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## **Determinants of Disclosure Quality**

A study of environmental liability disclosures

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## ABSTRACT

Accounting for environmental provisions involves judgment and individually developed accounting policies have led to the nature and extent of current disclosures to vary considerably among companies. Critics argue that the quality of disclosures is threatened, which causes problems with comparability. IAS 37 does not seem to be the only determining factor of quality in environmental liability disclosures. Defining quality as tone, readability and amount of narrative environmental liability disclosures, this study aimed at exploring what other potential factors could be determining the quality of such disclosures. An identification of determinants is deemed to be helpful for standard setters when developing and improving current standards aiming to overcome problems with e.g. comparability. The study was conducted using a sample of European oil- and gas producers that follow the IFRS. Quality of environmental liability disclosures was measured through the use of the computer based content analysis software DICTION and three different readability formulas. The output, in terms of tone, readability and amount represents the dependent variables. Conducting a literature review, the most commonly used potential determinants were identified and used as independent variables in the current study. Potential associations were investigated through the Variable selection model in STATA. The findings of this study show a use of positive and certain tone, difficult language and large dispersion in terms of amount of disclosures among oil- and gas producers. Country was found to be one of the most frequently appearing determining factors of quality, alongside with firm size and performance. The results show low quality of disclosures among UK firms, indicating the use of impression management, while the opposite was found for Scandinavian firms who present disclosures of high quality. The lower quality found among UK firms, compared to firms in other European countries, could be explained by the fact that UK have a shareholder-orientation. Scandinavian countries on the other hand are stakeholder-oriented and global leaders when it comes to CSR and corresponding reporting. These companies' greater emphasis on environmental issues is interpreted as being reflected in their higher quality of disclosures in environmental liabilities. In terms of size, larger firms tend to have a neutral and certain tone and provide larger amount of disclosures, which indicate high quality. On the other hand, they tend to provide disclosures that are difficult to read. Better performing firms provide larger amount of disclosures but use a less certain language. Serving as guidance, the results have implications for organizations such as the IASB when developing accounting legislation, aiming to harmonize accounting practice and hence enhancing comparability of disclosures across countries. The findings serve as an indication of drivers of disclosure quality and can be used as a starting point for further research in terms of studying determining factors more closely.

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<b>1. INTRODUCTION</b>	<b>1</b>
<b>1.1 BACKGROUND</b>	<b>1</b>
<b>1.2 RESEARCH QUESTION</b>	<b>3</b>
<b>1.3 CONTRIBUTION</b>	<b>4</b>
<b>2. INSTITUTIONAL SETTING</b>	<b>4</b>
<b>2.1 CONCEPTUAL FRAMEWORK</b>	<b>4</b>
<b>2.2 IAS 37</b>	<b>5</b>
<b>3. THEORETICAL FRAMEWORK</b>	<b>6</b>
<b>3.1 LEGITIMACY THEORY</b>	<b>6</b>
<b>3.2 IMPRESSION MANAGEMENT</b>	<b>6</b>
<b>3.3 DISCLOSURE QUALITY</b>	<b>7</b>
3.3.1 TONE	8
3.3.2 READABILITY	9
3.3.3 AMOUNT	10
<b>3.4 DETERMINANTS OF DISCLOSURE QUALITY</b>	<b>11</b>
3.4.1 FIRM SIZE	11
3.4.2 ENVIRONMENTAL LIABILITY SIZE	12
3.4.3 LEVERAGE	12
3.4.4 FINANCIAL PERFORMANCE	13
3.4.5 COUNTRY	14
<b>4. METHOD</b>	<b>15</b>
<b>4.1 SAMPLE SELECTION AND DATA COLLECTION</b>	<b>15</b>
<b>4.2 DEPENDENT VARIABLES</b>	<b>16</b>
4.2.1 TONE	17
4.2.2 READABILITY	17
4.2.3 AMOUNT	19
<b>4.3 INDEPENDENT VARIABLES</b>	<b>20</b>
<b>4.4 DATA ANALYSIS</b>	<b>22</b>
<b>5. RESULTS</b>	<b>23</b>
<b>5.1 DISCLOSURE QUALITY</b>	<b>23</b>
5.1.1 TONE	24
5.1.2 READABILITY	24
5.1.3 AMOUNT	24
<b>5.2 DETERMINANTS OF DISCLOSURE QUALITY</b>	<b>24</b>
5.2.1 TONE	25
5.2.2 READABILITY	26
5.2.3 AMOUNT	26
<b>6. ANALYSIS</b>	<b>27</b>
<b>6.1 TONE</b>	<b>27</b>
<b>6.2 READABILITY</b>	<b>28</b>
<b>6.3 AMOUNT</b>	<b>29</b>
<b>7. CONCLUDING REMARKS</b>	<b>31</b>
<b>8. REFERENCE LIST</b>	<b>33</b>

## **1. Introduction**

### **1.1 Background**

Financial accounting and annual reports are the primary source of information used by stakeholders as a base for decision-making (Richards & van Staden, 2015). Accounting quality is further of great importance in order for capital markets to be well functioning (Runesson, 2015). Thus, it is crucial for stakeholders to understand the information provided by companies. However, since the implementation of International Financial Reporting Standards (IFRS), the readability has decreased (Richards & van Staden, 2015). Also, annual reports have been criticized for being too technical and complicated, indicating low quality (Courtis, 1986; Jones & Shoemaker, 1994; Pomerence, 1999; Richards & van Staden, 2015). Users of annual reports are required to have at least an undergraduate degree, or sometimes even a master degree, in order to comprehend the information provided (Courtis, 1986; Jones & Shoemaker, 1994; Richards & van Staden, 2015). The use of complicated language in narrative disclosures further lead to time consuming processing of information, which thus lowers the quality of annual reports. In addition to the readability of annual reports, the tone has further been found to affect stakeholders' perception of a firm and thus there is a risk of opportunistic behavior when disclosures are written (Cho et al., 2010). Poor performing companies tend to provide positive disclosures, rather than neutral. They further tend to be more uncertain in their language compared to better performing companies.

The IASB is constantly trying to improve accounting standards and they are concerned with improving requirements and principles of disclosures, which are highlighted as important aspects of annual reports in the current Conceptual Framework project (IASB, ED/2014/1). This project aims at revising the Conceptual Framework for financial reporting, but also to facilitate amendments of existing standards and developing new ones. In order to bring clarity to proposed amendments of the presentation of financial statements in International Accounting Standard (IAS) 1, the Disclosure Initiative was initiated in 2013. One specific standard that has met criticism of, among other things, being too vague in measurement and disclosure requirements is IAS 37, which concerns provisions, contingent liabilities and contingent assets (IASB, ED/2010/1). To improve this particular standard, there is an ongoing project, partly aiming at enhancing clarity to the measurement of liabilities. The current unclear measurement requirement of liabilities is the notion of "the best estimate". Further, what costs to include in the estimation of liabilities are not specified in the standard. As a consequence of these vague requirements, firms are currently using different measures and policies when accounting for liabilities under IAS 37, which causes problems with comparability. Comparability is achieved when the same principles are used consistently among companies and over time, which is important for users of financial statements in order for them to be able to evaluate companies (IASB, CF, 2010).

One important aspect of the evaluation of a firm's profitability and risk is the firm's environmental impact and the awareness of environmental issues is constantly increasing in importance among different stakeholders (Raiborn et al., 2011). Information about firms' environmental performance is also valuable to investors and material when it comes to decision-making (Cho et al., 2010). It has further proven to be particularly useful for evaluation of environmental liabilities (Clarkson et al., 2008). When it comes to evaluation, information about environmental costs connected to the past, present and future is essential. There are still few requirements of content and presentation of environmental disclosures in accounting standards, leading to firms voluntarily providing such disclosures (Arena et al., 2014). Because of these limited requirements, there is a risk of impression management, but at the same time an opportunity for managers to provide more informative disclosures than

what is required. Even though environmental costs are often material, they tend to be difficult to estimate, leading to much judgment and discretionary behavior (Barth et al., 1997) and these environmental costs are unfortunately usually not fully reflected in financial statements and disclosures today (Raiborn et al., 2011). Instead, these types of costs are often hidden within accounts, grouped with other costs or totally neglected. Underlying this disclosure problem are accounting systems and reporting which have shown to disappoint regarding complete disclosure of costs related to environmental issues. When evaluating environmental costs, stakeholders and managers face many concerns, which often are similar to those arising when evaluating costs stemming from production of poor quality products. Failure to control production might lead to production of inadequate products that can be resembled with the failure of having a negative impact on the environment. In order to identify and counteract environmental failures, costs should be incurred. If these costs are not addressed there is a risk of large costs being unknown for stakeholders, which further threatens the transparency of a firm. Some activities with long-term environmental impact might be hard to estimate and quantify, which leads to firms ignoring disclosure of negative effects. This in turn leads to insufficient information and presentation of an inadequate and incorrect corporate picture, which do not meet the expectations of different stakeholders.

One type of industry where environmental costs are substantial and where application of accounting standards have shown to be both problematic and inconsistent with the conceptual framework is the extractive industries. The IASB provides the following definition of extractive activities:

*“Extractive activities are the activities undertaken by mining and oil and gas entities when searching for, and ultimately extracting, minerals or oil and gas.”*

(IASB, DP, 2010, p2)

Firms acting within the scope of extractive activities represent a substantial part of the world’s capital markets and the world economy as a whole (IASB, DP, 2010). Several significant risks and uncertainties are connected to these activities, which makes the participating entities unique in that sense. These firms are further faced with industry specific financial reporting challenges, which are not emphasized in current IFRS. The failure to address these challenges, together with an absence of guidance, has led to diversity in accounting practice among firms engaged in extractive activities. This further causes lack of comparability, which implies concern for users trying to assess and evaluate these entities. This phenomenon is partly explained by the fact that the current standard applicable to extractive activities, IFRS 6, is an interim standard that allows entities within these industries to continue with previously used local accounting policies. Entities engaged in these activities have developed their own policies in order to address the reporting issues that they face. As a consequence, the nature and the extent of current disclosures vary considerably among companies. Current accounting practices used by extractive companies have been criticized for not being in line with and not complying with general IFRS concepts and principles, such as relevance, thus threatening the quality of accounting. Today, the disclosure requirements for these firms are not specific enough. For instance, entities are not required to disclose information about e.g. mineral or oil and gas reserves and there is an expressed need among users of financial reports of more information about the risks these companies are faced with, than what currently is disclosed. This suggests that these disclosures are insufficient and not informative enough. The IASB further state that there is a great demand for a specific IFRS that offers a single accounting and disclosure model for these industries in order to address the discussed

concerns and enhance comparability and clarity. The extractive industries, more specifically the oil and gas industry, is frequently referred to by the IASB throughout the ED regarding IAS 37 (IASB, ED/2010/1). These references are interpreted as the current standard is not providing sufficient guidance for this particular industry. In the earlier mentioned DP on extractive activities, IASB emphasizes the importance of estimation and classification of oil and gas, accounting and measurement of properties, but also what information of the activities should be disclosed (IASB, DP, 2010).

