakeholders who demand credible information on sustainability performance, and as a response are associated with higher quality assurance on sustainability reports than companies in countries that are shareholder-oriented.

Hypothesis 2 predicted a positive association between reporting companies in industries associated with visible environmental issues and assurance quality, however, all models indicate *negative* associations, thus not supporting hypothesis 2. This indicates that companies in industries that are not associated with visible environmental issues are associated with higher quality assurance on sustainability reports than companies associated with visible environmental issues. This contradicts the findings by Perego and Kolk (2012), who found that traditionally, companies in more polluting industries are associated with higher quality assurance on sustainability reports than companies in less polluting industries. The results found by this thesis may be due to the industry classifications used. It was expected that companies associated with visible environmental issues are more likely to be associated with higher quality sustainability assurance due to higher external stakeholder pressure for these companies. The industries as classified by the CDP were used, which led to a distinction between more polluting industries (utilities, industrials, materials, consumer staple, consumer discretionary) and less polluting industries (energy, information technology, telecommunication, healthcare and financials), in which the more polluting industries were regarded as associated with visible environmental issues, which is a proxy for vulnerability to external stakeholder pressure. However, industries such as resources, water, paper and pulp, chemicals and power generation have traditionally

found to be associated with great environmental impact (Brammer & Pavelin, 2006). Thus, it might be the case that the industries classified as “more polluting” are not the industries associated with visible environmental issues by society.

Table 8

Regressions results with AQ and wAQ as dependent variables

	Model 1	Model 2	Model 3	Model 4
	Regression results with robust standard errors (dependent variable: wAQ)	Regression results with robust standard errors (dependent variable: AQ)	Regression results without influential outliers (dependent variable: wAQ)	Regression results without influential outliers (dependent variable: AQ)
Intercept	21.11*** (7.61)	18.92*** (9.61)	18.99*** (7.17)	17.70*** (9.28)
STAKE (+)	3.63*** (4.14)	2.79*** (4.09)	3.65*** (4.74)	2.55*** (4.58)
IND (+)	-2.08** (-2.39)	-1.45** (-2.18)	-2.76*** (-3.94)	-2.09*** (-4.13)
EP (+)	0.31* (1.80)	0.20 (1.63)	0.39** (2.37)	0.28** (2.38)
MEDIA (+)	-0.34* (-1.78)	-0.25* (-1.79)	-0.51*** (-3.05)	-0.31** (-2.58)
OWN (-)	0.29* (1.81)	0.21* (1.78)	0.17 (1.30)	0.10 (1.12)
AP (+)	1.64 (1.52)	0.96 (1.18)	1.83** (2.41)	1.31** (2.43)
ROA (±)	-0.02 (-0.37)	-0.03 (-0.58)	-0.02 (-0.43)	-0.03 (-0.75)
LEV (±)	-0.02 (-0.08)	-0.03 (-0.15)	0.02 (0.11)	0.02 (0.18)
SIZE (±)	-0.11 (-1.06)	-0.08 (-0.97)	0.02 (0.26)	-0.01 (-0.19)
N	128	128	117	118
R2	0.2538	0.2502	0.3907	0.3672
F-stat.	4.91***	4.32***	7.62***	6.96***
<p>The expected signs for the independent variables are presented in parentheses. ***, ** and * indicate statistical significance at respectively the 1, 5 and 10 percent level (two-tailed) T-values can be found below the regression coefficients, in parentheses. See table 3 for the definitions of the variables.</p>				

Hypothesis 3 predicted a positive association between companies' environmental performance and assurance quality, in the sense that more polluting companies are more likely to be associated with higher quality sustainability assurance. Model 1 and 2 show that only for the weighted assurance quality, an indication of a positive association exists (p -value <0.10). However, model 3 and 4, which exclude influential outliers, show positive and significant associations between environmental performance and assurance quality (p -value <0.05), supporting hypothesis 3. This suggests that companies with poorer environmental performance and higher pollution levels face high stakeholder pressure and threatened legitimacy, and as a response demand higher quality assurance on sustainability reports to reduce this pressure and to maintain or defend organizational legitimacy.

Hypothesis 4 predicted a positive association between a companies' percentage of negative media coverage and sustainability assurance quality, however, all models have found a negative association. Thus, no support for hypothesis 4 is found. This may be due to the measurement of (negative) media coverage. It was expected that companies facing high negative media coverage were likely to experience high stakeholder pressure and threatened legitimacy, as the media has the power to identify both social and environmental issues, and therefore the power to influence stakeholders' perceptions of a company. This in turn was expected to lead to higher quality assurance on sustainability reports, to reduce the pressure and maintain organizational legitimacy. In this thesis, the Orbis database is used for measuring (negative) media coverage, which includes all news articles for each company and a sentiment analysis for negative news. The database covers all news articles, and not articles specifically on environmental and social topics. Thus, the results might have been different when only news articles on these specific topics would have been included.

Hypothesis 5 predicted a negative association between ownership concentration and sustainability assurance quality. However, contrary to the prediction by hypothesis 5, the results from model 1 and 2 show an indicative positive association (p -value <0.10) between ownership concentration and assurance quality. This can be regarded as indicative evidence that companies with more concentrated ownership are associated with higher quality assurance on sustainability reports. However, when outliers are excluded, model 3 and 4 do not show any significant associations between ownership concentration and assurance quality. Thus, there does not seem to be convincing evidence for an association between ownership concentration and quality of sustainability assurance. This may be explained by limitations of the measurement of ownership concentration. This thesis followed earlier research by Brammer and Pavelin (2006) in their measure of ownership concentration, namely data of the largest shareholder, measured as a percentage of a company's share capital. However, it is often assumed that ownership is concentrated when an investor owns

over 20% of outstanding voting shares (Hahn & Kühnen, 2013) and others studies used measures such as the percentage of shareholders holding more than 5% of common stock (e.g. Roberts, 1992). Thus, other measures of ownership concentration might have provided different results.

Finally, hypothesis 6 predicted a positive association between assurance providers from the non-auditing profession and sustainability assurance quality. The regression analyses with robust standard errors from model 1 and 2 do not indicate significant associations between different types of assurance providers and assurance quality. However, when the results of the regression analyses with robust standard errors (model 1 and 2) are compared to the regression analyses without influential outliers (model 3 and 4), a difference is shown. In models 3 and 4, a positive and significant association (p -value < 0.05) is found between assurance providers from the non-auditing profession and assurance quality, which supports hypothesis 6 and indicates that assurance providers from the non-auditing profession are associated with higher quality assurance than assurance providers from the auditing profession, as implied by earlier research by O'Dwyer and Owen (2005) and Deegan et al. (2006). Furthermore, no associations between the control variables and assurance quality have been found by any of the models.

4.3 Interaction effects

Both the models with the unweighted measure of assurance quality and the models with the weighted measure of assurance quality as dependent variables were checked for possible interactions. Presence of interaction effects would indicate that the effect of any of the independent variables on (weighted) assurance quality differs depending on the value of one of the other independent variables (Jaccard & Turrisi, 2003). However, no significant interaction terms were found for the models at the 1 or 5% level. Only one significant interaction effect was found at the 10% level, which can only be regarded as indicative evidence of the presence of an interaction effect.

4.4 Big 4 audit firms analysis

The regression analyses from table 8 have only made a distinction between assurance providers from the non-auditing profession and assurance providers from the auditing profession. However, it could also be of interest to see whether or not the big 4 audit firms provide different levels of quality for assurance statements on sustainability reports. This gives more insights into the association between different assurance providers and assurance quality. Table 9 shows the frequency and percentages of big 4 assurance

providers chosen by companies that chose to buy assurance from an assurance provider from the auditing profession. Table 10 shows the regression results including three of the four dummy variables for the big 4 auditors, namely PWC, EY and KPMG, with Deloitte as the reference group.

Table 9
Frequency and percentages of big 4 assurance providers chosen

Provider	Frequency	Percent
Deloitte	16	17.58
EY	21	23.08
KPMG	22	24.18
PWC	32	35.16
Total	91	100.00

The results indicate that, controlling for all other variables, PWC provides assurance of higher quality compared to Deloitte. This difference is significant at the 5% level. There are no statistically significant differences in assurance quality from EY and KPMG compared to Deloitte. Also, the reported significant difference only holds for the regression equation with the unweighted measure of assurance quality and not for the regression equation with the weighted measure. This might indicate that, as mentioned by Deegan et al. (2006), big 4 auditors use standardized formats and are uniform in sustainability assurance structure.

Table 10
Regression results with big 4 audit firms analysis

	Regression results with robust standard errors (dependent variable: wAQ)	Regression results with robust standard errors (dependent variable: AQ)
Intercept	18.75*** (7.39)	16.41*** (9.78)
STAKE	3.09*** (4.92)	2.34*** (4.67)
IND	-2.03*** (-2.76)	-1.32*** (-2.68)
EP	0.27 (1.51)	0.18 (1.55)
MEDIA	-0.22 (-1.45)	-0.15 (-1.41)
OWN	0.23 (1.50)	0.16 (1.56)
PWC	1.00 (1.09)	1.24** (2.11)
EY	0.18 (0.17)	0.45 (0.63)
KPMG	0.30 (0.31)	0.77 (1.15)
ROA	-0.00 (-0.02)	-0.01 (-0.30)
LEV	0.05 (0.28)	0.03 (0.26)
SIZE	0.04 (0.46)	0.04 (0.74)
N	91****	91****
R2	0.2991	0.3493
F-stat.	4.39***	4.15***
<p>***, ** and * indicate statistical significance at respectively the, 1, 5 and 10 percent levels (two-tailed).</p> <p>**** Even though 92 companies bought assurance from a provider from the auditing profession, the analyses only include 91 observations, as one company bought assurance from a combined provider (two big 4 audit firms).</p> <p>T-values can be found below the regression coefficients, in parentheses.</p> <p>See table 3 for the definitions of the variables.</p>		

5. Discussion and conclusion

This thesis aimed at answering the question “*What are determinants of the quality of external assurance on sustainability reports?*” The results indicate that companies in countries that are stakeholder-oriented and have poor environmental performance are positively associated with the quality of assurance on sustainability reports. It is expected that these associations exist because these specific companies face high external stakeholder pressure and demand for credible information. These results indicate that higher quality assurance may be used strategically in order to reduce stakeholder pressure and legitimacy threats, and their consequences such as reduced reputation. Furthermore, the results provide support for the expectation that the quality of assurance on sustainability reports is higher when assurance providers from the non-auditing profession conduct the assurance engagement.

Even though the results of this thesis only hold for a sample of a limited amount of companies, they may provide useful insights for reporting companies that seek high quality assurance on sustainability reports, and also for stakeholders seeking credible sustainability information. The results of this thesis partly support the expectation that stakeholder pressures are positively associated with sustainability assurance quality, indicating that when these pressures rise, assurance quality will be higher. This is a rather pessimistic conclusion, as the goal of sustainability assurance should always be increasing the credibility of sustainability reports by providing high quality assurance, regardless of stakeholder pressures companies face. Together with the relatively low scores the 128 companies achieved for the quality of external assurance on their sustainability reports, this points to a need for a mandated disclosure and assurance regime. Mandatory sustainability reporting and assurance can bring the assurance practice further in line with the existing international guidelines from the GRI, IFAC, and AccountAbility. Furthermore, for reporting companies that want to provide high quality sustainability reports, the results of this thesis provide indicative evidence that assurance providers from the non-auditing profession are more likely to help with achieving this goal.

