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Master Degree Project in Accounting

# **Determinants of Decommissioning Provision Disclosures**

Empirical evidence from energy entities listed on EU-regulated markets

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Master Degree Project No. 2016:34  
Graduate School



## **Abstract**

The reporting of decommissioning provisions has recently received considerable attention due to inconsistent reporting and lack of sufficient information. The estimation of the provision is highly uncertain due to timing and amount and involves a high degree of professional managerial judgment as a pre-tax discount rate is used to estimate the value. As the decommissioning cost may have a material impact on financial statements, an increased awareness towards the disclosures of the judgments and estimates is essential. To reflect the underlying financial position of the entity the disclosures must be of high quality. However, previous research provides evidence that management has incentives to affect the perception of the entity. Self-serving presentation has been argued to involve strategic choices of both the content and language tone of disclosures. This thesis examines the determinants of decommissioning provision disclosures of entities operating in the energy industry, reporting in accordance with IFRS. We hypothesize that the quality and tone of the disclosures are determined by entity characteristics, more specifically decommissioning provision size, profitability, leverage and entity size. To capture the disclosure quality we use a self-constructed disclosure index, whereas we employ DICTION software to examine the verbal tone of the reports. Our findings show that entity characteristics to a large degree determine the quality and tone of decommissioning provision disclosures, indicating that the variation of disclosures is due to management incentives. The findings support what recently has been notified, i.e. the financial reporting of decommissioning provisions varies among entities. The vague requirements in the standards consequently leave more scope for strategic decisions on what and how to disclose why management may have incentives to provide deceptive disclosures in an attempt to affect stakeholders' perception.

**Keywords:** Decommissioning provision, IAS 37, Disclosure quality, Discount rate Impression Management.

**Acknowledgments:** We would like to express our gratitude to our supervisor, Emmeli Runesson, for her guidance and valuable input during the research process. Especially thanks for introducing the subject. Further, we would like to thank our seminar leader, Jan Marton, for insightful suggestions, and the participants in the seminars for useful comments. Thank you!

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# 1 Introduction

Financial reporting and disclosure are necessary for entities to communicate their performance to stakeholders (Healy & Palepu, 2001). It is important that the reported information is precise and reflects the entity's underlying financial position in order to serve as a basis for decision-making (Subramanian et al., 1993). High-quality disclosures reduce the information asymmetry between management and users of financial reporting, leading to reduced cost of capital (Kothari, 2000). To provide high-quality information, the International Accounting Standards Board (IASB) has issued principle-based standards, allowing management to determine estimations, methods and what to disclose that best reflect the entity's financial position (Barth et al., 2008; Healy & Wahlen, 1999). As management is allowed to exercise judgments under principle-based accounting, there might be incentives to provide deceptive disclosures for self-serving purposes (Barker et al., 2013). Entities, therefore, have the opportunity to consider costs and benefits to strategically provide disclosures (Barth et al., 1997; Cormier & Magnan, 1999). Disclosure choices have been argued to depend on management incentives, determined by entity characteristics such as entity size, profitability, and leverage (Iatridis, 2008; Joshi et al., 2011). Additionally, management may engage in impression management in an attempt to influence stakeholders' perception of the entity (Neu et al., 1998). Previous research argues that entities engage in impression management by using self-serving biased language and verbal tone in the disclosures presented to stakeholders. It has, for instance, been shown that less profitable entities tend to highlight good news while obfuscating bad outcomes (Cho et al., 2010).

The requirements for the content and structure of financial statements are presented in IAS 1 *Presentation of Financial Statements*. In addition, individual standards have their own disclosure requirements, providing item specific guidelines on how to disclose. However, the standards have been criticized for not providing sufficient guidance to ensure that the provided information is material for decision-making (IASB, 2014a). As financial statements, to a certain extent, depend on future estimates, the disclosures are necessary for clarifying these. It is crucial for investors to gain an understanding of the accounting estimates that reflect significant judgments and uncertainties to be able to interpret the information (Mayorga & Sidhu, 2012). IAS 37 *Provisions, Contingent Liabilities and Contingent Assets* is one particular individual standard where a high degree of professional judgments is required. Decommissioning provisions, which are treated under IAS 37, have recently received attention as the reporting is considered to be inconsistent in terms of transparency (Reuters, 2015). The decommissioning activities involve, for instance, the abandonment of wells, dismantling of assets and restoration of the damaged area to its original condition (KPMG, 2011). The estimation of decommissioning provisions is subjective due to uncertainty, as the settlement may be years in the future and as technological advances may change, thus affecting the costs (Pacter & Enoch, 1995). Consequently, the interpretation of provisions is complex (Suer, 2014) and concerns have been raised that future obligations cannot be reliably measured (Pacter & Enoch,

1995). As the decommissioning provisions are discounted using a pre-tax discount rate, significant assumptions have to be made since the discount rate should reflect the risks specific to the provision. However, the standards do not provide sufficient guidance on how to determine the discount rate (KPMG, 2008). Due to the uncertainties when estimating the provisions the risk that management manipulate the estimates is high (Suer, 2014). For instance, the choice of discount rate can be manipulated to achieve reporting targets (Eckel et al., 2003; Christensen et al., 2012). Disclosure of the item is, therefore, essential for explaining the estimates (Mayorga & Sidhu, 2012). A survey conducted by KPMG (2008) showed that disclosures of decommissioning and environmental provisions varied considerably. In the study, the discount rate was not disclosed by the main part of the entities, and by those who did, it was difficult to compare as the basis for the discount rate varied among the entities (KPMG, 2008). In addition, Capgemini highlights the issue of financial reporting of decommissioning costs and states that more information of the method used when estimating the cost is essential as this is absent in the reports. Entities use different discount and inflation rates to determine the present value of the decommissioning provisions, resulting in reduced comparability (Reuters, 2015).

As the estimation of the decommissioning provision is highly uncertain and may have a significant impact on the financial statements, an increased awareness towards the disclosure of these provisions is required. Provisions are regulated under IAS 37, but less attention is directed to decommissioning provisions. As IASB is principle-based, management is allowed to use their judgment to provide disclosures that best reflects the underlying financial position, resulting in varying disclosures. The vague requirements in the standards also leave more scope for strategic decisions. As the reporting recently has received attention due to inconsistent reporting and lack of sufficient information, the purpose of this thesis is to examine the determinants of decommissioning provision disclosures. Specifically, we study whether the quality and tone of the disclosures are determined by decommissioning provision size, profitability, leverage, and entity size. Previous research has provided inconsistent findings when examining the determinants of disclosure quality and tone, and the varying results have been argued to be explained either by the underlying financial condition or by strategic choices. Hence, management may have incentives to present information that does not reflect the underlying economics. Management may also have incentives to obfuscate information in an attempt to influence the perception of the entity (Cho et al., 2010; Negash, 2012). This indicates that impression management represents a crucial area for research within accounting (Merkl-Davies & Brennan, 2007).

We examine the decommissioning provision disclosures of entities operating in the energy industry, listed on EU regulated markets, reporting in accordance with IFRS. Partly, the sample consists of entities operating in the extractive industry, an industry highlighted by IASB. It is suggested that an industry-specific accounting and disclosure model is needed to report the risks and characteristics of extractive activities in a coherent way. Even though disclosures are provided accordingly to

regulations, it is implied that an extension would be necessary to ensure that the provided information is material and comparable. The provided information varies both to extent and type, which complicates the analysis and comparison of entities (IASB, 2010). Previous research further indicates that entities with large environmental impact may diffuse the disclosures why it is important to examine the disclosures provided by these entities (Cho et al., 2010).

We hypothesize that the quality ( $H_1$  and  $H_2$ ) and the tone ( $H_3$ ) of decommissioning provision disclosures are determined by entity characteristics, namely decommissioning provision size, profitability, leverage, and entity size. To evaluate the quality of decommissioning provision disclosures a disclosure index is applied, whereas for the tone the software DICTION is employed. We further study the disclosure and the level of discount rate separately as it has been found that both vary among entities. The risk of manipulating the choice of discount rate and the inconsistent disclosure makes it highly material to examine the discount rate. The disclosure of the item is, therefore, seen as an important aspect of disclosure quality. Our findings indicate that entity characteristics, to a certain extent, determine the quality and tone of decommissioning provisions disclosures. In addition, the disclosure of the discount rate varied to a great extent. Only a few entities disclosed the item, which complicates the comparability between entities. Overall, our results are in line with IASB's statement (IASB, 2010), an industry specific standard is necessary as the disclosures vary to a great extent. This study contributes to the literature in several ways. First, research within decommissioning provisions is scarce and most related studies have focused on environmental liabilities (e.g. Barth et al., 1997; Cormier & Magnan, 1999). Further, this study contributes to the incentives literature as it examines the association of entity characteristics and the quality and tone of disclosures. Previous research, closely related to our study, has provided inconsistent findings regarding the determinants of both the tone and quality of disclosures why it makes it essential to examine further. As IAS 37 has been criticized for being too vague to ensure that useful information is provided, our study provides insight on how entities disclose information of decommissioning provision. Lastly, to our knowledge, no previous research has narrowed their study to examine the decommissioning provision disclosures why this study will contribute with an insight of incentives for decommissioning provision disclosures.

The remainder of this study is organized as follows: a brief description of the institutional setting is provided in Section two. Section three reviews relevant literature leading to our hypothesis development. Section four presents our research design, followed by the results and analysis in Section five, and Section six provides the concluding discussion and suggestions for further research.