## **1.2 Research question**

The lack of guidance and vague requirements in IAS 37, in addition to the fact that accounting standards under IFRS are principles based, results in a lot of judgment being involved when accounting for provisions. This, taken together with the industry specific financial reporting challenges within the oil and gas industry, has led to disclosure of environmental provisions being the area of interest for the current study. In annual report disclosures, the notion of materiality, relevance and comparability have been questioned by critics, but also emphasized by the IASB themselves (IASB, ED/2014/1). Further, the readability of disclosures has decreased while the length of disclosures has increased after the introduction of IFRS, causing problems for stakeholders to comprehend the information in annual reports (Richards & van Staden, 2015). Current standards, especially the IAS 37, have shown not to provide enough guidance for preparers of financial statements within extractive industries, which has led to extractive entities developing their own accounting and disclosure policies (IASB, DP, 2010). Since IAS 37 does not seem to be the determining factor of quality of disclosures of environmental provisions, this study aims at exploring and presenting what other factors are determining quality of disclosures presented by companies engaged in extractive industries.

Prior research of the quality of environmental disclosures has mainly investigated voluntary disclosures and environmental performance as the determining factor of quality (Clarkson et al., 2008; Cho et al., 2010). In various studies, environmental performance has proven to significantly explain disclosure quality. Therefore, the current study contributes to research by investigating the association between other potential factors and disclosure quality. Other factors previously investigated as determinants of environmental disclosure quality have been the size of provision, litigation and other external factors (see e.g. Barth et al., 1997). These environmental disclosure studies have defined disclosure quality as tone, language (Cho et al., 2010) and amount (Richards & van Staden, 2015). Another stream of research concerns the readability of annual reports in general. Readability can be perceived as a measure of disclosure quality since a more complicated language leads to longer processing time (Richards & van Staden, 2015). These studies have investigated potential determining factors of readability such as firm size, liability size, profitability and risk (e.g. leverage). In their literature review of 32 readability studies, Jones and Shoemaker (1994) found that most of the studies were investigating the President's Letter or Chairman's Narratives while only a few studied disclosures.

By combining these streams of research, the current study examines the disclosure quality of environmental narratives of the provision note, as the IAS 37 have proven to be insufficient in guidance, thus leading to other factors determining the quality. Based on the two above-mentioned streams of research quality is defined as the tone, readability and amount of narrative disclosures in the current study. Environmental issues have increased in importance for stakeholders when evaluating companies' performance and risks. These issues are further of great concern in the oil and gas industry, which is also an industry where the application of accounting regulations has proven to be problematic. Therefore, using a sample of oil and gas



producing companies is perceived as suitable for achieving the aim of exploring and presenting determinants of disclosure quality within the extractive industry. This is achieved through answering the following research question:

*What determines the tone, readability and amount of narrative disclosures of environmental provisions?*

The findings of this study show a use of positive and certain tone, difficult language and large dispersion in terms of amount of disclosures among oil- and gas producers. Country was found to be one of the most frequently appearing determining factors of quality, alongside with firm size and performance. The results show low quality of disclosures among UK firms, indicating the use of impression management, while the opposite was found for Scandinavian firms who present disclosures of high quality. In terms of size, larger firms tend to have a neutral and certain tone and provide larger amount of disclosures, which indicate high quality. On the other hand, they tend to provide disclosures that are difficult to read. Better performing firms provide larger amount of disclosures but use a less certain language. Serving as guidance, the results have implications for organizations such as the IASB when developing accounting legislation, aiming to harmonize accounting practice and hence enhancing comparability of disclosures across countries. The findings serve as an indication of drivers of disclosure quality and can be used as a starting point for further research studying determining factors more closely.

### **1.3 Contribution**

This study contributes to the research area of environmental disclosures, but also to the stream of research concerning quality of disclosure in general. While there is much research conducted of parts of the annual report such as the “management discussion and analysis” section, Li (2010) suggests disclosures corresponding to the financial statements to be more carefully studied in the future, as they are closely linked to the data generating functions of financial numeric data. Most previous studies within these areas have been conducted in a US setting, while this study contributes with an IFRS perspective, by conducting a cross-country study investigating European companies following the IFRS. Environmental performance has already been studied in regards of environmental disclosure quality, why this study adds to the literature by focusing on other factors, namely firm size, size of environmental provision, leverage, financial performance and country.

The remainder of the paper begins with a presentation of current institutional setting which includes relevant accounting regulation, followed by a theoretical framework presenting the perspectives of impression management and legitimacy theory. This chapter also contains a literature review, which identifies potential determining factors of disclosure quality. The method is then presented followed by the results of this study. The results of the study are then analyzed against previous research, leading to an overall conclusion about determinants of disclosure quality.

## **2. Institutional setting**

### **2.1 Conceptual Framework**

One aspect of quality of financial statements is the usefulness of information for potential investors, creditors and other users of financial statements. In order for financial statements to be useful the fundamental qualitative characteristics *relevance* and *faithful representation*, along with the enhancing characteristics *comparability*, *verifiability*, *timeliness* and

*understandability* presented in the conceptual framework serve as guidance (IASB, CF, 2010). Information is relevant based on either the nature or the materiality of it, meaning that economic decisions would be affected by the size, omission or misstatement of the information. Relevant information can further be used as input to predict future events. Information should also be faithfully represented, meaning that information should be free from errors, complete and neutral. Quality of financial statements is also concerned with comparability of statements over time and between companies. Comparability is required in order for users to evaluate similarities and differences between firms and over time, but also to provide stakeholders with information enabling them to make well-informed decisions. To achieve comparability, accounting methods should be applied consistently. Further, understandability implies that information should be presented clearly and concisely to facilitate understanding. By excluding complex information, financial statements would be easier to understand. However, this would risk information to be incomplete and misleading the reader, which contradicts the requirement of faithful representation. The reader is assumed to have some knowledge about economic activities, and information should thus not be excluded based on the complexity of it. Furthermore, companies should inform about underlying assumptions of information provided in financial statements in order to enable stakeholders to verify the information, which help ensure faithfully represented information. Another important aspect of usefulness is the timeliness of information. The more up-to-date it is, the more useful it is for stakeholders and their decision-making.

## **2.2 IAS 37**

Apart from ensuring application of suitable recognition criteria and measurement base, the objective of IAS 37 is to make sure that the information disclosed in the corresponding notes is sufficient and facilitates the understanding of nature, timing and amount of liabilities under the standard (IASB, 2009). A provision is defined as *a liability of uncertain timing or amount* and a liability as *a present obligation of the entity arising from past events, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits* (IASB, 2009, §10). The obligating event is *an event that creates a legal or constructive obligation that results in an entity having no realistic alternative to settling that obligation* (IASB, 2009, §10). If a firm has a present obligation of either legal or constructive nature, which has resulted from a past event, a provision should be recognized. Further prerequisites are that the outflow of resources should be probable and that a reliable assessment of the amount can be made. It is further highlighted in the standard that only obligations resulting from past events that exist independently of a firm's future actions and way of conducting business, should be recognized as provisions. To exemplify, provisions might involve penalties or costs associated with environmental damage, which will exist irrespective of a firm's future actions. Hence, a decommissioning provision corresponding to the obligation to repair already caused damage to e.g. the seabed when installing an oilrig should be recognized as soon as the site is installed. Regarding measurement of provisions, the standard states that *the amount recognized as a provision shall be the best estimate of the expenditure required to settle the present obligation at the end of the reporting period* (IASB, 2009, §36). Further, if future events might have an effect on the amount and if there is adequate objective evidence that this is the case, this should be reflected in the amount. Connecting this to the earlier mentioned installation of e.g. oilrigs, an oil company should take into account reduced cost of cleaning up sites due to changes in future technology if it is supported by adequate objective evidence.

In IAS 37, §84-92, disclosure requirements are presented. Firms are required to disclose information about e.g. the carrying amount of provisions at both beginning and end of the period, additional provisions made and increases in existing provisions. Firms are allowed to

aggregate provisions into different classes. For each of these classes, a brief description of the obligation, expected timing of outflow and an indication of the uncertainties of timing and amount of the outflow should be disclosed. Further, major assumptions regarding future events should be disclosed. However, firms are allowed to not disclose any of the above mentioned information if *the information could be expected to prejudice seriously the position of the entity in dispute with other parties on the matter of the provision* (IASB, 2009, §92). The firm is instead required to disclose information about the general nature of the dispute and the reason for why they do not leave disclosures on the matter. This is however explained in the standard as very rare.

### **3. Theoretical framework**

#### **3.1 Legitimacy theory**

One of the most significant features of accounting, and accordingly accounting reports, is to legitimate the existence of different entities (Deegan & Unerman, 2011). Hence, a lot of strategy is embedded when producing corporate reports and related disclosures. Within the context of legitimacy theory, legitimacy is argued to be a corporate resource, which is vital for a firm's continued survival. As opposed to what is the case with many other resources, firms are able to manipulate and influence legitimacy through the use of different strategies related to disclosure. Entities use targeted disclosures in order to gain, maintain or repair legitimacy. Central within legitimacy theory is the notion of a “social contract” existing between a firm and the society in which it operates. The social contract builds upon society's expectations regarding how firms should conduct their business. If the management of a firm undertakes actions that are found to be unacceptable by the society, the view taken is that the management has misinterpreted the terms of the social contract, which in turn threatens the corporate legitimacy. Deegan and Unerman (2011) further describe the term “legitimacy gap” which is closely related to the notion of the social contract. It refers to situations where there is no correspondence between what is expected of a firm and how it is actually acting. The view taken among advocates of legitimacy theory is that firms tend to make self-serving disclosures when their legitimacy is threatened and this phenomenon is referred to as legitimization (Clarkson et al., 2008). This could be exemplified by poor environmental performers disclosing soft claims of being committed to the environment, which are hard to verify. Thus, instead of taking actions to actually change certain behavior, corporate disclosures are used to falsely indicate changed activities and performance (Deegan & Unerman, 2011). Hence, a greater tendency of legitimization behavior is assumed for firms who operate within environmentally sensitive industries. In a situation of threatened legitimacy, firms have incentives to inform relevant stakeholders about actual changes regarding performance by the use of disclosures. The aim is to change perceptions through emphasizing accomplishments about performance by distracting attention from issues of concern and hence change public expectations regarding performance. Underlying such reasoning is according to Clarkson et al. (2008) the assumption of a negative association between environmental performance and the level of discretionary environmental disclosure. It has been found that accounting narratives, such as environmental disclosures, are often preferred over quantifiable information because of the ability to tailor them in certain ways in order to enhance corporate legitimacy (Cho et al., 2010).

#### **3.2 Impression management**

Information asymmetry between management and stakeholders of a firm, causing management to behave opportunistically, is a common theme within the context of financial accounting research. Disclosures in annual reports are potential means of how to reduce

information asymmetry as it is increasing the transparency of a firm (Runesson, 2015). However, this is only achieved if the disclosures are of certain quality. Firms might instead engage in impression management and strategically provide discretionary disclosures motivated by self-interest and opportunistic behavior (Merkl-Davies & Brennan, 2007). Impression management may be a consequence of conflicts between management and shareholders arising due to e.g. negative corporate outcomes. The assumption of managers not presenting accounting narratives in a neutral manner, highlighting achievements and obfuscating failures, is referred to as the obfuscation hypothesis.