This thesis is not without its limitations. Measuring quality of external assurance on sustainability reports is not an easy task, and using content analysis is not a perfect way of measuring this quality. It is unlikely that for instance management’s influences on the assurance process can completely be discovered through analyzing assurance statements, and for an in-depth analysis of the assurance process and statement, case studies might be more appropriate. However, content analysis makes it possible to identify if the assurance statement has concluded that the sustainability report gives an account of the company and its performance that report users can rely on, and to identify if the report is regarded to be

complete, accurate, honest and balanced in its representation of the company. Those are crucial aspects of high quality assurance (Adams & Evans, 2004). Furthermore, this thesis measured the quality of assurance statements for over a hundred companies, which could not have been done through case studies within a limited time frame. Moreover, content analysis is the most common method for defining quality of sustainability assurance in current literature (Zorio et al., 2013).

Two other limitations can be mentioned. The results of the regression analyses have not shown significant associations between ownership concentration and assurance quality, and have found associations opposite from what was expected between assurance quality and media coverage, and assurance quality and industry associations. It was expected that companies with dispersed ownership, companies with a high amount of negative media coverage, and companies in industries associated with visible environmental issues were likely to experience high stakeholder pressure, and that these variables would have been positively associated with assurance quality. The lack of results and the results contrary to the expectations might have been caused by data limitations and the measurement of the variables. As indicated, there are many ways of measuring ownership concentration, which can lead to different results. Furthermore, the industries as categorized by the CDP do not include the industries traditionally associated with high environmental impact, and the amount of media coverage has not been specified for only the articles on environmental or social topics. As a final limitation, this thesis has identified several variables that can be regarded as indicators of external stakeholder pressure, however it might be the case that variables of interest have been omitted.

Future research could examine the quality of sustainability assurance further, as this thesis emphasizes variation in quality and room for improvement. In-depth case studies on assurance engagements can provide useful insights into the current practice of sustainability assurance, its quality, approaches to assurance and possible management involvement in the process. Furthermore, the indicative evidence from this study that assurance providers from the non-auditing profession are associated with higher quality assurance may be interesting for future research. This finding might indicate that assurance providers from the non-auditing profession have a greater set of skills required for sustainability assurance services. Of interest could be studies examining whether quality of assurance is context specific in the sense that assurance engagements for different types of companies require different sets of skills. It is likely that conducting assurance engagements for financial institutions or for oil producers are very different and require different types of expertise and skills. Thus, context- and industry- specific studies on assurance quality can be of interest. In line with this, future research could examine whether differences exist in assurance quality

between assurance providers who operate globally and assurance providers who do not. Operating globally means that assurance providers have access to global, potentially broader, knowledge and support, which is not the case for domestic assurance providers. Thus, differences in quality can be examined based upon industry classifications, assurance provider type, and domestic or multinational assurance providers. Moreover, as this thesis points to a need for a mandatory disclosure and assurance regime, future research could also examine the consequences of mandatory sustainability reporting and assurance. In several countries, such as Sweden, sustainability reporting and assurance according to the GRI guidelines is mandatory for state-owned companies.

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Appendices

Appendix A – Research instrument for measuring assurance quality

Ranking criteria	Definition	Scale (total 35 points for AQ, total 45 points for wAQ)
1. Title	Title of the assurance statement	0 No reference 1 Reference
2. Addressee	Party to whom the assurance statement is formally addressed (either in title separate addressee line or within text)	0 No reference 1 Addressee is internal 2 Readers 3 Stakeholder mentioned
3. Name of assesor	Name of the firm that conducts the assurance engagement	0 No reference 1 Reference
4. Location of assesor	Location of the office of the assurance provider	0 No reference 1 Reference
5. Report date	Reference to the date at which the assurance exercise was finished	0 No reference 1 Reference
6. Responsibilities of reporter	Explicit statement that reporter is responsible for preparation of report (keywords: responsible, responsibility)	0 No reference 1 Reference
7. Responsibilities of assesor	Explicit statement that the reporter is responsible to express an (independent) opinion on the subject matter (the sustainability/environmental/social report)	0 No reference 1 Reference
8. Independence of assesor from reporting organization	Statement expressing the independence of the two parties involved (a 1 is assigned as soon as the word(s) independent or independence appear anywhere in the assurance statement or its title. Thus, remarks such as “this is an independent opinion...” already qualifies for a 1)	0 No reference 1 Reference or mere statement expressing that independence can be looked up on the internet
9. Impartiality of assesor towards stakeholders	Assesor’s declaration of impartiality with respect to stakeholder interests	0 No reference 1 Reference (a remark that such a declaration can be made available on request or reference to an internet site already qualifies for a 1)

10. Scope of the assurance engagement	Assurance statement coverage (a 1 is assigned if anywhere in the assurance statement the coverage of the assurance exercise is stated)	0 No reference 1 Reference
11. Objective of the assurance engagement*	Objective to be achieved through the engagement (indicating the level of assurance intended)	0 No reference 1 Review, limited assurance, independent opinion, independent assurance, external verification, external assurance or validation 2 Reasonable assurance or reasonable and limited assurance (e.g., two different levels of assurance for different parts of the report)
12. Competencies of assessor	Description of the professional skills that enable the engagement team to conduct the assurance exercise	0 No reference 1 Statement claiming competency (but no explanatory note) or mere reference to an internet site 2 Explanatory statement of competencies based on prior experience/engagements
13. Criteria used to assess evidence and reach conclusion	A statement that makes reference to particular criteria against which the sustainability report has been prepared (e.g. GRI and often internally developed standards)	0 No reference 1 Reference to publicly unavailable criteria 2 Reference to summarized criteria which can be requested from the firm's HQ 3 Reference to publicly available criteria (e.g., internally developed criteria that are published anywhere in the report or GRI)
14. Assurance standard used	Standards used which govern the work of the assurance provider (e.g. AA1000AS or ISAE3000)	0 No reference 1 Reference to publicly unavailable criteria 2 Reference to summarized criteria which can be requested from the firm's HQ 3 Reference to publicly available criteria
15. Summary of work performed	Statement explaining the actions taken to arrive at a conclusion	0 No reference 1 Reference

16. Materiality (from a stakeholder perspective)*	Degree of information provision on materiality level. If the conclusion states that the report is in conformance with the AA1000 principles (Materiality, completeness, and responsiveness) this qualifies for a reference and thus a 1 is assigned	<p>1 Reference limited to a broad statement (e.g. "covers all material aspects" or "...in all material respects...") but also negative statements claiming that assessor has not undertaken any work to confirm that all relevant/ material issues are included</p> <p>2 Reference and explanation of materiality setting or reference limited to a broad statement and stakeholder perspective introduced (e.g. "issues material to stakeholders have been considered")</p> <p>3 Reference, explanation of materiality setting and stakeholder perspective introduced</p>
17. Completeness*	Statement expressing that all material aspects are covered by the report. If the conclusion states that the report is in conformance with the AA1000 principles (Materiality, completeness, and responsiveness) this qualifies for a reference and thus a 1 is assigned	<p>0 No reference</p> <p>1 Reference</p>
18. Responsiveness to stakeholders*	Statement referring to the organization's procedures (or lack of them) for identifying stakeholder interests and concerns. If the conclusion states that the report is in conformance with the AA1000 principles (Materiality, completeness, and responsiveness) this qualifies for a reference and thus a 1 is assigned	<p>0 No reference</p> <p>1 Reference</p> <p>2 Reference including explanations of procedures</p>
19. General conclusion/opinion*	Statement expressing the result of the assurance exercise. If there is no general conclusion but the conclusion solely refers to the 3 principles of AA1000 (Materiality, completeness, and responsiveness) a 0 is assigned	<p>0 No reference</p> <p>1 Mere statement expressing the opinion of the assessor (e.g., "XY's report is a fair presentation of XY's CSR performance"). A 1 is assigned only if the conclusion consists only of one sentence</p> <p>2 Explanatory statement (more than one sentence, but recommendations for improvement are not considered part of the conclusion)</p>

20. Introduction	0 No reference 1 Reference
21. Limitations	0 No reference 1 Reference
22. Recommendations/ observations	0 No reference 1 Reference
23. Signature assesor	0 No reference 1 Reference

* indicates that theses scores are doubled for the weighted assurance quality (wAQ).
Grey highlights indicate than an adjustment to the original research instrument by Perego and Kolk
(2012, p. 187) has been made.