## 2 Institutional Setting

### 2.1 Provisions under IAS 37

A provision is a liability that is uncertain in terms of timing and amount, thus determined by estimations and judgments. The aim of IAS 37 *Provisions, Contingent Liabilities and Contingent Assets* is to ensure that appropriate recognition criteria and measurements are applied and that adequate information is disclosed in the notes to the financial statements. A provision is recognized when the entity has an obligation raised from a past event, the payment is probable and the amount can be reliably estimated (IAS 37:14). Provisions are determined by calculating the present value using a pre-tax discount rate, taking risks and uncertainties into account (IAS 37:42, 45). The discount rate should reflect the current market assessments of the time value of money and the specific risks associated with the provision (IAS 37:47). When determining the provision, the best estimation of the expenditure required to settle the present obligation at the balance sheet date should be made (IAS 37:36). The further away in time an obligation is to be settled, the greater uncertainty lies in the valuation of the provision. The measurement of the provision should be reviewed and adjusted for changes in estimates of timing or discount rate each balance sheet date (IAS 37:59). IAS 37 requires entities to disclose the carrying value of the provisions at the beginning of the reporting period and additional provisions recognized during the period. Disclosures should also cover reversal of unused amount, information about unwinding of discount or changes in the discount rate, and the carrying value of the provision at the end of the reporting period (IAS 37:84). In addition, entities should provide a short explanation of each provision in terms of nature, timing, uncertainties, assumptions and reimbursement (IAS 37:85).

### 2.2 Disclosures under IAS 1

IAS 1 *Presentation of Financial Statements* covers the presentation, structure and the minimum requirements of the information presented in the financial statements. The objective is to present an accurate picture of entities' financial situation and provide useful information for decision-makers. The Conceptual Framework further describes the qualitative characteristics the financial reporting should fulfill in order to ensure useful information, i.e. *relevance, faithful representation, comparability, verifiability, timeliness, and understandability*. Since the preparation of financial statements involves assumptions and judgments, IAS 1 provides guidelines and requires entities to disclose information of these. Entities have to disclose information regarding judgments and accounting policies that significantly affect the financial statements (IAS 1:122), and information of key assumptions of the future and uncertainties in the reported period (IAS 1:125). Although IASB provides guidance on what to include in the financial statements, the materiality of disclosed information is still a continuing concern. IASB, therefore, issued the Disclosure Initiative regarding amendments to IAS 1, effective as of January 2016. The purpose was to clarify the disclosure and presentation requirements to enable entities to exercise judgments when applying the



standard, as critics have been that the standards have hindered such use (IASB, 2014a).

### **3 Literature Review and Hypothesis Development**

#### **3.1 Disclosure Quality**

##### **3.1.1 Definition of quality**

The financial reporting and disclosures are important for entities to communicate their performance to stakeholders. Management possesses more information of expected future performance and lack of comprehensive disclosures might lead to the wrong allocation of resources by investors (Healy & Palepu, 2001). Entities are likely to disclose financial information to ensure that they are in compliance with regulations, as well as—to meet stakeholders' information demands (Iatridis, 2008). However, management and stakeholders might have different incentives and the information provided by entities thus depends on a trade-off between the costs and benefits for the entity (Healy & Palepu, 2001). To serve as a basis for decision-making, it is important that the reported information is accurate and reflects the underlying financial position (Subramanian et al., 1993). Therefore, the financial reporting must be of high quality to be useful (Barth et al., 2008) in order to reduce the information asymmetry between stakeholders and management (Kothari, 2000).

The concepts quality and transparency are often used as synonyms. However, due to the difficulty of distinguishing these two, various definitions have been used (Kothari, 2000). Levitt (1998) argues that it is crucial that reporting standards are of high quality for investors to perceive relevant and useful information to make efficient decisions. Therefore, the reporting standards must allow for full disclosure that will enhance transparency and comparability. Investors will be more assured of the credibility of the financial reports if the disclosure system is established on high quality. Moreover, Pownall and Schipper (1999) define high quality in terms of transparency, full disclosure, and comparability, and argue that financial standards are established to achieve these characteristics. Transparency is obtained when transactions, events, estimates and judgments are disclosed. This allows users to see, not only the effects of management estimates and judgments, but also decisions regarding investments, financing, and operations. Full disclosure implies that all information that is necessary in order to not mislead users must be disclosed. Lastly, comparability is achieved when similar transactions and events are accounted likewise (Pownall & Schipper, 1999), as it should be possible for investors to assess the performance over time and across entities (Levitt, 1998). Kothari (2000) further states that not only standards but also institutional factors such as corporate governance, legal systems, and enforcement of law shape the quality of the reported information. Additionally, Kvaal and Nobes (2010) argue that entities tend to use their national

practices when it is possible under IFRS, resulting in non-comparability between entities.

Francis and Schipper (1999) recognize two concerns of financial reporting, the time and the content aspect. The former involves when the information is reported, whereas the latter concerns the content of the information. However, minor attention has been directed to the content of disclosures as previous research rather focuses on the quantity (Beretta & Bozzolan, 2004). Beretta and Bozzolan (2004) state that the quality of disclosures cannot only be measured by the quantity, but it is rather crucial to study the richness of content, i.e. what is disclosed and how it is disclosed. In a response to the study, Botosan (2004) criticizes Beretta and Bozzolan's (2004) definition and argues that IASB and FASB provide guidance on how to determine the quality. Botosan (2004) refers to IASB framework of qualitative characteristics of information as a measure of quality, i.e.  $quality = f(\text{understandability, relevance, reliability, and comparability})$ . The author highlights the difficulty of estimating the quality of disclosures and states that high-quality information is achieved when the information is useful for economic decision-making.

### **3.1.2 Principle-Based Standards**

The aim of principle-based standards is to provide high-quality standards that allow accounting measurements that best reflect the entities' situation. The preparation of statements involves managerial judgments and estimations, which enables management to use their knowledge to determine estimates, methods and what to disclose (Healy & Wahlen, 1999). However, as judgments are allowed under principle-based accounting, the disclosures might be reflected by management incentives (Barker et al., 2013). As financial statements to a certain extent depend on future estimates, the disclosures are found to be important for stakeholders to evaluate the reliability of the estimations (Barker et al., 2013; Mayorga & Sidhu, 2012). However, Mayorga and Sidhu (2012) argue that there is a lack of detailed guidance as the financial standards are not comprehensive enough to ensure that useful information is provided. The authors claim that entities provide standardized disclosures of the key assumptions of estimations, whereas the discussion of estimation uncertainty is absent. Further, the disclosure of uncertain estimations is considered as too complex and not useful enough for users of financial statements who might be misdirected from relevant information for their decision-making (Mayorga & Sidhu, 2012). In addition, Kvaal and Nobes (2010) stress that where there is room left for judgments, there will always be variation in practice. Standard setters and regulators thus have to determine how much judgment that should be allowed (Healy & Wahlen, 1999). The regulation of financial reporting is important to overcome market incentives and in order to understand how these regulations influence the entities accounting choices and the extent of disclosures, the regulations should be examined (Chow et al. 1996).

### *Previous research on Disclosure quality*

Several studies have examined how entity characteristics affect disclosures, as the disclosure policies may be strategic to gain economic benefits (Cormier & Magnan, 1999; Barth et al., 1997). Iatridis (2008) argues that the disclosure choices are reflected by management incentives, affecting the quality of disclosures. When examining the determinants of disclosures, the author finds that size, growth, and leverage are positively associated with the extent of disclosures. Entities disclose more extensively to assure that the applied accounting policies are in line with accounting regulations. This enables the entities to reduce the risk associated with the entity, which makes it easier to obtain capital from the stock and debt market. Moreover, Cormier and Magnan (1999) examined the determinants of environmental disclosures and based on a cost-benefit approach the authors argue that the disclosure policy is strategic to gain economic benefits. Especially the environmental disclosures are perceived as a subject for managerial decisions as it could be costly if they are perceived to be irresponsible for their environmental damage. The authors claim that the disclosure policy depends on the entities information costs, financial condition, and the environmental performance. Malone et al. (1993) apply a disclosure index as a proxy for disclosure quality when studying the disclosures provided by oil and gas entities. The disclosure index is based on the importance of the information provided for investments decisions, where analysts weigh the items. The study shows no significant association between entity size and disclosure level, whereas the authors provide evidence that leverage, audit size, the number of shareholders, and exchange listing status determine the extent of disclosures. Hence, Malone et al. (1993) imply that entities strategically provide different extent of disclosures.

#### **3.1.3 Discount rate**

As seen in the previous discussion financial reporting is entity-specific and management has the opportunity to choose accounting methods reflecting their financial situation (Barth et al., 2008). Accordingly, this concerns accounting policy choices (Iatridis, 2008). While the allowance for judgment enables management to provide essential information to stakeholders, management can use accounting methods to manage earnings (Barth et al., 2008; Fields et al., 2001). Fields et al. (2001) define accounting choices as the choices management make to impact the accounting output, either if the choice is opportunistically or to maximize the entity value. Christensen et al. (2012) further argue that there is an inherent estimation uncertainty in particular accounting estimations, enabling management to bias select estimates to achieve their reporting targets. As an example the authors highlight the estimation of the discount rate for pension liabilities and assets, arguing that the rate depends on management-input that is not observable, which makes the risk for opportunistic behavior more evident. The estimations are crucial as minor changes in estimations have large effects on the reported numbers. The authors further question whether financial reporting standards are effective, as the estimation uncertainty has

increased over time. In addition, Mayorga and Sidhu (2012) argue that the judgments of future estimates are becoming more subjective and complicated, as more items and assumptions are required, thus affecting uncertainties of future outcomes.