The IFRS is principles based and leaves much room for judgment, which could lead to managers accounting in a certain way. Within the research area of discretionary narrative disclosure strategies, Merkl-Davies and Brennan (2007) conducted a literature review investigating if preparers of corporate reports use narrative disclosures of discretionary nature, but also why and how such disclosures are used. They found and classified two different views taken within the studied area. One notion is connected to impression management adopting the view of opportunistic behavior being the reason behind disclosure choices. The second notion assumes disclosures to be valuable and containing relevant information and thus being useful in terms of decision-making. Underlying management disclosure choices is a variety of different methods used to manage impression or improving quality of disclosures, in other words take advantage of information asymmetries or trying to overcome it. In a study conducted by Cho et al. (2010), it is argued that accounting narratives are often preferred over financial information due to the fact that they can be intentionally tailored in certain ways in order to manage stakeholders' impressions. The notion of impression management in a corporate reporting setting implies effort put on biasing and controlling the impression created among users of accounting information (Merkl-Davies & Brennan, 2007). Hence, corporate reports could be perceived as impression management tools used by managers in order to influence perceptions and decisions among different groups of stakeholders, by manipulation of corporate report presentation and content. The descriptive parts of annual reports have become increasingly important which has created an opportunity for preparers to present information in a favorable manner, taking advantage of information asymmetry. Today, corporate narratives are unregulated to a large extent, which further facilitates impression management in terms of opportunistic behavior behind discretionary disclosure choices. Several opportunistic motives underlying preparers' behavior have been identified by Merkl-Davies and Brennan (2007) and strategies of impression management within these categories could be exemplified as e.g. manipulation of numerical and verbal information through emphasizing positive news. Two strategies of impression management, relevant for the current study, is reading ease manipulation and rhetorical manipulation. These involve making disclosures harder to read, the use of a convincing language and obfuscation of negative news by manipulation of the presented information. In other words, this means a use of strategies to decrease readability and manipulate tone.

### **3.3 Disclosure Quality**

Disclosure quality can be defined in numerous ways. In line with Merkl-Davies and Brennan (2007) and Cho et al. (2010) one aspect of disclosure quality chosen for the current study is the tone used in disclosures. Further, readability has proven to decline since the introduction of IFRS (Richards & van Staden, 2015), and readability has been used as a measure of quality in numerous previous studies (Courtis, 1986; Jones & Shoemaker, 1994; Rennekamp, 2012; Richards & van Staden, 2015). Based on the findings by Pomeroy (1999), Campbell et al. (2014) and Hennes (2014), that qualitative disclosures are informative, a larger amount of disclosures is perceived as enhancing quality in the current study. Based on the above

reasoning, the definition of quality in the current study is the use of neutral and certain tone, high readability and a large amount of disclosure.

### **3.3.1 Tone**

Verbal tone affects how information is interpreted and understood (Davis et al., 2012) and the use of a persuasive language have been found to be a conventional proxy for obfuscation within the research area of rhetorical manipulation, which focuses on how firms express themselves rather than what they express (Merkl-Davies & Brennan, 2007). Rhetorical manipulation seems to be used by fraudulent companies to manage impressions (Goel & Gangolly, 2012). Fraudulent companies deliberately deceive others in order to gain advantage by providing financial reports with misstatements or by omitting to report material facts. Such companies tend to use more complex sentential structure, difficult and uncertain language, more positive tone and passive voice in their annual reports.

Relying on the study by Merkl-Davies and Brennan (2007), Cho et al. (2010) investigated managerial impression management strategies in 10K environmental narrative disclosures of annual reports of 190 American firms, operating in various industries. They investigated how biased language and verbal tone in environmental disclosures can be used as self-servingly impression management tools by the use of concealment and attribution. As described by Merkl-Davies and Brennan (2007), concealment and attribution are used by management to manipulate e.g. presentation, quantity and thematic content of disclosures. These aspects of impression management in regards to environmental disclosures have to a little extent been investigated before (Cho et al., 2010). It was concluded by Cho et al. (2010) that environmental disclosures provided by poor environmental performers are written in a less certain language to conceal information and are more optimistic than environmentally better performing companies. Thus, a high degree of optimism and low degree of certainty was found to indicate impression management. The results further indicate that poor environmentally performing companies manage impressions by emphasizing good news, while obfuscating bad news and blur information about the company's responsibility of poor performance. Arena et al. (2014) however, found that among US oil and gas companies, the use of optimistic tone of CSR disclosures in 10-K filings and environmental press releases, are not associated with impression management. Rather, they found that positive tone is associated with future outlook of good performance. Hence, the tone provides a true picture of expected future environmental performance. The authors further argue that providing voluntary environmental information is important for companies within environmentally sensitive industries as a means to increase stakeholder trust. The authors acknowledge that their study is conducted only among American companies, and that the findings therefore could be different for companies in other countries.

Cho et al. (2010) and Sydserff and Weetman (2002) all used the software DICTION to identify the tone in annual reports. DICTION calculates e.g. the level of optimism and certainty in texts through categorization of words into different word lists (Digitext inc. 2000). Cho et al. (2010) used a sample of US firms from environmentally sensitive industries (oil and gas extraction, chemicals, paper, primary metals, petroleum refining and metal mining) and found that the optimism scores ranged from 37.13 to 63.78 with a mean score of 48.21. They further highlight an example of disclosures with a high score of 51.36 and one example with a low score of 40.21. When it comes to certainty the scores ranged from 0 to 120.56 with a mean of 42.78 and the authors exemplify a high score of 120.56 and a low score of 14.61. Investigating both good and bad performers in terms of both short-term performance and long-term performance, Sydserff and Weetman (2002) found the median of

DICTION optimism scores of chairman's statement and manager's report to range from 50.54 to 54.08. The certainty scores ranged from 46.84 to 49.82.

### 3.3.2 Readability

The quality, understanding of and attitude towards a firm's disclosure are depending on the readability of the disclosure (Rennekamp, 2012). Readability could be exemplified as the chosen font, font size, color, the use of common or uncommon words and difficult- or easy-to-pronounce words. Since the implementation of IFRS, the level of readability of annual reports has significantly decreased (Richards & van Staden, 2015). Rennekamp (2012) found that the attitude towards a company is dependent on the readability of information provided by the company. She measured readability as the feeling of processing fluency, meaning how easy or difficult people perceive a text to be processed. It was found that texts of higher processing fluency leads more trust in the company and the information provided. There are numerous definitions of readability (Jones & Shoemaker, 1994). In 1949, Dale and Chall presented a definition that was used by e.g. Jones and Shoemaker (1994) in their literature review of 32 readability studies. The same definition is also used in the current study and is presented below.

*The sum total (including interactions) of all those elements within a given piece of printed material that affect the success which a group of readers have with it. The success is the extent to which they understand it, read it at optimum speed and find it interesting.*

Jones and Shoemaker (1994. p.143)

In a review of 32 readability studies, Jones and Shoemaker (1994) found annual reports to be difficult to read and stated that they should be classified as technical literature, meaning most of the population are not able to understand them. In order to fully comprehend the information presented in annual reports, an educational completion of at least university undergraduate level is required (Courtis, 1986; Jones & Shoemaker, 1994). In a Canadian study of the readability of Chairman's Address and disclosures in annual reports, Courtis (1986) also found the average reading ease to be difficult to very difficult. In order to measure readability objectively, readability formulas are frequently used (Courtis, 1995). The most commonly used readability formula within the area off financial accounting is the Flesch test (Jones & Shoemaker, 1994) which is a scale of readability where 0 is the lowest level of readability, meaning the text is very difficult to read, and 100 the highest, meaning the text is very easy to read (Richards & van Staden, 2015). Sydserff and Weetman (2002) further used the Flesch formula when investigating good and bad performers in terms of short term and long-term performance. They found the chairman's statement and manager's report of annual reports also to be very difficult to read.

In their literature review from 1994, Jones and Shoemaker found that only a few of the reviewed studies investigated the notes of the annual reports. They further found that the notes are characterized by jargon and are especially difficult to understand, in contrast to the President's Letter or Chairman's Narratives. Further common reasons for low readability within disclosure documents was identified by the Securities and Exchange Commission (SEC) in 1998 (Pomerence, 1999). The most common problems with readability are described to be the use of long sentences, superfluous words, legal and financial jargon and unreadable design and layout. This has led to too technical reports that do not provide enough information for users of these documents to make informed decisions. In the US, this has led to the creation of a Plain English Handbook by SEC with principles of how to write disclosure

documents more readable and thus increase its usefulness. For example, the use of everyday words and short sentences are encouraged and the text should be written in an active voice.

Different levels of readability have been found to be used strategically by management (Li, 2008). Merkl-Davies and Brennan (2007) found that within the readability research area, reading difficulty is perceived as a suitable proxy for obfuscation behavior. Obfuscation is explained as a technique of writing aiming to conceal the intended information through blurring, which leaves the reader with decreased clarity and increased confusion. Underlying this behavior of manipulation is an aversion to disclose information about the real situation. Bloomfield (2008) presents an opposite perspective of readability. He emphasizes that even though studies have shown that annual reports of poor performers are more difficult to read there may be other explanations for it than impression management. He also put forth the notion of “management by exception”. It means that investors demand more complete explanations for poor performance than for good performance, leading to additional length and complexity of such annual reports. Bad news are usually more difficult to present, hence the annual report of poor performers tend to be more complex, leading to lower readability. The author further presents the incomplete revelation hypothesis (IRH), which assumes that documents presenting bad news are more difficult to read and less transparent and the market reactions of such news are often delayed or the reactions mitigated. Thus, language can be a tool for managers to present or hide information from stakeholders. The IRH is supported by Rennekamp (2012) who found that information presented in a less readable manner led to modest investor reactions while more readable information caused significantly stronger reactions. Courtis (1986) further examined whether the levels of readability were a result of manipulation in terms of either concealment or highlighting certain levels of risk and return. No statistical relationship between either levels of high risk or low profitability and low readability was found. Instead the author suggests that the underlying explanation of poor quality in terms of low readability might be explained by individual corporate practice, policy and writing skills.

### **3.3.3 Amount**

When investigating the association between disclosures and performance, Cho et al. (2010) emphasize the importance of considering amount, in addition to tone and language. There is an ongoing debate of whether disclosures are informative or if there is information overload, thus there is currently no consensus of whether large or small amount of disclosure increases quality (Campbell et al., 2014; Hennes, 2014; Richards & van Staden, 2015). Absence of disclosures might be perceived as bad news that the company does not want to present, or that there is no more material information to present (Barth et al., 1997). Hennes (2014) investigated the usefulness of disclosures of contingent liabilities in a legal setting by examining if such disclosures provide information useful to investors or if the legal setting creates disclosures of formal nature, which contain little useful information. The author’s concern is underpinned with critique concerning “pages of disclosures that say little” directed towards disclosures. She found that while the quantitative information in such disclosures did not provide sufficient information, the qualitative part of the disclosures did and thus she considered them to be informative. Campbell et al. (2014) also found disclosures to be informative, contrary to previous criticism. They further found that the larger risk a company is faced with, in terms of high leverage, high turnover or low profitability, the more risk disclosures are presented by the company. The larger the liability is, the more disclosures companies tend to leave in general (Barth et al., 1997; Peters & Romi, 2013). This suggests that the more material the amount of a liability, the more information is provided in annual reports (Peters & Romi, 2013). Environmentally sensitive industries have also proven to disclose more information about environmental issues, as opposed to non-sensitive industries.