Appendix B – Regression assumptions

1. Regression analysis with weighted assurance quality (wAQ)

Assumption: homoskedasticity

White's test for H_0 : homoskedasticity

against H_a : unrestricted heteroskedasticity

$\chi^2(51) = 83.73$

$\text{Prob} > \chi^2 = 0.0026$

Assumption: normality residuals

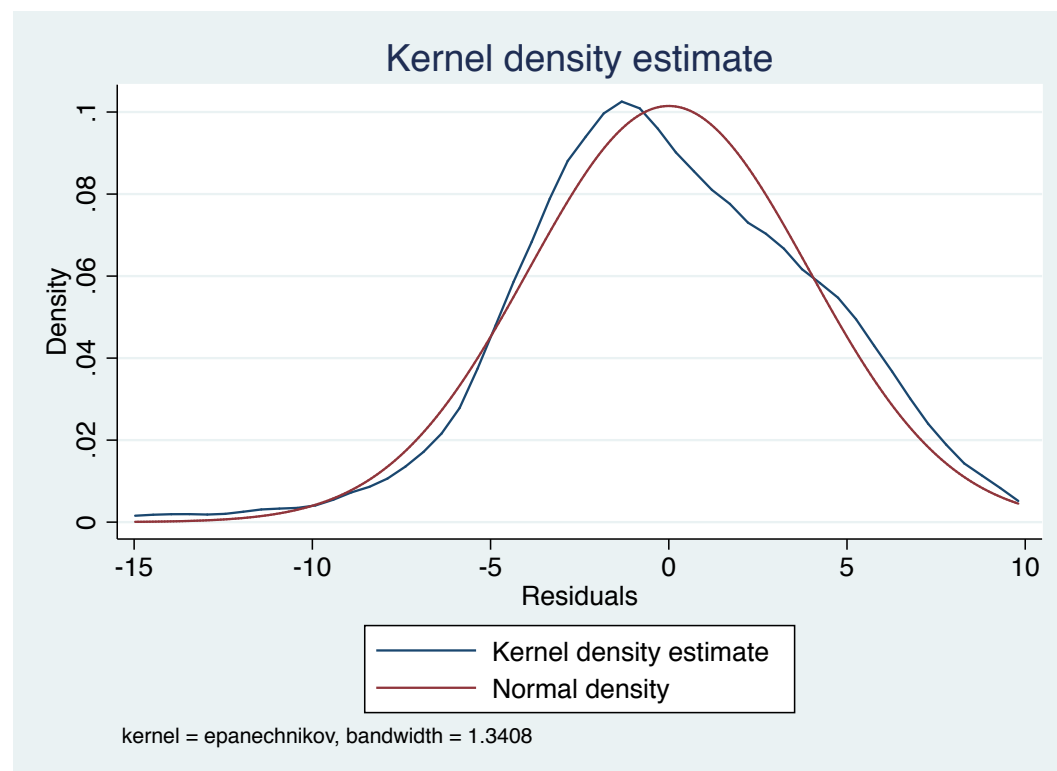


Figure 2. Kernel density plot of residuals with normal distribution superimposed

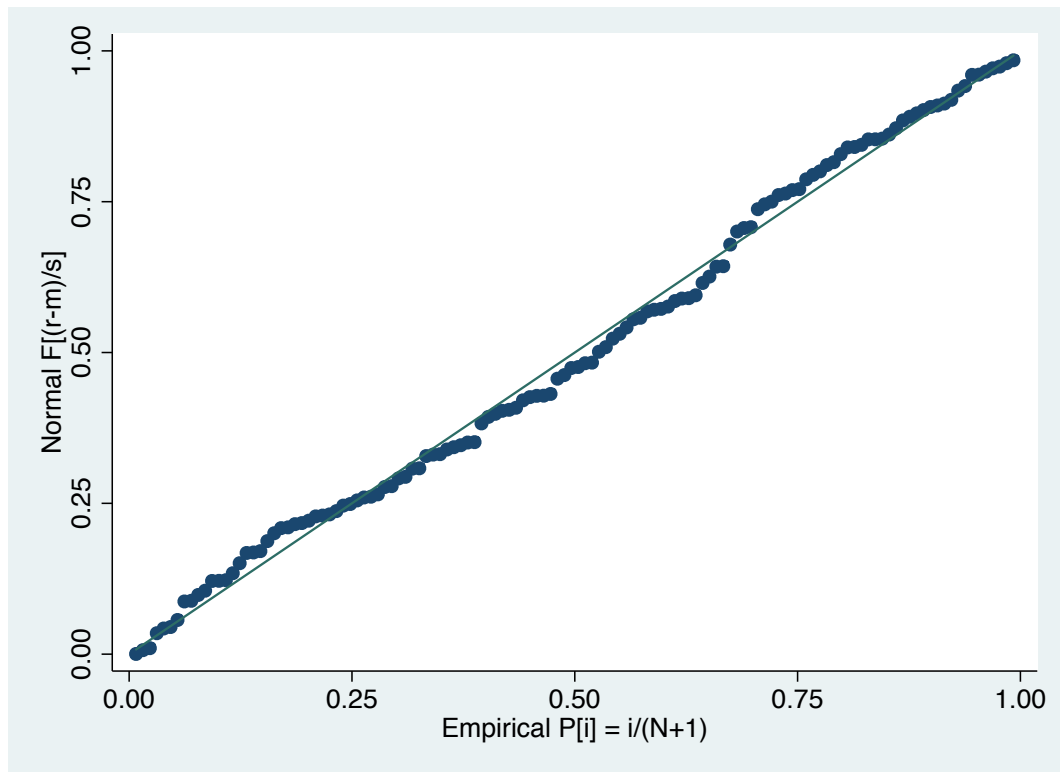


Figure 3. Normal probability plot

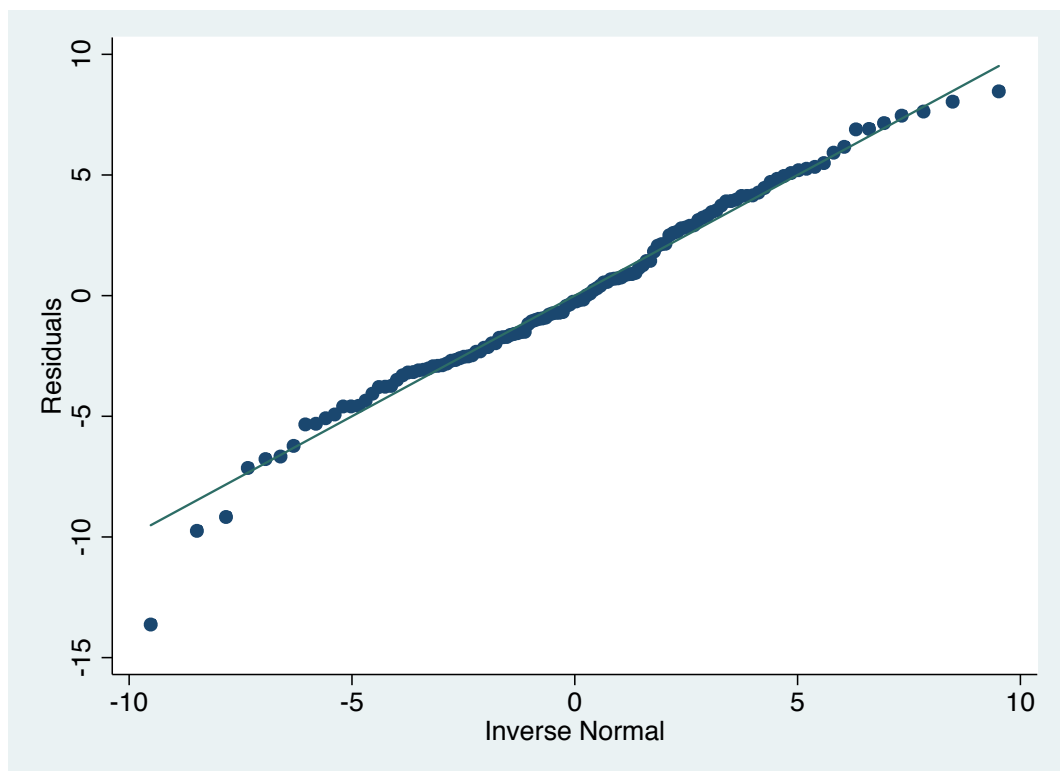


Figure 4. Normal quantile plot

2. Regression analysis with assurance quality (AQ)

Assumption: homoskedasticity
White's test for H_0 : homoskedasticity against H_a : unrestricted heteroskedasticity $\chi^2(51) = 85.89$ $\text{Prob} > \chi^2 = 0.0016$