The process of recognizing a provision involves estimations, apprehension of probabilities and assumptions. Given the uncertainties associated with the recognition of provisions, management may have incentives to manipulate the estimates in a favorable way (Suer, 2014). Concerns have been that decommissioning obligations cannot be reliably measured as estimations include future forecasts and that changes in technology are not taken into account (Pacter & Enoch, 1995). The decommissioning and restoration at the end of the useful life of e.g. oil and gas sites are often required by legal or contractual obligations, and the time before settlement may be 60 years or more (Pacter & Enoch, 1995). The estimation concerned with the decommissioning provision is particularly the determination of the pre-tax discount rate. However, IAS 37 does not provide adequate guidance how to determine the discount rate (IASB, 2014). As no general accounting standard addresses the discount rate the determination involves a high degree of professional judgments. Standard setters have failed to provide guidance on which discount rate to apply or the criteria to be achieved when selecting the rate. The discount rate is thus determined individually for each case, for which the standards include a recommendation when possible. This results in a variation of the applied rate between entities, which complicates comparability. For instance, the estimation of environmental liabilities is seen as uncertain due to the timing, and as there is no current trade market for these liabilities the market rate of interest cannot be applied. Management may have incentives to manage the choice of discount rate in situations that are unusual, uncertain or of high information asymmetry. A higher risk requires a higher discount rate; however, managers may tend to manipulate accounting numbers as to hide the risks associated with the liabilities. In addition, some items are highly uncertain, and a high discount rate could lead to a too low value, immaterial for recognition (Eckel et al., 2003). Eckel et al. (2003) use the contingent liability to illustrate and argue that managers can manipulate the accounting numbers by employing a high discount rate and/or a long discounting period, which result in extremely low values. These liabilities are sensitive, as they are not expected to be settled in the near future.

Investors and analysts who are the primary users of financial statements are often interested in the disclosures regarding the present value measurements. IASB, therefore, points out that disclosures regarding the discount rate should be examined and requests more disclosures of the key assumptions made when discounting the present value (IASB, 2014). IASB has identified issues regarding inconsistent disclosure requirements in terms of discount rate and the method used when determining the present value. The disclosures of assumptions made for measuring the present value are insufficient, resulting in a lack of transparency and comparability (IASB, 2015). Further, Capgemini highlights the issue that entities do not disclose the method used to determine the total cost of decommissioning in their annual reports. As there is room for assumptions, entities use different discount- and inflation rates to

calculate the present value of the decommissioning provisions. Therefore, Capgemini argues for the importance of addressing this at a European level (Reuters, 2015).

### **3.2 Impression Management**

During the last decade, research about impression management has increased and questions the quality of reported information. When preparing financial reports management might have incentives to present the information in a way that affects stakeholders' perception of the entities, referred to as impression management (Neu et al., 1998). Moreover, management might have incentives to present a biased picture of the entity performance by highlighting positive events and concealing negative outcomes. Hence, reports will only provide useful information to the extent that the information is reliable and understandable (Courtis, 1998). The quality of the information will be low if the disclosures are used for impression management instead of informative purposes. Erroneous decisions on the allocation of capital can be made if entities engage in impression management and users are receptive to it (Merkl-Davies & Brennan, 2007). Merkl-Davies and Brennan (2007) argue that there are two motives behind impression management, concealment and attribution. The former takes place when management obfuscates bad outcomes or highlights positive results, whereas the latter concerns when management take credit for good outcomes while blaming external circumstances for bad performance. Accordingly, Li (2010) finds that entities tend to refer to themselves when performance is well, indicating that management engages in self-serving attribution. The study shows that managerial characteristics can be revealed by the way managers communicate and, therefore, have an important role in understanding entities decisions. Negash (2012) further claims that in order to create a reputation and counteract the negative publicity that the entities may encounter, the disclosures in the financial statements are of a self-servings style with elements of propaganda. However, Clatworthy and Jones (2006) question whether it is conscious manipulation or rather as entities aim to describe the actual financial performance.

#### **3.2.1 Legitimacy theory**

Legitimacy theory can provide valuable knowledge behind managements' decision-making (Deegan, 2002). The notion of legitimacy theory is that entities seek to ensure that their activities are perceived as legitimate by society. The organizational structure is thus a result of institutional rules, as entities try to comply with norms and rules set by society. Failing to adopt these rules may threaten entities legitimacy, hence their prospects of survival (Meyer & Rowan, 1977). Deegan (2002) stresses that the perception of the entity can be influenced by disclosure policies. Management may have incentives to provide deceptive disclosures to change the perception of the entity in order to be perceived as legitimate. The author further argues that disclosure decisions should not only be based on how legitimate the entities want to be perceived by stakeholders, but it is rather crucial to meet the stakeholders' information needs. To affirm compliance with stakeholders' expectations management may provide

target disclosures regarding certain activities. Hence, disclosures of information are provided, not because of the perceived responsibility, but due to other strategic reasons to appear legitimate. Previous research has applied the legitimacy theory when studying environmental disclosures to obtain an understanding of the decisions of management to provide disclosures. Cormier and Magnan (2015) argue that there is a conflict where management has to determine whether to disclose environmental information aligned to stakeholders needs or to achieve legitimacy. Their analysis was conducted on CER, a report where all environmental activities are covered, as the authors' stress that management can use impression management to improve legitimacy when disclosing environmental information. The authors conclude that the provided information did not only enhance the quality of information leading to better forecasting by analysts but also that the environmental disclosures were used as a tool to gain legitimacy. The stakeholders' perception of the entity was thus influenced. However, for financial stakeholders increased legitimacy was seen to mitigate information uncertainty.

### **3.2.2 Tone**

Previous research has found that disclosures vary in language tone (Davis et al., 2012) and that the manipulation of tone and readability of financial statements influence stakeholders' perception of the provided information (Davis et al., 2012; Tan et al., 2014). When examining earnings press releases Davis et al. (2012) found that an optimistic tone is used to signal expectations about future performance. Stakeholders' reactions imply that the language is perceived credible, as the entity is optimistic about future performance. Tan et al. (2014) further study the effect of readability and language sentiment to see how this impact the valuation of future performance. The use of a positive language is perceived to reflect confidentiality about future performance and investors perceive the future performance to be better than indicated by the financial statements. When both readability and language sentiment is studied the language sentiment has less effect on the valuation of the entity when readability is high. However, if readability is low, the tone affects investors' perceptions. For less sophisticated investors, positive language results in an optimistic valuation, whereas more sophisticated investors perceive this as less credible, resulting in decreased valuation. While Davis et al. (2012) imply that stakeholders perceive an optimistic tone as credible, Tan et al. (2014) study indicate that a positive tone might have an opposite effect.

Previous research has also examined the disclosures of entities operating in environmental sensitive industries and found that these vary both in extent and quality. Cho et al. (2010) study if the language in environmental disclosures is self-serving by examining whether differences of the tone in accounting narratives depend on the environmental performance. The study implicates that worse environmental performers present outcomes by expressing more optimism and less certainty. The worse environmental performers still emphasize good news while obfuscating bad news, which is accordingly to Merkl-Davies and Brennan (2007) conclusion that

entities use concealment and attribution to present their performance more favorable. However, Arena et al. (2015) provide contrary results when studying the tone of the disclosures of US oil and gas entities. In line with the study of Cho et al. (2010), Arena et al. (2015) also apply the optimism score when examining whether environmental reporting is used to increase transparency or as to manipulate the stakeholders' perceptions of the entity. The authors conclude that a positive tone in the disclosures is not purely used to present opportunistic information, but rather to communicate future expectations.

### **3.3 Disclosure Determinants**

*This section presents the entity characteristics that we hypothesize will determine the quality and tone of decommissioning provision disclosures.*

#### **3.3.1 Size of Decommissioning Provision**

To estimate entity value, assess risks, and potential investments the disclosures of information regarding environmental costs is crucial for stakeholders. However, due to the measurement issues associated with environmental costs, these costs are often combined with other costs, hidden or completely absent in the financial statements. Consequently, the information conveyed does not fulfill the expectations of stakeholders (Raiborn et al., 2011). A study conducted by Negash (2012) shows that entities did not disclose the size of the costs for decommissioning, rehabilitation and restoration of environmental damage. Therefore, the author argues that clearer and mandatory standards are required to ensure that the size of environmental assets and liabilities are disclosed. Environmental costs may be of high significance for entities and failure to disclose these costs may convey an incorrect picture of the entity's financial position, which may prevent stakeholders from recognizing long-term risks and benefits (Raiborn et al., 2011). Raiborn et al. (2011) thus argue that higher transparency, credibility, trust and accountability are achieved when "hard" and comparable data is presented.