Based on these arguments, a larger amount of disclosures could be perceived as enhancing the quality of disclosures. At last, Van der Laan Smith et al. (2005) investigated differences in environmental disclosures across countries and found that Scandinavian countries, which are found to be stakeholder-oriented, had a larger amount of disclosures of higher quality than shareholder-oriented countries.

### **3.4 Determinants of disclosure quality**

Many researchers have tried to find explanation for the varying quality of annual reports and its different sections by investigating the correlation of measures of quality and other factors. In the following sections, a literature review of previously hypothesized and identified determining factors of disclosure quality is presented.

#### **3.4.1 Firm size**

The political cost hypothesis, presented by Watts and Zimmerman (1978), assumes that larger firms attract more political attention and hence they are more politically sensitive than small firms. This leads to higher political costs among large firms, in terms of e.g. a higher tax rate. To minimize the political cost, the hypothesis implies that managers of large firms are likely to choose accounting methods that decrease earnings. While Zimmerman (1983) found this was found for the oil and gas industry, the correlation was not found to be true for all investigated industries. Hence political cost is argued to be industry specific.

Courtis (1995) investigated the trend of readability of chairmen's statements and footnotes to the accounts of annual reports of public companies in Hong Kong. The author examined the level of readability and whether type of industry, size of firm and profitability had any association with the levels. It was found that the addresses of chairmen made from large firms with high profitability were easier to read than those made in smaller firms with lower profitability. The association between profitability and readability was also found in the case of the footnotes, but the author stresses the importance of caution when generalizing from the small sample. He explains the results as large and profitable firms produce annual reports with higher readability as a result of the ability to allocate more resources to annual report preparation. Li (2008) also found that large companies tend to provide longer annual reports than smaller companies. However, opposite to the findings by Courtis (1995), this study provided evidence that long annual reports were correlated with low readability, measured by the Fog index, assuming long annual reports implies increased difficulty of reading. This association was also found earlier by Jones (1988) who found that the larger a firm grows, the more complex the operations become, thus increasing the difficulty of reading and comprehension of the annual reports.

While Richards and van Staden (2015) did not find a correlation between firm size and the level of readability, they did find evidence of a positive association between firm size and amount of disclosure. The same was found a couple of years before by Reverte (2009) who found a strong correlation between firm size and the amount of CSR disclosure among Spanish companies. The amount of CSR disclosures within the sample was also associated with media visibility and industry sensitivity and this is perceived as companies striving for legitimacy. Except for these factors, the author also hypothesized a correlation between the amount of CSR disclosure and return on assets, international listing, ownership structure and leverage, measured as debt to book value of equity ratio, but did not find any strong correlations. By the use of control variables, Cho et al. (2010) found that certain language is used more frequently by large and old companies in their environmental disclosures.



### **3.4.2 Environmental liability size**

Environmental liabilities are complex due to estimation difficulties, which leads to discretionary decisions of whether to recognize them or just disclose information about them (Barth et al., 1997). In their study of superfund sites, Barth et al. (1997) investigated potential determinants of environmental liability disclosures. Superfund sites are the most hazardous waste sites in the US and once a site is defined as a Superfund, the Environmental Protection Agency (EPA) assigns responsible parties, liable to remediate the site. More explicit, the researchers investigated whether there is an association between environmental liability disclosures and regulatory influence, site uncertainty, allocation uncertainty, litigation and negotiation concerns, capital market concerns and other regulatory effects. Site uncertainty refers to the uncertainty of timing and amount of costs for remediating a site and allocation uncertainty refers to the uncertainty of how large proportion of the total remediation cost each company is liable to pay. Sometimes, the responsibility of remediation is difficult to determine because of different owners of the land, multiple firms operating on the site and another party responsible for delivery of the hazardous product. A significant association was found between all of these features and environmental liability disclosures, with an exception for site uncertainty. The authors conclude that substantial discretion is exerted when preparing environmental liability disclosures. On the other hand, it was also found that the regulatory environment has a considerable influence on these types of disclosures. It was also found that the larger the estimated liability, the more disclosures were made in terms of environmental liabilities. This is supported by Peters and Romi (2013) and Campbell et al. (2014), who also found evidence that the larger the potential liability, the more disclosures are provided in annual reports. At last, in a literature review, Li (2010) found that the greater litigation risk a firm is faced with, the more cautionary and optimistic language is used in earnings announcements.

### **3.4.3 Leverage**

Leverage has also been found to be a determining factor of accounting choices. The debt-to-equity hypothesis assumes that the higher the debt-to-equity ratio, the more likely it is that managers shift earnings from future periods to the current period (Watts & Zimmerman, 1990). Graham et al. (2005) found that firms with binding constraints perceive covenants as important, especially firms close to violating them. This is interpreted as there is a risk of impression management in firms with high leverage compared to firms with low leverage, due to e.g. risk of exceeding debt covenants. In a study of New Zealand firms, Richards and van Staden (2015) found that firms with high leverage provided less readable and more difficult annual reports and they also tended to provide longer annual reports than firms with lower leverage. On the contrary, Reverte (2009) did not find an association between the hypothesized correlation between leverage, measured as debt/book value of equity, and the amount of CSR disclosure. More research of the association between leverage and disclosure is suggested by Richards and van Staden (2015), in order to understand the correlation and the underlying reasons.

In a study of risk factor disclosures, Campbell et al. (2014) found increased amount of disclosures to be associated with several risk factors, such as more leverage, higher turnover and lower profitability. It was further found that the greater risk a firm was faced with, the more disclosures were made. Disclosure requirements have been criticized for not leading to informative disclosures but little evidence is found of whether disclosures are informative or not. This study addresses this critique by examining the usefulness of disclosures and concludes that they are informative. Leverage is perceived as one aspect of risk in the study by Courtis (1986), who investigated the readability level of chairman's address and footnotes sections in annual reports. Readability scores were tested against four corporate measures,

namely the current ratio, leverage, earnings variability and rate of return on total assets used as proxies for corporate risk, since this factor can't be measured directly. Higher current ratio, lower earnings variability and leverage are interpreted as lower risk. These chairman's address and footnotes were found to be too difficult for the average reader, leading the author to investigate the association of corporate risk and return and the readability level of annual report prose passages. Underlying this hypothesized association is the assumption that managers in firms with high corporate risk and low return might wish to hide these aspects, hence it might be tempting to do so through manipulation of the text, making it more difficult to read. As opposed to what Campbell et al. (2014) found, none of the hypothesized relationships was found the earlier study by Curtis (1986). Instead, he concluded that the readability level might be connected to individual corporate practice, policy and writing skills rather than manipulating behavior in terms of concealing or highlighting.

#### **3.4.4 Financial performance**

Positive language is often used when describing a company's performance in order to present the company in a favorable manner and influence investors perceptions of the company (Tan et al., 2014). Also, certain language has been found to be associated with better performing companies (Cho et al., 2010). This supports the findings by Graham et al. (2005), who found that economically poor performing companies tend to delay bad news. Better performing companies on the other hand tend to present bad news early and good news late in order to not risk lawsuits, but also to build credibility. Based on this, it can be assumed that economically poor performing companies have a more optimistic tone in their disclosures.

Managers may have incentives to obfuscate information when performance is poor leading to poor performing companies providing disclosures which are difficult to read (Bloomfield, 2008). Jones and Shoemaker (1994) found inconclusive results regarding the correlation between readability and performance, in a review of 68 previous studies of accounting, finance and taxation narratives. Later, in 2008, Li found that companies with high performance, measured as current earnings, provided disclosures that were easier to read than worse performing companies. Further, profitable companies provided more readable disclosures than non-profitable companies. Even though Li (2008) found a difference in readability depending on profitability, the difference did not seem to be economically significant. However, Jones (1988) found the opposite association between readability and performance, measured as net profit on sales and return on capital.

Using a sample of UK firms, Sydserff and Weetman (2002) investigated whether there was a difference in Flesch readability- and DICTION scores of certainty and optimism of the Chairman's statement and Manager's report between bad and good performers. DICTION is a content analysis software, which counts words and classifies them into different categories and wordlists, such as certainty and optimism (Digitext inc., 2000). No significant difference was found between good or bad performance and readability in the short term (Sydserff & Weetman, 2002). However, for long-term performance, higher readability scores were found among good performers and lower scores among bad performers. The authors conclude that this supports the obfuscation hypothesis, namely that managers will try to obfuscate disclosures of bad news and failures and hence not being neutral. Further, no significant differences of the certainty score were found between the two groups. This is in line with the findings of Ober et al. (1999) who drew the same conclusion after investigating management's discussion and analysis of US corporate reports. Sydserff and Weetman (2002) explain this phenomenon by the use of a self-serving strategy, meaning that bad performers simply copy the tone of good performers. Regarding long-term performance, no significant differences of the optimism scores were found between the two groups. When it comes to

short-term performance on the other hand, slightly lower scores were found for bad performers.

### **3.4.5 Country**

The institutional setting varies among different nations and country has been highlighted as one important determinant of accounting quality (Meek et al., 1995; Cormier et al., 2005; Soderstrom & Sun, 2007). Geographic sectors of operations are encouraged to be further tested as determinants of the quality of annual report disclosures (Richards & van Staden, 2015). Soderstrom and Sun (2007) found that important factors affecting the quality of disclosures both directly and indirectly are the institutional factors of e.g. a country's legal and political system. Most previous studies of determinants of disclosures have focused on the US setting (Cormier et al., 2005) and the need of more cross-country studies are encouraged by Arena et al. (2014) as there may be differences in how tone and language are used among firms operating in different countries. Cross-country studies are further encouraged by Li (2010) who found that the writing style and expressions vary depending on culture and institutional setting. Glaum et al. (2013) found that both accounting tradition and factors specific for the particular countries are important determinants of compliance level of IFRS, since there are still differences in accounting policies among European countries. Kvaal and Nobes (2010) also found that there are large differences in accounting practices among countries. The explanation for the differences is that previous local GAAP is still used among companies when possible, despite the implementation of IFRS. Compliance level is perceived as one aspect of quality since Glaum et al. (2013) states that non-compliance leads to biased accounting and the risk of firms not providing relevant information in their disclosures of annual reports. The researchers further found Scandinavian and UK firms to have a higher compliance level of IFRS than the average European firm. These findings are explained by the influence of culture, different strength of enforcement systems and the importance of the stock market.

Van der Laan Smith et al. (2005) is another group of researchers that highlights country of origin to be a vital determinant of amount and quality of corporate social disclosures, which among other things includes the environmental impact of corporate operations. The authors found that Scandinavian countries, which are stakeholder-oriented, tend to present a larger amount of such disclosures compared to shareholder-oriented countries. One country within the European Union that on the other hand has been identified as a typical shareholder-oriented is the UK (Armour et al., 2003). Disclosures made by Scandinavian countries have further been found to be of higher quality than what is the case for shareholder-oriented countries (Van der Laan Smith et al., 2005). Firms within stakeholder-oriented countries have a strong emphasis on social issues, while shareholder-orientation on the other hand represents weaker emphasis on social issues. Regarding stakeholder-orientation, the view taken is that the firm has responsibilities that go beyond traditional goals of achieving financial performance and hence firms are expected by the society to fulfill social responsibilities of different kinds. In other words, firms have responsibilities towards all of their different stakeholders, not only the stockholders. In a study by Strand et al. (2015), Scandinavia is highlighted as a global leader in CSR where the stakeholder engagement is deeply seated. Scandinavian countries are further strong performers when it comes to CSR, which is partly explained by institutional and cultural factors. Van der Laan Smith et al. (2005) further stress the fact that there is a lack of consistency of amount and quality of corporate social disclosures across different countries.

