

The influence of readability on cost of equity

Erasmus University Rotterdam

Erasmus School of Economics

Master's thesis Accounting and Auditing

Name: Rahman Kepir

Student number: 369974

Coach: Dr. C.D. Knoop

Co-reader: Drs. R. Van der Wal RA

Abstract:

This thesis investigates the association between the readability of the annual reports and the cost of equity. Also investigates the readability of the IFRS and US GAAP based annual reports. The sample size consists of the 50 largest market-valued firms of S&P 500 and LSE. The readability of the annual report is measured by the BOG index. The main finding is that there is no significant association between the readability of annual reports and the cost of equity. The second finding is that the IFRS based annual reports are more readable and understandable in comparison to the US GAAP based annual reports. This thesis provides evidence that the IFRS based annual reports have a higher readability than the US GAAP based annual reports.

Key words: Readability, BOG Index, Cost of Equity, IFRS, US GAAP, Disclosure Quality

Table of contents

1. Introduction.....	3
2. Theoretical background.....	9
2.1 Disclosure.....	9
2.2 Disclosure quality.....	10
2.3 Theories relating to management incentives.....	11
2.4 Readability of annual reports and measurement.....	13
2.5 Readability measurement tools.....	13
2.6 Cost of equity.....	15
2.7 Residual income valuation model and abnormal earnings growth valuation model.....	15
2.8 Summary.....	16
3. Literature review and hypotheses development.....	18
3.1 Studies investigating the readability of the annual report.....	18
3.2 Studies investigating the readability of the annual report and firm-specific characteristics.....	19
3.3 Studies investigating the cost of equity.....	21
3.4 First hypothesis.....	23
3.5 Introduction of the International Financial Reporting Standards.....	24
3.6 Studies on the United States Generally Accepted Accounting Principles and International Financial Reporting Standards.....	25
3.7 Studies on the United States Generally Accepted Accounting Principles and International Financial Reporting Standards.....	26
3.8 Second hypothesis.....	27
3.9 Summary.....	28
4. Research design and data.....	30
4.1 The readability measurement tool: BOG Index.....	30
4.2 The cost of equity measurement tool: Price-earnings growth ratio model.....	32
4.3 Control variables.....	33
4.4 Models to test the hypotheses.....	35
4.5 Libby Boxes.....	35
4.6 Sample and data.....	37
4.7 Summary.....	38
5. Empirical results and analysis.....	39
5.1 Hypothesis 1: Descriptive statistics.....	39
5.2 Hypothesis 1: Pearson correlation.....	40
5.3 Hypothesis 1: Regression analysis.....	41
5.4 Hypothesis 2: Descriptive statistics.....	44
5.5 Hypothesis 2: Pearson correlation.....	45
5.6 Hypothesis 2: Two-sample t-test.....	45
5.7 Main result.....	46
6. Conclusion, contribution, and limitation.....	48
References.....	50
Appendix.....	55
Appendix A: US firms based on market capitalization S&P 500.....	55
Appendix B: UK firms based on market capitalization LSE.....	57
Appendix C: Information about the hypotheses.....	59
Appendix D: Summary table.....	60

1 Introduction

This thesis investigates two related subjects: (1) the association between the readability of the annual reports and the cost of equity (COE), and (2) the readability of the annual reports based on the United States Generally Accepted Accounting Principles (US GAAP) and International Financial Reporting Standards (IFRS) GAAP. Firms that are active in the capital market are required to publish at least one annual report per year. The various groups (e.g. shareholders, analysts, and investors) active in the capital market need information to make business decisions. The annual report can be considered a communicating tool to provide valuable and relevant information about the firm's financial condition and business operations (Loughran and McDonald 2014).

The Financial Accounting Standards Board (FASB) is the board that provides the accounting standard for firms active in the United States (US), which is known as US GAAP. The International Accounting Standard Board (IASB) provides these standards for firms active in European, Asian, and African countries, and for US firms that have applied the accounting standard of the IASB, i.e. the IFRS. The IFRS consists of accounting standards for annual reports. The purpose of these two well-known accounting regimes, the FASB and IASB, is to increase the quality of annual reports (IASB 2015). The annual report consists of financial statements and other disclosures.

Since the year 2004, the two most important accounting regimes have collaborated to produce the same qualitative characteristics for annual reports. This way, they try to reduce the difference in disclosure quality (SEC 2008; Financial Accounting Foundation 2009). The purpose of the accounting regimes is to develop accounting standards, which increase the quality of annual reports and the effective allocation of capital in capital markets (IASB 2015). Levitt (1997) provides evidence that good accounting standards increase disclosure quality, and thereby decreases the cost of capital.

Previous studies have yielded evidence that there exists a strong association between the disclosure quality and the cost of capital (Diamond and Verrecchia 1991; Easley and O'Hara 2004; Lambert et al. 2007). The cost of capital consists of the cost of equity and the cost of debt. Investors emphasize the cost of equity, because it provides the future returns they generate from their investment. Firms that are active in the capital market use a combination of debt and equity to support their operations and

further growth (Easton 1997). Investors evaluate the performance of the firm based on information from the annual report. Annual reports are the primary source of information for investors to rely on when they make an investment decision. Investors fund the equity part and face the risk of not receiving future returns, such as dividends. This risk is much greater for investors than for debt holders. The future returns depend on the performance of the firm. The debt lenders receive their capital with interest back because the firm has a contractual agreement.

