



CSR Assurance and Analyst Behavior

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Abstract

Globally, firms are increasingly publishing corporate sustainability (CSR) reports and there has been an increase in companies demanding assurance on their CSR reports. This study seeks to understand the benefits of CSR assurance on analyst behavior. Using a sample of 521 publicly-listed firms (from 21 European countries) that produced CSR reports between 2011-2015, a multilevel panel data regression is used to examine the effect of voluntary external assurance of CSR reports on analyst behavior. Analyst behavior includes analyst following, measured by the number of analysts following a firm, and analyst forecast accuracy, measured by the forecast error. The results show a positive relationship between assurance of CSR reports and analyst following. When looking at assurance-specific characteristics, the results indicate a positive relationship between assurance providers from the Big Four and analyst following. Looking at analyst forecast accuracy, the findings show support for a higher forecast accuracy when CSR reports are assured. This effect is only significant for forecasts made for one-year ahead. The assurance-specific characteristics are not relevant for analyst forecast accuracy.

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1. Introduction

Over the past decade there has been a growing interest in both Corporate Sustainability Responsibility (hereafter CSR) reports as well as the assurance of these CSR reports. Due to the lack of common CSR reporting standards and the diversity of scope of CSR disclosures, managers have substantial opportunities to disclose CSR information strategically (Clarkson, Li, Richardson and Tsang, 2015; Cho and Patten, 2007). Different corporate scandals, for example Volkswagen emissions scandal, show how top management in companies try to hide the truth about environmental issues by issuing misleading CSR reports. This illustrates the information asymmetry towards stakeholders. One way to increase the credibility of CSR disclosure is to have CSR reports assured by an external third party (Simnett, Vanstraelen and Chua, 2009). The assurance of CSR reports has been of growing importance, according to KPMG (KPMG, 2008). In the study of Simnett et al. (2009) the authors show that across the world almost 40 percent of stand-alone CSR reports are assured. Most of the assurance of these CSR reports is done by the Big Four auditing firms and experts from outside the profession (Plfugrath, Roebuck and Simnett, 2011).

Arguably, the assurance of CSR reports could provide both external stakeholders and management with a greater sense of confidence and credibility of CSR information voluntarily disclosed by firms (Clarkson et al., 2015; GRI, 2013). However, the empirical evidence regarding the assurance of external reports remain inconclusive (Clarkson et al., 2015). While some empirical research suggests that CSR assurance is potentially value relevant and can mitigate the concern of the lack of reliability in CSR disclosure (Simnett et al., 2009; Casey and Grenier, 2014), other studies argue the contrary (Cho, Michelon, Pattern and Roberts, 2014). In academic literature, the most studied aspect of CSR is the link between CSR and firm value/performance. Prior research emphasizes the role of analyst coverage, because analysts' forecasts and reports are important in improving firm value (Jo and Harjoto, 2014). Despite the growing importance of the value implication of CSR, there is only very limited evidence investigating this link. Prior literature studies argue that CSR practices are value relevant and that firms with less social responsibility are characterized by less reputation, high risk, high information asymmetry, and non-transparent disclosures (Bhandari and Kohlbeck, 2016). These are all aspects that analysts take into consideration and will influence analysts' behavior. There is initial evidence that analyst following and consensus analyst forecast accuracy are related to the amount of CSR activities disclosed (Bhandari and Kohlbeck, 2016). Existing literature provides two competing views between a firms' CSR performance and analyst behavior. On the one hand firms who issue CSR reports can influence analyst behavior (Bhandari and Kohlbeck, 2016; Luo, Wang, Raithel and Zheng, 2014; Lang and Lundholm, 1996) and on the other hand financial analysts can affect the CSR activities of firms (Dong, Lin and Zhan, 2015).

Prior research that looked into the link between analyst behavior has only looked at CSR disclosures, but not at assured CSR disclosures. Therefore, this research examines whether CSR assurance influences analyst behavior. Analyst behavior includes the number of analysts following a firm and analyst forecast accuracy.

This study empirically contributes to existing literature in several ways. First, this research contributes to current literature on analyst behavior. This study adds to existing literature by showing the role financial analysts play in financial markets. Current literature shows that financial analysts help reduce the information asymmetry, serve as external monitors to firm managers, and thus affect firms' investment financing (Dong et al., 2015; Derrien and Kecskes, 2011). Earlier studies have investigated the relationship between financial disclosure and analyst behavior. However, less studies have examined the relationship between non-financial information and analyst behavior. This study also contributes to the literature on CSR disclosures, by providing more information on this topic. Most literature covers CSR disclosures, but less research has been done regarding assurance of CSR disclosures. The studies of Lang and Lundholm, 1996; Bhandari and Kolkbeck, 2016; Dhaliwal, Radhakrishnan, Tsang and Yang, 2012; Jo and Harjoto, 2014 and Dong et al., 2015 all look at the relation of CSR information and analyst behavior/following, but CSR assurance is not addressed in these studies.

This is the first study to the author's knowledge that specifically looks at CSR assurance and analyst behavior. Existing literature mainly focuses on CSR and analyst behavior. By also addressing CSR assurance, it is possible to see if analysts perceive assured CSR disclosures differently compared to CSR disclosures that are not assured, and how that influences their behavior.

Besides theoretical relevance, this study also provides practical insights. Firstly, this study has practical relevance for different institutions (regulators and standard setters). When standard setters are designing a sustainability reporting framework and guidelines for firms in Europe, the Financial Accounting Standards Board (FASB) and Sustainability Accounting Standards Board (SASB) will benefit if they know if CSR activities are of influence in the behavior of one of its main users, namely financial analysts. The results of this study also have practical implications for various stakeholders of European companies that are considering using or use assurance of CSR disclosures. Secondly, the different interested stakeholders that require a better understanding of assured CSR activities are members of the accounting profession, non-accounting firms, managers, audit committee members, investors, shareholders and government. This research provides this group with a better understanding of the assurance of CSR disclosure and its implications.

The remainder of this thesis is organized as follows; the next chapter discusses the prior literature on CSR and assurance of CSR disclosures, followed by the background concerning the increasing demand for assurance of CSR disclosures.

In chapter 2 the literature concerning analyst behavior will also be discussed. In this chapter, several hypotheses will be developed. In chapter 3, the research method will be discussed, including a discussion of the empirical models used in this research. Also, the data will be discussed. Chapter 4, will consist of a presentation of the results and tests of hypotheses. This thesis will end with a conclusion and discussion.

2. Literature Review and development of hypotheses

In this chapter, the focus of assurance is discussed. First, the definition of assurance is explained. Next firm-incentives to demand assurance and the benefits of assurance are discussed. To get a better understanding of why firms voluntarily disclose CSR information in the first place, two competing theories are explained. Lastly, assurance of CSR disclosures related to analyst behavior is discussed.

2.1 Assurance of CSR reports

In recent years the assurance of CSR reports has become increasingly important. Society has become less trusting of firms and firms are being held more accountable for their actions (Pflugrath, Roebuck and Simnett, 2011). There has been a shift from trusting firms which audited little to a situation where many things are audited and little trust is left (Pentland, 2000; Power, 1997). When stand-alone CSR reports are assured, stakeholder trust and confidence are enhanced (Pflugrath et al., 2011). Assurance is defined as an independent professional service that improves the quality of information, or its context, for decision makers (Louwers, Ramsay, Sinason, Strawser and Thibodeau, 2015). Companies issue stand-alone CSR reports to improve their reputation on sustainability issues. However, without the assurance, these CSR reports are less credible and do not provide stakeholders with the necessary confidence. Therefore, assurance of CSR reports is a tool to enhance credibility. The increase in credibility is a result of the assurer being ethically and technically competent in their role, and their independence from the preparer of the information (IAASB, 2013). Assuring CSR disclosures is mainly important for positive information. Negative information is viewed credible without assurance. (Casey and Grenier, 2015). When CSR reports are not assured, these CSR reports may provide stakeholders with limited value and represent what may simply be unverified assertions of company management (Ackers and Eccles, 2015; Jenkins and Unies, 2001). Overall, users of corporate annual reports perceive mandatory information as being more credible and reliable than non-mandatory information. This is because the mandatory information is subject to independent verification, whereas voluntary information is not. Independent assurance enhances the quality of voluntary CSR reports (Sierra, Zorio and García-Benau, 2013) and it can also prevent green washing (Alves, 2009; Delmas and Burbano, 2011).