## 4. Method

### 4.1 Sample selection and data collection

The process of selecting the sample started with identifying all European oil- and gas producing entities, using Datastream. This resulted in an initial sample of 102 firms and due to a chosen time span of ten years; the sample included 1020 unique firm year observations. In this study, firms are defined as European if listed on a European stock exchange on December 31, 2007 or later. This date represents the earliest available data in the database CESR MiFID. Due to the chosen European context, only entities following IFRS were included in the sample and in order to facilitate the data collection process, only firms with available data in Datastream were included. Further, the annual reports had to be written in English in order to enable textual analysis. The chosen time span for this study is the years 2005 to 2014 and if the four criteria were not fulfilled for a certain firm year observation, that observation was excluded. Annual reports for each firm year were collected from the entities' websites, and if not available, the database Orbis was used to complete the collection. If an annual report could not be found in neither way, the observation was excluded from the sample. The provision notes of these annual reports were then read and narrative environmental provision disclosures were extracted and individual text documents created for each firm year disclosure, enabling further textual analysis. During this process, the amount of environmental provisions was also manually collected. This manual part of the process involved judgment and subjectivity, which might lead to some degree of inconsistency if the study were to be replicated. However, choosing parts of passages covering environmental liabilities instead of entire passages, or even all text included in the provision note, reduces the level of noise. Since environmental liabilities are the focus in this study, this approach is perceived as the most suitable. Annual reports were excluded from the sample if no environmental provision could be identified or if the note did not contain any narrative disclosure about environmental provisions. The additional independent variables were collected using Datastream. As a last step in the sample selection process, firm year observations missing one or more independent variables were excluded from the sample. The final sample resulted in 278 firm year observations, corresponding to 54 unique companies. The tables below show the distribution of observations by fiscal year and country.

Table 1. Distribution of observations by fiscal year

<b>Year</b>	<b>Number of observations</b>
2014	30
2013	33
2012	32
2011	29
2010	27
2009	28
2008	29
2007	24
2006	24
2005	22
<b>Total</b>	<b>278</b>

Table 2. Distribution of observations by country

<b>Country</b>	<b>Number of observations</b>
Austria	10
Croatia	2
Czech Republic	10
Finland	9
France	14
Greece	1
Hungary	9
Iceland	5
Italy	25
Netherlands	8
Norway	40
Poland	29
Slovakia	6
Slovenia	2
Spain	12
Sweden	10
United Kingdom	86
<b>Total</b>	<b>278</b>

#### 4.2 Dependent variables

In this study, quality is defined as neutral and certain tone, high readability and large amount of disclosures. Tone is further divided into optimism and certainty. The narrative environmental provision disclosures were analyzed using content analysis. No numerical tables were included since it would not allow capturing tone or readability. Early content analysis studies have mainly been conducted manually, which is time consuming and costly, leading to small sample sizes dominating in this type of research (Jones & Shoemaker, 1994; Li, 2010). Previous studies have been criticized by Jones and Shoemaker (1994) due to the fact that they are not perceived as robust enough. For instance, only two out of the 68 studies of readability and tone in their literature review had a sample of more than 100 reports. As a fairly large sample was selected for the current study (278 firm year observations), computer based tools were chosen for both text- and readability analysis. This method enables more data to be processed at a much lower cost, leading to significantly larger samples and, *ceteris paribus*, higher generalizability and replicability (Li, 2010). It is important to stress the fact that a human may observe other aspects than what computers are able to do. Output from DICTION may hence contain some noise, which could give weaker results. However, computer based tools increase the objectivity of a study since subjectivity of manual coding is avoided (Jones & Shoemaker, 1994; Davis et al., 2012). In table 3 below, the dependent variables are listed and defined.

Table 3. Dependent variables

Variable	Definition
Amount	Total characters measured by DICTION
Certainty	Adjusted certainty score measured by DICTION
Optimism	Optimism score measured by DICTION
Fog index	Readability measured by Fog index formula
Flesch reading ease	Readability measured by Flesch reading ease formula
Flesch grade level	Readability measured by Flesch grade level formula

#### 4.2.1 Tone

Data for the dependent variables Optimism and Certainty were analyzed using the computer based content analysis software DICTION. The software counts words in texts and categorizes the words based on 31 unique word lists (Digitext inc., 2000). Based on an algorithm, the software calculates the five master variables Activity, Optimism, Certainty, Realism and Commonality by combining the results of the word lists. The algorithm is based on 20 000 texts from various areas, including financial statements and financial news. The Optimism score refers to *language endorsing some person, group, concept or event or highlighting their positive entailments* (Digitext inc., 2000, p.43), while the measure of certainty refers to *language indicating resoluteness, inflexibility, and completeness* (Digitext inc., 2000, p.42). Certainty and Optimism are two master variables chosen for the study and below follows an explanation of which other word lists these measures consist of and how they are calculated:

$$\text{Certainty} = (\text{Tenacity} + \text{Leveling} + \text{Collectives} + \text{Insistence}) - (\text{Numerical Terms} + \text{Ambivalence} + \text{Self Reference} + \text{Variety})$$

$$\text{Optimism} = (\text{Praise} + \text{Satisfaction} + \text{Inspiration}) - (\text{Blame} + \text{Hardship} + \text{Denial})$$

(Digitext inc., 2000, p. 42-43)

DICTION identifies numerical terms both as actual numbers (1, 2, 3 etc.) and as numbers written in letters (one, two, three etc.) (Digitext inc., 2000). However, the negative adjustment by *Numerical terms* to the Certainty score have been criticized by e.g. Ober et al. (1999) and Cho et al. (2010), who argued that it is not suitable to use the original certainty score for financial accounting studies. They argued that numerical terms should be perceived as increasing certainty in a financial accounting setting. Thus they added the subcomponent numerical terms to the certainty score. Based on this argument, the certainty measure adjusted for numerical terms is also used for the current study. Certainty is calculated as follows:

$$\text{Certainty} = (\text{Tenacity} + \text{Leveling} + \text{Collectives} + \text{Insistence}) - (\text{Numerical Terms} + \text{Ambivalence} + \text{Self Reference} + \text{Variety}) + \text{Numerical Terms}$$

#### 4.2.2 Readability

Several proxies for readability, such as word- and sentence length as measures of sentence complexity are highlighted by Curtis (1995). Word length is an appropriate measure of the speed of word recognition while sentence length is a suitable measure of a reader's ability to memorize texts. By using readability formulas, the difficulty of a text is quantified and measured objectively. The Flesch test and Fog index have been the most frequently used readability measures in financial accounting studies (Curtis, 1986; Jones & Shoemaker, 1994; Curtis, 1995; Li, 2010). The Flesch test was further found to be the most common

measure of annual report readability in content analysis studies in a literature review by Jones and Shoemaker (1994), where 26 of 32 reviewed studies used the test. The Fog index was further used by Li (2008) when studying notes of financial statements.

Several researchers have equated readability and understandability but Jones and Shoemaker (1994) are critical towards this assumption, and stress that it needs further evaluation. Instead, they argue that readability tests should only be interpreted as relative measures, meaning that it can be concluded that one text is more difficult than another. They stress that the understandability of a text depends on more factors than readability, e.g. the reader's interest and knowledge. Therefore, they encourage caution when generalizing readability to understandability. Richards and van Staden (2015) were aware of this common critique towards readability formulas, but argued that by using several formulas, they could overcome this shortcoming and still conclude the general readability level. Richards and van Staden (2015) further found a strong correlation between different readability measures such as the Fog index and the two measures of Flesch tests, which indicates that these measures are internally valid and measures the same concept although different calculations are used for each formula. Based on the above reasoning, the two Flesch tests and Fog index are perceived as suitable readability measures for the current study. In order to ensure that the results from using the readability formulas are valid also for the current study, a correlation test between the measures was performed. In the current study, the readability scores have been calculated using an online service for readability (Readability-Score, 2016). The accuracy of the online service has been controlled and approved by randomly selecting a few texts, and calculating the scores manually followed by a comparison of the results from the online service.

#### *Flesch test*

There are two kinds of Flesch tests - the Flesch reading ease formula and the Flesch grade level formula, also referred to as Flesch-Kincaid (Richards & van Staden, 2015). Both of them takes into account total number of words, number of syllables and total number of sentences in a text. The Flesch reading ease formula normally gives a number between 0-100, where a higher score indicates higher readability, meaning the text is easier to read. Calculation of the score and interpretation (table 4) of it is found below.

$$\text{Flesch reading ease} = 206.835 - ((\text{mean sentence length} * 1.015) + (\text{average word length} * 84.6))$$

(Wydick, 1980, p 714)

Table 4. Interpretation of Flesch reading ease scores

<b>Flesch reading ease score</b>	<b>School Level</b>
90 to 100	5th grade
80 to 90	6th grade
70 to 80	7th grade
60 to 70	8th and 9th grade
50 to 60	High school / Plain English
30 to 50	College
0 to 30	College graduate

The Flesch grade level formula translates the Flesch reading ease formula to the number of years of education the reader is required to have in order to comprehend a text (Richards & van Staden, 2015). Interpretation of scores are presented in table 5 below:

Table 5. Interpretation of Flesch grade level

<b>Flesch grade level</b>	<b>Required education</b>
18	Master degree
16	Degree
12	School level

(Richards & van Staden, 2015)

### *Fog Index*

The Fog index assumes that longer sentences and longer words leads to higher cost of information processing, thus leading to a more difficult text to process (Li, 2008). It takes into account the total number of words, number of words with three or more syllables (polysyllabic words) and the total number of sentences (Richards & van Staden, 2015). The interpretation of the index is similar to the Flesch grade level since it also states the required number of years of education the reader should have for the text to be understood. It is suggested that material classified as technical should not exceed a Fog index of 14 and business material should be below 12. Below is the calculation used to reach the Fog index and table 6 presents how the scores are interpreted:

$$US\ Grade = 0,4 * (Average\ number\ of\ words\ per\ sentence + percentage\ of\ polysyllabic\ words)$$

(Gunning, 1979)

Table 6. Interpretation of Fog Index

<b>Fog Index</b>	<b>Required education</b>
18	Master degree
16	Degree
12	School level

(Richards & van Staden, 2015)

### **4.2.3 Amount**

The amount of disclosures is also considered as defining quality of disclosures. In this study, disclosures are perceived as being of higher quality the more information is disclosed, due to the fact that more information leads to better-informed decisions. However, there is an ongoing debate of whether disclosures are informative or just boilerplate (Campbell et al., 2014; Hennes, 2014; Richards & van Staden, 2015). It is therefore important to stress the fact that quality in terms of quantity have been criticized, since a larger amount may be mistaken for irrelevant information. On the other hand, the SEC has expressed concern over insufficient disclosures (Pomeranke, 1999). Because of this, and the fact that previous studies have found disclosures to be informative (Campbell et al., 2014; Hennes, 2014), larger quantities are



perceived as increasing the quality in this study. Amount is defined as the number of characters in the narrative environmental disclosures. The disclosures extracted from annual reports are analyzed using DICTION.