Assumption: normality residuals
--

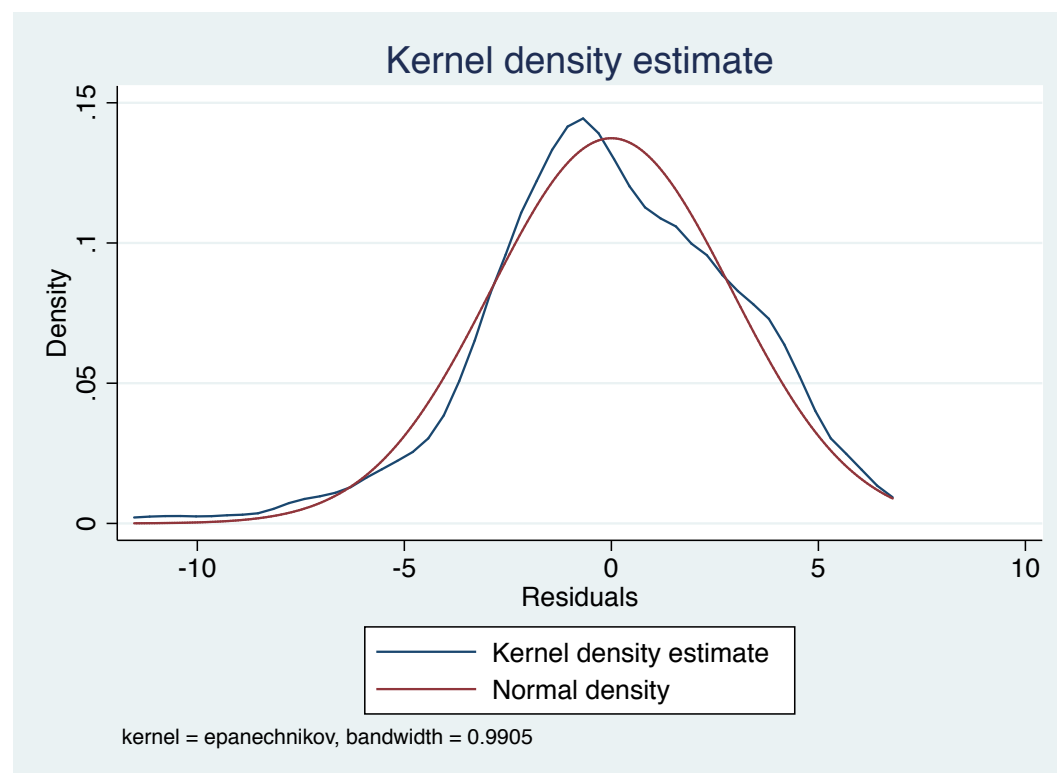


Figure 5. Kernel density plot of residuals with normal distribution superimposed

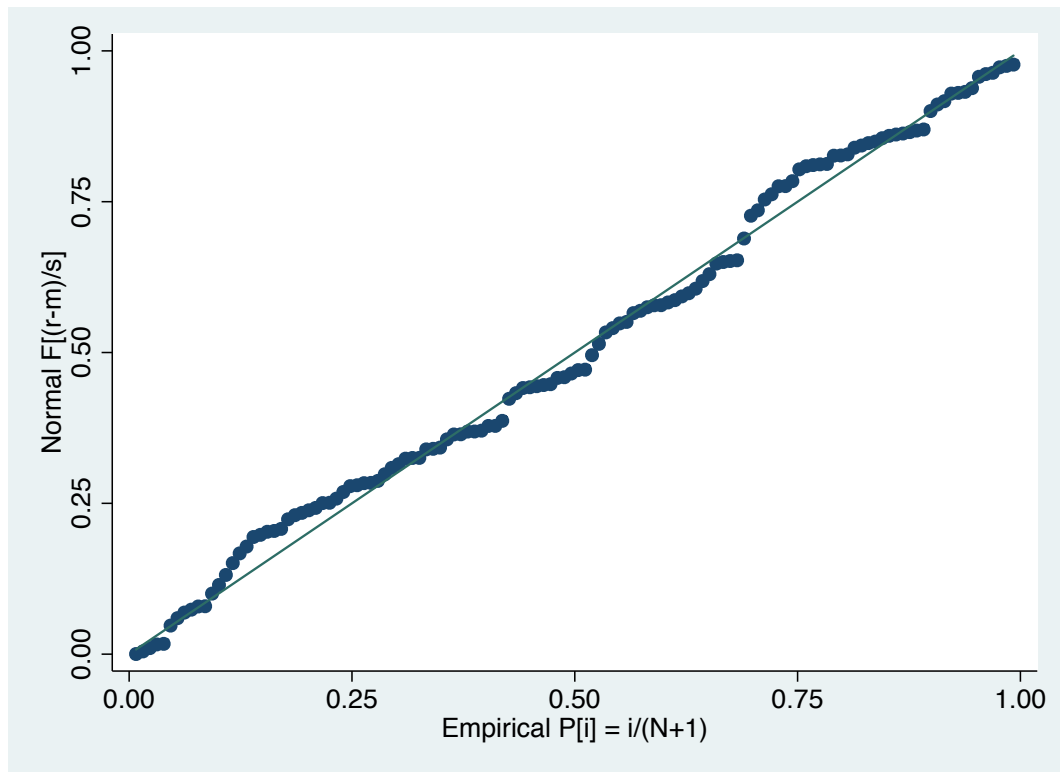


Figure 6. Normal probability plot

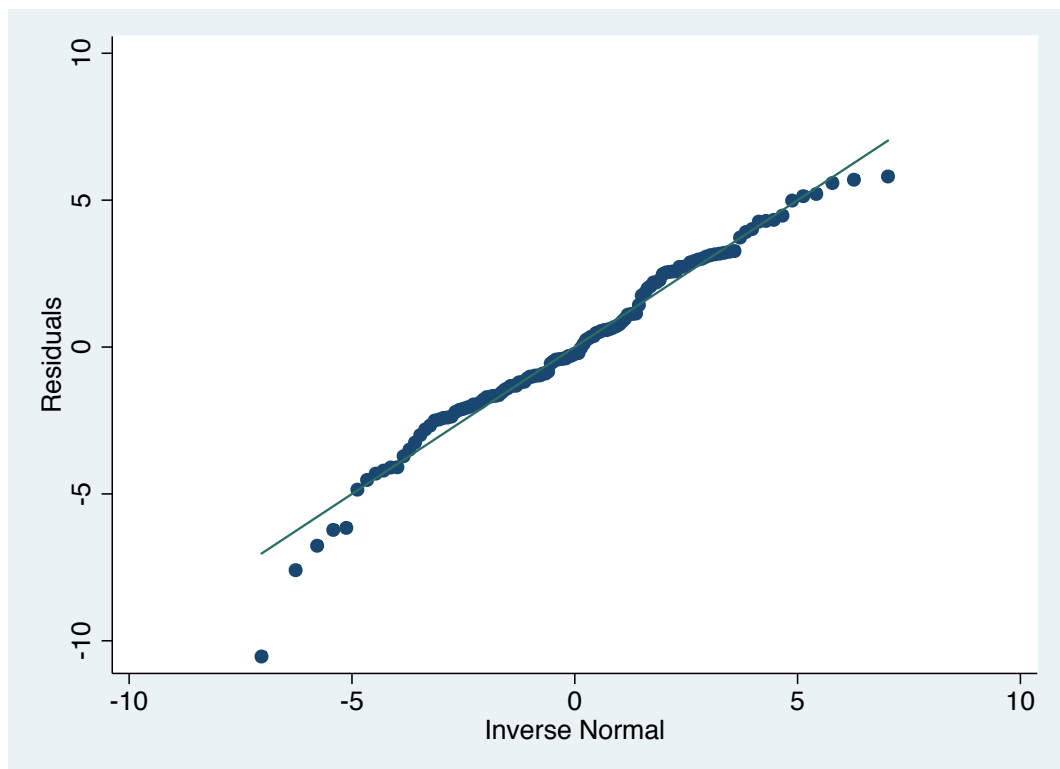


Figure 7. Normal quantile plot

3. Regression analysis with assurance quality (AQ), without influential outliers

Assumption: homoskedasticity
White's test for H_0 : homoskedasticity against H_a : unrestricted heteroskedasticity $\chi^2(51) = 58.65$ $\text{Prob} > \chi^2 = 0.2154$

Assumption: normality residuals
--

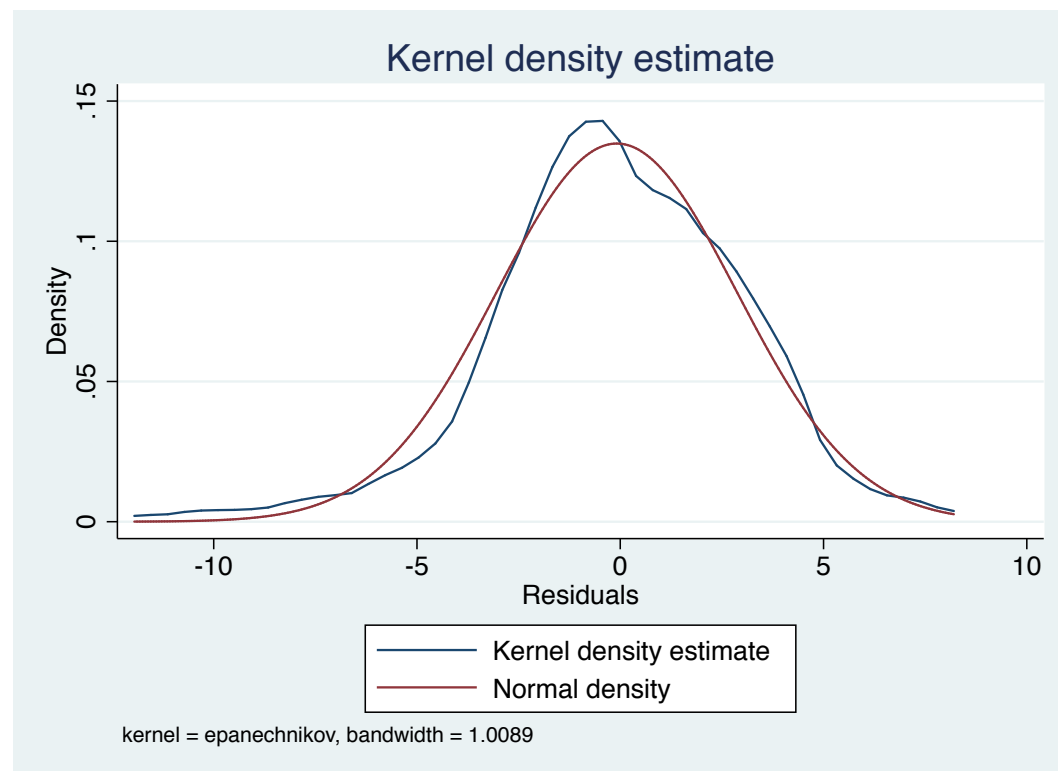


Figure 8. Kernel density plot of residuals with normal distribution superimposed

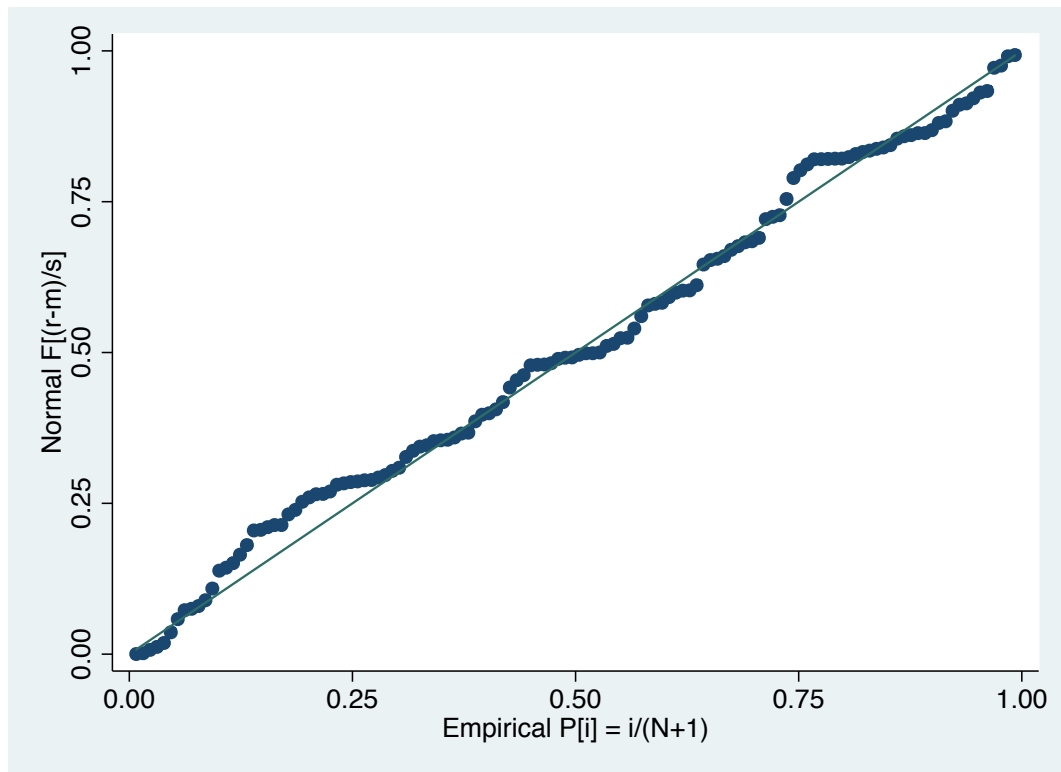


Figure 9. Normal probability plot

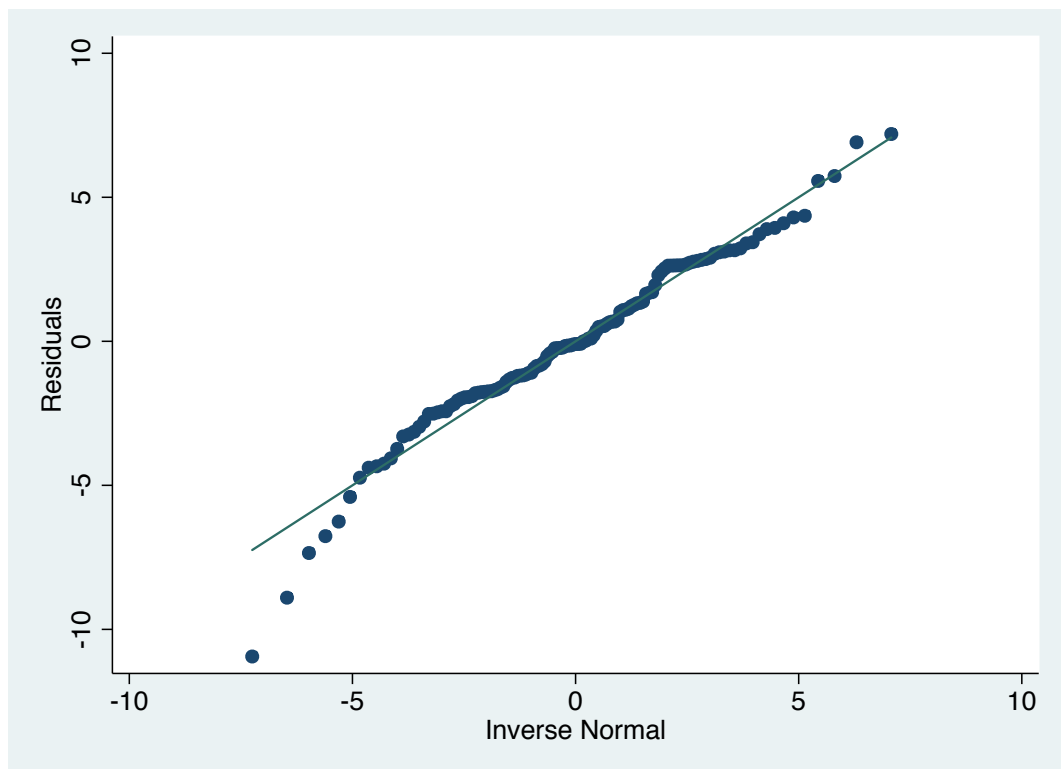


Figure 10. Normal quantile plot

4. Regression analysis with weighted assurance quality (wAQ), without influential outliers

Assumption: homoskedasticity

White's test for H_0 : homoskedasticity
against H_a : unrestricted heteroskedasticity