Disclosing CSR information is not mandated, firms voluntarily choose to issue CSR information. The main reason why firms disclose CSR information is to enhance their reputation on sustainability issues. Most prior literature, which tries to give an explanation on why firms voluntarily disclose CSR information, make a distinction between socio-political theories (political economy, legitimacy theory and stakeholder theory) and the voluntary disclosure theory (e.g. signaling theory and agency theory) (Clarkson, Richardson and Tsang, 2008; Cohen and Simnett, 2014; Casey and Grenier, 2014).

The voluntary disclosure theories argue that companies with strong environmental performance have a positive relation with the level of CSR disclosure. The notion is that companies that are good environmental performers want to signal their performance to investors and other stakeholders. Companies will point out their objective performance indicators, which are hard to mimic by inferior environmental performers. Basically, these theories argue that companies that are engaged in sustainability will want to signal this information to its investors, and therefore will voluntarily disclose this information. Inferior environmental performers will disclose less or even be 'silent' on their environmental and sustainability reports. Socio-political theories predict a negative relation between the environmental performance and the level of disclosure. These theories suggest that these environmental and sustainability disclosures create a certain kind of pressure for companies, in which poor performing companies feel more pressure and sense that their social legitimacy is threatened leading that these firms feel the need to increase the amount of sustainability information. By disclosing more sustainability information companies attempt to change stakeholder perceptions about their performance (Clarkson et al., 2008).

According to an international study conducted by KPMG, 79% percent of the largest 250 companies in the world issued a stand-alone CSR report in 2008, compared to 52% in 2005. The number of reports that are assured increased from 30 percent in 2005 to 40 percent in 2008 (KPMG, 2008). According to the study of KPMG the most significant region assuring CSR reports is Europe, with up to 30 percent of assured reports (KPMG, 2008). Regarding the choice of assurance provider, the study of KPMG (2008) found that 65 percent of the assurance of CSR reports for the 22 largest companies are performed by the accounting profession.

Generally, the market for assurance provision is divided between certification bodies, specialist consultancies and the Big Four service firms (O'Dwyer, Owen and Unerman, 2011). Firms have the ability to choose which assurance provider will assure their CSR reports. In case of assurance of CSR reports, members outside the audit profession also have the ability to provide assurance on CSR reports. Although the Big Four are associated with their conventional role of auditors of annual financial statements, they are diversifying their professional services which include the provision of independent assurance (Ackers and Eccles, 2015). Auditors tend to cautiously focus on the consistency of CSR disclosures with underlying evidence (O'Dwyer et al., 2011). According to several studies, non-auditor assurers such as specialist consultants appear to provide higher levels of CSR assurance, while simultaneously adding value to the CSR reporting process (Ackers, 2009; Manetti and Bacetti, 2009; O'Dwyer et al., 2011).

An important point that should be made is that the evidence used to form audit judgments may only be based on explanations provided by management, or observations from walk-through factory inspections, which can possibly illustrate a false reality (Ackers and Eccles, 2015; Jenkins, 2001).

Therefore, some studies suggest that the assurance of CSR reports should cover the entire process through which the companies determine and measure their economic, social and environmental impacts, and report on the results to affected stakeholders (Owen, Swift, Humphrey and Bowerman, 2000). Assuring CSR reports consists of more than issuing a simple statement related to the CSR report and should therefore also address the underlying processes and systems that generate the CSR report.

An important aspect of assurance is the level and scope of the engagement. Concerning the level of assurance, the IFAC International framework for Assurance Engagements and ISAE 3000 both distinguish between 'reasonable assurance engagements' and 'limited assurance engagements'. 'Reasonable assurance engagements' is an audit where the assessor collects sufficient relevant evidence to form an opinion whether the subject disclosed all material aspects in line with the identified criteria, and provides a report in the form of positive assurance. Compared to a 'limited assurance engagement' where the practitioner gathers sufficient relevant information to conclude that the disclosure is plausible in the circumstances, which represents a negative assurance opinion (Mancetti and Becatti, 2009; O'Dwyer et al., 2011). Members from outside the audit profession can also provide assurance based on the AA1000 assurance standard. This standard makes a distinction between a high and moderate level of assurance (Accountability, 2008). The second aspect of assurance is the scope of the engagement. The scope determines the focus, extent and boundary of the engagement. Meaning that the broader the scope of assurance, the more extensive, the assurance will be. Companies can choose to assure their whole CSR report or assure a specific part of their CSR report.

In contrast to the audit of financial statements, there are no generally accepted standards related to the assurance of CSR reports. This absence may result in combining heterogeneous standards or even mixing conflicting guidelines and standards (Ackers and Eccles, 2015). There are some certification standards for sustainability reporting however, released by the Global Reporting Initiative (GRI), which try to increase the quality and quantity of CSR reports (Kolk and Perego, 2010). The GRI is a reporting guideline but not an assurance standard. It recommends companies to provide external assurance on their reports to enhance credibility, but this is not an imposed requirement (GRI, 2013). The main non-financial standards for assurance are the AA1000AS and the International Standard on Assurance Engagements (ISAE3000). The AA1000AS is a principle-based non-proprietary assurance standard which is specifically designed for CSR assurance, and designed to complement the GRI principles (Ackers and Eccles, 2015).

The ISAE3000 is a standard of assurance on non-financial information, which can be applied for audits, sustainability and compliance with rules and regulations. Most standards consist of guidelines for ethical behavior, quality management and performance of an ISAE 3000 engagement (ISAAB, 2013).

Furthermore, a number of (draft) standards have emerged, for example in The Netherlands (the Royal NIVRA, 2005) and in Australia (Standards Australia, 2003) (Kolk and Perego, 2008).

Although assurance on CSR reports is not mandatory, regulators and countries have begun to realize the importance of assurance on CSR disclosures. Germany, for example, passed the Accounting Law Reform Act, which mandates the inclusion and regular auditing of key CSR performance indicators (Helm, Liehr-Gobbers and Storck, 2011; Chen, Srinidhi, Tsang and Yu, 2016). France has implemented the 2012 Grenelle II act, which mandates all large companies to issue integrated sustainability and financial reports.

Compared to research on CSR disclosure, relatively little research has been performed on external assurance of CSR disclosures. The industry in which these firms are active also plays an influential role. According to the research of Simnett (2009) firms in specific industries are more likely to disclose CSR information than others. Firms in politically, socially and environmentally sensitive industries face a higher risk, which creates more incentives to make sure that they are seen in the most favorable way. This causes firms in these sensitive industries not only to issue more CSR reports, but also to have a greater incentive to enhance the credibility of these reports by seeking external assurance (Pflugrath et al., 2011). In the study of KPMG (2008) the highest rate of assurance is found in the mining industries and the lowest rate of assurance in the industry containing retail and trade.

2.2 Assurance of CSR reports and analyst behavior

The focus of this thesis is on analyst behavior, which includes the choice of analysts to follow a firm, which can be measured by the number of analysts following a firm and analyst forecast accuracy, which can be measured by the forecast error.

2.2.1 Analyst following

Analysts play important roles in society. They play a role as information intermediaries who help expand the breadth of investor attention, and as corporate monitors who help reduce agency costs (Jo and Harjoto, 2014). Analysts also provide an important information-production role, uncovering any financial reporting irregularities. In addition, they also fulfill a role as a monitoring mechanism and maintain that analyst coverage imposes discipline on misbehaving managers. Analyst monitoring also helps align managers incentives with shareholders incentives, hence analyst monitoring helps improve managers incentives to undertake more optimal policies (Jo and Harjoto, 2014).

Previous studies on analyst following offered various factors which play a role for analysts determining the number of analyst following firms. For example, Bhushan (1989) studied the major determinants of the number of analysts following a firm. In his study, he found that the number of analysts following a firm is increasing in firm size, institutional ownership, and return variability (Lang and Lundholm, 1996).

O'Brien and Brushan (1990) examined the firm and industry characteristics that affect analyst coverage. They find that the number of analysts following a firm increases when a firm's return volatility has declined, and will increase when firms issue more strict disclosure requirements. Other studies on analyst coverage have provided various speculations on the factors determining the distribution of analyst services and voluntary disclosures. Moyer, Chatfield and Sisneros (1989) argue that analysts are the monitors of managerial performance and that the number of analysts following a company is determined by the complexity of the company's agency problems. Other studies suggest there is a relationship between disclosing CSR information and firm value. More CSR information being voluntarily disclosed reduces the information asymmetry between insiders and outsiders and discourages managerial self-dealings, which will lead to an enhanced firm value (Jo and Kim, 2008). Hong and Kacperczyk (2009) studied the benefits of engaging in CSR, by using direct financial measures of corporate financial performance. They found evidence for the claim that engaging in CSR activities is beneficial to firms because analyst following increases. Furthermore, the study by Bhandari and Kohlbeck (2016) investigated the influence of a firm's CSR activities on analyst following. They also provide evidence that financial analysts are interested in CSR information, and that this may influence their behavior. In their study, they show that analyst following increases with the amount of CSR performance (Bhandari and Kohlbeck, 2016). Thus, there is a relation between the amount of CSR information being disclosed and the number of analysts following firms.