In 2011, Mary Schapiro, the former head of the Securities and Exchange Commission (SEC), recommended to the makers of annual reports to provide reliable information that will help investors make an optimal decision about capital allocation (Schapiro 2011). Firms that are active in the capital market obtain capital to expand their operations or to use for acquisitions for further growth. Investors invest their capital by assessing the annual report of a firm and develop expectations about future returns (Healy and Palepu 2001). An annual report consists of 80% of written text, and the remaining part is figures, tables, and numbers (Lo et al. 2016). The amount of information and the number of regulations have increased in the past decades. Readers of annual reports have to process this large amount of information, which can influence the effectiveness of annual reports (Schroeder 2002). Annual reports are often prepared with complex language and long sentences. This may lead to a decrease in the readability of these reports (Courtis 1995). In 2007, the former head of SEC, Christopher Cox, expressed his concerns about the readability of annual reports (SEC 2007).

The management group of a firm prepares the annual reports. The management obfuscation hypothesis predicts that the management could have incentives to influence the readability of an annual report (Courtis 1998). They can use their writing skills to hide unfavorable information from the capital market, because not meeting the market expectation would have negative consequences for the firm and for the management (Healy and Palepu 2001).

One of the factors for evaluating disclosure quality is readability. Readability can be defined as the ease with which the reader can understand the reports (Courtis 1998). The writing skills of the management can be measured by assessing the readability to determine if this has an impact on the cost of equity (Courtis 1998). The research question for this thesis is as follows:

RQ: Does the readability of an annual report affect the cost of equity?

This thesis consists of two hypotheses. The first hypothesis is that there is a negative association between the readability of the annual report and the cost of equity. The second hypothesis is that US GAAP provides more readable and understandable annual reports than reports based on IFRS.

The first hypothesis is based on the studies by Subramanian et al. (1998), Li (2008), Lehavy et al. (2011), and Lee (2012). They provide evidence that the readability of an annual report is positively associated with firm-specific characteristics, such as performance, current earnings, analyst following and market reaction, and used Ordinary Least Squares (OLS) regression model. Diamond and Verrechia (1991) and Botosan (1997) provide evidence that the disclosure quality influences the cost of capital. Botosan (1997) offers empirical support that there exists a negative association between disclosure quality and COE. Investors evaluate a firm based on the information provided by the management. The management can have an incentive to influence the readability of the annual report to attract or mislead investors. Annual reports consist of relevant information that is valuable for investors to understand and analyze in order to make an investment decision. The expectation is that a better, more readable annual report leads to a decrease in the COE, and that a less readable annual report leads to an increase in the COE.

The introduction of the IFRS in Europe in 2005 showed positive effects for the European capital markets (Daske et al. 2008; Armstrong et al. 2010). Since 2007, SEC allows foreign registrants to submit their annual report based on IFRS. This raises concerns about a level playing field for US firms (SEC 2007). In 2007, a discussion was held about the adoption of the IFRS instead of US GAAP for US-based firms. United States constituents have advised the SEC that they do not support this idea, however, because the US GAAP accounting standards provide information of higher quality (Van der Meulen et al. 2007; White 2017). The IFRS and US GAAP are accounting standards that influence annual reports. The adoption of the IFRS in 2005 has provided positive influences for the capital market (Daske et al. 2008; Armstrong et al. 2010). The studies of Richards and Van Staden (2011) and Jang and Rho (2016), however, provide evidence that the adoption of the IFRS decreased the readability of annual reports. The conclusions are contradictory because this is not in accordance with

the objectives of IFRS, which is to make information more practical and understandable for users. This led to a discussion about which accounting standards provide better disclosure quality by measuring the readability. Firms that are active in US economy apply US GAAP, and the US economy is the largest in the world. The US GAAP accounting quality is comparable with the IFRS accounting quality (Barth et al. 2012). The second hypothesis is based on the study of Barth et al. (2012), which states that the US GAAP-based annual reports have higher disclosure quality due to more readable and understandable.

To test the hypotheses and answer the research question, several models are used. To test the first hypothesis, a simple OLS regression model, based on previous studies that examined the readability of annual reports and firm-specific characteristics (Li 2008, Lehavy et al. 2011 and Lee 2012), is used. The OLS regression examines the association between the readability coefficient and the COE coefficient after controlling for other factors. There are various readability measurement tools that measure the readability of a text. The traditional readability measurement tools, such as Gunning's fog index (Fog) and the Flesch-Kincaid readability score (F-K index), have validity concerns. They identify complex words based on the number of syllables (Loughran and McDonald 2014). However, words with more syllables are not necessarily difficult words. Instead of the traditional readability measurements, in this thesis, the BOG index is used to measure the readability of annual reports. The BOG index is independent variable and has been chosen because it avoids the validity problems other measurement tools suffer from (Wright 2013). Cost of equity is dependent variable and has been measured using the price-earnings growth ratio model (PEG). The PEG model calculates the COE based on earnings and the future growth rate of earnings. This model uses accounting data, which are more reliable, accurate, and have a high construct validity (Botosan and Plumlee 2005). The model used to test the second hypothesis is the two-sample t-test. The second hypothesis examines the average readability score of IFRS-based annual reports and US GAAP-based annual reports. The two-sample t-test is an appropriate model to investigate if the average readability score of the two accounting standards differ from each other.

The sample size for the first hypothesis consists of the 50 largest market-valued firms of the S&P 500 for the years 2013 and 2016. The S&P 500 is the largest stock market in the US, and therefore representative of the stock market as a whole. The data about the readability scores of the annual reports was hand collected. The financial data for the PEG model and control variables are from Data stream and Wharton Research Data Services (WRDS) databases. The second hypothesis examines the readability of the IFRS and US GAAP annual reports. The total sample size is 100 annual reports. The United Kingdom (UK) was selected because it has the same native language as the US. The 50 largest market-valued firms of the London Stock Exchange (LSE) were selected to represent IFRS annual reports. The LSE is representative of the stock market in the UK. The annual reports are available on the websites of the selected firms.