$\chi^2(51) = 46.14$

Prob > $\chi^2 = 0.6667$

Assumption: normality residuals

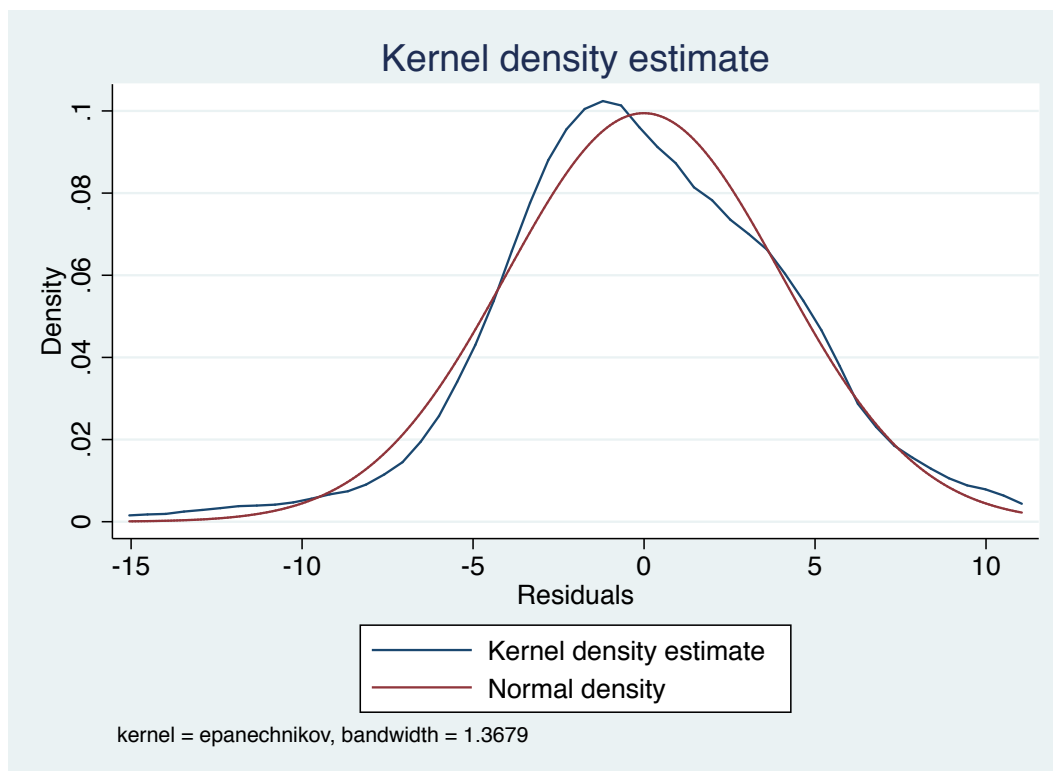


Figure 11. Kernel density plot of residuals with normal distribution superimposed

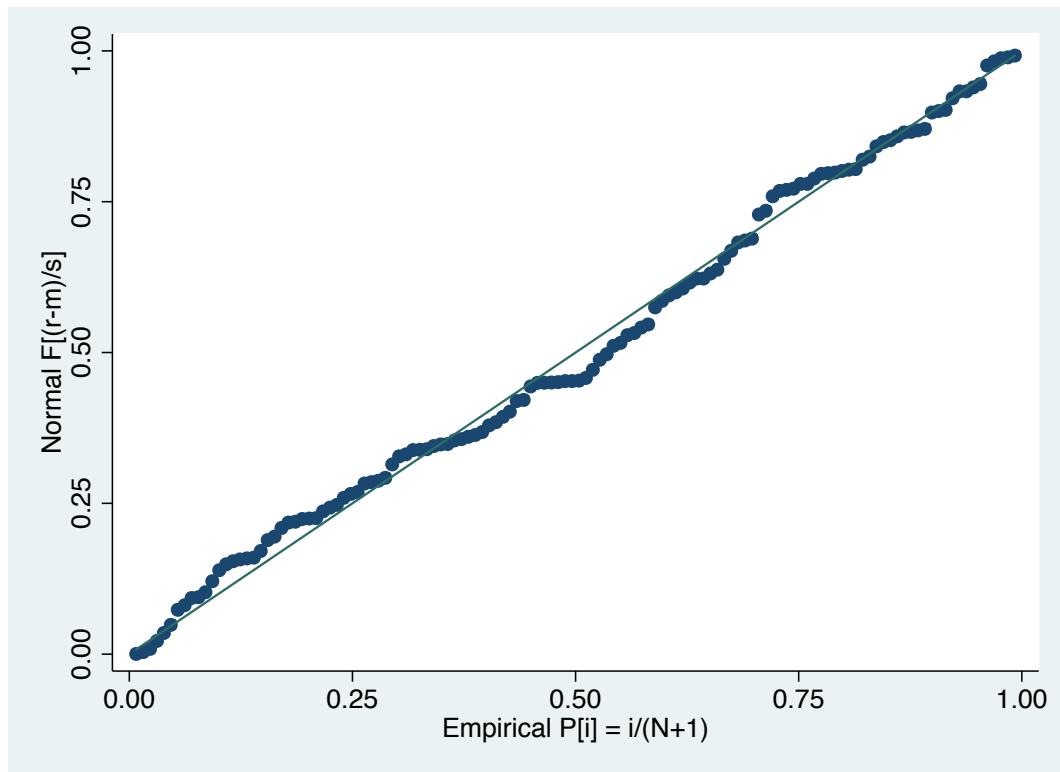


Figure 12. Normal probability plot

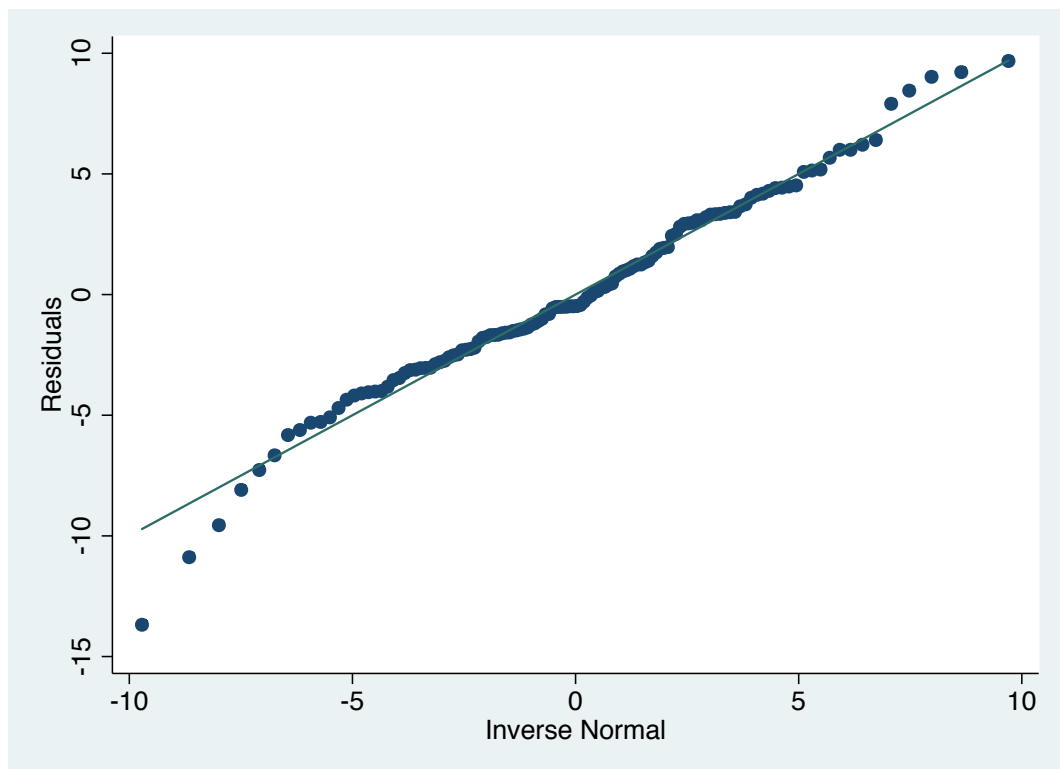


Figure 13. Normal quantile plot

Appendix C – Data transformation

1. Variable: ownership concentration (OWN)

Table 11

Subset of the ladder of powers for variable transformations into normal distributions

Transformation	formula	chi2(2)	P(chi2)
cubic	OWN^3	65.69	0.000
square	OWN^2	49.31	0.000
identity	OWN	19.67	0.000
square root	\sqrt{OWN}	8.80	0.012
log	$\log(OWN)$	32.05	0.000
1/(square root)	$1/\sqrt{OWN}$	.	0.000
inverse	$1/OWN$	.	0.000
1/square	$1/(OWN^2)$	.	0.000
1/cubic	$1/(OWN^3)$	.	0.000

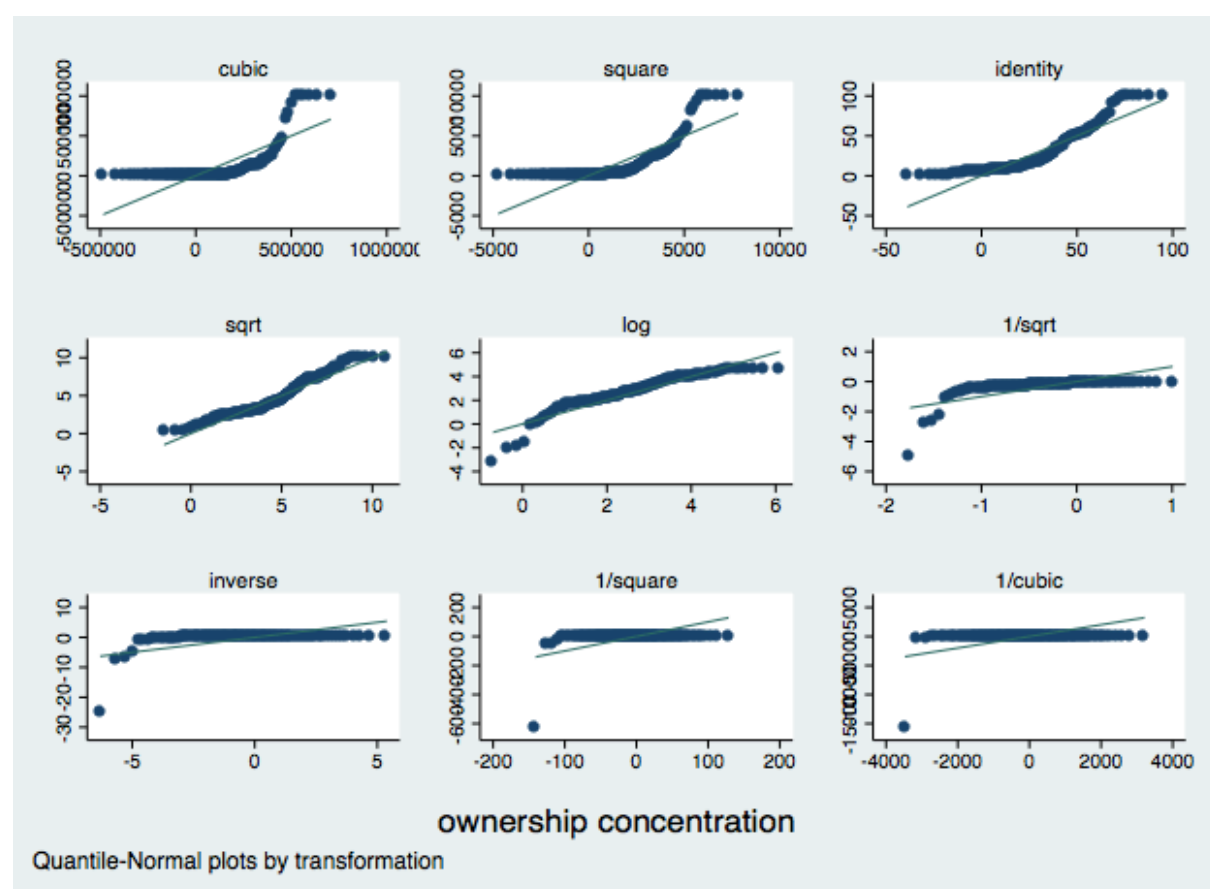


Figure 14. Quantiles of transforms of OWN (according to the ladder of powers) against the quantiles of a normal distribution.