Previous research further indicates that the size of environmental liabilities affects the disclosures. Barth et al. (1997) find a positive association between environmental liability size and the extent of disclosures as these entities are under more regulatory pressure and thus have incentives to disclose more. Due to the long estimated period, the environmental liabilities are highly uncertain and a high degree of discretion is used in the disclosures of environmental liabilities (Barth et al., 1997). Disclosures of provisions are essential for the apprehension of probabilities and uncertainty estimations. In the determination of provisions, management is required to exercise judgment, where they might have incentives to use creative accounting (Suer, 2014). In addition, Chen et al. (2014) study the motives for entities to initiate environmental liability disclosures, arguing that it might be due to impression management strategies. Their results imply that entities disclosed information although the amount was immaterial, thus allowed for non-disclosure. Chen et al. (2014) thus argue that

entities disclose immaterial liabilities to avoid inaccurate estimations by stakeholders if the environmental liabilities are not disclosed.

### **3.3.2 Profitability**

Previous research identifies that the financial situation influences the extent of disclosures. To support the position and compensation that management has, more profitable entities may disclose more detailed information. However, when profits are low management may choose to disclose less as a way of covering up the reasons for losses or decreasing profits (Singhvi & Desai, 1971). Raiborn et al. (2011), however, state that less profitable entities tend to disclose more information than necessary to appease stakeholders. Accordingly, when examining the environmental disclosures Neu et al. (1998) find a negative association between profit and the extent of environmental disclosures. The authors argue that this is due to that management considers stakeholders' responses and therefore disclose more to gain legitimacy.

A well-performing entity is more likely to disclose more about environmental liabilities than a poor performing. Good performing entities benefit from having more open disclosures as this lowers the cost of capital, and thus outweigh the costs from disclosing more. Poor performing entities, however, disadvantage from disclosing more sufficiently as this might result in reputational and contractual costs (Cormier & Magnan, 1999). Previous research examining the tone related to performance has identified differences. Clatworthy and Jones (2006) examine the chairman's statement of profitable and less profitable entities and imply that impression management is most evident for less profitable entities. Less profitable entities distance themselves from bad events and present more future-oriented information, whereas profitable entities highlight their outcome. In addition, Cho et al. (2010) fail to find a significant relationship between profitability and tone in terms of certainty and optimism in the environmental disclosures. However, Arena et al. (2015) find a negative association between profitability and optimism when studying environmental disclosures, indicating that less profitable entities tend to use more optimism in their language.

### **3.3.3 Leverage**

According to the agency theory, conflicts between the entity and its stakeholders are more likely to occur for more leveraged entities (Joshi et al., 2011). Previous research indicates that highly leveraged entities tend to disclose more information in the annual reports due to monitoring costs. To reduce these costs entities are likely to provide more information (Jensen & Meckling, 1976; Joshi et al., 2011). Moreover, Elzahar and Hussainey (2012) argue that more leveraged entities tend to provide more information as a way to signal their capability of fulfilling their obligations. Accordingly, Iatridis (2008) finds that higher leverage is associated with more extensive disclosures, which is argued to be a way to attract investors. More comprehensive disclosures are appreciated by investors as it reduces the risk associated with the entity. However, there are contradictory results. Raffournier (1995) shows that there is no significant relationship between leverage and



disclosures. Further, to conceal the risk level, highly leveraged entities may have incentives to disclose less information (Hossain, 1999 see Ali et al., 2004 pp. 189). In addition, highly leveraged entities may be unable to face the first negative consequences of providing more information, why less information is provided (Cormier et al., 2009).

### **3.3.4 Entity size**

Several studies indicate that entity size determines the disclosure level in the annual reports. The cost of providing detailed information is assumed to be lower for larger entities as these, due to internal purposes, already intent to produce the information. Further, due to competition, smaller entities may not be willing to disclose more information than necessary as the annual report is the main source of information for competitors (Singhvi & Desai, 1971; Raffournier, 1995). Moreover, Singhvi and Desai (1971) stress that larger entities seem to understand the advantages with disclosures of higher quality. Disclosing more detailed information facilitates the sale of securities and provides better opportunities for financing. Iatridis (2008) further argues that larger entities disclose more extensively as a way to reassure investors that they are in compliance with accounting policies. The author argues that this is also due to avoid political monitoring. This is in line with Watts and Zimmerman (1990), stating that larger entities, due to higher political attention may use accounting methods that reduce profits to avoid political costs or regulations (Watts & Zimmerman, 1978). In addition, Cooke (1989) argues that larger entities may experience higher demands from stakeholders to disclose more.

As for environmental information, Cormier and Magnan (1999) identify that larger entities tend to disclose more environmental information than smaller entities. Larger entities are subject to higher visibility and therefore disclose more environmental information (Cho et al., 2010). Regarding the tone of the language of environmental disclosures, Cho et al. (2010) identify that the entity size determines how certain and optimistic the language is. Larger entities tend to use a more certain and optimistic tone. However, Arena et al. (2015) show that there is a negative relationship between an optimistic tone of the environmental disclosures and entity size. Li (2010a) further stresses that larger entities are more prone to use less positive tone due to political costs and legal concerns and therefore more caution in the disclosures.

## **3.4 Hypothesis Development**

The literature review shows that high-quality disclosures are essential for decision-making why the information provided should reflect the entity's financial position (Subramanian et al., 1993). Previous research has focused on disclosures in general or environmental disclosures when examining the quality and the tone of these. However, mixed results are obtained when investigating the determinants, showing that the disclosures vary in quality. This study focuses on decommissioning provision disclosures due to the high degree of uncertainty when estimating these, which thus can be reflected in the disclosures. As IASB is principle-based, the information

provided is entity-specific (Barth et al., 2008). Management might have incentives to provide disclosure strategically (Barker et al., 2013), which previous research has stated might be explained by entity characteristics (Iatridis, 2008). Hence, our first hypothesis is formulated:

*H<sub>1</sub>: The quality of decommissioning provision disclosures is determined by entity characteristics*

Based on the literature review we assume the following predictions:

**Table 3.1**

<b>Disclosure Quality (H<sub>1</sub>)</b>		
<b>Determinants</b>	<b>Prediction</b>	<b>Explanation</b>
Size of decommissioning provision	+	Regulatory pressure
Profitability	+/-	Nothing to conceal/ Impression Management
Leverage	+	Reduce associated risk
Entity size	+	Higher visibility

In addition, the determination of the decommissioning provision requires estimation uncertainties as a pre-tax discount rate is used to determine the size. However, as aforementioned the discount rate can be used strategically, resulting in a variation of the level of the discount rate (Eckel et al., 2003). Disclosures of the item are, therefore, essential for explaining the estimates (Mayorga & Sidhu, 2012). Since IAS 37 is vague and does not explicitly requires entities to disclose the discount rate level, comparability between entities and over time becomes difficult. For instance, it has been shown that management may have incentives to estimate the value opportunistically to achieve their reporting targets (Christensen et al., 2012). Based on this, we study the discount rate separately and the following hypotheses are formulated:

*H<sub>2a</sub>: The level of the discount rate is determined by entity characteristics*

*H<sub>2b</sub>: The disclosure of the discount rate is determined by entity characteristics*

Based on the literature review we assume the following predictions:

**Table 3.2**

<b>Discount rate level (H<sub>2a</sub>)</b>		
<b>Determinants</b>	<b>Prediction</b>	<b>Explanation</b>
Size of decommissioning provision	+	Increasing income
Profitability	-	Higher visibility
Leverage	+	Increasing income
Entity size	-	Higher visibility

**Table 3.3**

<b>Disclosure of discount rate (H<sub>2b</sub>)</b>		
<b>Determinants</b>	<b>Prediction</b>	<b>Explanation</b>
Size of decommissioning provision	+	Regulatory pressure
Profitability	+/-	Nothing to conceal/ Impression Management
Leverage	+	Reduce associated risk
Entity size	+	Higher visibility

As seen in the literature review, the disclosure and the interpretation of the information are further affected by the language tone. As previous research noted, entities operating in sensitive industries are prone to use biased tone, such as optimism and certainty, when presenting environmental information as these entities are under high pressure from the public (Cho et al., 2010). As the decommissioning provision to a high degree is uncertain, and have a great impact on the environment, there might be a tendency for management to present the information in a self-serving way. Our last hypotheses are therefore expressed as:

*H<sub>3a</sub>: The optimistic tone of decommissioning provision disclosures is determined by entity characteristics*

*H<sub>3b</sub>: The certain tone of decommissioning provision disclosures is determined by entity characteristics*

Based on the literature review we assume the following predictions:

**Table 3.4**

<b>Optimism (H<sub>3a</sub>)</b>		
<b>Determinants</b>	<b>Prediction</b>	<b>Explanation</b>
Size of decommissioning provision	-	Tone reflects performance
Profitability	+/-	Tone reflects performance/ Impression Management
Leverage	+	Impression Management
Entity size	-	Tone reflects the performance

**Table 3.5**

<b>Certainty (H<sub>3b</sub>)</b>		
<b>Determinants</b>	<b>Prediction</b>	<b>Explanation</b>
Size of decommissioning provision	-	Environmental impact
Profitability	+/-	Nothing to conceal/ Impression Management
Leverage	-	Impression Management
Entity size	+	Tone reflects performance