According to the study of Ioannou and Serafeim (2010) there is evidence for the claim that firms who issue CSR reports also receive more favorable analysts' investment recommendations. The study by Luo et al. (2014) provides evidence for the claim that financial analysts closely monitor the performance in CSR of firms they cover, meaning that financial analysts explicitly look at CSR performance of firms. Moreover, Jemel-Fornetty, Louche and Bourghelle (2011) argue that financial analysts pay more attention to environmental and social activities of firms to add investment value. This corresponds with the study of Luo et al. (2014), which states that analyst recommendations are likely to be upgraded (or downgraded) if there is an increase (or decrease) in firms' CSR performance. In other words, this means that there is a positive effect of analyst coverage on CSR performance, because CSR activities can act as a value-enhancing corporate strategy. This will attract attention from analysts and they will take this information into account in their reports (Dong et al., 2015).

Lang and Lundholm (1996) advocate that analysts prefer to follow firms who issue CSR reports and firms who are expected to disclose CSR reports. Thus, firms that issue more CSR reports will have larger analyst coverage than firms that issue less CSR reports. Dhaliwal et al. (2012) also find that firms with superior CSR performance attract large analyst coverage.

Overall firms who engage more in CSR activities will provide more information that is considered to be of high quality. Since more and more firms are disclosing their CSR information, the information transparency is increasing for CSR practices.

Several studies showed that firms who have participated in positive CSR activities provide more and more extensive disclosures. The improvement of the information environment has led to lower searching costs for analysts, which results in more analysts following firms who disclose CSR information. Analysts prefer to follow stock of firms which have a high reputation. Prior research has found a positive correlation between firm reputation and levels of CSR activity (Turban and Greening, 1997). In addition, El Ghoul, Guedhami, Kwok and Mishra (2011) provide evidence that green investors, which are concerned about society, demand stocks of firms which display high corporate social responsibility. Hong and Kacperczyk (2009) add to this, by showing that although sin stocks, which are stocks of companies involved in producing tobacco, gaming and alcohol, having a higher stock return, are less attractive for analysts because of the social norms.

Although there is substantial literature on analyst following related to CSR disclosure, relatively few papers consider how assurance of CSR disclosures affects analyst following. As Bhushan (1989) showed in his paper, the equilibrium of the number of analysts following a firm is determined by the intersection of the aggregate demand and supply curves for analyst services (Lang and Lundholm, 1996). Bhushan (1989) created a model that describes how different firm characteristic can affect this intersection. This model is based on how firm-provided information affects supply and demand for analyst services. This means that if it is less costly for analysts to obtain information from the firm than to obtain information independently from other sources, more disclosure by firms will increase aggregate supply. *Ceteris paribus*, this will increase the equilibrium number of analysts. Thus, increased firm-provided information will increase the number of analysts following a firm.

Assuring a CSR report not only increases the accuracy of firm-provided information, but it also enhances the credibility of the information provided. Since assurance of CSR disclosures impacts the perceptions of the credibility of the information (Plfugrath et al., 2011), it is expected that analysts will prefer to follow firms who choose to assure their CSR report. Assurance of disclosures will increase information transparency even more, and therefore will have a greater impact on the decision of analyst to follow certain firms.

Analysts have the assurance that the information they obtain from these disclosures is correct and complete, and therefore will be attracted to follow firms who choose to assure their CSR report. This leads to the first hypothesis:

H1: Assurance of CSR disclosures is positively associated with the number of analysts following a firm.

2.2.2 Analyst forecasts accuracy

In addition to affecting the number of analysts following the firm, assurance of CSR disclosures is likely to affect analysts' earnings forecasts. Previous studies have shown that CSR activities affect firm value (Jo and Harjoto, 2011), and therefore CSR information will be useful for analysts' forecasting. The financial performance of firms can be influenced through various channels including sales, cost and operational efficiency, financing, and litigation risk (Dhaliwal, Li, Tsang and Yang, 2011). According to Dhaliwal et al. (2011) consumers have a high awareness regarding CSR issues which can cause firms with superior CSR performance to enhance their brand value and reputation. Lev, Petrovits and Radhakrishnan (2010) argue that an enhanced reputation can lead to increased sales. Firms with a better reputation, who want to improve the welfare of their employees via CSR programs can attract better talent and motivate employees to improve productivity (Waddock and Graves, 1997; Roberts and Dowling, 2002; Dhaliwal et al., 2011). Banker and Mashruwala (2007) provide evidence that increased employee satisfaction leads to better future financial performance. In addition, firms that operate in industries that have strict regulations can attract more positive media coverage if they disclose more CSR information (Brown, Helland and Smith, 2006). Previous research has shown that firms gain more benefits in the capital market if they have good CSR performance. For example, Dhaliwal et al. (2011) provided evidence that firms who disclose more CSR information experience a lower cost of capital. Furthermore, banks offer soft financing if firms have a high CSR performance.

In general, there is a relation between CSR performance and financial performance of firms. This relation, suggests that investors and analysts can collect useful non-financial information concerning CSR activities, and incorporate this information in their forecasts. Because socially responsible firms issue more non-financial information, the opacity in the communication with its stakeholders is reduced. Therefore, analysts who follow these firms can make more accurate forecasts, because the communication between analysts and management is good and analysts have greater access to non-financial information (Bhandari and Kohlbeck, 2016). Transparent and informative non-financial information provided by firms leads to more accurate analysts' forecasts.

Simnett et al. (2009) found that firms who assure their CSR disclosures enhanced their credibility on their disclosures and built a better reputation. Thus, the main goal of assuring CSR information is to improve the quality and credibility of the information for decision-making. Information that has been assured is considered more credible than information that has not been assured. Assurance of CSR information increases the quality of disclosures, because auditors will have removed any errors. Therefore, assured CSR disclosures contain a more accurate and complete set of information, compared to non-assured CSR disclosures.

Therefore, firms who seek assurance on their CSR disclosures are expected to provide more transparent and informative disclosures, thereby increasing analyst forecast accuracy. This leads to the following hypothesis:

H2: Assurance of CSR disclosures is positively associated with the accuracy of analysts' forecasts.

3. Research method

In this chapter, the research method and data sample will be discussed. First, the data sample will be explained. Next the variables used in this research are discussed and the econometric models for analyst coverage and analyst forecast accuracy are deliberated.

3.1 Data Sample

In order to test the hypothesis, data is collected from Thomas Reuters Eikon and the GRI database. The total sample consists of 2,057 observations of 521 publicly-listed companies during the period of 2011-2015. The sample only consists of companies that issue CSR reports, making a distinction between companies who choose to assure their CSR report and companies who do not choose to assure their CSR report. The sample consists of 21 European countries. This research focusses on European countries, because most prior research has focused on the U.S. Studies of Lang and Lundholm (1996), Bhandari and Kohlbeck (2016) and Pflugrath et al. (2011), who all look at CSR disclosures and analyst behavior in the U.S. The studies of Sierra et al. (2013) studied the development of assurance of CSR reports in Spain. Hardly any other studies related to assurance of CSR are focused on Europe, while Europe is the most active CSR-reporting region (producing 52% of the world's CSR reports) and has the highest CSR assurance rate (Ackers, 2009). For this reason, the sample consists of firms in all European countries who issue CSR reports. The period 2011 until 2015 is chosen because it the most recent period for the available information.

The first step was to collect a sample of all European companies that issue CSR reports. The initial sample consisted of 1,079 European companies that issue CSR reports. The second step was to narrow this sample down based on the availability of data. All companies which had missing or non-available information were dropped out of the selection. This led to a drop of 558 companies, resulting in the final sample of 521 companies. Table 1 provides an overview of all countries and the number of companies located in each country. These companies were selected by making use of Thomson Reuters Eikon database. Social, environmental and financial data is captured by the ASSET4 ESG database of Thomson Reuters Eikon. Assurance-related data, i.e. level and scope of assurance, are collected from the sustainability database of the Global Reporting Initiative (<http://database.globalreporting.org>). The GRI provides students with a free copy of the GRI reports lists from which the assurance related information is obtained.