The findings of the first hypothesis are that there is no significant association between the readability of annual reports and COE for US firms. The regression analysis provided no statistically significant relation between the BOG index and the COE. This finding is not in accordance with the expectation of this thesis. One of the reasons may be that the sample size is small and only selected UK firms instead of other countries that have English native language.

The findings of the second hypothesis provide evidence that there is a significant difference in the BOG indexes of the annual reports. The average BOG index for the IFRS-based annual reports is lower than the average BOG index of the US GAAP-based annual reports. This shows that IFRS-based annual reports are more readable and understandable in comparison with US GAAP-based annual reports. Furthermore, the BOG index of the US GAAP-based annual reports increased from 2013 to 2016. This indicates that the readability of the annual reports became more difficult to read and understand.

This thesis contributes to the existing literature about readability and disclosure quality. The annual reports were measured using the readability software BOG, and differ from traditional readability measurements. Traditional readability measurements are based on simple models and have validity concerns (Bonsall et al. 2017). Another contribution of this thesis is that it provides evidence for the on-going debate about which accounting standard provides better disclosure quality. This thesis provides evidence that the IFRS-based annual reports have a lower BOG index in comparison with the

US GAAP-based annual reports. This indicates that IFRS annual reports are easier to read and understand.

Chapter 2 provides the theoretical background about disclosure, disclosure quality, theories about management incentives, readability, readability measurement tools, and the COE and the COE approaches of residual income valuation model (RIV) and abnormal earnings growth valuation model (AEG). Chapter 3 presents a literature review of studies that investigate the readability of annual reports, firm-specific characteristics, and COE. The first hypothesis is developed also. The second section of Chapter 3 outlines the consequences of the introduction of IFRS, the studies that investigated the adoption of the IFRS, the influence of the IFRS on readability, and then the second hypothesis is developed. In Chapter 4, the BOG index, PEG model, Libby boxes, sample size, and the models to test the hypotheses are explained. In Chapter 5, the results of the descriptive statistics are presented, and the Pearson correlation, regression analysis, and two-sample t-test are performed. The conclusion, recommendation, and the limitations of this thesis are discussed in Chapter 6.

2 Theoretical background

In this section, the definition of disclosure; disclosure quality; the theories related to management incentive, readability, and measurements; readability measurements tools; COE; and the RIV and AEG models are discussed.

2.1 Disclosure

Disclosure can be described as the main communication tool for financial and non-financial information, whether it be quantitative or qualitative information, or voluntary or required information provided by (in)formal channels to interested parties (Gibbins et al. 1990). A firm discloses information in different ways. This can be by disclosing corporate annual reports, interim reports, conference calls, press releases, websites, etc. An annual report is an official communicating tool that provides information about a firm. Today, firms can disclose more often because technology has made the process easier. Disclosure can be in the form of digital documents, such as interim reports or press releases, to provide additional information for the capital market (Marston and Shrive 1991; Epstein and Palepu 1999; Hope 2003a).

Disclosure can be divided into two groups: mandatory and voluntary. Mandatory disclosure requires firms to disclose information to the capital market in accordance with accounting standards, regulations, and the law. Mandatory disclosure provides the minimum amount of information that must be presented in the annual report (Hassan and Marston 2010). Voluntary disclosure is any type of additional information not required from accounting standards, regulations, or the law, but which is relevant for the decision-makers. The incentives to provide additional disclosure could be to protect against misunderstanding or a conflict of interests between the firm and market participants. This may lead to a reduction in information asymmetry and agency conflicts. Additional disclosure may provide answers to the demand for information from the market participants (Lev 1992).

2.2 Disclosure quality

Different qualitative characteristics are important for disclosure quality. The IASB and FASB began a project to have similar qualitative characteristics for their annual reports. The fundamental qualitative characteristics are relevance and a faithful representation. Relevance is an important characteristic because investors need relevant information to make a profitable business-decision. Faithful representation implies that information is complete, neutral, and free of errors and/or materiality bias. The additional characteristics are comparability, verifiability, timeliness, and understandability. Comparability of information makes it possible for users of the annual report to compare information about the firm throughout the years and identify trends in performance and financial position. Understandability is that an annual report be comprehensible for users. Verifiability refers to information that can be authenticated by an independent accountant. Timeliness indicates that the information can influence the choices of decision-makers (IASB 2015). In this thesis, the focus is on the understandability of the information.

Disclosure quality measurements can be divided into two groups: direct and indirect disclosure vehicles. Indirect disclosure vehicles do not directly examine the reports that are disclosed, but take other observable variables into account, e.g. analysts following, accounting restatement from accounting failures (Hassan and Marston 2010). The direct approach examines the origin of the disclosure vehicle. Content analysis is a part of the direct approach. This examines the text by counting data items or the number of words, sentences, and pages. Content analysis can be divided into two groups: conceptual content analysis and relation content analysis. Conceptual content analysis examines the frequency of key words in texts. Relation content analysis examines the relation between concepts in texts. Content analysis can be performed in partially or comprehensively, whereby partial examines part of a text, and comprehensive examines the entire text. The drawback of content analysis is that it is very labor-intensive to collect data. There are different types of software that can measure readability. This type of software only accepts PDF files, however, and can only be used for documents written in English (Hassan and Marston 2010). The readability of an

annual report is a part of content analysis. In section 2.5, the various types of readability, their advantages and disadvantages, are discussed.