## 4 Research Design

### 4.1 Sample selection

To fulfill the purpose of our study a quantitative method is appropriate, enabling us to examine the determinants of the quality and tone of decommissioning provision disclosures. The sample consists of entities listed on EU-regulated markets as of 2007, reporting in accordance with IFRS. Financial statements of entities operating in the energy industry during 2010 to 2014 are examined. This industry is mainly selected as the decommissioning provision is highly material and these entities have a huge environmental impact, which makes it essential to examine the provided disclosures. The reports are collected from the entities websites when available, otherwise the reports are retrieved from the database ORBIS. To select our sample we first conducted a pilot study where we examined the different industry sub-sectors to identify for which entities decommissioning was relevant. Based on this we excluded certain industry sub-sectors that were not proper for this study. This resulted in 960 observations that further were reduced, as the observations did not fulfill our prerequisites. Entities whose annual reports were not available in Thomson Reuters Datastream, or presented in a different language than English, are excluded from the sample. This resulted in 445 missing observations. Only English written reports are included to enable tone analysis in DICTION software. Further, observations that did not mention decommissioning provision are excluded, resulting in 151 missing observations. The final sample consists of 364 observations, mentioning any of the following keywords: *decommissioning*, *dismantling*, *restoration*, *reclamation*, *abandonment* and *asset retirement obligation*, either in the accounting policy or provision note. The number of observations varies for the different hypothesis tests, as the variables have not been available for each observation, resulting in missing values (See Exhibit 5.2-5.4). The sample size is limited as we manually collected data why generalization might be difficult. However, we argue that the sample size is suitable for this study as similar studies have approximately the same sample size when examining the quality or tone of disclosures (e.g. Cho et al., 2012; Arena et al., 2015; Raffournier, 1995, Joshi et al., 2011).

## 4.2 Data collection

The text that is analyzed in DICTION (See 4.4) and items in the disclosure index (See 4.3) are manually collected. The study is limited to analyze the accounting policy note and the provision note since the essential information regarding the decommissioning provisions is provided here. When conducting the pilot study we noticed that several entities mentioned key assumptions of decommissioning provision in the accounting policy note. Therefore, the note is included as crucial information otherwise would be missing. However, information regarding decommissioning provisions provided in other parts in the annual reports is not taken into account why important information might be missing. Further, only the paragraphs covering decommissioning provisions are included in the text analysis. To assure objectivity, we consistently include the whole paragraphs mentioning decommissioning provisions. The paragraphs that do not cover decommissioning provisions are excluded, as these are not of interest for the study and would have influenced the tone analysis. The financial data and control variables are retrieved through Datastream, except the size of decommissioning provision and discount rate level that are manually collected. Using Datastream to collect data is reliable as the retrieval is free from subjectivity. On the other hand, the manual collection of the decommissioning provision size and discount rate level may be influenced by subjectivity and judgments, which can affect the possibility for replication of the study. In an effort to reduce the validity issue concerning manually collected data, our self-constructed index and data collection for tone testing, a part of the sample was examined twice to ensure that correct manual retrieval of data and text had been made.

**Table 4.1**  
**Variable Description**

<b>Variable</b>	<b>Description</b>
<b><u>Dependent variable</u></b>	
DI	Disclosure index. Entities are scored for disclosing the studied items.
DRlevel	The level of the discount rate. Manually collected from the annual reports. In cases where entities disclose two discount rates the mean is applied.
DR	Dummy variable in the probit regression. 1 if the discount rate is disclosed, 0 otherwise.
OPT	Diction "optimism" score to examine the tone of the disclosures.
CERT	Diction "certainty" score to examine the tone of the disclosures.
<b><u>Independent variable</u></b>	
DECsize	Decommissioning provision over total assets as a proxy for size of decommissioning provision. Manually collected from the financial statements and converted to euros by using a fixed currency from 2014.
ROA	Return on assets as a proxy for profitability.
LEV	Total debt over total capital as a proxy for leverage.
SIZE	Entity size. Natural logarithm of total assets.
<b><u>Control variable</u></b>	
Industry	Dummy variable. Five Industry sub-sectors: Exploration & Production, Integrated Oil and Gas, Gas Distribution, Multi-utilities, Conventional Electricity
Country	Dummy variable. 18 countries.
Year	Dummy variable. Year 2010 to 2014.

See appendix for full description

In the regression models we control for country, industry and year. The level of discount rate is reflected by interest rates and risks, which might explain the different discount rate levels. This is taken into account as we control for these factors. The interest rate is controlled by country and year whereas the risk is controlled by industry. The control variables are also included as they might affect the disclosure policies. Even though all studied entities report in accordance with IFRS there might be national differences (Kvaal & Nobes, 2010; Kothari, 2000). Country may also reflect the tone of the disclosures, as there might be different expression habits in the different countries. In addition, industry is included as the various industry sub-sectors may have different disclosure practices, which can be reflected in the quality and tone of disclosures. Further, the decommissioning provision might be more material for some industry sub-sectors. The sample consists of the following countries and industries:

<b>Table 4.1</b>			<b>Table 4.2</b>
<b>Country</b>			<b>Industry</b>
Austria	Czech Republic	Croatia	<u>Oil and Gas Producers</u>
Belgium	Spain	Hungary	-Exploration and Production
United Kingdom	Finland	Italy	-Integrated Oil and Gas
Sweden	Island	Poland	<u>Gas, Water and Multi-utilities</u>
Norway	France	Portugal	-Gas Distribution
Germany	Netherlands	Romania	-Multi-utilities
See appendix for full description			<u>Electricity</u>
			-Conventional Electricity
			See appendix for full description

### 4.3 Disclosure Index

To capture the quality of the disclosures we use a self-constructed disclosure index. Self-constructed disclosure indexes are commonly used by researchers despite the criticism it has received (Beretta & Bozzola, 2008). Healy and Palepu (2001) question the reliability of the metrics and argue that the development of the index involves judgments and therefore hinders replication of the studies. However, as the researcher develops the index the study will examine and capture what the researcher aims to study (Healy & Palepu, 2001). Some disclosure studies have employed quantity as a proxy for quality, thus relying on word counts to measure quality. The use of a disclosure index in this study enable us to use our judgment to examine what is material to disclose, thereby determine if the disclosures are of high quality. In line with Cooke (1989) and Raffournier (1995), we apply an unweighted disclosure index where entities are scored for each disclosed item. The items are assumed to be equally important. Some of the studied items may, however, be more significant than others, but applying a weighted disclosure index increases the subjectivity issues. This is not the problem when applying unweighted disclosure indexes. Following Cooke's (1989) equation of disclosure index, we apply the following metric:

$$M = \sum_{i=1}^n d_i$$

Where,

M is the maximum points to receive, which in our case is 8 points,

$d_i$  is 1 if the studied item is disclosed otherwise 0,

n is the expected number of items to be disclosed

Since IASB is principle-based, no rules are provided for what is significant enough to disclose, thus resulting in a variation between entities. Following Botosan (2004) our self-constructed disclosure index is based on IASB, specifically the requirements in IAS 37 and IAS 1. According to IAS 37 paragraph 85, entities are expected to disclose a brief explanation of each provision regarding nature, timing, uncertainties, assumptions, and reimbursement. Table 4.4 illustrates the scoring of our disclosure index. Entities are only scored for mentioning decommissioning provision or synonyms in the accounting policy or provision note. We further consider whether the provision note contains qualitative information, i.e. if a brief explanation of the decommissioning provision is provided. Moreover, we argue that the disclosures are of high quality if entities include tables and separate the text into subheadings as it becomes clearer and thereby increases the understandability. If the provision note contains an own decommissioning provision heading the scoring is the same as for entities with subheadings, as we find it to be equally clearly presented. We further consider the disclosure of discount rate, inflation rate and timing of the decommissioning provision as relevant for investors. IAS 37 does not explicitly require disclosure of these items, resulting in variation of disclosures among entities. In accordance with IAS 1 paragraph 122 and 125, judgments, accounting policies and key assumptions of the future and uncertainties are required to be disclosed by entities. The estimates determine the decommissioning provision size why we argue that these are crucial to disclose to evaluate estimates and enhance comparability.

Once all items are scored, a disclosure index is created to measure the quality of decommissioning provision disclosures. Our disclosure index does not take into account whether entities are allowed for non-disclosures if the decommissioning provision is not material (the materiality concept). This is not a problem per se, but our index might contain some noises. We are aware that our disclosure index is simplified. However, it captures what we seek to examine. Further, employing a disclosure index to capture the quality of disclosures limits our sample size due to the manual creation of the index. In cases when the accounting policy and/or the provision note is included in the disclosure index the text is also included for testing the tone of the language.

**Table 4.4**

<b>Disclosure Index</b>	
<b>Items</b>	<b>Points</b>
Decommissioning (or synonyms) is mentioned in the accounting policy note	1
A note for provision is presented and mentions decommissioning (or synonyms)	1
The provision note contains qualitative information (text)	1
The provision note contains subheadings	1
The provision note contains a table	1
Time span is disclosed	1
Discount rate is disclosed	1
Inflation rate is disclosed	1
<b>Maximum points</b>	<b>8</b>

#### 4.4 DICTION

The tone of the text is analyzed by employing DICTION software. The choice of DICTION software is due to the efficient way to analyze texts. DICTION is a content-analysis computer software that analyses the verbal tone of a text. The analysis is based on search words from 33-word lists and the verbal tone is measured by five master variables: *certainty*, *optimism*, *activity*, *realism* and *commonality*. These are constructed by combining other dictionary scores and are supposed to be the variables that generate the best understanding of a text. Compared to other text analysis programs, DICTION is superior due to the excess of several dictionaries (Hart, 2001). DICTION is suitable for impression management research as the results are reliable and valid due to the objectivity of the analysis (Sydserff & Weetman, 2002). Previous research applying DICTION to analyze tone argues that other methods rely on judgment when coding the content (Davis et al., 2012), whereas when employing DICTION both coding and quantification are computerized, which increase the validity (Sydserff & Weetman, 2002). Hence, the results are more objective and comparable (Arena et al., 2015). However, a weakness of DICTION is that the context is not considered (Davis et al., 2012). Thereof, we do not consider other conditions that may influence the tone of the text, but only whether the tone is biased. However, this study aims to study whether the tone is affected by entity characteristics, which is captured by this method. If the text analysis is manually conducted, the coding is likely to involve interpretation from the researchers (Bryman & Bell, 2015), whereas we avoid subjectivity issues as we employ DICTION software to analyze the text.