Table 1
Sample Overview
Year

<i>Country</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>Total (n)</i>
Austria	6	7	7	7	5	32
Belgium	11	9	9	10	12	51
Czech Republic	2	1	1	1	2	7
Denmark	15	13	12	12	15	67
Finland	19	19	18	20	18	94
France	66	52	64	66	78	326
Germany	37	38	38	39	40	192
Great Britain	147	120	121	122	144	654
Greece	7	5	4	5	6	27
Hungary	5	5	6	6	5	27
Ireland	6	8	7	7	9	37
Italy	20	17	16	17	20	90
Luxembourg	1	1	1	1	1	5
Netherlands	22	21	21	21	22	107
Norway	10	7	7	7	10	41
Poland	2	2	3	2	3	12
Portugal	4	3	3	3	4	17
Spain	31	26	26	26	30	139
Sweden	32	24	25	26	33	140
Turkey	5	5	5	5	6	26
Switzerland	26	22	24	24	26	122
Total	474	405	418	427	489	2213

The presented overview is based on the number of observations (*n*).

3.2 Dependent variables

This research uses two dependent variables. The first dependent variable is analyst following. There are numerous models to explain analyst following, but generally, the explanatory variables are firm and earnings-based characteristics (Bhandari and Kohlbeck, 2016). This research will follow Lang and Lundholm (1996) in developing the model. The second dependent variable is analyst forecast accuracy. In this thesis, the forecast error is used, in accordance to Dhaliwal et al. (2012). The analyst forecast error is used as an inverse measure of forecast accuracy. In this thesis, the forecast horizon is limited to two years because it unlikely that analysts will make forecast beyond this period (Dhaliwalet al., 2012). Therefore, two variables are used. The first variable *FERROR(1)* measures the forecast accuracy of analysts' forecasts one year ahead and *FERROR(2)* measures the forecast accuracy of analysts' forecast for two years ahead. Forecast error (*FERROR*) is defined as the average of the absolute errors of all forecasts made in the year for target earnings, scaled by the stock price at the beginning of the year. The forecast error model of Dhaliwal (2012) is used.

$$ERROR(Y)_{i,t} = \frac{1}{N} \sum_{j=1}^N |FC_{i,t,j}^Y - EPS_{i,t}^Y| / P_{i,t}$$

Where,

ERROR = Forecast error for time horizon 1 and 2

i = Firm

t = Year

j = Forecast

Y = Forecast from year

EPS = Actual earnings per share

FC = Analyst earnings forecast

P = Stock price at the beginning of the year

The indicator *Y* takes 2 values, 1 and 2, to denote whether the target earnings and the forecast are from one year ahead and two years ahead. Distinction among forecasts for different years is made, because analyst forecast error gets larger as the forecast horizon increases (De Bondt and Thaler, 1990). Both *FC* (analyst earnings forecast) and *EPS* (actual earnings per share), are obtained from the I/B/E/S database using Thomas Reuters Eikon.

3.3 Independent variables

The first independent variable is assurance of CSR reports. Assurance of CSR reports (*ASSURANCE*) represents whether the CSR disclosure is assured or not. An indicator value that equals 1 is given if the firm's CSR report released in that year is assured by a third party, and value 0 is given when the CSR report is not assured by a third party.

The second variable is 'CSR provider' and shows whether the assurance provider is from the Big Four or not (*PROVIDER*). Value 1 is given to an assurance provider belonging to the Big Four, and value 0 is given when the assurance provider does not belong to the Big Four. The providers not belonging to the Big four can include non-auditor assurers, such as specialist consultants. This variable is added because information is perceived to be more credible when the assurer is a professional accountant (Pflugrath et al., 2011).

The third variable is 'Assurance scope' (*SCOPE*) and represents the scope of the assurance engagement provided. The scope of the assurance specifies the extent, boundary, and focus of the assurance engagement. The broader the scope (i.e. the entire CSR report), the more extensive the assurance on the report is. This variable is added because the more extensive the assurance on the report, the more credible the information is, which likely increases analyst following and analyst forecast accuracy.

In this research, value 1 is given to an assurance scope covering the entire CSR report, and value 0 is given to a lower assurance scope (i.e. specific section of the CSR report).

The fourth variable, is 'the level of assurance' which takes into account the level of assurance engagement provided (*LEVEL*). The level of assurance provides readers an understanding of the level of work behind the assurance statement. Hence, value 1 is given to an assurance engagement containing a reasonable/high assurance. Value 0 is given to limited/moderate assurance, not specified assurance and no opinion on the assurance engagement. It is expected that having a reasonable high level of assurance will have a positive effect in analyst behavior, because the level of assurance is higher and therefore the credibility of these CSR reports is higher than those with a moderate limited level of assurance.

The independent variables are gathered from the sustainability database of the Global Reporting Initiative.

3.4 Control variables

Control variables are included in the regression model to ensure there is no bias in research. The control variables used in this thesis for CSR assurance are, firm size (*FSIZE*), industry (*INDUSTRY*), leverage (*LEVERAGE*) and return on assets (*ROA*). Firstly, the control variable firm size will be added because size captures various factors motivating firms to issue CSR reports such as public pressure of financial resources (Lang and Lundholm, 1996; Dhaliwal et al., 2012). Previous research has found that firms with an increased firm size are more likely to demand assurance on CSR reports (Simnett et al., 2009; Casey and Grenier, 2015). Firm size is also used to control the number of analysts following firms, because larger firms are expected to have better information environments and therefore a greater analyst following is expected (Lang and Lundholm, 1996). Firm size is measured as the natural logarithm of the total year-end assets.

Secondly, a control variable for industry is added, because companies in sensitive industries demand more assurance on CSR reports in order to manage their risks and to increase user confidence. The environmentally and socially sensitive industries include, mining, paper, chemicals, petroleum, metals, utilities, finance, insurance and real estate. These industries are considered to be more exposed to environmental and social risks. These risks can occur as a result of social pressure of disclosing negative environmental news (Simnett et al., 2009). According to O'Dwyer et al. (2011) firms in sensitive industries are affected more by CSR disclosures and also demand more assurance. The socio-political theories argue that firms in sensitive industries deal with more political and environmental issue, which can lead to more legitimacy threats. (Clarkson et al., 2008; O'Dwyer et al., 2011). These firms therefore demand more assurance on CSR reports, because they have a greater need to enhance their credibility and enhance user confidence of their reported activities (Simnett et al., 2009).

In this thesis, the framework of industry categories of Patten (2002) and Simnett et al. (2009) is used. The environmentally and socially sensitive industries are taken into account, by adding dummy control variables. The industries can be divided into highly socially and environmentally sensitive industries and non-sensitive industries. Value 1 is given to sensitive industries and value 0 is given to non-sensitive industries. Table 2 provides an overview of the environmentally and socially sensitive industries.

Table 2
Environmentally and socially sensitive industries

<i>SIC Code</i>	<i>Industry</i>	<i>Observations (n)</i>
<i>Environmentally Sensitive</i>		
1000-1499	Mining	161
2600-2699	Paper	49
2800-2899	Chemicals	198
2911	Petroleum	0
3300-3399	Metals	65
4900-4000	Utilities	147
<i>Socially sensitive</i>		
6000-6799	Finance, Insurance and Real Estate	152
Total		772

Next, leverage (*LEVERAGE*) is taken into account. It is expected that firms with a high leverage are less likely to demand assurance on CSR reports (Casey et al., 2015). Leverage is the ratio of total liabilities to total assets. Return on assets (*ROA*) is used as a measure of profitability. ROA is measured by dividing a firm's annual net income by its year-end total assets. This control variable is added, because firms with better financial performance are more likely to have more resources to practice CSR activities and produce CSR reports (Dhaliwal et al., 2012).

Other control variables are related to analyst behavior. A number of return-earnings characteristics will be taken into account as control variables, because they are likely to be positively related with analyst following. It is easier for analysts to predict stock price based on earnings forecast (Lang and Lundholm, 1996). These characteristics include market value (*MVALUE*), standard deviation of return on equity (*SD_ROE*), and earnings surprise (*SURPRISE*) (Lang and Lundholm, 1996; Bhandari and Kohlbeck, 2016). The reason to add these variables is that they influence analyst incentives to gather information. The market value is measured by the market value of the firm's equity at the beginning of the fiscal year.

The standard deviation of ROE is measured by the historical standard deviation of return on equity computed over the preceding 10 years.

The earnings surprise is measured by the absolute of the difference of between the current year's earnings per share and last year's earnings per share, divided by the price at the beginning of the fiscal year.