### 4.3 Independent variables

The most commonly used independent variables and potentially determining factors of disclosure quality were identified conducting a literature review. The identification of independent variables started with studying several prior literature reviews concerning the area of interest, which served as a basis for further investigations of determining factors of disclosure quality. Data for independent variables were collected using the database Datastream. The independent variables identified and selected for the current study are leverage (D/A), size of environmental liabilities (EP), financial performance (NI, Profitability and ROE), firm size (Size) and country (UK, Scandinavia and Other countries). These variables are presented in table 7, followed by definitions and measures of them.

Table 7. Abbreviation and definition of independent variables

Variable	Definition
D/A	<p>Liabilities/Total assets - Leverage ratio based on data retrieved from Datastream.</p> <p><i>Liabilities</i> (WC03351) represent all short and long-term liabilities.</p> <p><i>Total assets</i> (WC02999) represent the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.</p>
EP	<p>Environmental provision - Manually collected from annual reports, scaled by <i>Total assets</i>.</p> <p><i>Total assets</i> (WC02999) represent the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.</p>
NI	<p>Net Income retrieved from Datastream, scaled by <i>Total assets</i>.</p> <p><i>Net Income</i> (DWNP) represents income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items.</p> <p><i>Total assets</i> (WC02999) represent the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.</p>
Profitability	<p>Profitability based on <i>Net Income</i> (DWNP) retrieved from Datastream.</p> <p><i>Profitability</i> is defined as a dummy variable where companies with a Net income above zero equal 1 and companies with Net income equal to or below zero equal 0.</p> <p><i>Net Income</i> (DWNP) represents income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items.</p>
ROE	<p>Net Income/Equity - Return on equity based on data retrieved from Datastream.</p> <p><i>Net Income</i> (DWNP) represents income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items.</p> <p><i>Equity</i> (WC03501) represents common shareholders' investment in a company.</p>

Scandinavia	Swedish and Norwegian firms, through the use of a dummy variable based on the definition of country of domicile in Datastream.  <i>Country</i> (MSCTRY) represents the MSCI country code for the country of domicile.
Size	Total assets retrieved from Datastream. <i>Total assets</i> (WC02999) represent the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.
UK	UK firms, through the use of a dummy variable based on the definition of country of domicile in Datastream.  <i>Country</i> (MSCTRY) represents the MSCI country code for the country of domicile.
Other Countries	Firms from other European countries than UK and Scandinavia through the use of a dummy variable based on the definition of country of domicile in Datastream. The following countries are included: Austria, Croatia, Czech Republic, Finland, France, Greece, Hungary, Iceland, Italy, Netherlands, Poland, Slovakia, Slovenia and Spain.  <i>Country</i> (MSCTRY) represents the MSCI country code for the country of domicile.

The firm size is measured as Total assets. In order for the size of the firm not to interfere with NI and Environmental Provision these measures were divided by Total assets. The independent variable Environmental provision were collected manually from annual reports at the same time as the narrative environmental provision disclosures from the notes were extracted. The currencies of Environmental provisions varied among companies but were transformed into euro using the exchange rate for each currency against the euro, which were reported on the last working day of each year (European Central Bank, 2016). For the other variables, the currencies were transformed using Datastream. Environmental provisions were not always separately disclosed in the reports, leading to judgment being involved when selecting information. Categories associated with environmental provisions were identified within both tables and textual content in the notes. This led to the selection of texts and numbers connected to provisions for *decommissioning, restoration, dismantlement, environmental costs, spill response, litigations and claim* (connected to environmental issues) and *CO2 emission allowances*. Most of the companies also disclosed the category *other provisions*. Some companies provided narrative descriptions of the content of this provision while others did not. When information and amount of additional environmental costs were provided in these parts, the amount was added to the variable Environmental provision and the narrative description was extracted for content analysis. Thus environmental provisions within this category could only be identified for some companies, which may lead to some misrepresenting data since environmental provisions could be included in this category also for companies not disclosing this information.

Using dummy variables, country is divided into three categories, namely UK, Scandinavia and Other countries, where the latter category serves as a benchmark. In this study, Swedish and Norwegian firms represent Scandinavia, due to the fact that no Danish firms fulfilled the sample criteria. UK is shareholder-oriented while Scandinavia is stakeholder-oriented, meaning a greater emphasis is put on environmental issues among the latter nations (Van der Laan Smith et al., 2005). Scandinavian firms have also been found to provide disclosures of higher quality than firms in other shareholder-oriented countries. UK and Scandinavia further represents two main law traditions, the common-law and civil law, which could also influence the accounting (La Porta et al., 1998). The institutional setting is further described as similar among the Scandinavian countries but different to others. Referring back to the study by

Strand et al. (2015), Scandinavia is highlighted as a global leader when it comes to CSR, but also as a region where the stakeholder engagement is deeply seated. Scandinavian countries are further strong performers when it comes to CSR, which is partly explained by institutional and cultural factors. Building on the above reasoning, the country variable is divided into UK and Scandinavia with the rest of the other European countries within the sample serving as benchmark.

#### 4.4 Data analysis

As described above, a pre-selection of potential variables was performed through a literature review of determining factors of tone, readability and amount. Observed in prior research, contradicting findings have been identified regarding what determines quality of disclosures. To find those of the identified variables that are determining the quality of disclosures in the particular sample, and to rule out those that do not have significant effect on quality, the Variable selection model was deemed appropriate. This model captures which of the identified potentially determining factors that best explain the dependent variables. The Variable selection model resulted in the identification of the subset that best explains each category of quality investigated in this study. It is important to stress the fact that conducting a pre-selection of independent variables angles the study. Through conducting a comprehensive search for recurring potential determinants of disclosure quality in prior relevant research, the risk of an angled study is perceived as diminished. Despite this, there may be other factors than those identified in the current study that also determine tone, readability and amount of disclosures. One such potential variable could be the choice of auditor. Richards and van Staden (2015) suggests that the auditors' impact on annual report disclosures in terms of readability should be investigated more in order to increase the understanding of determinants. Iatridis (2013) found that firms producing environmental disclosures of high quality were usually audited by a Big-4 auditor (EY, KPMG, PWC or Deloitte). This is explained by the fact that a Big-4 auditor directly, or at least indirectly, encourages their client firms to disclose relevant information that are meaningful to users. Firms audited by a Big-4 auditor would generally be prone to provide high quality disclosures that are informative, aiming to receive a satisfactory audit report (Iatridis, 2011). These firms further tend to be offered higher quality guidance in terms of preparing accounts and their reports reflects higher reliability and credibility. However, using Datastream it was confirmed that only 2 out of 54 firms, corresponding to 11 out of 278 unique firm year observations, in the sample of the current study had an auditor not classified as a Big-4 auditor. Hence, the choice of auditor was not included as an independent variable in the current study.

For the current study, the Variable selection model was performed using the *vselect* command in the Stata module. The command performs both forward selection and backward elimination of variables, which means that the model adds or removes variables, to reach the subset of independent variables that best explains variations in the dependent variable (Lindsey & Sheather, 2010). These two methods are described in the section below. To decide the best subset of variables, information criteria need to be determined. The combinations of variables with the most explanatory power are those that optimize the chosen criteria. These criteria are equally good and only measures of how to reach the optimal model and no recommendation of which criteria to choose have been identified. In the current study, the information criteria chosen were AICc and  $R^2_{ADJ}$ , as was done by Runesson (2015). When analyzing what subset of variables is optimal for explaining the dependent variable, the information criteria AICc should be as small as possible while  $R^2_{ADJ}$  should be as large as possible (Lindsey & Sheather, 2010). If the results are inconclusive under the chosen information criteria, Lindsey and Sheather (2010) state that an arbitrary decision of which model to use is necessary.

In the forward selection process, the starting point is a single independent variable included in the first regression (Lindsey & Sheather, 2010). One independent variable at a time is then added to the model, starting with the one affecting the information criteria in the desired direction the most. In the backward elimination process on the other hand, all independent variables are included in the model at the beginning of the regression series. The variable that proves to have the least explanatory power, thus affecting the information criteria the least, is excluded. The processes of forward selection and backward elimination are then repeated until the variables included in the final model is the subset optimizing the information criteria an all other variables are excluded from the model.

In backward elimination and forward selection, the model does not reassess the previously chosen or eliminated variables (Runesson, 2015). The leaps- and bounds algorithm in *vselect* overcomes this weakness by combining forward selection and backward elimination processes and can thus go in both directions in order to reassess if e.g. a previously included variable is significant or not. It displays the best subset of variables at every predictor size, which means that it displays which single independent variable best explain the dependent variable, then which two independent best explains the dependent variable and so on. This is achieved using the *best* option and it also displays all information criteria and highlights which predictor size under each information criteria that optimizes the particular criteria. For the current study, the *best* option was used as a first step, and forward selection and backward elimination were used for additional analysis to select the optimal model.

Before starting with the *vselect* process, the data was first winsorized in order to adjust for outliers ( $p$  (0.01)), replacing the extreme values with the closest number counting from the mean and out. After having performed the *best* option, the optimal regression for both AICc and  $R^2_{ADJ}$  were run again to ensure that the data were not suffering from heteroskedasticity, using the command *Robust*. After this, the optimal model could be selected. To identify the optimal model, the  $p$  value for f-test and t-test were compared as well as the adjusted  $R^2$  for each model. The model with the highest number of significant predictors of the dependent variable was then chosen as the optimal model. The coefficients further show the relationship between the dependent and independent variables.

## 5. Results

### 5.1 Disclosure Quality

In table 8 below, descriptive statistics of the dependent variables of disclosure quality are presented.

Table 8. Descriptive statistics dependent variables

<b>Dependent variables</b>	<b>Observations</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Optimism	278	49.64	1.07	47.94	51.53
Certainty	278	85.44	25.74	51.71	124.61
Fog	278	18.09	3.27	12.8	23.7
Flesch reading ease	278	32.42	10.90	18.1	52
Flesch grade level	278	14.44	2.84	10.1	19.2
Amount	278	1021.72	583.16	333	2085

### 5.1.1 Tone

Optimism scores were found to vary between 47.94 and 51.53 with a mean of 49.64. The standard deviation in the sample is 1.07 indicating that most observations are close to the mean and the dispersion of data in the sample is low. Regarding certainty, the scores vary between 51.71 and 124.61 with a mean of 85.44. The standard deviation of 25.74 shows that the observations are less concentrated around the mean.

### 5.1.2 Readability

The Fog index score vary from 12.8 to 23.7 with a mean of 18.09. A fog index score of 18 corresponds to a master degree level of studies in terms of interpretation of a text (Richards & van Staden, 2015). The standard deviation is 3.27, indicating that most of the analyzed texts require a higher education or even a master degree level.

The mean of the Flesch reading ease score were found to be 32.42 and the scores range from 18.1 to 52. The standard deviation was found to be 10.9, which indicates that at least a university degree is required in terms of interpretation of texts.

The Flesch grade level scores range from 10.1 to 19.2 with a mean of 14.44. The standard deviation is 2.84, which indicates a spread of the observations where the required education varies from elementary school to a master degree. The mean value of the Flesch grade level and Fog index is 16.27, implying that a degree is required to be able to read and understand these disclosures. Taken together, the outputs of these readability measures show that an overall high level of education is needed in order to read and understand the narrative environmental liability disclosures of annual reports in this sample.