In this study, we analyze the text using the master variables *optimism* and *certainty*. Optimism is defined as “*Language endorsing some person, group, concept or event or highlighting their positive entailments.*”<sup>1</sup> (Digitext inc, 2000, pp. 43), while

<sup>1</sup> Optimism Formula: [Praise + Satisfaction + Inspiration] - [Blame + Hardship + Denial]



certainty is defined as “*Language indicating resoluteness, inflexibility, and completeness and a tendency to speak ex cathedra*”<sup>2</sup> (Digitext inc, 2000, pp. 42). Previous research (Cho et al., 2010; Arena et al., 2015) has applied DICTION to study the tone of disclosures of environmental information and found a significant association of *optimism* and *certainty* related to firm characteristics. As this study, similar to theirs, examine the disclosure of entities with highly environmental impact, we argue that optimism and certainty is suitable to test the tone. These entities have more to gain by using a more certain or optimistic language to disguise their actual situation.

#### 4.5 Statistical analysis

##### *Pearson’s correlation*

**Exhibit 4.1**

<b>Pearson’s correlation</b>									
Variable	DI	DRlevel	DR	OPT	CERT	DEC	ROA	LEV	SIZE
DEC	0.0028	<b>-0.2563</b>	-0.0270	0.0204	<b>-0.0890</b>	1			
ROA	<b>-0.1483</b>	<b>-0.0824</b>	<b>-0.0602</b>	<b>0.1314</b>	<b>-0.1059</b>	<b>-0.3139</b>	1		
LEV	<b>-0.3081</b>	<b>-0.0782</b>	0.0400	<b>0.1351</b>	<b>0.1300</b>	<b>0.2243</b>	<b>-0.1729</b>	1	
SIZE	<b>-0.2549</b>	<b>-0.4987</b>	<b>-0.0645</b>	<b>0.2726</b>	<b>-0.1888</b>	<b>0.0749</b>	<b>0.3436</b>	<b>0.0953</b>	1

Boldface:  $p \leq 5\%$

Pearson’s correlation is presented in Exhibit 4.1. Since the data is parametric and continuous Pearson’s correlation is applicable (Collis & Hussey, 2014). We conduct pairwise correlation analysis to test if there is a significant association between our independent variables in order to avoid multicollinearity issues that could affect the regression tests. Correlation coefficients between 0 and 0.39 are considered to indicate low correlation (Collis & Hussey, 2014). Based on this, the correlation coefficients between our independent variables are low, indicating that there are no multicollinearity issues in the regression models.

##### *Regression models*

To test our hypotheses and identify the relationship between the variables, ordinary least square multiple regression is conducted. Multiple regression enables to control for various factors that may influence the dependent variable. Hence, more of the variations in the dependent variable can be explained if more variables are included in the regression model (Wooldridge, 2014). For  $H_1$ ,  $H_{2a}$  and  $H_3$  OLS regression is conducted, whereas for  $H_{2b}$ , a probit regression is performed, as the dependent variable in this case is a dummy, taking the value 0 or 1. The interpretation of the

<sup>2</sup> Certainty Formula: [Tenacity + Leveling + Collectives + Insistence] - [Numerical Terms + Ambivalence + Self Reference + Variety]

probit regression analysis is different than the OLS regression as it tests the probability of an event to appear and not the correlation between variables. When performing the probit regression, the average marginal effect is presented in the exhibit results.

To control for measurement errors and outliers that may distort the results we winsorize all variables with 1%, thus eliminating the effect of these, as the values below first and above last of 99th percentile are omitted. We also include the robust standard error to control heteroskedasticity (Wooldridge, 2014). Heteroskedasticity assumes that the variance of the residuals is not constants, which is problematic when performing OLS as the underlying assumption is that the variance of the residuals is constant. The regression models used to test the determinants of decommissioning provision disclosures are presented below. The first model test the disclosure index, as a proxy for disclosure quality, the second and third test the hypotheses regarding the discount rate. Lastly, the fourth and fifth models test the tone of the decommissioning provision disclosures.

$$DI = \beta_0 + \beta_1 DECsize + \beta_2 ROA + \beta_3 LEV + \beta_4 SIZE + \sum_{i=1}^{n=27} \beta_i Controls_i + \varepsilon_i \quad (1)$$

$$DRlevel = \beta_0 + \beta_1 DECsize + \beta_2 ROA + \beta_3 LEV + \beta_4 SIZE + \sum_{i=1}^{n=27} \beta_i Controls_i + \varepsilon_i \quad (2)$$

$$PR[DR=1] = \phi[\beta_0 + \beta_1 DECsize + \beta_2 ROA + \beta_3 LEV + \beta_4 SIZE + \sum_{i=1}^{n=27} \beta_i Controls_i + \varepsilon_i] \quad (3)$$

$$OPT = \beta_0 + \beta_1 DECsize + \beta_2 ROA + \beta_3 LEV + \beta_4 SIZE + \sum_{i=1}^{n=27} \beta_i Controls_i + \varepsilon_i \quad (4)$$

$$CERT = \beta_0 + \beta_1 DECsize + \beta_2 ROA + \beta_3 LEV + \beta_4 SIZE + \sum_{i=1}^{n=27} \beta_i Controls_i + \varepsilon_i \quad (5)$$

## 5 Results & Analysis

### 5.1 Descriptive statistics

**Exhibit 5.1**

Descriptive statistics					
Variable	Mean	Std. Dev.	Min	Max	N
<u>Dependent</u>					
DI	5.14	1.82	1	8	364
DRlevel	5.48	3.13	0.5	14.2	148
DR	0.37	0.48	0	1	364
OPT	50.21	1.37	45.77	55.3	352
CERT	49.42	5.51	31.05	60.37	352
<u>Independent</u>					
DECsize	4.87	6.51	0.017	43.13	340
ROA	1.03	11.00	-52.27	26.39	771
LEV	33.00	28.22	0	153.55	795
SIZE	21.28	2.42	15.76	26.27	797

Exhibit 5.1 presents the descriptive summary statistics. All variables are winsorized at 1%. Notifiable, only a few entities disclose the discount rate level, as there are only 148 observations. DRlevel further varies to a high degree, from 0.5% to 14.2%, a variation that is noteworthy. As the determination of the discount rate requires a high degree of professional judgments, management can take advantage of this opportunity by strategically manage the choice of the discount rate (Eckel et al., 2003), which can explain the variation of the discount rate level in our sample. The estimation of decommissioning provisions is to a high degree uncertain, and as pointed out by Eckel et al. (2003) the risk for management to manipulate the discount rate is higher in uncertain situations. As aforementioned, the highest discount rate level in our sample is 14.2% and compared to the mean, which is 5.5%, this is extremely high. As noted by Eckel et al. (2003) a too high discount rate or/and a too long discounting period results in a low value of the decommissioning provision. In some cases, the value could be extremely low and therefore immaterial for recognition.

The exhibit shows that the mean for optimism is 50.21, whereas the mean for certainty is 49.42. Previous research studying tone by applying DICTION has argued what low and high optimism and certainty scores are based on their sample (e.g. Cho et al., 2010). However, one must be careful when comparing these results as the studies may differ. It is difficult to ensure whether our scores illustrate too high or too low optimism. The minimum and maximum score for optimism do not differ to a great deal from the mean, which could be interpreted as the level of optimism is accurate for the sample. For certainty, on the other hand, the scores differ significantly. Therefore, it is difficult to interpret whether certainty score is too high

or too low. However, the minimum and maximum score differs from 31.05 and 60.37, indicating that the entities are applying a more or less certain tone.

In addition, DECsize, the decommissioning provision in relation to total assets, vary extensively where the maximum is 43%, indicating that this item has a significant impact on the financial statement. However, the minimum decommissioning provision is 0.02%. Taking into account the concept of materiality these entities are allowed for non-disclosures of the decommissioning provision due to the small impact on the financial statements, still, entities disclose the item. This can be explained by applying the legitimacy theory (Deegan 2002), as entities may choose to disclose the information even though it is not material to affect stakeholders' perception of the entity. Another explanation could be as pointed out by Chen et al. (2014) that entities disclose the item to prevent wrong estimations if stakeholders estimate the size of the item.