2.3 Theories relating to management incentives

A management group makes day-to-day decisions to achieve the headed goals of the organization. The management has a better perspective of daily operations, and is more informed about the firm than the capital market is. This is also called the information problem. In this case, the management has greater knowledge about the firm and its prospects. This results in information asymmetry. The investors know less about the firm and its prospects in comparison with the management. The information problem arises from having conflicting incentives and information between managers and investors (lemon problem). In a lemon problem situation, investors who do not have analyzing skills cannot make a distinction between good and bad business ideas. This leads to bad ideas that crowd out the good ideas, which can result in a break down in the capital market and loss of investor confidence. A solution to this problem is optimal contracts. Shareholders and investors could establish optimal contracts that align the incentives of the management with the shareholders. This would lead management to disclose their private information to the capital market (Healy and Palepu 2001).

The incentives or objectives of the management and the shareholder can differ. This is called the agency problem (Healy and Palepu 2001). The agency problem or theory describes the relation between the principal (shareholders) and agent (management group). The principal hires the agent to perform a certain task and gives authority to the agent to make business decisions. In the current business structure, there is separation between the ownership group and the control group. The ownership group consists of the shareholders (principal), who provide capital to a firm and bear the risk for their invested capital. In return, they receive economic benefits. The control group consists of the management group (agent). They manage the capital and have decision-making authority. The two groups have their own characteristics and interests or incentives. When the agent tries to maximize his/her own interest instead of the interests of the principal, he/she will not always make the best decisions, in the interest of the principal. The agency problem arises when there is a conflict of interests or if the costs for the principal are high to monitor the behavior of the agent. To prevent

agency problems, the principal can use equity incentives in contracts, such as compensation contracts. Also, corporate governance mechanisms can be used to monitor the behavior of the agent. This will result in the alignment of the interests of the management group and the capital providers. This motivates management to disclose private information to capital markets and minimize the agency costs (Jensen and Meckling 1976).

The agency theory explains a situation in which there is conflict of interests between the agent and principal. It does not apply to all relation, nor does it accurately describe the behavior of humans in organizations (Davis et al. 1997; Corbey 2010).

The stewardship theory describes how the steward (management group) is not interested in satisfying its own interests but the interest of the principals. The steward makes decisions that are beneficial to the organization. Corbey (2010) says that the stewardship theory is rational because, in the long term, the interests of the steward are aligned with the organization. By achieving the organization goal, it will also achieve its personal interest. Self-interest of the steward can damage its own career opportunities and the health of the organization, which therefore act as incentives to reduce the self-interest of the steward.

The management of a firm prepares the annual report. It has discretion to decide what kind of information they disclose and how it will be presented. The quality of the disclosure influences the perception of the principal, by which they evaluate the performance of the agent. The agency and the stewardship theory have different incentives, which may influence disclosure quality.

The agency problem arises when the incentives of the agent are different from those of the principal. This can influence the quality of information presented in the annual report. In the stewardship theory, management incentive is aligned with the organization goal. The management takes its own reputation and career opportunities into account. The steward makes decisions that create value for the organization in the long term and are in the best interest of shareholders.

2.4 Readability of annual report and measurement

Readability is the ease with which the reader can understand the reports (Courtis 1998). The preparers of the annual reports (management group) have an influence on the readability of the annual reports. The investors can face difficulty understanding the annual reports. This may have an influence on their investment decisions. The management obfuscation hypothesis describes how the management uses a complex writing style to hide unfavorable information from stakeholders. The management can influence the readability of the information. Courtis (1998) confirms that management uses less complex writing style when the results are favorable for the management, and when the performance of the management will be evaluated by the annual report. The writing style and use of words of the management also influences the information asymmetry for the interested parties. When the financial results are poor, management will use a complex writing style and hide unfavorable information from the interested parties, so the users of the annual report have difficulty understanding the information (Courtis 1998).

2.5 Readability measurement tools

Robert Gunning developed one of the most popular readability measurement tools in 1952: the Fog. It was not designed for use with economic literature, but has been used by various researchers to measure readability, such as Li (2008), Biddle et al. (2009), Miller (2010), Lehavy et al. (2011), and Lawrence (2013). Biddle et al. (2009) claim that the Fog instrument is an appropriate tool to measure the readability of annual reports. The mechanism of the readability formula calculates an index. This index indicates how many years of education a person needs to understand a text. The formula consists of two parts. The first calculates the average words per sentence. The second measures the complexity of words (Gunning 1968). A Fog index of > 16-18 implies that the text is more difficult to read and understand.

Another well-known measurement tool is the F-K index, which Rudolf Flesch and J. Peter Kincaid developed in 1948. The F-K index is applied in the educational arena to measure the readability of textbooks. The formula measures the educational level a person needs to understand a text. The formula consists of two parts. The first measures the average words per sentence, and the second

measures the number of syllables per word, both multiplied by weight factors (Dubay 2007). This measurement provides a score between 0 and 100. A score between 50 and 100 can be interpreted as a text that is easy to read and understand.

The two measurement tools, F-K index and Fog index, are simple and easy to apply. Researchers have their concerns about the validity of the measurements, however (Loughran and McDonald 2014). This is because the two measurement tools identify all words that consist of two or more syllables as complex words. Despite of the number of syllables, words such as firm, cooperation, and telecommunication are relatively clear words for a large portion of the population.

The BOG index is a new measurement tool with which to measure readability. It is in accordance with the Plain English Handbook provided by the SEC. The purpose of the Plain English Handbook is to improve the readability of annual reports. This should lead to better investment decisions by investors and discourage the preparers of annual reports from using complex words (SEC 1998).