The variable controls for the fact that forecast characteristics are likely to be affected by the magnitude of the earnings information to be disclosed. For example, when a firm introduces a new product, the realized earnings are likely to deviate from expected earnings, consensus among analysts will be low, and therefore it is likely that there will be significant revisions in analyst forecasts (Lang and Lundholm, 1996). Lastly, a control variable for growth is added (*GROWTH*), because high growth firms mean it is harder for analyst to make accurate forecast of earnings, which will lead to greater disagreement among analyst and more revision (Bhandari and Kohlbeck, 2016). Growth is measured by the compounded rate in sales over the past 5 years. Table 3 provides an overview of the variables, including definitions of the dependent variables, independent variables and the control variables.

Table 3
Variable Definitions

Variable	Definition
<i>Dependent Variable</i>	
Analyst following	The total amount of analyst following a firm.
Analyst forecast accuracy	The average of the absolute errors of all forecasts made in the year for target earnings, scaled by stock price at the beginning of the year.
<i>Independent Variable</i>	
Assurance	Assurance equals 1 if firm in year t demanded an assurance statement on its CSR report, and otherwise 0
Provider	Provider equals 1 if the assurance provider belongs to the Big Four, and 0 otherwise.
Scope	Scope equals 1 if the assurance scope contains the entire CSR report, and 0 otherwise.
Level	Level equals 1 if the assurance level is reasonable/high, and value 0 if the assurance level is limited/moderate.
<i>Control variables</i>	
Size	Size is measured as the natural logarithm of the firm's total year-end assets.
Industry	Industry is a dummy variable and equal 1 if the industries are environmentally or socially sensitive, and 0 otherwise.
Leverage	Leverage is the ratio of total liabilities and total assets.
Return on assets	Is measured by dividing a firm's annual net income by its year-end total assets.
Market Value	Is measured by a firm's equity at the beginning of the fiscal year
Growth	Is measured as the compound rate in sales over the past 5 years.
St. Dev. Of Return on Equity	Is measured by the historical standard deviation of return on equity computed over the preceding 10 years
Earnings Surprise	The absolute of the difference of between the current year's earnings per share and last year's earnings per share, divided by the price at the beginning of the fiscal year

3.5 Econometric model

The effect of CSR assurance on analyst behavior is tested. Different tests will be performed to test both the effect of CSR assurance on the number of analyst following of a firm and the effect of CSR assurance on analyst forecast accuracy. The hypotheses are tested by making use of a multilevel regression models. A multi-level regression model is the appropriate model, because this research uses panel data, which includes data from different firms in different countries at different time levels.

A multi-level regressions model recognizes the existence of such data. This model fits mixed-effects (random and fixed effects) for binomial and binary variances.

First, the effect of CSR assurance on analyst following is tested. Second, the effect of CSR assurance on analyst forecast accuracy is tested. The forecast accuracy is tested for forecasts one year ahead *FERROR(1)* and two years ahead *FERROR(2)*, therefore two regressions are performed. Important is to note that only in case a CSR report is disclosed, firms may demand assurance on the report. When assurance is provided, the level, scope and provider of assurance are relevant. In other words, when no assurance is provided, the provider, level and scope of assurance are not relevant, and thus not taken into account. Therefore, two regression models are used to test the hypothesis. The first regression model contains assurance, but omits provider, level and scope of assurance. With this regression, the total effect of assurance on the two dependent variables is measured. The second regression model contains a subsample. In this sample, only companies who demand assurance on their CSR reports are taken into account. Thus, the second regression model contains the variable assurance, only if assurance is provided (*ASSURANCE = 1*), and adds the variables provider, scope and level of assurance. With this regression the effect of provider, level and scope of assurance can be measured. If the variables assurance, provider, level and scope of assurance would be used in the same regression model the outcome of the regression would be distorted, because provider, level and scope only have meaning when assurance is provided. Therefore, the assurance-specific variables are only added when assurance is provided. The regression models are as follows:

Model 1:

$$ANALYST = \beta_0 + \beta_1 ASSURANCE + \beta_2 MVALUE + \beta_3 SD_ROE + \beta_4 SIZE + \beta_5 ROA + \beta_6 INDUSTRY + \beta_7 LEVERAGE + \epsilon$$

$$FERROR = \beta_0 + \beta_1 ASSURANCE + \beta_2 SUPRISE + \beta_3 GROWTH + \beta_4 SIZE + \beta_5 ROA + \beta_6 INDUSTRY + \beta_7 LEVERAGE + \epsilon$$

Model 2

$$ANALYST = \beta_0 + \beta_1 ASSURANCE_{=1} + \beta_2 PROVIDER + \beta_3 SCOPE + \beta_4 LEVEL + \beta_5 MVALUE + \beta_6 SD_ROE + \beta_7 SIZE + \beta_8 ROA + \beta_9 INDUSTRY + \beta_{10} LEVERAGE + \epsilon$$

$$FERROR = \beta_0 + \beta_1 ASSURANCE_{=1} + \beta_2 PROVIDER + \beta_3 SCOPE + \beta_4 LEVEL + \beta_5 SUPRISE + \beta_6 GROWTH + \beta_7 SIZE + \beta_8 ROA + \beta_9 INDUSTRY + \beta_{10} LEVERAGE + \epsilon$$

Table 4 presents the Pearson correlation matrix of the total sample. The variables are tested for autocorrelation. A variable is perfectly correlated when it is 1 or -1. The closer the variables are to zero, the less correlation there is between the variables. Correlation between two variables

above 0.7, indicates high correlation. The solution for this high correlation is to leave one of the correlated variables out of the regression. Table 4 shows that the correlation between *FERROR(1)* and *FERROR(2)* is high (0.9347), but this correlation is not important for this research because the correlation is between two dependent variables, which are never used in the same regression. The sample also shows a high correlation between the variables *SIZE* and *MVALUE* (0.8319). This correlation is not surprising, because companies of a greater size will likely have more equity compared to smaller firms. Since correlation exists between size and market value, two separate models will be used. One model including size, but leaving out market value and the other model including market value, but leaving out size. Furthermore, variance inflation test (VIF) is performed to test for multicollinearity. The results show that all VIF scores are below 10, which means that there is no correlation between these variables.

Table 4
Pearson Correlations

	<i>ANALYST</i>	<i>FERROR(1)</i>	<i>FERROR(2)</i>	<i>SD_ROE</i>	<i>SURPRISE</i>	<i>GROWTH</i>	<i>MVALUE</i>	<i>ROA</i>	<i>SIZE</i>	<i>LEVERAGE</i>
<i>ANALYST</i>	1.000									
<i>FERROR(1)</i>	-1.008***	1.000								
<i>FERROR(2)</i>	-0.1269***	0.9347***	1.000							
<i>SD_ROE</i>	-0.0069	0.0763**	0.0746**	1.000						
<i>SURPRISE</i>	0.0063	0.4162***	0.3658***	0.0033	1.000					
<i>GROWTH</i>	-0.0053	0.1325***	0.1438*	-0.947***	0.0554**	1.000				
<i>MVALUE</i>	0.5245***	-0.1810***	-0.2514***	-0.0641**	-0.0047	-0.465*	1.000			
<i>ROA</i>	0.0675**	-0.0376	0.0001	0.0096	-0.0601**	0.1854***	-0.0459**	1.000		
<i>SIZE</i>	0.4947***	-0.1648	-0.2165***	-0.816**	-0.0161	-0.0977***	0.8319***	-0.1140***	1.000	
<i>LEVERAGE</i>	0.0449**	-0.0282	-0.0361	0.1577***	0.0291	-0.0986***	0.0357	-0.1506***	-0.0693**	1.000

***, **, * Indicate statistical significance at 10 percent, 5 percent and 1 percent, respectively.

In this table, the Pearson correlations are presented of the continues variables. The Pearson correlations for all variables can be found in the appendix.

Table 3 presents definitions of the variables.

4. Results

4.1 Descriptive statistics

Table 5 presents the descriptive statistics of the variables used. The total sample consists of 2.213 observations. The variable year, three dependent variables and seven control variables are included. The forecast error for two years ahead is bigger than the forecast error for one year ahead. Meaning that the forecast error gets larger as the forecast horizon increases. In table 5 the average number of analysts following a firm is 19, and overall only 38% of the firms choose to assure their CSR report. In the period 2011-2015 the percentage of assurance is highest in 2015; 63,60% of all CSR reports has been assured. The percentage of assurance of CSR reports is lowest in the year 2013; 58.85% of the CSR reports has been assured. Appendix A presents an overview of the percentages of CSR reports that have been assured, for the period 2011 till 2015. Portugal is the country with the highest assurance on CSR reports; 88.24% of all CSR reports in Portugal are assured. Appendix B presents an overview of the assurance percentages of all countries for the period 2011-2015.