### 5.1.3 Amount

The number of characters in the disclosure range from 333 to 2085 with a mean of 1021.72. The standard deviation is 583.16, which indicates that there is a large dispersion in amount of disclosures within the sample. This was evident when conducting the manual collection of environmental liability disclosures, where some companies were found to write only a sentence while others wrote up to three pages of such disclosures.

## 5.2 Determinants of disclosure quality

In table 9 below, results from the Variable selection model (*Vselect* command in the Stata module) showing what independent Variables that best explains the dependent variables are presented.

Table 9. Results from the Variable selection model

	Prob > F	R <sup>2</sup> adj	Predictors	Coefficient	P>  t	Confidence
<b>Optimism</b>	0.0000	0.1332	<i>D/E</i>	-0.168	0.123	87%
AICc			<i>EP</i>	0.0617	0.173	82%
			<i>Size</i>	-3.11e-09	0.054	94%
			<i>UK</i>	0.793	0.000	99%
<b>Certainty</b>	0.0000	0.1087				
AICc			<i>ROE</i>	-22.783	0.026	97%
			<i>Size</i>	1.73e-07	0.000	99%
		<i>UK</i>	-13.299	0.000	99%	

<b>Fog</b>	0.0000	0.1187				
AICc			<i>Scandinavia</i>	-2.664	0.000	99%
			<i>Size</i>	1.30e-08	0.014	98%
<b>Flesch reading ease</b>	0.0000	0.094				
AICc			<i>Scandinavia</i>	5.717	0.000	99%
			<i>Size</i>	-7.23e-08	0.000	99%
<b>Flesch grade level</b>	0.0000	0.1712				
AICc			<i>Scandinavia</i>	-2.968	0.000	99%
			<i>Size</i>	1.10e-08	0.016	98%
			<i>UK</i>	-1.075	0.004	99%
<b>Amount</b>	0.0000	0.1276				
R <sup>2</sup> <sub>ADJ</sub>			<i>EP</i>	30.351	0.243	75%
			<i>NI</i>	-3540.114	0.001	99%
			<i>Profitability</i>	281.921	0.056	94%
			<i>ROE</i>	554.135	0.062	93%
			<i>Scandinavia</i>	-373.811	0.000	99%
			<i>Size</i>	3.81e-06	0.002	99%
			<i>UK</i>	-231.820	0.003	99%

### 5.2.1 Tone

#### *Optimism*

The output from the leaps and bounds algorithm shows that for the information criteria AICc and R<sup>2</sup><sub>ADJ</sub>, the optimal models contain four identical predictors and the model as a whole have explanatory power (Prob > F = 0.0000). The variables included in the final model are UK, Size, D/E and Environmental provision, which together explain 13.32 percent of the variability in Optimism. However, only UK and Size were found to have significant effect on Optimism (P > | t | = 0.054-0.000). Size is negatively correlated with Optimism, while UK was found to have a positive relationship with the dependent variable. The findings suggest that larger firms have less optimistic tone in their disclosures and UK firms tend to have an optimistic tone in their disclosures.

#### *Certainty*

The leaps and bound algorithm suggests a three-predictor model under the information criteria AICc but a four-predictor model under R<sup>2</sup><sub>ADJ</sub>. In the four-predictor model, one predictor is insignificant but for the three-predictor model, all variables are significant (P > | t | = 0.026-0.000). The statistically significant AICc model (Prob > F = 0.0000) includes UK, Size and ROE and it explains 10.87 percent of the variation in Certainty. While Size is positively correlated to Certainty, UK and ROE has a negative relationship to the dependent variable. These findings imply that larger firms and firms with lower ROE tend to use a more certain tone in their disclosures. The findings further suggest that UK firms use a less certain language.

### 5.2.2 Readability

#### *Fog index*

Output from the leaps and bounds algorithm suggest a three-predictor model under the information criteria  $R^2_{ADJ}$  but a two-predictor model under AICc. However, one of the variables included in the  $R^2_{ADJ}$  model is insignificant. The AICc model is statistically significant (Prob > F = 0.0000) and has explanatory power. The model explains 11.87 percent of the variation in Readability, measured through the Fog Index. Size is positively related to the Fog index and the effect is significant ( $P > |t| = 0.014$ ), while Scandinavia is negatively correlated with the Fog index ( $P > |t| = 0.000$ ). The higher the Fog index, the lower the readability and the more difficult a text is to read. The findings of the current study show that larger firms have disclosures of lower readability. Further, the findings suggest that Scandinavian firms have disclosures of higher readability.

#### *Flesch reading ease*

An identical two-predictor model with the variables Size and Scandinavia is suggested by the leaps and bounds algorithm under both the AICc and  $R^2_{ADJ}$  information criteria. The significant model (Prob > F = 0.0000) explains 9.4 percent of variations in Readability, measured by the Flesch reading ease formula. Further, the variables are significant ( $P > |t| = 0.000$ ). Size is negatively correlated with the Flesch reading ease score while Scandinavia is positively associated with the dependent variable. The higher the Flesch reading ease score, the easier a text is to read. This implies that larger firms are associated with disclosures with lower Readability that are more difficult to read. Scandinavian firms have disclosures of higher Readability, hence disclosures produced in these companies are easier to read.

#### *Flesch grade level*

The leaps and bound algorithm, suggests an identical three-predictor model under both information criteria AICc and  $R^2_{ADJ}$ . The model is significant (Prob > F = 0.0000) and explains 17.12 percent of variation in Readability, measured by the Flesch grade level formula. The variable Size is positively correlated to the Flesch grade level scores while UK and Scandinavia are negatively associated to the dependent variable. The higher the Flesch grade level score, the lower is the readability of a text. The findings imply that larger firms provide disclosures with lower readability that are more difficult to read. The findings further suggest that Scandinavian firms and UK firms have disclosures of higher readability.

Conducting an additional regression test, the three readability formulas were found to be significantly correlated ( $P > |t| = 0.000$ ) to each other ( $R^2 = 0.9427$ ). The measures identify the same significant independent variables, except for the Flesch grade level, which also identifies an additional independent variable. This leads to the conclusion that the results are valid.

### 5.2.3 Amount

The optimal models suggested by the leaps and bounds algorithm for Amount are a five-predictor model under the information criteria AICc and a seven-predictor model under  $R^2_{ADJ}$ . For the latter one, six variables are significant ( $P > |t| = 0.062-0.000$ ). The final model under  $R^2_{ADJ}$  is significant (Prob > F = 0.0000) and explains 12.76 percent of variation in Amount. Size, ROE and Profitability are positively correlated to the dependent variable, while NI, Scandinavia and UK are negatively associated with it. The current study shows that larger firms, profitable firms, firms with higher ROE and lower NI have larger amounts of disclosures. Scandinavian and UK firms were on the other hand found to have lower amount of disclosures.

## 6. Analysis

### 6.1 Tone

The mean optimism score found within the sample (49.64) is almost identical to the mean optimism score (48.21) of disclosures made by US companies within environmentally sensitive industries in the study conducted by Cho et al. (2010). The study by Cho et al. (2010) is perceived as an appropriate benchmark since the oil and gas industry, among other environmentally sensitive industries, is included in their sample. Due to the fact that these researchers define a score of 51.36 as being a high level of optimism, the level found in the current study is hence interpreted as high within the context of environmentally sensitive industries. This high level could indicate a strategically use of tone in order for the entities to present themselves in a more favorable manner (Cho et al., 2010; Tan et al., 2014), but the tone could on the other hand also be associated with expected future good performance (Arena et al., 2014). Despite the different geographical settings, the current study supports the findings by Cho et al. (2010) in terms of the level of positive tone. Regarding certainty, the mean score found in the current study (85.44) is twice as high as the score found in the study by Cho et al. (2010). The lowest and highest levels in the current study are also significantly higher than the same levels of the sample investigated by Cho et al. (2010). This indicates higher levels of certainty in the European setting, compared to the US setting. Relying on the view taken by Cho et al. (2010), which builds upon the study by Merkl-Davies and Brennan (2007), this combination of high levels of both optimism and certainty would not imply the use of impression management.

The findings of the current study suggest that larger firms have less optimistic and more certain tone in their disclosures. Larger firms are more politically sensitive and therefore they are more likely to engage in manipulative behavior (Watts & Zimmerman, 1978; Zimmerman, 1983). Since the combination of high optimism and low certainty are perceived as an impression management tool by Merkl-Davies and Brennan (2007) and Cho et al. (2010), a positive relationship between firm size and optimism, and a negative relationship between firm size and certainty could therefore have been expected. However, in the current study the opposite associations were found. Hence, impression management in terms of rhetorical manipulation is interpreted as not being exerted among large firms within the sample. Instead, building on the view taken by Arena et al. (2014), the use of tone is simply interpreted as a way of presenting a true picture of the firm. The disclosures are perceived as being neutral, which is one important aspect of the fundamental qualitative characteristic faithful representation highlighted by IASB (CF, 2010). The positive association between firm size and certainty found in the current study is in line with the findings by Cho et al. (2010), which also supports that tone is not used as an impression management tool. A further indication of impression management not being exerted is the negative association between performance, measured as ROE, and the level of certainty in environmental disclosures. This means that, as opposed to the findings by Graham et al. (2005) and Cho et al. (2010), poor performance is not associated with uncertain language. The findings are further in contrast to Ober et al. (1999) and Sydserff and Weetman (2002) who did not find a significant association between performance and certainty in disclosures. Building on the above reasoning, the results of the study shows no signs of legitimization behavior in terms of self-serving disclosures described by Clarkson et al. (2008). This stands in contrast to Deegan and Unerman (2011) who highlights a greater tendency of legitimization behavior among companies operating in environmentally sensitive industries.

In this study, a correlation between UK and the tone of disclosures was found, which indicates that institutional factors are determinants of disclosure quality for UK firms in terms



of tone. This supports Cormier et al. (2005) and Soderstrom and Sun (2007) who found that institutional factors such as a country's legal and political system affects the quality of disclosures. The finding is also in line with Li (2010) who found that writing style and expressions vary between different countries. It also supports the view taken by Arena et al. (2014) who assume that tone and language are used differently among firms in different countries and encourages more research within this area. The finding is also in line with Glaum et al. (2013) who highlight differences in accounting policies among European countries, which in turn affects the quality of disclosures. One reason for the differences in accounting policy could be that parts of previous local GAAP are still used (Kvaal & Nobes, 2010). The use of different accounting policies threatens the notion of comparability, which is highlighted by the IASB as a prerequisite for information to be useful (IASB, CF, 2010). Further, a positive tone may be a sign of predicted future good performance (Arena et al., 2014). In contrast to the findings of the overall sample described above, both a generally positive and uncertain tone was found in UK firms' disclosures, which could indicate impression management being exerted (Merkl-Davies & Brennan, 2007; Cho et al., 2010). In line with the view taken among advocates of the legitimacy theory, this behavior could be explained by the fact that the legitimacy is threatened (Clarkson et al., 2008), which is common within companies operating in environmentally sensitive industries (Deegan & Unerman, 2011). Since disclosures of UK firms are not presented in a neutral way, information is interpreted as not being faithfully represented, which in turns leads to information being less useful (IASB, CF, 2010).