The BOG index is a measure of readability, which takes plain English attributes into the calculation, such as fewer hidden verbs and the active voice. It also avoids the validity problems we discussed concerning the Fog index or F-K index (Bonsall et al. 2017). The BOG index consists of three parts: Sentence BOG, Word BOG, and Pep. First, the Sentence BOG measures the average length of the sentence throughout the entire text, whereby a longer sentence is less readable. Word BOG measures the English style and word difficulty of the text. The Word BOG highlights the following types of words: abstract words, wordy phrases, passive verbs, hidden verbs, and legal terms. Also, the difficulty of the words is measured. Traditional readability measures calculate the complexity of words based on the number of syllables. This contrasts with the BOG index software. Its dictionary contains 200,000 words to which points are assigned between zero and four. Abstract words receive higher points. The final component is Pep. Pep analyzes the understandability of the text by identifying the written attributes, it then offers recommendations for increasing the readability. Thus, the text will be more interesting for the reader (Wright 2013). A higher BOG index score indicates that the text is more difficult to read and understand. In section 4.1, the BOG index is discussed further, and the BOG value table is presented.

2.6 Cost of equity

The capital structure of a firm consists of the COE and cost of debt. Various groups, such as investors, provide their capital to the firm to fund their operations and expect future returns. The cost of capital is the cost for the firm to pay their debt and equity holders. In this thesis, the emphasis is on the COE. Firms that are active in the capital market raise funds to realize their current operations and investment plans. Equity investors invest their capital in a firm's shares to receive future returns. The investors use the annual report to analyze the COE. Cost of equity determines the return that the investor and shareholders will receive in the future for their investment. The investors use models to calculate if the investment is profitable. This risk is higher for equity holders than for debt holders (Botosan 2006).

The capital market hypothesis describes how investors' perception is important for the management when they are going to issue public equity/debt/take over a firm in a stock transaction. The management has the incentive to disclose more frequently, and with a larger amount of information, to the capital market. This reduces the information asymmetry and external financing costs. This way, investors have more relevant information with which to evaluate the firm (Healy and Palepu 2001). The management can have an incentive to provide annual reports that are easier to read and understand, especially when they are going to issue stock or debt bonds or other special events. The management obfuscation hypothesis describes how the management group could have an incentive to negatively influence the readability of unfavorable information for the capital market (Courtis 1998).

2.7 Residual income valuation model and abnormal earnings growth valuation model

There are two different approaches that measure the COE: RIV and AEG. The RIV models measure the COE by using the book value of the equity and earnings instead of using dividends. Models based on dividends reduce the value of a firm. Dividend declaration goes to the investors and does not add value to the firm itself. The RIV models calculate the residual income by earnings minus COE. A positive residual income indicates that the industry is profitable, and this leads to new firms entering the industry. This then leads to a decrease in the profits of a firm. A negative residual income

indicates that firms will leave the industry because there is less profit (Lee et al. 1999). The AEG approach measures the COE by calculating the value of a firm based on the earnings and their growth rate.

The difference between the RIV model and AEG model is that the AEG model does not need a clean surplus relation to hold. The accounting rules allow some equity changes to flow directly to the equity of the firm and do not affect the earnings in the income statement (Ohlson 1995). Secondly, investors are more focused on the earnings than the book value, because the earnings offer an indication of the future earnings of the firm. The RIV model calculates the abnormal earnings by the book value of the equity of the firm. The AEG model calculates the value of the firm based on the earnings (Ohlson 2005). The investor emphasizes the earnings and the expected growth rate of the earnings because the earnings are a future-looking aspect. This is in accordance with the investors view at a firm when they are going to make investment decision (Ohlson 2005).

The PEG model is based on the earnings and expected growth rates of the earnings to calculate the COE. The model does not need to hold a clean surplus relation and is in accordance with the investors to view, who make investment decisions based on the earnings rather than the book value of the equity. The PEG model belongs to the abnormal earnings growth valuation model approach.

2.8 Summary

Disclosure is a communication tool for the management. It provides information about a firm to the capital market. Firms that are listed on the stock market are required to provide financial and non-financial information (annual report). Management can also provide voluntary disclosure to the capital market for additional information. Disclosure quality consists of different qualitative characteristics. These are implemented to make the disclosed information useful and readable for the investors. One of the qualitative characteristics is the understandability of the information, which indicates that information is presented in a clear way.

The management, who issues the annual report, can influence the readability of the information. The investors evaluate the performance of the management via the annual report. Management has an

incentive to influence unfavorable information in the annual report by using a difficult writing style. Another incentive is for management to make the information more readable when it is going to issue shares or bonds.

Readability is the ease with which the reader can understand the reports (Courtis 1998). In the past, there were various tools that measured readability. The traditional measurement tools – the Fog and the F-K index – are easy to use and interpret. The disadvantage of these tools is the concern about validity. The complexity of the words is measured based on the number of syllables a word consists of. The BOG index avoids these validity problems, and therefore is used in this thesis.

3 Literature review and hypothesis development

In this section, the relevant literature is discussed. The first part describes the relevant studies of the readability of annual reports. The second part describes the relevant studies that relate readability to firm-specific characteristics. The third part consists of studies about the COE. The final part of this chapter is about the introduction of the IFRS and relevant studies concerning the US GAAP and IFRS are also discussed. Furthermore, the two hypotheses are developed, based on the discussed studies. In Appendix D, the summary table of the studies for the hypotheses is presented.

3.1 Studies investigating the readability of the annual report

Annual reports are one of the information sources for participants of the capital market, through which they can receive financial and non-financial information about a firm. The interested parties active in the capital market require this type of information to evaluate the performance of a firm and its management to make investment decisions (Whittington 2008).

The readability of annual reports is a major problem in the accounting world. Previous studies, such as Holley and Early (1980) and Courtis (1995), have analyzed the readability of annual reports. They conclude that the wording and language are difficult or very difficult to understand. Using long sentences and complex words causes problems. Other studies examined the readability of the notes that clarify annual reports. They conclude that the notes are difficult to read, even for experts. They also note that the average readability of annual reports has significantly decreased over the years (Healy 1977; Barnett and Leoffler 1979; Smith and Taffler 1992).