The variables have to meet the classical assumptions in order for least squares estimates to be the best available (Studenmund, 2014). The variables are tested for normality. The complete sample contains variables that are not normally distributed namely: the forecast error for time horizon 1, the forecast error for time horizon 2, market value, standard deviation of return on equity and leverage. Therefore, these variables are transformed by making use of a natural logarithm. After transforming these variables, the complete sample is normally distributed, only earnings surprise is not completely normally distributed. The complete sample contains many observations (2.213), so the lack of normality will not influence the validity of this research. The variables are also tested for outliers. Outliers and influential cases can influence the scope of the regression, and therefore should be removed. All variables containing outliers are winsorized.

Table 5
Descriptive Statistics

Variable	Observ. (<i>n</i>)	Mean	Std. Deviation	Min.	Max
<i>Dependent variables</i>					
<i>ANALYST</i>	2213	19.53954	8.513201	0	48
<i>FERROR(1)</i>	2213	0.242948	0.549091	0	5.012173
<i>FERROR(2)</i>	2213	0.310091	0.602346	0	5.865586
<i>Independent variables</i>					
<i>ASSURANCE</i>	2213	0.382287	0.486056	0	1
<i>PROVIDER</i>	2213	0.292815	0.455157	0	1
<i>LEVEL</i>	2127	0.057828	0.233473	0	1
<i>SCOPE</i>	2123	0.198775	0.399173	0	1
<i>Control variables</i>					
<i>MVALUE</i>	2175	15.03306	1.671173	11.32227	19.38121
<i>SD_ROE</i>	2116	-2.081946	1.233581	-4.60517	2.320425
<i>SURPRISE</i>	2213	28.42491	26.82422	0.001	1140.751
<i>INDUSTRY</i>	2213	0.348848	0.476713	0	1
<i>SIZE</i>	2213	15.51405	1.928717	11.29581	21.13072
<i>ROA</i>	2213	5.593498	7.307565	-50.1	69.32
<i>LEVERAGE</i>	2213	0.2278263	0.583222	-1.609438	1.560248
<i>Year</i>					
<i>Year_dum2011</i>	2213	0.2141889	0.4103512	0	1
<i>Year_dum2012</i>	2213	0.1830095	0.3867617	0	1
<i>Year_dum2013</i>	2213	0.1888839	0.3915048	0	1
<i>Year_dum2014</i>	2213	0.1929507	0.3947039	0	1
<i>Year_dum2015</i>	2213	0.220967	0.4149921	0	1

Table 3 presents definitions of variables

4.2 Regression results

Multiple regressions are performed to test the hypotheses of this research. The relation between assurance of CSR reports and analyst following is tested, subsequently the effect of CSR assurance on analyst forecast accuracy is tested. For both effects two separate regression models are used. The first model takes the whole sample into account, but omits provider, level and scope of assurance. Model 2 only takes a subsample into account. The subsample only consists of firms who assured their CSR report. Table 5 demonstrates the effect of assurance of CSR disclosures on analyst following. The results indicate that assurance of CSR reports (*ASSURANCE*) has a significant positive effect ($z = 5.83, p < 0.01$, two-tailed) on the number of analysts following a firm (*ANALYST*). This suggests that firms who choose to demand assurance on their CSR report will have more analyst following their firm.

So, hypothesis 1 holds for this performed regression, namely: assurance of CSR reports is positively related with the number of analysts following a firm. Industry has no significant effect on analyst following, meaning that firms in socially and environmentally sensitive industries do not attract more analysts. For analysts, it is not important whether a firm is active in an environmentally or socially environment. The results also show that the market value and standard deviation also have a positive significant effect, ($z=27.4, p < 0.01$, two-tailed) and ($z= 3.4, p < 0.01$, two-tailed) respectively. The two earnings-characteristics indicate that analysts have a greater incentive to gather information, and thus follow the firm. Due to correlation between market value and size, separate regression models are estimated. Appendix C represents the regression including size, but omitting market value. This result indicates that size has a positive significant influence ($z= 27.69, p < 0.01$, two-tailed) on the number of analysts following a firm. This is consistent with the expectations, indicating that larger firms are likely to have better information environments and therefore a greater analyst following is expected. The return on assets also has a significant positive effect ($z= 6.75, p < 0.01$, two-tailed). This indicates that the control variable return on assets, which measure the firm's profitability, has an effect on analyst following. Firms with a higher return on assets are more likely to have more resources to practices CSR, which attracts analysts. The control variable leverage has no significant effect, meaning that firms with a higher leverage ratio do not attract more analysts. Lastly, there is a time effect. All years have a negative significant effect, indicating that as time proceeds the number of analysts following a firm decreases.

The second regression performed is to examine if the provider, level and scope of CSR assurance have an effect on analyst following. The results in table 5 indicate that the provider of CSR assurance is significant ($z= 2.19, p < 0.1$, two-tailed). This result indicates that analysts will more likely follow firms who have their CSR report assured by auditors from the Big Four. The level and scope of assurance are both insignificant, meaning that analysts do not attach value to the level and scope of assurance.

The market value and return on assets remains significant ($z=13.43$ $p < 0.01$, two-tailed) and ($z=3.73$, $p < 0.01$, two-tailed), respectively. Due to correlation between market value and size a second regression is performed on the subsample, excluding market value and including size. Size has a significant positive effect ($z=12.63$, $p < 0.01$, two-tailed), indicating that firms with a greater size attract more analysts. Further there are some differences in results between the total sample and the subsample. In the subsample, the standard deviation of return on equity and leverage becomes insignificant. Interesting is that industry is negatively significant in the subsample ($z=-1.133$, $p < 0.1$, two-tailed), meaning that firms who demand assurance on their CSR report will attract less analysts if they are active in an environmentally or socially sensitive industry. The time effect on analyst following disappears. The only significant year is 2013 ($z=-2.64$, $p < 0.05$, two-tailed). This indicates that in the year 2013, it is less likely that an analyst will follow a firm.

After the effect of assurance of CSR reports on analyst following is tested, the effect of assurance of CSR disclosure on analyst forecast accuracy is tested. Table 6 presents the results of the regression of the forecast accuracy for the two forecast horizons for both models. The results indicate that assurance has a positive significant effect on the forecast error for time horizon 1, and no significant effect on the forecast error for time horizon 2, ($z=2.30$, $p < 0.1$, two-tailed) and ($z=1.66$) respectively. This result confirms that assurance of CSR reports is an important determinant of the accuracy of the analyst forecasts for time horizon 1. For the forecast accuracy of time horizon 2 the assurance of CSR reports has no effect on the forecast accuracy, meaning that analysts will not be able to make a more accurate forecast if CSR reports are assured. Thus, hypothesis 2 only holds for time horizon 1 *FERROR(1)*, and not for time horizon two *FERROR(2)*. The assurance-specific variables provider, level and scope of assurance, have no significant effect on analyst forecast accuracy. The characteristics of assurance have no real effect on the forecast accuracy. This indicates that whether the provider is from a Big Four or not, whether the whole CSR report or a specific section is assured, and whether the level of assurance is reasonable/high or limited/moderate does not influence the forecast accuracy of analysts. The control variable earnings surprise is significantly positive in model 1 ($z=19.31$, $p < 0.01$, two-tailed) for *FERROR(1)* and ($z=16.56$, $p < 0.01$, two-tailed) for *FERROR(2)*. Earnings surprise is also significantly positive for *FERROR(1)* and *FERROR(2)* in model 2, ($z=24.17$, $P < 0.01$, two-tailed) and ($z=18.80$, $p < 0.01$, two-tailed), respectively. This result indicates that analysts' forecasts tend to be more accurate when the earnings surprise is large. Growth also has a significantly positive effect on analyst forecast accuracy for both time horizon 1 and 2 in model 1, ($z=2.24$, $p < 0.1$, two-tailed) and ($z=2.21$, $p < 0.1$, two-tailed) respectively. This suggests that analysts' forecasts are relatively more accurate for growth firms. The expectation was that growth firms make it harder for analysts to make accurate forecast of earnings, which will lead to greater disagreement among analysts and more revision.