2. Variable: leverage (LEV)

Table 12

Subset of the ladder of powers for variable transformations into normal distributions

Transformation	formula	chi2(2)	P(chi2)
cubic	$LEV1^3$	.	0.000
square	$LEV1^2$	.	0.000
identity	$LEV1$	28.02	0.000
square root	$\sqrt{LEV1}$	1.00	0.605
log	$\log(LEV1)$	52.91	0.000
1/(square root)	$1/\sqrt{LEV1}$	.	0.000
inverse	$1/LEV1$	.	0.000
1/square	$1/(LEV1^2)$	.	0.000
1/cubic	$1/(LEV1^3)$	.	0.000

The variable *LEV* is first transformed into *LEV1*, to include only values >0 in order to show all possible transformations.

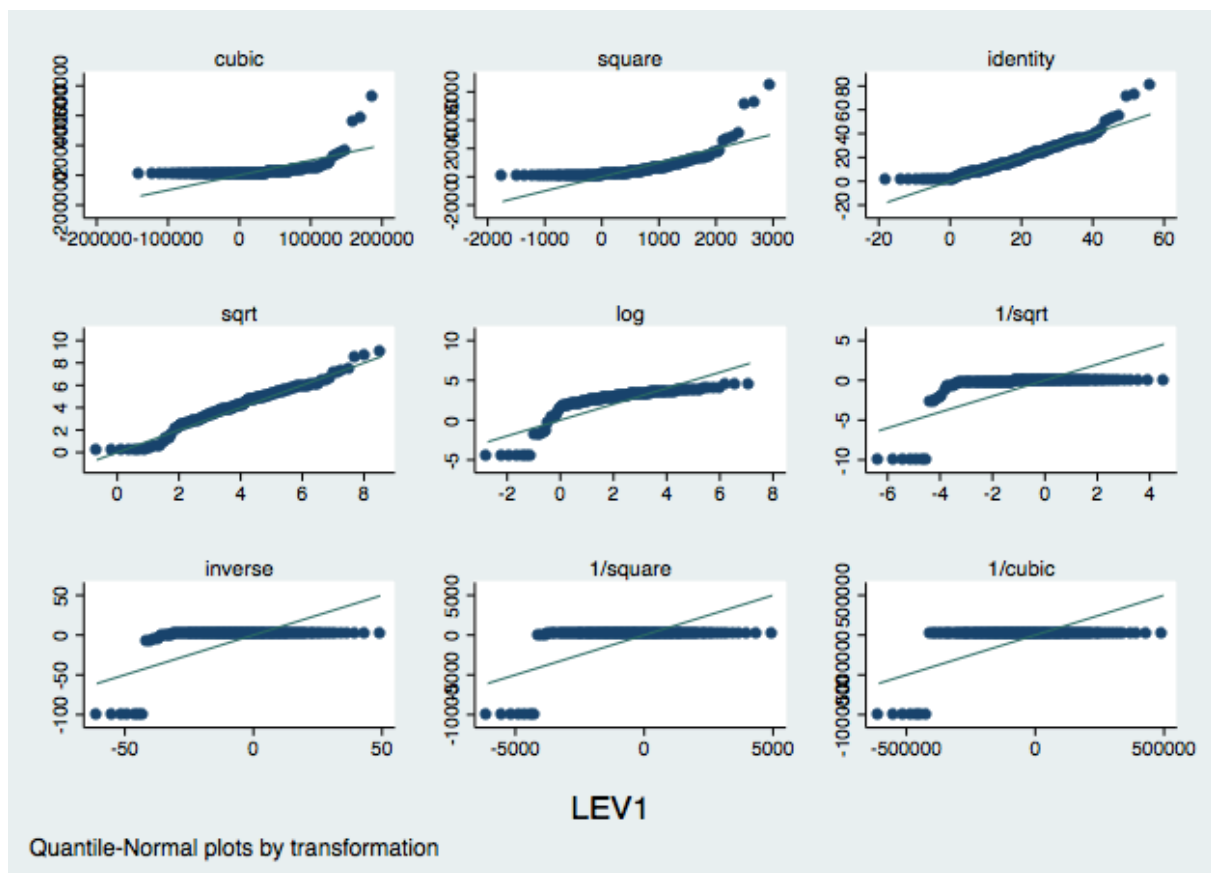


Figure 15. Quantiles of transforms of LEV1 (according to the ladder of powers) against the quantiles of a normal distribution.

3. Variable: return on assets (ROA)

Table 13

Subset of the ladder of powers for variable transformations into normal distributions

Transformation	formula	chi2(2)	P(chi2)
cubic	$ROA1^3$	.	0.000
square	$ROA1^2$	.	0.000
identity	$ROA1$	54.99	0.000
square root	$\sqrt{ROA1}$	67.69	0.000
log	$\log(ROA1)$	.	0.000
1/(square root)	$1/\sqrt{ROA1}$	.	0.000
inverse	$1/ROA1$	.	0.000
1/square	$1/(ROA1^2)$	.	0.000
1/cubic	$1/(ROA1^3)$	.	0.000

The variable ROA is first transformed into ROA1, to include only values >0 in order to show all possible transformations.

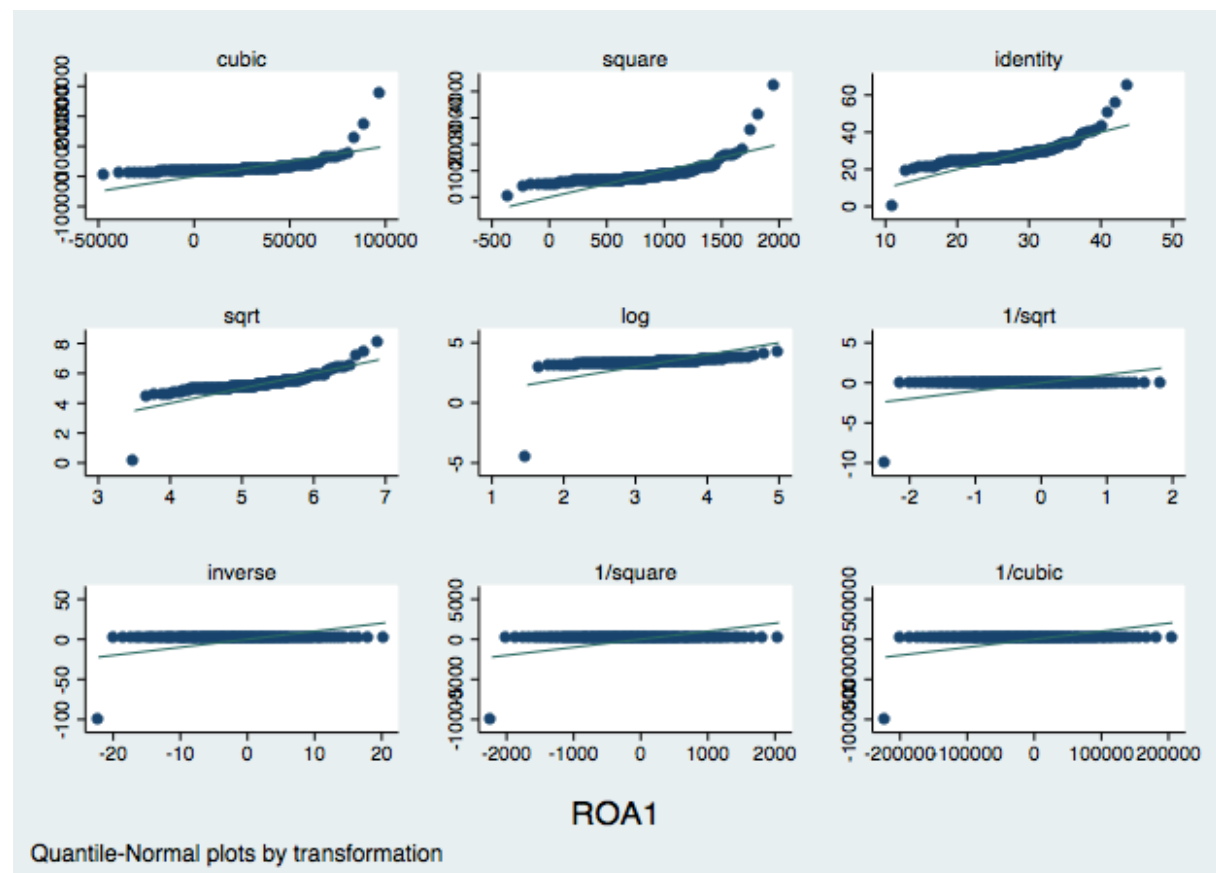


Figure 16. Quantiles of transforms of ROA1 (according to the ladder of powers) against the quantiles of a normal distribution.

4. Variable: size (SIZE)

Table 14

Subset of the ladder of powers for variable transformations into normal distributions

Transformation	formula	chi2(2)	P(chi2)
cubic	SIZE^3	27.65	0.000
square	SIZE^2	12.65	0.002
identity	SIZE	1.28	0.528
square root	sqrt(SIZE)	6.48	0.039
log	log(SIZE)	18.93	0.000
1/(square root)	1/sqrt(SIZE)	35.86	0.000
inverse	1/SIZE	54.64	0.000
1/square	1/(SIZE^2)	.	0.000
1/cubic	1/(SIZE^3)	.	0.000