Courtis (1995) investigates readability of the notes in the annual reports. Concluded that the readability of the notes of the annual report decreased, less readable annual report. The readability and understandability of the annual report is of higher quality when the management beats or meets the market expectations. When the firm does not beat or meet the market expectations, management could have incentives to influence the readability of the bad news. This is also called the management obfuscation hypothesis (Courtis 1998).

3.2 Studies investigating the readability of the annual report and firm-specific characteristics

Over the past decade, the topic of 'readability' has become a popular subject in the text-based research area. Previous studies have investigated the association between the readability of annual reports and firm-specific characteristics, e.g. performance (Subramanian et al. 1998), current earnings (Li 2008), capital investment efficiency (Biddle et al. 2009), analyst following (Lehavy et al. 2011), stock prices (Lee 2012), and market reaction (Franco et al. 2015).

Subramanian et al. (1998) investigated the association between the performance of firms and the readability of annual reports. To measure the readability of annual reports, the software RightWriting was used. The study of Subramanian et al. (1998), well-performing firms are given a score of 10.1. This indicates that the annual report is readable for the general public. Firms that perform worse have average score of 14.1. This indicates that the annual reports are less readable than the annual reports of better performing firms. Li (2008) investigated the relation between the readability of annual reports, the performance of firms, and earnings persistence. The sample consists of 55,719 firms. The study measured the readability of annual reports by using the Fog index. A higher Fog index score indicates that the annual report is more difficult to read and understand. The study provides evidence that the readability of annual reports depends on the performance of firms. When the performance of a firm is poor, the readability of the annual report becomes more difficult, so as to possibly hide unfavorable results from investors. The study indicates that management uses a difficult writing style to hide adverse information from investors; this is in accordance with the management obfuscation hypothesis (Courtis 1998).

Bloomfield's (2002) incomplete revelation hypothesis describes how the market price of shares is not fully revealed when the statistics are too costly to extract from the public data. When the cost of extraction of the statistics is higher than the gains of the information, fewer analysts search to find valuable information. Bloomfield (2008) describes how the management can have incentives to use a difficult writing style or write longer sentences that will make bad information costlier for analysts to extract from an annual report. This can result in delays or negative market reaction. Bloomfield (2008) provides another explanation for the findings in the study of Li (2008). Li (2008) states that readability

has a positive association with the performance of a firm. The explanation of Bloomfield (2008) for the finding of Li (2008) is that the management uses more and complex words to explain losses in a year, compared with gains in a year. Losses increase the length of sentences and the complexity of the used words because the management needs to explain more, which decreases the readability of the annual report of a firm.

Lee (2012) investigated the relation between the readability of quarterly reports and stock prices based on the efficient market hypothesis (EMH). The EMH describes how stock prices reflect the information available, and that they immediately change to reflect new information. The EMH assumes that the capital market participants can process information in an efficient way. The researcher uses the Fog and the number of words to measure the readability of the quarterly reports. Lee (2012) provides evidence that more information is not always better than less information, because less readable information decreases stock prices. This is not in accordance with the EMH theory, because the EMH hypothesis explains how stock prices quickly change based on available information, and it does not take the readability of the annual reports into account.

Lehavy et al. (2011) investigated the effect of the readability of annual reports on the behavior of analysts, who analyze and interpret annual reports, by measuring readability using the Fog index. The researchers predicted that less readable annual reports increase the cost of information processing. They state that, when an annual report is less readable, it has a negative influence on the perception of an analyst. Less readable annual reports increase the effort and cost for analysts to interpret the results. Investors are more willing to read analysts' reports instead of reading the complex annual report themselves, because the analysts' reports are more informative. The readability of annual reports influences the behavior of analysts as well. Analysts increase their efforts to investigate less readable annual reports to interpret the results to the capital market. Franco et al. (2015) investigated the relation between the readability of analysts' reports and the reaction of the market, measured by trading volume. The study provides evidence that a more readable analyst's report has a positive market reaction, which leads to a higher trading volume. Readable analyst reports decrease the information processing cost for the investors.

Biddle et al. (2009) investigated the relation between financial reporting quality (FRQ) and capital investment efficiency. FRQ represents the quality of an annual report. The capital investments efficiency represents investor investment decisions based on the information they find in annual reports. In the study, the Fog index is used to measure the FRQ. A higher FRQ is associated with efficient capital investment, which reduces the information asymmetry between the management and investors. A higher FRQ implies that the annual report is more readable and understandable for readers.

The previous studies investigating the relation between readability and firm-specific characteristics show that there is a relation (Subramanian et al. 1998; Li 2008; Biddle et al. 2009; Lehavy et al. 2011). The readability of annual reports is an important factor for capital market participants to be able to understand the business operation. The capital market participants evaluate a firm based on the information in the annual report. The management is the preparer of the annual report and may have incentives to influence the information (Courtis 1998). The readability of the annual reports influences different firm-specific characteristics, such as performance, earnings persistence, analyst behavior, stock prices, and market reaction (Subramanian et al. 1998; Li 2008; Lehavy et al. 2011; Lee 2012; Franco et al. 2015). The previous studies conclude that the readability of annual reports has a positive influence on firm-specific characteristics.

3.3 Studies investigating the cost of equity

The capital structure of a company consists of equity and debt. Investors provide the capital to the company to fund their daily operations, and receive returns for their capital. There are various studies that examine the relation between disclosure quality and cost of capital. Diamond and Verrecchia (1991) examined this relation and investigated its effect on liquidity. When a firm reveals more information to the capital market, it decreases the information asymmetry between the agent and the principal. The information asymmetry decreases because the capital market participant is exposed to more relevant information to evaluate the current situation and future of a firm. More information leads to an increase in the liquidity of the securities, which decreases the cost of capital.