Moreover, the return on assets, which measures the profitability, is significantly negative associated with analyst forecast accuracy for *FERROR(1)* and *FERROR(2)* for model 1, ($z = -5.28$, $p < 0.01$, two-tailed) and ($z = -4.35$, $p < 0.01$, two-tailed) respectively. Furthermore, the return on assets is significantly negative for *FERROR(2)* for model 1 ($z = -2.44$, $p < 0.1$, two-tailed). Meaning that a high profitability of a company has a negative effect on analyst forecast accuracy. The variables leverage and size have no effect on the forecast accuracy, indicating that the size of a firm and the leverage ratio have no significant effect on analyst forecast accuracy. Industry only has a significantly positive effect on analyst forecast accuracy for *FERROR(1)* for model 1 ($z = 3.14$, $p < 0.01$, two-tailed), indicating that whether a company is active in an environmentally or social sensitive industry has an effect on the forecast of analysts for time horizon 1. Industry has no significant effect on analysts' forecasts for the other models. The time effect for analyst forecast accuracy is only present for the subsample, indicating that the years have a negative effect in the forecast accuracy.

Table 5
Analyst Following and Assurance of CSR disclosure

<u>Variables</u>	<u>Model 1</u>	<u>Model 2</u>
<i>ASSUR</i>	1.910*** (5.83)	0 (.)
<i>PROVIDER</i>		1.509* (2.19)
<i>LEVEL</i>		1.102 (1.50)
<i>SCOPE</i>		-2.167*** (-3.72)
<i>MVALUE</i>	2.844*** (27.42)	2.528*** (13.43)
<i>SD_ROE</i>	0.371*** (3.40)	0.146 (0.71)
<i>ROA</i>	0.138*** (6.75)	0.161*** (3.73)
<i>LEVERAGE</i>	1.300*** (4.28)	-0.791 (-1.26)
<i>COMPANY</i>	0.000557 (0.58)	0.00196 (1.08)
<i>INDUSTRY</i>	-1.416 (-4.65)	-1.133* (-1.99)
<i>YEAR dummy 2012</i>	-0.977* (-2.17)	1.471 (1.69)
<i>YEAR dummy 2013</i>	-2.007*** (-4.45)	-2.337** (-2.64)
<i>YEAR dummy 2014</i>	-3.325*** (-6.19)	-2.840 (-2.52)
<i>YEAR dummy 2015</i>	-1.821*** (-4.31)	-3.866 (-4.68)
Intercept	-23.39*** (-12.56)	1.324*** (-5.35)
Wald chi	1107.48***	262.78***
N	2175	699

***, **, * Indicate statistical significance at 10 percent, 5 percent and 1 percent levels respectively.
The variables represent the regression coefficient and the z-score (two-tailed)

Table 6
Analyst Forecast Accuracy and CSR Assurance

	FERROR (1)		FERROR (2)	
	Model 1	Model 2	Model 1	Model 2
<i>ASSURANCE</i>	0.0479* (2.30)	0 (.)	0.0359 (1.66)	0 (.)
<i>PROVIDER</i>		-0.0332 (-0.98)		-0.0164 (-0.41)
<i>LEVEL</i>		-0.0107 (-0.30)		-0.0374 (-0.88)
<i>SCOPE</i>		-0.0382 (-1.33)		-0.0294 (-0.88)
<i>SURPRISE</i>	0.00656*** (19.31)	0.0232*** (24.17)	0.00584*** (16.56)	0.0212*** (18.80)
<i>GROWTH</i>	0.280* (2.24)	0.324 (1.72)	0.288* (2.21)	0.353 (1.60)
<i>ROA</i>	-0.00656*** (-5.28)	-0.00352 (-1.66)	-0.00592*** (-4.35)	-0.00601* (-2.44)
<i>LEVERAGE</i>	-0.0260 (-1.32)	0.05578 (1.83)	-0.0302 (-1.47)	0.0686 (1.87)
<i>SIZE</i>	0.00383 (0.61)	-0.00357 (-0.38)	0.000601 (0.09)	-0.00192 (0.17)
<i>COMPANY</i>	0.0000603 (0.98)	-0.0000507 (-0.56)	0.0000740 (1.15)	-0.000128 (-1.20)
<i>INDUSTRY</i>	0.0625** (3.14)	0.0531 (1.87)	0.0302 (1.46)	0.0393 (1.18)
<i>YEAR dummy 2012</i>	0.00927 (0.31)	-0.150** (-3.27)	0.00209 (0.07)	-0.171** (-3.20)
<i>YEAR dummy 2013</i>	-0.00861 (-0.28)	-0.155*** (-3.36)	-0.0165 (-0.52)	-0.201*** (-3.73)
<i>YEAR dummy 2014</i>	0.0104 (0.29)	-0.215*** (-3.67)	-0.00117 (-0.03)	-0.270*** (-3.94)
<i>YEAR dummy 2015</i>	-0.0454 (-1.66)	-0.134** (-3.24)	-0.0381 (-1.34)	-0.152** (-0.71)
Intercept	-1.770 (-10.44)	-2.151*** (-10.79)	-1.541*** (-9.37)	-1.775*** (-9.42)
Wald chi	482.75***	649.00***	340.18***	406.03***
N	2191	709	2191	709

***, **, * Indicate statistical significance at 10 percent, 5 percent and 1 percent levels respectively.

The variables represent the regression coefficient and the z-score (two-tailed)

5. Discussion and conclusion

Assurance of CSR reports is increasing in importance. In the past decade, more firms considered the impact of CSR in making strategic business decisions. This has led to an increase of firms demanding assurance on their CSR report. CSR assurance can enhance the credibility of the CSR report, which can reduce the information asymmetry. Analysts are a part of a firm's information environment, and therefore analysts are interested in CSR information. Assured CSR information may influence their behavior. The aim of this thesis is to examine the influence of CSR assurance on analyst behavior. Analyst behavior consists of analyst following and analyst forecast accuracy. Analyst following is measured by the number of analysts following a firm and analyst forecast accuracy is measured by the forecast error. A multilevel panel data regression model is used to provide insight on the effect of CSR assurance on analyst following for the period 2011-2015 in Europe.

The results of this thesis indicate that CSR assurance has a positive effect on analyst following for European countries. Firms in Europe who decide to demand assurance on their CSR reports are more likely to be followed by analysts. An important factor in analyst following is the assurance provider. Companies who choose an auditor from the Big Four are more likely to have greater analyst following. The level and scope of assurance, which convey more information about the extent and quality of assurance, have no real influence on analyst following. The results of this study suggest that the information about the level and scope of the assurance engagement have no influence on the decision of an analyst to follow a firm or not. Overall, these results are consistent with the view that assuring CSR reports, which enhances the credibility, attract more analysts because assurance reduces the information asymmetry and reduces analysts' costs of receiving credible information.

The results on assurance and the forecast accuracy indicate that CSR assurance has a positive effect on analyst forecast accuracy. The results show that this effect is only significant for forecast horizon 1. Analysts are more likely to make more accurate forecasts for one year ahead, based on the assured CSR information. This indicates that the assurance of CSR leads to less information asymmetry, resulting in analysts receiving more credible and accurate information to base their forecasts on. For analysts making forecasts for two years ahead, assurance of CSR has no significant effect on the forecast accuracy. This result may be due to the fact that as the time horizon increases the forecast accuracy will decrease, because it is more difficult to make accurate forecasts for the future. The provider, level and scope of assurance engagements do not produce more information which enhances analyst forecasts, meaning this information does not increase analyst forecast accuracy. This suggests that the additional information does not convey new or enhanced information, which can help analysts with making more accurate forecasts.

This research has a scientific contribution to a better understanding of the effect of CSR assurance on analyst behavior. Prior research mainly focused on the effect of CSR information on analyst behavior, but no research has been conducted on the effect of assured CSR information on analyst behavior. Firstly, the results of this research are interesting for analysts that demand better insight in managements decisions on CSR. The results of this research provide evidence on the impact of non-financial information on the behavior of analysts. The results show that assurance on CSR, has a positive effect in analysts' behavior. Secondly, the results are interesting for international standard setters and regulators. This research may help standard setters develop sufficient regulations with respect to CSR assurance. This might also help standard setters legitimize new rules regarding CSR reports and assurance. Currently there are no generally accepted standards related to the assurance of CSR reports. The result of this research shows the impact of assurance on analysts' behavior, and therefore also the importance to develop standards related to the assurance of CSR reports. Thirdly, assurance providers can use the results of this research to respond to the interest of analysts on assurance of CSR information.