## **6.2 Readability**

When making an overall assessment of the results from the three different readability formulas it is concluded that the readability level within the studied sample is low. This imply that environmental liability disclosures are difficult to read and require a high level of education in terms of interpretation, which is in line with the findings of Courtis (1986), Jones and Shoemaker (1994) and Pomerence (1999). Relying on the view taken by Merkl-Davies and Brennan (2007), this reading difficulty could imply obfuscation behavior, meaning that information is concealed through the use of a difficult language. However, it is important to stress the fact that other factors than impression management could be the reason underlying the low level of readability. To exemplify, the annual reports of poor performers tend to be more complex due to the fact that bad news are usually more difficult to present (Bloomfield, 2008). It may also be the result of individual corporate practice, policy and writing skills (Courtis, 1986). The low readability found in the study implies a risk of limited understandability of the information, which is one of IASBs enhancing characteristics of usefulness of information (IASB, CF, 2010). The fact that low readability may limit the usefulness of the disclosures is highlighted by Pomerence (1999). Due to the low levels of readability, there is further a risk of low degree of trust among stakeholders (Rennekamp, 2012).

As described earlier, in accordance with the political cost hypothesis, larger firms could be expected to be engaged in impression management (Watts & Zimmerman, 1978; Zimmerman, 1983). Readability was found to be negatively correlated with firm size, according to all three readability measures, which could be perceived as larger firms are engaged in impression management. This indicates that larger firms tend to disclose information that is difficult to read. This association is in line with Li (2008) who found larger firms to provide longer annual reports than smaller firms and length of annual reports to be associated with low readability. Underlying this association could also be incentives to obfuscate information through the use of difficult language (Bloomfield, 2008). The finding of the current study is further in line with the observations made by Jones (1988) who explains this correlation as the

larger a firm grows, the more complex the operations becomes. Therefore, readability is decreased for larger firms and the readability level should not be viewed as impression management. The opposite correlation between firm size and readability was found by Courtis (1995) who explains it as larger companies have more resources to allocate to the writing of annual report preparation, thus increasing the readability.

The findings further imply that readability is dependent on country specific factors since a positive correlation between Scandinavia and readability were identified through all three readability measures, which is in line with Glaum et al. (2013). Also, the same correlation was found for the UK variable, which was included in the model for one of the readability measures. This is in line with the findings of Cormier et al. (2005) and Soderstrom and Sun (2007) who found that institutional factors such as a country's legal and political system have an impact on the quality of disclosures. Based on these findings it is concluded that impression management in terms of reading ease manipulation is not being exerted among Scandinavian and UK firms included in the sample. In order to establish the underlying reason for the association between performance, firm size and country with readability, additional studies are required.

### **6.3 Amount**

The results of the current study show a great dispersion of the amount of environmental liability disclosures in the sample, where some disclosures only contain one sentence while others contain several pages. This dispersion in terms of amount is underpinning the critique directed towards IASB regarding diversity as consequence of vague accounting guidance for users of IAS 37 in general and extractive industries in particular (IASB, ED/2010/1; IASB, DP, 2010). It could be problematic to compare a company providing extensive disclosures to a company providing limited information. This scenario highlights problems with comparability, which is vital for stakeholders in order to evaluate firms (IASB, CF, 2010).

The current study shows that firms that are larger, profitable or have lower net income tend to have a larger amount of disclosures. While others have found strong correlations between liability size and amount of disclosures (Barth et al., 1997; Peters & Romi, 2013; Campbell et al., 2014), this association was not found in the current study. Firm size was found to be positively correlated with the amount of disclosures, which is in line with findings of prior studies both regarding amount of disclosures and length of annual reports in general (Courtis, 1995; Reverte, 2009; Li, 2010; Richards & van Staden, 2015). It is also in line with Li (2008) who found annual reports of larger companies to be longer than those of small companies. The reason for why a correlation between environmental provision and amount was not found could be that those costs were not fully identified and thus not included in the study. Underlying this could be the risk that companies have neglected to account for them, they are hidden within accounts or grouped with other costs (Raiborn et al., 2011).

Performance measured as Profitability and ROE were also found to be associated with a larger amount of disclosures, which is in line with Campbell et al. (2014) who found the amount of disclosures to be correlated with performance, measured as high turnover. These findings suggest that better performing companies provide more information than poor performing companies, suggesting disclosures are informative. This may indicate that poor performing companies either have less material information to present or that material information is withheld, as presented by Barth et al. (1997). However, performance measured as NI was found to be negatively correlated with performance in the current study. This opposite correlation might suggest that NI captures something else than the other performance measures, which could be perceived as a weakness of this study. Campbell et al. (2014) also

found a positive correlation between leverage and performance and they explain their results as risk factors being the reason for the larger amount of disclosures. However, no correlation between leverage and amount was found in the current study, which is in line with the findings of Reverte (2009). Thus, the current study does not support the suggestion of risk factors determining the amount. Scandinavia and UK were found to be negatively correlated with amount of environmental liability disclosures, implying that country is a determinant of amount. Once again, the findings of the current study support Glaum et al. (2013) who highlights country specific factors to be determinants of different accounting policies and Cormier et al. (2005) and Soderstrom and Sun (2007) who explain that quality of disclosures is depending on e.g. a country's legal and political systems.

To sum up, alongside with size and performance, country was found to be one of the most frequently appearing determining factors of quality in the results of the current study. Country variables were found to be correlated with all of the dependent variables tone, readability and amount. Apart from having disclosures that are easier to read, the results of the study show that UK firms tend to have environmental liability disclosures of low quality compared to what is the case for other European firms. As mentioned above, the combination of high optimism and low certainty indicates a use of impression management. Further, the fact that UK firms have lower amounts of disclosures also indicates low quality. The results for Scandinavian firms on the other hand show a general high level of quality compared to other European firms. In terms of tone, no sign of impression management was found for Scandinavian firms, as opposed to the case of UK firms. Further, readability, measured by all three readability formulas, is positively correlated to the Scandinavian variable, showing that disclosures are easier to read. Similar to what was the case for UK, Scandinavian countries tend to have lower amounts of disclosures than the rest of the European countries, indicating lower quality under the definition of quality in this study. The lower amount is in contrast to the findings by Van der Laan Smith et al. 2005 who found the opposite. As highlighted earlier, the view that larger quantities of disclosures equal higher quality of disclosures have been criticized (Campbell et al., 2014; Hennes, 2014; Richards & van Staden, 2015). Adopting the opposite view, that less disclosures increases the quality, the findings would instead imply higher quality in terms of amount for UK and Scandinavia. Since Scandinavia is found to have high quality in terms of both tone and readability, adopting the view that less disclosure are a sign of higher quality could be perceived as reasonable. The fact that UK firms are shareholder-oriented (Armour et al., 2003) could explain why UK firms have lower disclosure quality. Shareholder-orientated firms are less concerned about environmental issues than stakeholder-oriented firms (Van der Laan Smith et al. 2005), which make this a plausible explanation as to why environmental liability disclosures are of poorer quality among UK firms than other European firms. The lower degree of quality are further in line with the findings by Van der Laan Smith et al. (2005) that stakeholder-oriented countries have higher quality of disclosures than shareholder-oriented countries. Scandinavian countries on the other hand are stakeholder-orientated with a great emphasis on environmental issues (Armour et al., 2003; Van der Laan Smith et al., 2005; Strand et al., 2015). These countries are further considered to be global leaders within the area of CSR and the tradition of stakeholder engagement is deeply seated (Strand et al., 2015), which is supported by the findings in the current study. This could explain the higher quality of environmental liability disclosures among Scandinavian firms compared to other European firms.

## **7. Concluding remarks**

Today, a lot of judgment is involved when accounting for provisions, due to the lack of guidance and vague requirements in IAS 37, but also the fact that accounting standards under IFRS are principles based. This, taken together with the fact that firms engaged in extractive activities face specific financial reporting challenges, was the underlying reason for disclosures of environmental provisions being the area of interest for this study. Since IAS 37 is interpreted as not determining the quality of such disclosures, this study aimed at examining what determines the quality of narrative disclosures of environmental provisions.

The findings suggest that size, country and performance are determinants of quality in terms of tone. Impression management is interpreted as not being exerted among large firms since they use less optimistic and more certain tone in their disclosures. This was further confirmed by the negative association between performance and the level of certainty in environmental disclosures, since uncertain language was not found to be used to hide poor performance. Further, a correlation between tone and UK was found, which indicates that country specific characteristics are determinants of quality. Also, the combination of a generally positive and uncertain tone, which was found in UK firms' disclosures, could indicate impression management being exerted. Adopting the view of legitimacy theory, underlying this behavior of self-serving behavior may be threatened legitimacy, which is common within this industry. The biased tone could imply less useful disclosures due to information not being faithfully represented. The findings further suggest that size and country are determinants of quality in terms of readability. Larger firms provide disclosures that are difficult to read which may be explained either by impression management through reading ease manipulation or simply that larger firms have more complex operations which are difficult to describe, leading to decreased readability of disclosures. The correlations between Scandinavia, UK and readability confirm that country specific characteristics are determinants of disclosure quality. In terms of amount of disclosures, country, size and performance were found to be determining factors. Larger firms and profitable firms provide larger amount of disclosures. Scandinavian firms on the other hand, tend to have a lower amount of disclosures. Once again, it is important to stress the fact that there are two conflicting views of quality in terms of amount. Under the definition of quality used in the current study, the lower amount of disclosures found among UK and Scandinavian firms indicates less informative disclosures, meaning lower quality. Adopting the opposing view, the lower amount would instead imply less boilerplate disclosures, meaning higher quality. In this study, the association between country and amount of disclosures was found but more studies are required in order to assess whether more or less disclosures enhances quality. As mentioned above, country was found to be one of the most frequently appearing determining factors of quality in terms of tone, readability and amount of disclosures. Overall, the study shows that UK firms have lower disclosure quality than other European countries. This may be explained by the fact that UK is stakeholder-oriented and do not emphasize environmental issues. Scandinavia were found to have higher disclosure quality than other European countries. Underlying this phenomenon could be the strong emphasis on environmental issues among Scandinavian firms since, which in turn is explained by cultural and institutional factors and a deeply rooted stakeholder engagement. The results of this study confirm that IAS 37 is not the determining factor of disclosure quality.

The extractive industries are perceived as typical environmentally sensitive industries. Hence, the results of this study could be generalized to other such industries. Regarding disclosures of provision under IAS 37 in general, caution is recommended when generalizing from the results since environmentally sensitive industries are unique due to the fact that several

significant risks and uncertainties are associated with these industries. Serving as guidance, the results of the study have implications for organizations such as the IASB when developing accounting standards, aiming to harmonize accounting practice and hence enhancing comparability of disclosures across countries. The findings serve as an indication of drivers of disclosure quality and can be used as a starting point for further research in terms of studying determining factors more closely. The study identified several underlying reasons for the correlations of determinants and quality. However, more studies are required for each determinant in order to determine the underlying reasons with certainty. Prior research has provided contradicting evidence as to why an optimistic tone is used in disclosures. The current study find that UK firms have a more optimistic tone in their disclosures than other European firms. In order to determine the reason for this tone, longitudinal research investigating the development of companies' performance and the tone in their disclosures is suggested in order to see if the tone is followed by future good performance. Such a study would determine whether optimistic tone is associated with impression management or not. The current study contributes with the identification of UK oil and gas extractive firms as possible sample for such a study.

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