Accounting regimes influence the cost of capital of a firm by developing and providing accounting standards. Accounting standards influence disclosure quality, which indirectly influences the quality of information in annual reports (Levitt 1997). The 2007 study by Lambert et al. supports Levitt's (1997) findings. They both conclude that the quality of the annual report directly and indirectly influences the cost of capital. The relation between earnings quality, insider trading, and cost of capital was investigated by Aboody et al. (2005). They describe how the private information of market participants is a noise (private information), which decreases earnings quality. Private information results in an asymmetric treatment of the information. In this case, one side has superior information, which influences the cost of capital of a firm. When the information asymmetry is minimized, an increase in the earnings quality and decrease in the cost of capital follows. Easley and O'Hara (2004) examined the relationship of the cost of capital when there is an asymmetry between public and private information. As a result of the poor information the investors have access to, they demand a higher return to hold stocks. Cheng et al. (2008) conclude that disclosure quality has an important role in the usefulness of annual reports. With a high disclosure quality, investors can evaluate the performance of a firm more accurately, which leads to a decrease in the COE. The information asymmetry costs between management groups and investors decreases when higher quality disclosure is managed.

Fu et al. (2012) investigated the relation between financial reporting frequency, information asymmetry, and COE. They concluded that information asymmetry and COE decrease when they increase the frequency of their financial reporting, such as their quarterly reports. Botosan (1997) examined the influence of disclosure on the COE of a firm. Botosan (1997) concludes that firms with a low analyst following can benefit when the firm provides higher quality disclosure. This reduces the COE. Firms with a high analyst following will not benefit from higher disclosure quality.

Disclosure quality influences the cost of capital of a firm (Diamond and Verrecchia 1991; Aboody et al. 2005; Biddle et al. 2007). When the firm provides more relevant information, this decreases the cost of capital for a firm because the investor has more information to assess the firm better. The cost of capital consists of equity, which is primarily relevant for investors when they want to make an

investment decision. The COE is the return that investors receive for their investment (Botosan 1997). Disclosure quality can be interpreted in this thesis as the readability of an annual report.

3.4 First hypothesis

Based on the findings of Subramanian et al. (1998), Li (2008), Lehavey et al. (2011), and Lee (2012), an increase in readability – a more readable annual report – is associated with a positive influence on firm-specific characteristics like performance, earnings persistence, analyst behavior and stock prices, which has a positive influence on the continuity of a firm. Better readability can increase firm-specific characteristics, such as stock prices, a positive market reaction, change in analyst behavior, and lead to a higher earnings persistence (Li 2008; Lehavey et al. 2011; Lee 2012; Franco et al. 2015).

Disclosure quality influences the cost of capital of a firm (Diamond and Verrecchia 1991; Aboody et al. 2005; Biddle et al. 2009). Diamond and Verrecchia (1991) conclude that a higher quality of disclosure results in a decrease of the cost of capital. Botosan (1997) provides empirical support that there is a negative relation between disclosure quality and COE.

Cost of equity is relevant for investors when they have to make an investment decision because equity holders face higher risk. The compensation, such as a dividend, for the investors depends on the performance of the firm (Botosan 1997). Investors must evaluate a firm's annual report, which is provided by the management group, before they make an investment decision. Readability is an important factor for understanding an annual report. The annual reports consist of information that can influence the decision of the investor. The management group can have incentives to influence the readability of the annual report, i.e. to attract or mislead investors (Courtis 1998).

This makes it interesting to investigate whether there is an association between the readability of annual reports and the COE. Based on the findings of Diamond and Verrecchia (1991) and Botosan (1997), a negative association between the readability of annual reports and the COE is expected. A more readable annual report, which means more understandable information for the investors, may lead to a decrease in the COE. Disclosure quality in this thesis is measured by the readability of the

annual report. The readability of an annual report is measured using a readability measurement tool. The first hypothesis:

H1: Readability of the annual report is negatively associated with the cost of equity.

The negative association means that an annual report that is more readable leads to a decrease in the COE.

3.5 Introduction of the International Financial Reporting Standards

During the pre-IFRS adoption period before 2005, each country in Europe had its own national accounting standards and regulations concerning the reporting of annual reports. By introducing the IFRS in 2005, firms in Europe are now required to apply the IFRS. These are accounting standards provided by IASB. The purpose of the IFRS is to have common accounting and reporting rules for annual reports, to increase the integration of the capital markets and politics, and to reduce the differences in local accounting standards. The advantages of adopting the IFRS are examined in a study by Ball (2006).

There are several advantages to adopting IFRS compared with local accounting standards. First, the annual reports are more informative, accurate, disclose relevant information, and are more usable compared with annual reports based on local GAAP. Hence, investors and other groups face lower risk for their capital. Information from annual reports becomes more value-relevant for decisions. The IFRS makes more use of fair-value measurements compared with accounting standards in local GAAP. This is accomplished by introducing accounting standards such as IAS 16 (a choice between cost model or fair value of the property, plant, and equipment); IAS 36 (asset impairment); IAS 38 (intangible asset impairment); IAS 39 (fair value of financial instruments, such as securities, hedge, and loans); IAS 40 (fair-value option for investment); IFRS 16 (capitalization of operational lease transaction); and IFRS 15 (recognition of revenue).

Second, replacing local accounting standards with IFRS (single tone) increased the comparability of the annual reports of firms that are active in different countries. This leads to a reduction in costs and time for the processing information. Before, for example, you had to translate an annual report to the

native language of the users. Third, by reducing the cost of processing information, the efficiency in the capital market for stock prices increases. Fourth, having one single accounting standard increases information quality, which reduces the COE for investors. Because of the higher quality of information, investors or other parties can evaluate the firm well. Fifth, increase in information quality also leads to an increase in transparency, which reduces the information asymmetry (contracting cost) between parties.