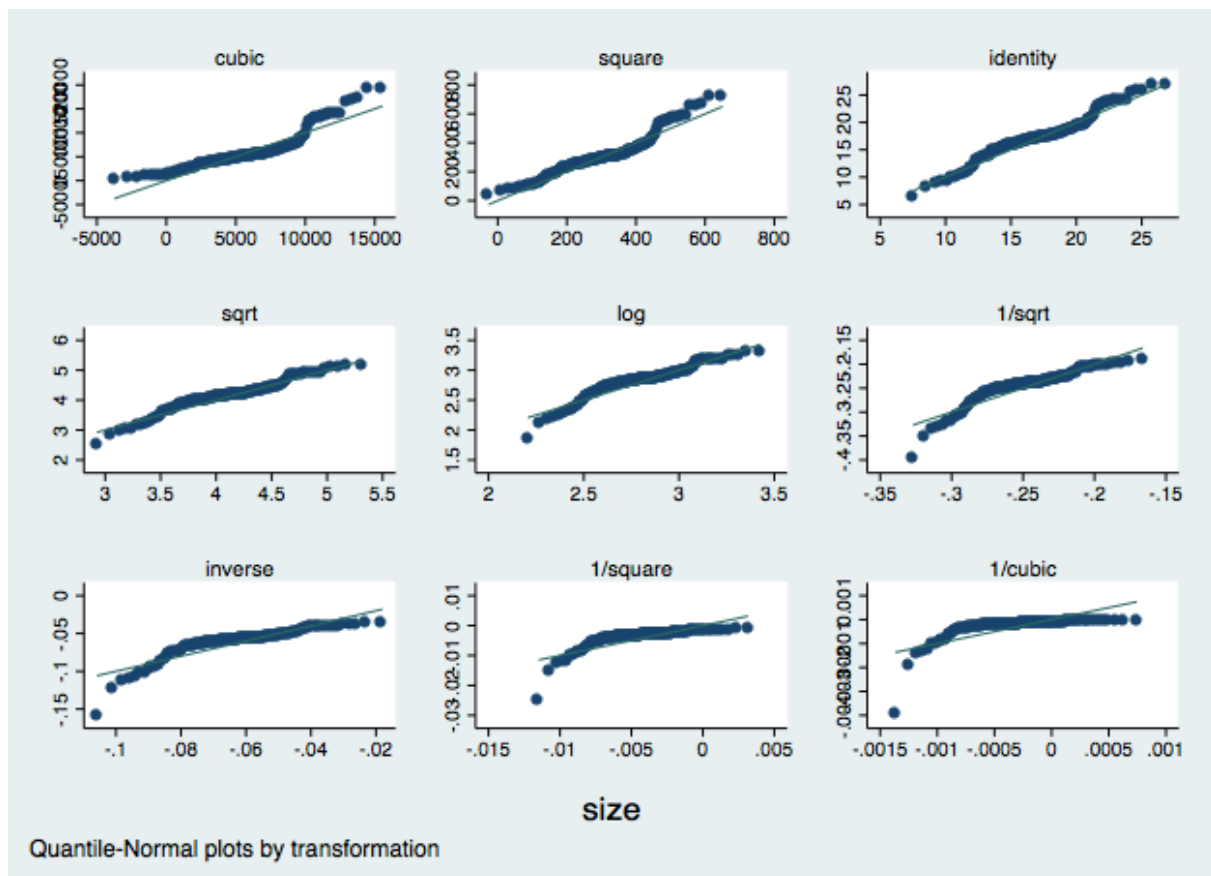


Figure 17. Quantiles of transforms of SIZE (according to the ladder of powers) against the quantiles of a normal distribution.

5. Variable: media (MEDIA)

Table 15

Subset of the ladder of powers for variable transformations into normal distributions

Transformation	formula	chi2(2)	P(chi2)
cubic	$MEDIA1^3$	.	0.000
square	$MEDIA1^2$	.	0.000
identity	$MEDIA1$	45.03	0.000
square root	$\sqrt{MEDIA1}$	18.52	0.000
log	$\log(MEDIA1)$	.	.
1/(square root)	$1/\sqrt{MEDIA1}$	.	.
inverse	$1/MEDIA1$	.	.
1/square	$1/(MEDIA1^2)$	.	.
1/cubic	$1/(MEDIA1^3)$	.	.

The variable *MEDIA* is first transformed into *MEDIA1*, to include only values >0 in order to show all possible transformations.

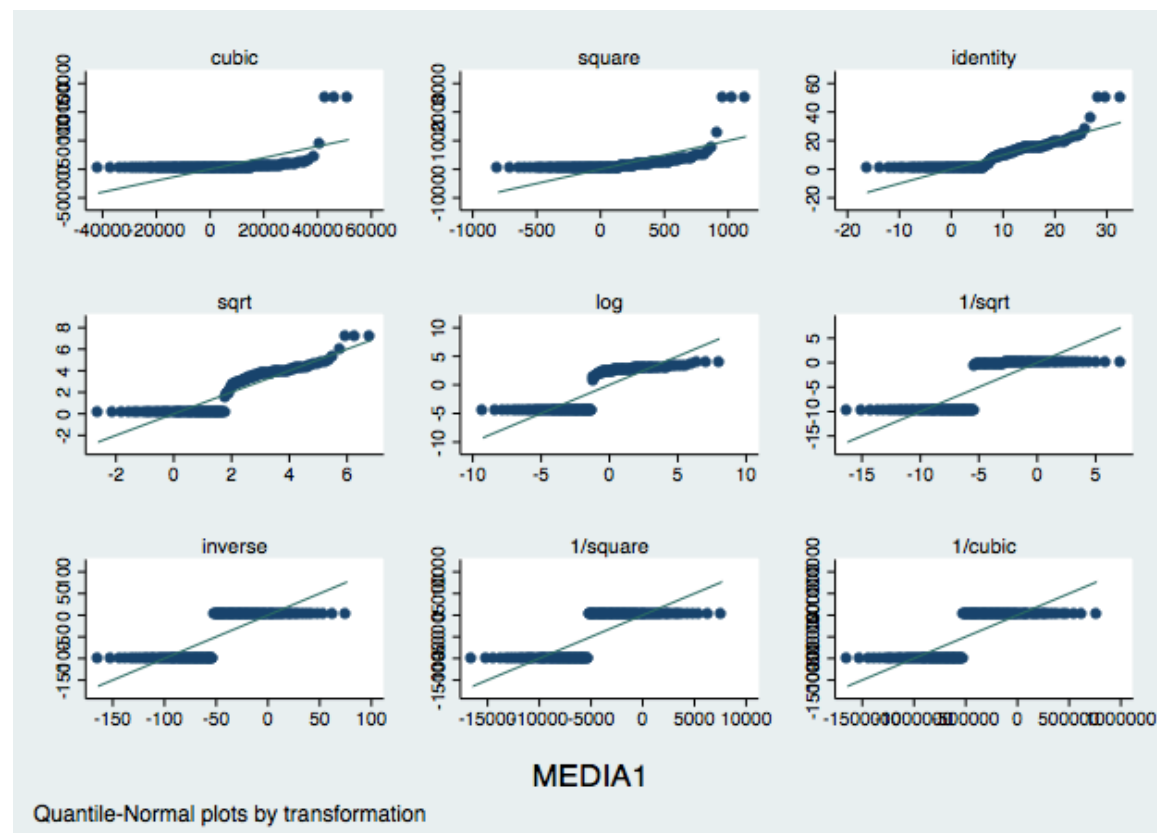


Figure 18. Quantiles of transforms of MEDIA1 (according to the ladder of powers) against the quantiles of a normal distribution.

6. Variable: environmental performance (EP)

Table 16

Subset of the ladder of powers for variable transformations into normal distributions

Transformation	formula	chi2(2)	P(chi2)
cubic	EP^3	.	0.000
square	EP^2	.	0.000
identity	EP	.	0.000
square root	\sqrt{EP}	.	0.000
log	$\log(EP)$	4.27	0.118
1/(square root)	$1/\sqrt{EP}$	.	0.000
inverse	$1/EP$	.	0.000
1/square	$1/(EP^2)$	.	0.000
1/cubic	$1/(EP^3)$	.	0.000

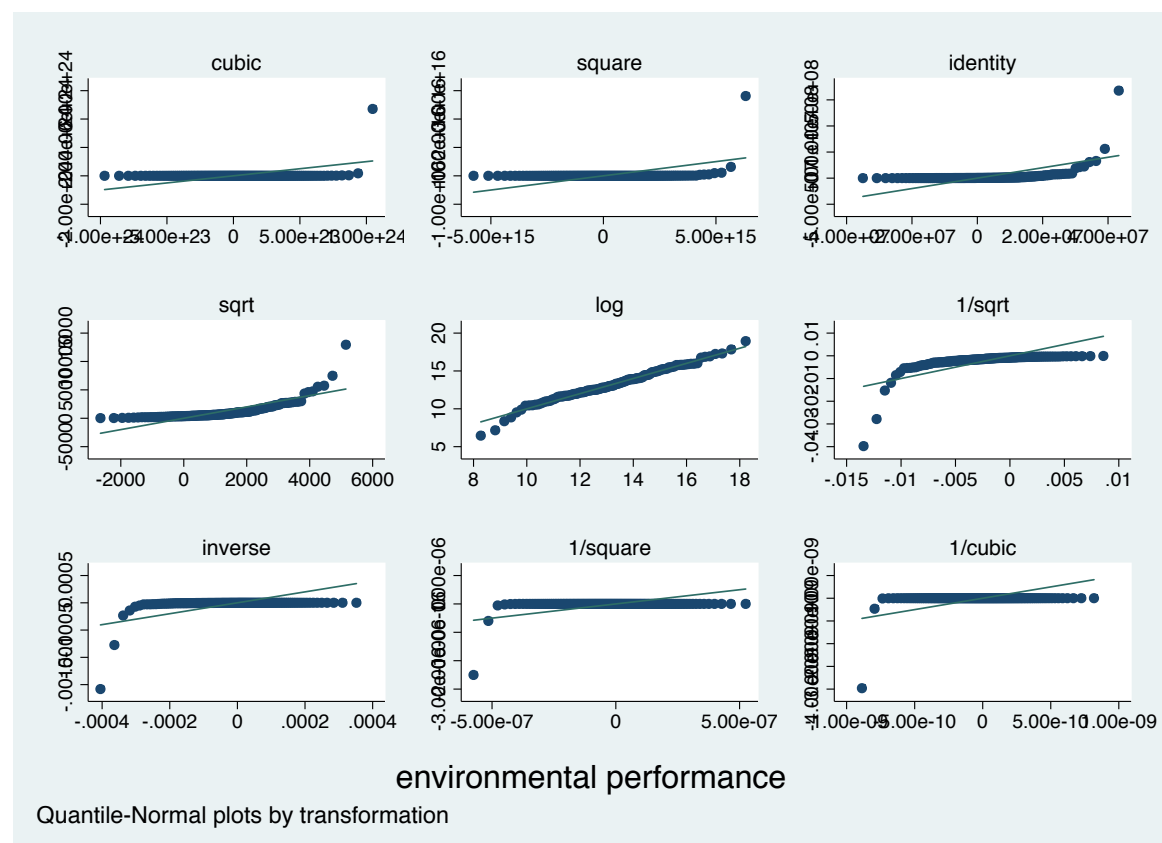


Figure 19. Quantiles of transforms of EP (according to the ladder of powers) against the quantiles of a normal distribution.