## 5.2 Disclosure Quality

### 5.2.1 Disclosure Index

**Exhibit 5.2**

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**OLS Regression results**

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**Dependent variable Disclosure Index**

Independent variable	Pred.	
DECsize	(+)	0.0189 (1.21)
ROA	(+/-)	-0.02515** (-3.04)
LEV	(+)	-0.0122*** (-4.3)
SIZE	(+)	0.1771** (2.95)
Intercept		1.933 (1.35)
N	331	
Adj. R-sq	0.3864	
R-sq	0.4384	

t statistics in parentheses  
 \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001  
 Control variables Country, Industry and Year

When testing hypothesis 1, disclosure index, all entity characteristics are significant except for DECsize. ROA is negatively correlated with DI at a significance level of 1%. The test suggests, all else equal, that the disclosure quality is lower for more profitable entities. First, this result is contrary to previous research stating that well-performing entities disclose more as these do not have anything to hide, whereas less performing entities disclose less to conceal the reasons for decreasing profits (Singhvi & Desai, 1971). Our results might indicate that well performers do not find extensive disclosures necessary, as they do not feel the need to appease stakeholders. The

findings imply that less profitable entities tend to provide more disclosures to reassure stakeholders about their trustworthiness, which is in line with Raiborn et al. (2011) and Neu et al. (1998). This is accordingly to the legitimacy theory as less profitable entities are keener to provide more information in an attempt to justify their financial condition to stakeholders. Therefore, less profitable entities can use the disclosures as a mean to affect stakeholders' perception to enhance their legitimacy, whereas this is not necessary for well performers.

LEV is also negatively associated with DI at a 0.1% significance level, i.e. the higher leverage, the lower disclosure quality, which is not in line with our prediction. This supports the argument that highly leveraged entities in an attempt to conceal the level of the entity risk may disclose less information (Hossain, 1999 see Ali et al., 2004 pp. 189). In line with Healy and Palepu (2001) statement that the information provided depends on the cost and benefit trade-off, these highly leveraged entities might find the provision of more disclosures inefficient as the cost exceed the benefit. Therefore, these entities disclose less as they may be reluctant to face the negative consequences of more disclosures (Cormier et al., 2009). This is, however, contrary to previous research where findings indicate a positive association between leverage and disclosure level (Jensen & Meckling, 1976; Joshi et al., 2011; Iatridis, 2008; Elzahar and Hussainey, 2012).

The results further show that SIZE is positively correlated to DI, significant at a level of 1%, indicating that larger entities tend to have higher disclosure index, i.e. higher quality of disclosures, which is in line with our prediction. This finding supports previous research stating that larger entities tend to provide more detailed information as the costs are assumed to be lower when preparing the financial statements (Singhvi and Desai, 1971; Raffournier, 1995; Iatridis, 2008). The cost of providing more disclosures is more manageable for larger entities as the benefits are greater than the costs. Further, larger entities are more visible, and therefore prone to disclose more. In line with Iatridis (2008), these entities disclose more to inform that their accounting policies are accurate and also to avoid political monitoring. The entity size in combination to the negative environmental impact can also explain the level of disclosures. As mentioned above these entities are under the public eye and therefore experience higher pressure for information. As larger entities have more resources they can have a more strategic disclosure policy, thus affecting stakeholders perception of the entity. For smaller entities, on the other hand, the disclosures of decommissioning provisions may not be as material, resulting in less provided information. Entities of different size further attract stakeholders with different information needs. This might be a reason for the differences in disclosure index, which is in line with Cooke (1998), who states that larger entities experience higher demands to provide more extensive disclosures.

## 5.2.2 Discount rate

**Exhibit 5.3**

<b>Regression results</b>				
<b>Dependent variable</b>	<b>DRlevel</b>		<b>DR</b>	
<b>Independent variable</b>	<b>Pred.</b>	<b>OLS</b>	<b>Pred.</b>	<b>PROBIT</b>
DECsize	(+)	-0.1931*** (-4.09)	(+)	0.0101* (2.09)
ROA	(-)	0.0001 (0.28)	(+/-)	-0.0027 (-0.86)
LEV	(+)	0.0004 (0.03)	(+)	-0.0010 (-0.92)
SIZE	(-)	-0.0056** (-2.86)	(+)	0.0468* (2.25)
Intercept		18.9111*** (4.13)		0.4663*** (16.66)
<b>N</b>		137	<b>N</b>	271
<b>Adj. R-sq.</b>		0.3721	<b>Pseudo R2</b>	0.1001
<b>R-sq.</b>		0.4986		

t statistics in parentheses

z statistics in parentheses (PROBIT), Probit model

represent Average Marginal effect

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

Control variables Country, Industry and Year

The results from testing hypothesis 2a show that SIZE is negatively associated with DRlevel at a significant level of 1%, i.e. larger entities tend to have a lower discount rate. Larger entities are more drawn to political attention and might, therefore, use accounting methods that reduce the profit (Watts and Zimmerman, 1990). DECsize is also negatively associated with DRlevel but significant at a level of 0.1%, which is not in line with our prediction. We assumed that entities would strive to have a low decommissioning cost and therefore apply a high discount rate. However, the results imply that entities with larger decommissioning provisions tend to have lower discount rates. A large decommissioning provision results in a high cost, and relying on Watts and Zimmerman (1990) this could be a strategic choice to reduce profits to avoid political attention that could, for instance, lead to increased taxes or other regulations. The findings that both SIZE and DECsize is negatively associated with DRlevel can be explained by the same arguments. Applying a lower discount rate increases the decommissioning costs, which reduces the profit. As Christensen et al. (2012) point out; a small change in the discount rate can have a large effect on the accounting numbers why management might have incentives to manipulate the choice of discount rate.

When performing the probit regression for hypothesis 2b, DECsize and SIZE are significant at a level of 5%. When the size of decommissioning provision increases by one percentage point, the probability of disclosing the discount rate increases by 1.008 percentage points on average. The results are closely related to the findings of Barth

et al. (1997) that entities with higher environmental liabilities provide more disclosures due to higher regulatory pressure. Entities with higher decommissioning provisions thus disclose more due to higher information demands, and in order to gain legitimacy the key assumptions are explained. Entities with low decommissioning provisions, on the other hand, do not need extensive disclosures as the provision might be immaterial. Another explanation could be that entities with a high decommissioning provision have nothing to conceal and therefore disclose more, whereas an entity with a low decommissioning provision (which results in a low decommissioning cost) may not be as willing to disclose their judgments and uncertainties. Further, when size increases by one percentage point, the probability of disclosure increases by five percentage points on average. Disclosure of the discount rate ( $H_{2b}$ ) is a part of the disclosure index ( $H_1$ ), which also can be seen in the results. Therefore, the same conclusion can be drawn, i.e. larger entities are under higher public scrutiny, and provide more disclosures. Hence, these findings imply that decommissioning size and entity size influence the probability of disclosing the discount rate.

### 5.3 Tone

**Exhibit 5.4**

<b>OLS Regression results</b>				
<b>Dependent variable</b>		<b>OPT</b>		<b>CERT</b>
<b>Independent variable</b>	Pred.		Pred.	
DECsize	(-)	-0.0269* (-2.29)	(-)	-0.024 (-0.46)
ROA	(-)	-0.0153* (-2.13)	(+/-)	-0.0370 (-1.30)
LEV	(+)	0.0106*** (4.23)	(-)	0.0002 (0.02)
SIZE	(-)	0.1760** (3.18)	(+)	-0.0409 (-0.2)
Intercept		48.2636*** (34.80)		39.5757*** (7.04)
N		322		322
<b>Adj. R-sq.</b>		0.2188		0.2073
<b>R-sq.</b>		0.2869		0.2764

t statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Control variables Country, Industry and Year

When testing the tone hypotheses all independent variables are significant for optimism whereas none is significant for certainty. Hence, we cannot draw any conclusion regarding the association between entity characteristics and certainty of the language in the decommissioning provision disclosures. However, the regression model for certainty is significant as the adjusted  $R^2$  is relatively high, 20.73% indicating that some of the controls variables are significant.

Both DECsize and ROA are negatively associated with OPT at a significance level of 5%, indicating that entities with larger decommissioning provisions tend to use less

optimistic tone in the disclosures of decommissioning provisions, which is accordingly to our prediction. A high decommissioning provision results in higher costs, indicating that these entities have nothing to conceal and therefore do not need to use optimistic language. The less optimistic tone might, therefore, reflect the actual situation. The same discussion applies for ROA, i.e. more profitable entities tend to use less optimistic language tone. This implies that entities with higher ROA and high decommissioning provision size do not opportunistically engage in impression management but rather convey a true picture of the underlying financial position, which is in line with Arena et al. (2015). However, our results indicate that less profitable entities are more optimistic in the disclosures. Relying on previous research (Clatworthy & Jones, 2006) this indicates that these entities tend to use the tone bias when presenting information of decommissioning provisions. Hence, it appears that less profitable entities engage in impression management to affect stakeholders' perception. As stated by Negash (2012) this might be a way to prevent negative interpretation of the entity, thus concealing the true picture of financial performance by using an optimistic tone. This can be a strategic action of the entities, as pointed out by Tan et al. (2014) an optimistic tone can result in overestimation of earnings.