The results of this research are subject to some limitations. Firstly, this research used a sample of 521 publicly listed firms in twenty-one European countries. But, these 521 firms are unequally distributed across the twenty-one countries. For example, 147 firms are located in Great Britain in 2011. Therefore, it is difficult to generalize the results to other European countries (Vennix, 2012). The distribution of the firms across countries is presented in table 1. Secondly, many factors may influence analyst behavior, it is difficult to include all these factors in one model. The explanatory power of the regressions is higher, when more factors are included. This would result in a higher percentage of the variance in the dependent variable analyst behavior. Analyst forecast accuracy can be explained by variances in the independent variables (Studenmund, 2014). An important variable of CSR, CSR performance, is left out in this research. Previous research of Dhaliwal (2011) has found that firms with superior CSR performance attract large analyst coverage. Including CSR performance would give a better insight in the relation of assurance of CSR and analyst behavior. The reason for leaving out this variable is that the data available for this CSR performance is not exhaustive, meaning that not all aspects of environmental and social performance is captured and available. Thirdly, the validity of the main variable (*ASSURANCE*) and the generalization of results are unsure because there was not a perfect match between Thomas Reuters Eikon (*ASSET4*) and the GRI database. For example, the Thomson One Eikon database would provide data on a firm indicating that the CSR report of that firm was assured, but when looking up that same firm in the GRI database, no assurance on the CSR was provided according to the GRI. Because the GRI is an independent organization especially focused on the sustainability issue, the GRI database is used for the CSR

specific variables to mitigate potential measurement errors. Furthermore, there is one other limitation concerning the assurance-specific variables.

The information of the level and scope assurance is limited. The level and scope of the assurance is not specified for all firms, meaning that for a lot of firms who assure their CSR report it is unknown what the level and scope of the assurance engagement is. This caused a lot of missing data regarding these two variables, which does not give an accurate representation of the true level and scope of assurance. With such little information on these two variables, it is difficult to examine the true effect of level and scope on analyst behavior.

Overall, the results show that there is an association between the assurance of CSR and improvements in analyst following and analyst forecast accuracy. Several possibilities for future research exist. First, CSR performance should be included. As mentioned in chapter 2, several studies have found a relation between good CSR performance and analyst behavior. For example, Dhaliwal et al. (2012) find that firms with superior CSR performance attract large analyst coverage. A recommendation for future research is to include CSR performance as a variable and see if the results of prior research hold for assured CSR disclosures. Second, another interesting recommendation for future research is to investigate how analysts incorporate relevant information they conduct from assured and non-assured CSR disclosures in their forecasts. Future research could examine how analysts incorporate CSR information in their forecast models, and particularly examine the type of information analysts use in their forecasts. Third, another recommendation for further research is examining the effect of CSR assurance on other forecast attributes, like forecast dispersion and revisions. The effect of assurance of CSR reports on the dispersion of analyst forecasts depend on whether differences in forecasts are due to differences in information or differences in forecast models. It would be interesting to examine if assured CSR information causes a decrease in the forecast dispersion. The revision volatility in the time leading up to an earnings announcement is likely to be reduced by more forthcoming disclosures (Lang and Lundholm, 1996). It would be interesting for future research to examine whether assured CSR disclosures have a greater informativeness than non-assured CSR disclosures, and will decrease forecast revisions.

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Appendix A

Table A
Assurance per year

<i>Assurance on CSR report</i>	Year					Total
	2011	2012	2013	2014	2015	
No	297 (62.66%)	246 (60.74%)	246 (58.85%)	267 (62.53%)	311 (63.60%)	1.367 (61.77%)
Yes	177 (37.34%)	159 (39.26%)	172 (41.15%)	160 (37.47%)	178 (36.40%)	846 (38.23%)
Total	474 (100%)	405 (100%)	418 (100%)	427 (100%)	489 (100%)	2.213 (100%)

The overview presents the percentage of CSR assurance per year based on the number of observations (*n*).

Appendix B

Table B
Assurance on CSR reports (2011-2015)

	Year										Total		
	2011		2012		2013		2014		2015		No	Yes	Total
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes			
<i>Austria</i>	1	5	2	5	2	5	2	5	1	4	8 (25%)	24 (75%)	32 (100%)
<i>Belgium</i>	5	6	5	4	6	3	5	5	9	3	30 (58.82%)	21 (41.18%)	51 (100%)
<i>Czech Republic</i>	2	0	1	0	1	0	1	0	2	0	7 (100%)	0 (0%)	7 (100%)
<i>Denmark</i>	10	5	11	2	10	2	11	1	12	3	54 (80.60%)	13 (19.40%)	67 (100%)
<i>Finland</i>	8	11	6	13	5	13	7	13	5	13	31 (32.98%)	63 (67.02%)	94 (100%)
<i>France</i>	51	15	34	18	35	29	50	16	59	19	229 (70.25%)	97 (29.75%)	326 (100%)
<i>Germany</i>	21	16	24	14	24	14	24	15	25	15	118 (61.46%)	74 (38.54%)	192 (100%)
<i>Great Britain</i>	119	27	94	26	94	26	99	22	115	28	521 (80.15%)	129 (19.85%)	650 (100%)
<i>Greece</i>	1	6	1	4	0	4	1	4	1	5	4 (14.81%)	23 (85.19%)	27 (100%)
<i>Hungary</i>	3	2	2	3	3	3	3	3	3	2	14 (51.85%)	13 (48.15%)	27 (100%)
<i>Ireland</i>	5	1	6	2	4	3	5	2	7	2	27 (72.97%)	10 (27.03%)	37 (100%)
<i>Italy</i>	5	1	6	2	4	3	5	2	7	2	32 (72.97%)	58 (27.03%)	90 (100%)
<i>Italy</i>	6	14	5	12	6	10	6	11	9	11	1 (35.56%)	4 (64.44%)	5 (100%)
<i>Luxembourg</i>	0	1	0	1	0	1	0	1	1	0	20.00%	80.00%	100%
<i>Netherlands</i>	13	10	12	9	12	10	11	11	9	14	57 (51.35%)	54 (48.65%)	111 (100%)
<i>Norway</i>	4	6	5	2	3	4	2	5	3	7	17 (41.46%)	24 (58.54%)	41 (100%)
<i>Poland</i>	4	6	5	2	3	4	2	5	3	7	8 (66.67%)	4 (33.33%)	12 (100%)
<i>Portugal</i>	1	1	1	1	2	1	1	1	3	0	2 (11.76%)	15 (88.24%)	17 (100%)
<i>Spain</i>	0	4	0	3	0	3	0	3	2	2	37 (26.62%)	102 (73.38%)	139 (100%)
<i>Sweden</i>	7	24	7	19	6	20	8	18	9	21	81 (57.86%)	59 (42.14%)	140 (100%)
<i>Turkey</i>	23	9	14	10	14	11	14	12	16	17	16 (61.54%)	10 (38.46%)	26 (100%)
<i>Switzerland</i>	3	2	3	2	3	2	2	3	5	1	73 (59.84%)	49 (40.16%)	122 (100)
<i>Total</i>	14	12	13	9	16	8	15	9	15	11	1367 (61.77%)	846 (38.23%)	2213 (100%)

The presented overview is based on the number of observations (*n*).

Appendix C

Table C
Analyst Following and Assurance of CSR disclosure including size

Variables	Model 1	Model 2
	2.069***	0
<i>ASSURANCE</i>	(6.36)	(.)
		1.624*
<i>PROVIDER</i>		(2.34)
		1.115
<i>LEVEL</i>		(1.50)
		-2.275***
<i>SCOPE</i>		(-3.85)
	2.724***	2.466***
<i>SIZE</i>	(27.69)	(12.63)
	0.0807	-0.0481
<i>SD_ROE</i>	(0.76)	(-0.24)
	0.180***	0.230***
<i>ROA</i>	(8.97)	(5.34)
	0.654*	-1.291*
<i>LEVERAGE</i>	(2.18)	(-2.02)
	0.00128	0.00320
<i>COMPANY</i>	(1.33)	(1.75)
	-1.303***	-0.872
<i>INDUSTRY</i>	(-4.28)	(-1.52)
	2.522***	2.434**
<i>YEAR dummy 2012</i>	(5.35)	(2.61)
	1.629***	1.720
<i>YEAR dummy 2013</i>	(3.45)	(1.81)
	0.801	1.753
<i>YEAR dummy 2014</i>	(1.43)	(1.45)
	-1.950***	-3.344***
<i>YEAR dummy 2015</i>	(-4.62)	(-3.99)
	-26.15***	-21.00***
Intercept	(-13.79)	(-5.83)
Wald chi	1120.51***	249.08***
N	2213	710

***, **, * Indicate statistical significance at 10 percent, 5 percent and 1 percent levels respectively.

The variables represent the regression coefficient and the z-score (two-tailed)