Appendix D – Assurance quality per company

Company	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	AQ	wAQ
Abengoa	1	1	1	1	1	1	1	1	0	1	2	1	3	3	1	1	1	1	2	0	0	1	1	26	33
Accenture	1	1	1	1	1	1	1	0	0	1	1	0	0	3	1	0	0	0	1	0	0	1	1	16	18
ACCIONA SA	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	1	0	1	1	26	32
Amadeus IT Holding	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	21	24
Anglo American Platinum	1	1	1	1	1	1	1	1	0	1	2	1	3	3	1	1	0	0	1	1	1	1	1	25	29
Anheuser Busch InBev	1	2	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	22	25
Apple Inc.	1	0	1	1	1	1	1	1	0	1	1	1	0	3	1	0	0	0	1	1	0	0	0	16	18
Arcelik a.s.	1	1	1	1	1	1	1	1	1	1	2	1	3	3	1	1	0	0	1	0	1	0	1	24	28
Associated British Foods	1	1	1	1	1	1	1	1	0	1	1	1	0	3	1	1	0	0	1	1	1	0	0	19	22
AstraZeneca	1	3	1	1	1	1	1	1	0	1	1	2	0	3	1	1	0	0	1	1	1	1	0	23	26
Atos SE	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	1	1	0	0	0	1	21	25
Aviva	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	1	0	0	22	25
Banco Santander	1	0	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	0	0	1	1	24	30
Bankia	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	1	1	0	1	1	26	31
Bayer AG	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	1	1	1	0	1	0	23	27
BMW AG	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	0	0	1	0	21	24
BT Group	1	2	1	1	1	1	1	1	1	1	2	1	0	3	1	1	1	1	1	0	0	1	1	24	30
CaixaBank	1	1	1	1	1	1	1	1	0	1	2	0	0	3	1	1	1	1	2	0	1	1	1	23	30
Carillon	1	3	1	1	1	1	1	1	0	1	1	1	3	0	1	1	1	0	1	1	1	0	0	22	26
Centrica	1	0	1	1	1	1	1	1	0	1	1	1	3	3	1	0	0	0	1	0	1	0	0	19	21
CNH Industrial NV	1	0	1	1	1	1	1	1	1	1	2	1	3	3	1	1	1	1	1	1	1	1	1	27	33
Cobham	1	0	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	0	1	0	1	21	24
Coca-Cola HBC AG	1	3	1	1	1	1	1	1	0	1	1	2	3	3	1	1	1	1	2	1	1	1	1	30	36
Commonwealth Bank of Australia	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	1	0	1	21	24
CSX corporation	1	0	1	1	1	1	1	1	0	1	2	0	3	0	0	0	0	0	1	0	0	0	1	14	17
Dai Nippon Printing Co., Ltd.	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	0	0	0	1	1	0	0	0	20	22
Daikin Industries, Ltd.	1	1	1	1	1	0	0	1	0	1	1	0	3	3	1	0	0	0	1	1	0	0	1	18	20
Daimler AG	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	0	0	0	0	20	23
Dampskibsselskabet NOI	1	3	1	1	1	1	1	1	1	1	1	0	3	3	1	0	0	0	1	1	0	0	1	23	25
Danone	1	1	1	1	1	1	1	1	0	1	1	0	1	3	1	1	0	0	1	1	0	1	1	20	23
Delta Electronics	1	0	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	1	0	0	1	1	24	29
Deutsche Bahn	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	1	0	21	24
Dexus Property Group	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	1	0	1	21	24
Diageo Plc	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	1	0	0	22	25
DIRECTV	1	1	1	1	1	1	0	0	0	1	1	0	3	3	0	1	0	0	1	0	1	0	0	17	20
Doosan Heavy Industries	1	0	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	2	1	1	1	1	27	33
Elisa Oyj	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	1	0	1	22	25
Endesa	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	1	1	2	0	0	1	1	24	30
Ericsson	1	1	1	1	1	1	1	1	0	1	2	1	3	3	0	1	1	1	1	1	0	2	1	26	32
Essar Oil	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	1	1	1	1	27	33
Ferrovial	1	0	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	0	1	1	1	25	31
Fiat	1	0	1	1	1	1	1	1	1	1	2	1	3	3	1	2	1	1	2	1	1	1	1	29	37
Flughafen Munchen GmbH	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	1	0	22	25
Fujitsu, Ltd.	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	21	24
Gas Natural SDG SA	1	1	1	1	1	1	1	1	0	1	2	1	3	3	1	1	1	1	2	0	0	1	1	26	33
General Motors Company	1	0	1	1	1	1	1	1	0	1	1	0	0	3	1	1	0	0	1	0	0	0	1	16	19
Groupe Steria	1	1	1	1	1	1	1	1	0	1	2	0	2	3	1	1	0	0	1	1	1	0	0	21	25
H&M Hennes & Mauritz AB	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	1	0	0	20	23
Harmony Gold Mining Co. Ltd.	1	1	1	1	1	1	1	1	0	1	2	1	3	3	1	1	0	0	1	1	1	0	1	24	28

Heineken NV.	1	2	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	22	25
Hewlett-Packard	1	1	1	1	1	1	1	1	0	1	1	0	0	3	0	1	0	0	1	1	1	0	1	18	21
Hitachi, Ltd.	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	21	24
Holmen	1	1	1	1	1	1	1	1	0	1	1	0	3	3	0	1	0	0	1	1	0	0	0	19	22
HSBC Holdings plc	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	0	0	0	19	22
Hyundai E&C	1	2	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	1	1	1	1	28	34
Iberdrola	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	0	0	0	1	1	0	0	1	20	22
ING Group	1	3	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	1	1	0	1	0	0	23	27
Insurance Australia Group	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	1	1	1	1	0	1	24	28
Intesa Sanpaolo S.p.A.	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	1	1	1	0	0	1	22	26
Investa Office Fund	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	21	24
Israel Chemicals	1	2	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	0	21	24
Italcementi	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	1	1	22	25
Kering	1	1	1	1	1	1	1	1	0	1	1	0	2	3	1	1	0	0	1	1	1	0	1	21	24
Komatsu Ltd.	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	21	24
Konica Minolta, Inc	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	21	24
KT Corporation	1	3	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	1	1	1	1	29	35
L'Oreal	1	1	1	1	1	1	1	1	0	1	2	0	1	3	1	1	0	0	1	1	0	0	0	19	23
Larsen & Toubro	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	1	1	2	1	1	1	1	26	32
LG Chem	1	0	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	2	1	1	1	1	27	33
LG Electronics	1	3	1	0	1	1	1	1	1	1	1	0	0	3	1	0	0	0	1	1	1	0	0	19	21
Lockheed Martin Corporation	1	0	1	1	1	1	1	1	0	1	1	2	0	3	1	0	0	0	1	1	0	0	1	18	20
MAN SE	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	0	0	0	1	1	0	1	0	21	23
Mitsui OSK Lines Ltd	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	21	24
Morrison Supermarkets	1	0	1	1	1	1	1	1	0	1	1	1	3	3	1	0	0	0	1	0	0	1	1	20	22
National Australia Bank	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	0	1	0	1	0	1	23	27
Nissan Motor Co., Ltd.	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	1	0	1	23	26
Nokia Group	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	21	24
Novozymes A/S	1	3	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	1	1	1	1	0	27	32
Orange	1	1	1	1	1	1	1	1	0	1	2	0	3	3	1	1	0	0	1	0	1	1	0	22	26
Raiffeissen Bank International	1	2	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	1	1	0	1	1	26	31
Reed Elsevier Group	1	0	1	1	1	1	1	1	0	1	1	0	0	3	1	1	0	0	1	0	1	1	0	17	20
Renault	1	1	1	1	1	1	1	1	0	1	2	0	2	3	1	1	0	0	1	1	1	0	1	22	26
Royal BAM Group	1	1	1	1	1	1	1	1	0	1	2	0	3	3	1	0	0	0	1	1	1	0	0	21	24
Royal KPN	1	1	1	1	1	1	1	1	0	1	2	0	3	3	1	0	0	0	1	1	1	0	1	22	25
Royal Philips	1	1	1	1	1	1	1	1	0	1	2	0	3	3	1	1	0	0	1	0	0	0	0	20	24
RWE AG	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	0	0	0	1	1	0	1	0	21	23
S-Oil corporation	1	3	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	1	1	1	1	29	35
SABMiller	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	0	20	23
Samsung C&T	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	1	1	1	1	1	1	0	24	29
Samsung Electro-mechanical	1	3	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	2	1	1	1	1	29	35
Samsung Electronics	1	1	1	1	1	1	1	1	0	1	1	0	0	3	1	1	1	1	2	1	1	1	1	23	29
Samsung Fire & Marine Insurance	1	1	1	1	1	1	1	1	0	1	1	0	0	3	1	1	1	1	1	1	1	1	0	21	26
Samsung SDI	1	3	1	1	1	1	1	1	1	1	1	1	3	3	1	1	1	1	2	1	1	1	1	30	36
Sanlam	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	0	1	0	1	22	25
SAP AG	1	1	1	1	1	1	1	1	0	1	2	1	3	3	1	1	0	0	1	1	0	0	0	22	26
Sekisui Chemical Co., Ltd	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	1	0	0	21	24
Shimizu Corporation	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	21	24
Shinhan Financial Group	1	0	1	1	1	1	1	1	1	1	1	2	3	3	1	2	1	1	2	1	1	1	1	29	36
Siemens Aktiengesellschaft	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	1	0	0	20	23

Simon Property Group	1	1	1	1	1	0	0	1	0	1	1	0	0	3	1	0	0	0	1	0	0	0	1	14	16
Sonae	1	0	1	1	1	1	1	0	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	19	22
Standard Bank group	1	1	1	1	1	1	1	1	0	1	2	1	3	3	1	1	0	0	1	1	0	1	1	24	28
Standard Chartered	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	0	0	0	0	20	23
Syngenta International A	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	1	0	0	22	25
Taisei Corporation	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	1	22	25
Tata Consultancy Service	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	1	1	1	1	1	1	1	25	30
TD Bank Group	1	1	1	1	1	1	1	1	0	1	1	0	1	3	1	1	0	0	1	0	1	0	1	19	22
Tech Mahindra	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	1	2	1	25	28
Teck Resources Limited	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	1	0	1	22	25
Telefonica	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	1	1	2	0	0	1	1	24	30
Telenor Group	1	0	1	1	1	1	1	1	0	1	1	0	0	0	1	0	0	0	1	1	1	0	1	14	16
TeliaSonera	1	1	1	1	1	1	1	0	0	1	1	1	3	3	0	1	0	0	1	1	0	0	0	19	22
Thales	1	1	1	1	1	1	1	1	1	1	1	0	1	3	1	1	0	0	1	1	0	0	0	19	22
The Mosaic Company	1	1	1	1	1	1	1	1	0	1	2	0	0	3	1	1	1	1	1	1	1	1	1	23	29
Tofas Turk Otomobil Fabr	1	3	1	1	1	1	1	0	0	1	2	0	3	3	1	1	0	0	1	1	0	0	1	23	27
Toppan Printing Co., Ltd.	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	1	0	1	1	0	0	1	22	26
Toto Ltd.	1	1	1	1	1	0	0	1	0	1	1	0	0	3	1	2	0	0	1	0	0	0	1	16	20
Toyota Motor Corporatio	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	0	0	21	24
UBS	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	1	1	0	1	0	1	22	26
Unilever plc	1	0	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	0	0	1	19	22
UPM-Kymmene Corporat	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	1	1	1	1	1	26	31
Vaisala Oyj	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	1	0	0	1	21	24
VERBUND AG	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	0	0	0	1	0	1	0	1	20	22
Volkswagen AG	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	1	1	1	1	1	1	0	25	30
Wipro	1	0	1	1	1	1	1	1	1	1	1	2	3	3	1	1	1	1	1	1	1	1	1	27	32
Wyndham Worldwide Coi	1	1	1	1	1	1	0	1	0	1	1	0	0	3	1	1	0	0	1	0	0	0	1	16	19
YOOX SpA	1	1	1	1	1	1	1	1	0	1	1	0	3	3	1	1	0	0	1	0	0	1	1	21	24
Zurich Insurance Group	1	1	1	1	1	1	1	1	0	1	1	1	3	3	1	1	0	0	1	1	0	1	1	23	26

Number 1 to 23 indicate all ranking criteria from the research instrument in appendix A, and accompanying values per company. AQ refers to total assurance quality per company, and wAQ refers to total weighted assurance quality per company.