LEV is positively correlated with OPT, significant at 0,1%, indicating that the language tone of decommissioning provision disclosures of more leveraged entities is more optimistic, which is in line with our prediction. This can indicate that entities with higher leverage exercise impression management to provide a picture of the entities situation that is better than indicated by the accounting numbers. Although they are highly indebted, they still seek to convince stakeholders that their situation is under control. In line with Merkl-Davies and Brennan (2007) and Courtis (1998), this might imply that these entities use a concealment strategy, thus highlighting the positive aspects and avoiding disclosing the negative, in this case, the poor financial situation. SIZE is further positively associated with OPT, at a significance level of 1%. Larger entities tend to use more optimistic tone, which is in accordance to Cho et al. (2010) findings. This may also indicate, as mentioned earlier, that larger entities experience higher visibility and therefore use the tone in an attempt to manipulate stakeholders' perception of the entity. However, as stated by Arena et al. (2015) it might not be that entities explicitly engage in opportunistic behavior by using more optimism in the disclosures but rather to accurately convey information about future expectations.



## 5 Concluding Discussion

The intention of this study was to examine the determinants of decommissioning provision disclosures. Previous research has found that disclosures in general both to quality and tone are affected by entity characteristics (Singhvi & Desai, 1971; Cooke, 1989; Malone, 1993; Raffournier, 1995; Neu et al., 1998; Cormier & Magnan, 1999; Iatridis, 2008; Cho et al., 2010; Joshi et al., 2011; Elzahar & Hussainey, 2012; Arena et al., 2015). Our findings can, to a certain extent, support previous research as our results show that disclosure quality and tone is determined by entity characteristics.

We find support for our first hypothesis that the quality of decommissioning provision disclosures is determined by entity characteristics, more specifically profitability, leverage and entity size. The differences in disclosure index, as a proxy for disclosure quality, can be interpreted to be influenced by the entities need of being perceived as credible. As noted, the disclosures of less profitable entities are of higher quality. This can be explained as an attempt to calm stakeholders and therefore enhance their legitimacy even though accounting numbers show their poor financial condition. However, contrary to previous research, we find that more leveraged entities have a lower disclosure quality. This is surprising, as these entities would benefit from assuring stakeholders about their current situation as pointed out by Elzahar and Hussainey (2012). Meanwhile, larger entities are associated with higher disclosure quality as they are under more public scrutiny and therefore pressured to disclose more.

For hypothesis two ( $H_{2a}$  and  $H_{2b}$ ), testing whether the discount rate level and the disclosure of the discount rate are determined by entity characteristics, we find support that these are determined by the size of decommissioning provision and entity size. The disclosure of discount rate is seen as an important aspect of disclosure quality as this determines the size of provision why this item was examined separately. The output from the descriptive summary statistics shows that only a few entities disclosed the discount rate. The findings show that by those who did disclose the discount rate the level varied significantly why we argue that the disclosures of judgments and estimations are important to enhance the transparency. The variation of the discount rate can be an indication of manipulation as pointed by Eckel et al. (2003). However, the variation of discount rate level can have reasonable explanations as the discount rate is reflected by interest rate and risks. This is taken into account as we control for country, year and industry. If the disclosures of discount rate were mandatory users of the financial report would gain a comprehensive understanding of the choices behind the selected rate. This could also enhance comparability of entities' performance both over time across entities.

Hence, we find evidence that the variation of disclosure quality can be explained by the vague requirements in IAS 37. To increase transparency and comparability, full disclosures are necessary as pointed out by Levitt (1998) and Pownall and Shipper

(1999). However, our results show that the entities have varying disclosure quality, which complicates comparability.

Further, no conclusions can be drawn when testing hypothesis 3b that entity characteristics determine how certain the language of decommissioning provision disclosures is. However, for hypothesis 3a we can reveal that the use of optimistic language can be explained by all tested entity characteristics, thus implying that some entities engage in impression management. Our findings suggest that depending on the entity's financial situation management might use the tone as mean to influence investors' perceptions of the entity. The results are supported by legitimacy theory as impression management is exercised to manipulate the view of the entity, which is in line with Neu et al. (1998). However, this conclusion can be discussed as previous research argues that the use of tone is not necessary a result of opportunistic behavior (Arena et al., 2015) but rather that the optimistic tone can be explained by the underlying situation.

In conclusion, our results support what recently has been notified, i.e. the financial reporting of decommissioning provisions varies among entities (KPMG, 2008; Reuters, 2015). As mentioned above, the vague requirements in IAS 37 consequently leave more scope for strategic decisions on what to disclose. Management might have incentives to provide deceptive disclosures in an attempt to affect stakeholders' perception. Particularly, the size of the decommissioning provision and the discount rate show significant differences why further research regarding the estimations and disclosures are important. As Raiborn et al. (2011) argue the disclosures of environmental activities have a great influence on decision-making. However, reporting systems are not sufficiently shaped to convey transparent information concerning costs and benefits of environmental activities, such as decommissioning provisions.

Since our study is limited only to examine the accounting policy and provision note, information regarding decommissioning provisions provided in other parts of the financial report is not considered. Noteworthy, our study contains a small sample why our findings must be interpreted carefully. Further research could, therefore, examine the entire annual report with a larger sample. Moreover, materiality guidelines are not taken into account in this study. Insufficient disclosures regarding decommissioning provisions might be due to the immaterial size of the item why further research can explore whether the materiality affects the disclosures. Further research can also examine whether entities disclose about uncertainties in the assumptions made as the estimations of the decommissioning provisions are highly uncertain depending on managerial judgments. In addition, as industry and country only are control variables in this study, it would be of great interest to explore whether this may explain the differences regarding disclosure quality as Kothari (2000) argues that corporate governance, legal systems, and enforcement of laws determine the quality of disclosures.

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## Appendix

Dummy Variable	Descriptive statistics									
	DI		DRlevel		DR		OPT		CERT	
	Frequency	%	Frequency	%	Frequency*	%	Frequency**	%	Frequency**	%
<b>Industry</b>										
<u>Oil and Gas Producers</u>										
-Exploration & Production	152	41,8%	72	48,6%	152	41,8%	147	41,8%	147	41,8%
-Integrated Oil and Gas	71	19,5%	24	16,2%	71	19,5%	70	19,9%	70	19,9%
<u>Gas, Water &amp; Multiutilities</u>										
-Gas Distribution	17	4,7%	0	0,0%	17	4,7%	12	3,4%	12	3,4%
-Multiutilities	34	9,3%	17	11,5%	34	9,3%	34	9,7%	34	9,7%
<u>Electricity</u>										
-Conventional Electricity	90	24,7%	35	23,6%	90	24,7%	89	25,3%	89	25,3%
<b>Total</b>	<b>364</b>	<b>100,0%</b>	<b>148</b>	<b>100%</b>	<b>364</b>	<b>100,0%</b>	<b>352</b>	<b>100,0%</b>	<b>352</b>	<b>100,0%</b>
<b>Country</b>										
Austria	5	1,4%	4	2,7%	5	1,4%	5	1,4%	5	1,4%
Belgium	4	1,1%	0	0	4	1,1%	4	1,1%	4	1,1%
United Kingdom	120	33,0%	50	33,8%	120	33,0%	116	33,0%	116	33,0%
Sweden	10	2,7%	6	4,1%	10	2,7%	10	2,8%	10	2,8%
Norway	50	13,7%	28	18,9%	50	13,7%	49	13,9%	49	13,9%
Germany	15	4,1%	8	5,4%	15	4,1%	15	4,3%	15	4,3%
Czech Republic	5	1,4%	5	3,4%	5	1,4%	5	1,4%	5	1,4%
Spain	22	6,0%	0	0	22	6,0%	21	6,0%	21	6,0%
Finland	5	1,4%	0	0	5	1,4%	5	1,4%	5	1,4%
Island	5	1,4%	0	0	5	1,4%	5	1,4%	5	1,4%
France	20	5,5%	14	9,5%	20	5,5%	19	5,4%	19	5,4%
Netherlands	5	1,4%	0	0	5	1,4%	5	1,4%	5	1,4%
Croatia	2	0,5%	0	0	2	0,5%	2	0,6%	2	0,6%
Hungary	5	1,4%	5	3,4%	5	1,4%	5	1,4%	5	1,4%
Italy	52	14,3%	9	6,1%	52	14,3%	51	14,5%	51	14,5%
Poland	30	8,2%	15	10,1%	30	8,2%	26	7,4%	26	7,4%
Portugal	4	1,1%	0	0	4	1,1%	4	1,1%	4	1,1%
Romania	5	1,4%	4	2,7%	5	1,4%	5	1,4%	5	1,4%
<b>Total</b>	<b>364</b>	<b>100,0%</b>	<b>148</b>	<b>100%</b>	<b>364</b>	<b>100,0%</b>	<b>352</b>	<b>100,0%</b>	<b>352</b>	<b>100,0%</b>
<b>Year</b>										
2010	69	19,0%	27	18,2%	69	19,0%	66	18,8%	66	18,8%
2011	70	19,2%	29	19,6%	70	19,2%	70	19,9%	70	19,9%
2012	71	19,5%	31	20,9%	71	19,5%	68	19,3%	68	19,3%
2013	77	21,2%	32	21,6%	77	21,2%	74	21,0%	74	21,0%
2014	77	21,2%	29	19,6%	77	21,2%	74	21,0%	74	21,0%
<b>Total</b>	<b>364</b>	<b>100,0%</b>	<b>148</b>	<b>100%</b>	<b>364</b>	<b>100,0%</b>	<b>352</b>	<b>100,0%</b>	<b>352</b>	<b>100,0%</b>

\*Since this variable is a dummy the frequency includes both disclosed and not disclosed item

\*\*The total frequency differs from DI as some entites only included tables and not qualitative information