In general, one common language and terms for the construction of annual reports increase transparency, comparability, and market efficiency. The US GAAP is the accounting standard for firms active in the US.

3.6 Studies on the United States Generally Accepted Accounting Principles and International Financial Reporting Standards

Daske et al. (2008) investigated the consequences of mandatory IFRS adoption in 2005 for 26 countries. The researchers focused on the following topics: market liquidity, cost of capital, and Tobin's q. Tobin's q measures the market value of a firm divided by the total assets and gives an indication whether the stocks of a firm are undervalued or overvalued. In the study, the adoption of IFRS brought benefits such as transparency, decrease in cost of capital, improvement in liquidity, and the Tobin's q. In 2004, it was possible to adopt the IFRS voluntarily. These adopters experienced greater benefits in comparison with the adopters in 2005. Daske et al.'s (2008) findings are in accordance with Armstrong et al. (2010), who examined the market reaction to the IFRS adoption in the European capital market. The introduction of IFRS changed the information environment for European countries due to having a single accounting regime for the entire European capital market. Investors experience benefits from the introduction of the IFRS because it leads to a reduction in the information asymmetry between the parties and an increase in information quality, and investors have access to better information to assess firms or their own investments.

Barth et al. (2012) examined the quality of the two well-known accounting regimes according to their accounting standards. The SEC wants to allow non-US firms to submit their financial statements based on IFRS. There is political debate about the relative accounting quality between the two regimes. The

study finds that the US GAAP standards, which are applied by US firms, have accounting quality compared with the IFRS firms. The researchers compared the accounting amounts of the IFRS-based annual reports with the US GAAP-based annual reports. They find that the US GAAP standards are higher quality in comparison with the IFRS. The US GAAP leads to an increase in disclosure quality and information quality in the financial statements. Also, the accounting information is of greater value and relevance for the capital market. Second, they examined the effect of IFRS adoption in Europe according to disclosure quality and compare it with the US GAAP. The adoption of IFRS shows a positive effect on disclosure quality. Furthermore, the difference in disclosure quality gap between the US GAAP and IFRS is closing. The overall conclusion is that the US GAAP provides better disclosure quality than the IFRS, but they are still comparable.

Psaros and Trotman (2004) examined the differences between the rules-based accounting standards and the principles-based accounting standards. Today, US GAAP is more rules-based, and the IFRS is relatively more principles-based. They examined the effect of the two regimes using an experimental study. They conclude that principles-based accounting standards are more favorable than rules-based accounting standards, because a professional applies rules-based standards more aggressively to assess accounting information and offers less discretion.

3.7 Studies investigating readability of the United States Generally Accepted Accounting and International Financial Reporting Standards

There are several studies that investigated the readability of annual reports based on IFRS or US GAAP. Richards and Van Staden (2011) investigated the adoption of IFRS in New Zealand. They find that the adoption of IFRS has a negative impact on the readability of annual reports. The readability of annual reports has not improved, when compared with the local GAAP. Another research investigated the influence of IFRS adoption on the readability of financial disclosures in South Korea. They conclude that the adoption of IFRS has negative effects on the readability of annual reports (Jang and Rho 2016). From these studies, we can assume that the adoption of IFRS did not make positive contributions to the readability of annual reports. The SEC introduced the Plain English Handbook for the preparers of annual reports to discourage the use of complex words or sentences that have a

negative effect on readability. The introduction of the Plain English Handbook by SEC has improved the readability of annual reports over the years (Loughran and McDonald 2009).

3.8 Second hypothesis

The IFRS and US GAAP are two well-known accounting standards applied in many countries. The IASB and FASB have the same purpose, i.e. to increase the quality of annual reports for shareholders, investors, and other groups (Financial Accounting Standards Board 2002). The IFRS and US GAAP have their own accounting standards for annual reports. These standards influence the amount of information and readability of annual reports (Van Beest et al. 2009). Today, there is discussion about the permanent adoption of IFRS in the US. The proponents argue that the IFRS will add value to the US economy, but the opponents, such as US constituents, do not agree with this view. The two accounting standards boards have the same goals (IASB 2015). In the past few years, the two accounting regimes have worked together to increase disclosure quality to make accounting information useful for the capital market participants, to reduce the differences, and to have the same set of accounting standards (SEC 2008; Financial Accounting Foundation 2009).

The main qualitative characteristics of the accounting regimes are the same. One of the main characteristics is understandability. Understandability of information means an annual report being comprehensible to users (IASB 2015). Since 2007, the SEC allows non-US firms to submit their annual reports to the SEC based on IFRS (SEC 2007).

The introduction of IFRS brings with it a new set of accounting rules and regulations for annual reports. Firms active in Europe are required to apply IFRS accounting standards. The introduction of IFRS leads to more informative, accurate, transparent, and comparable annual reports. The IFRS requires firms to provide more timely information about the recognition of gains and losses and use of fair-value accounting (Ball 2006)

The studies by Daske et al. (2008) and Armstrong et al. (2010) examined the effect of IFRS in the European capital market. Their findings show that IFRS adoption had a positive effect for the European capital market. The results of Richards and Van Staden (2011) and Jang and Rho (2016),

however, are not in accordance with the results of Daske et al. (2008) and Armstrong et al. (2010). They provide evidence that the adoption of IFRS has a negative influence on readability. It should be taken into account that Richards and Van Staden (2011) and Jang and Rho (2016) only conducted research in a single country (Jang and Rho (2016) in South Korea, and Richards and Van Staden (2011) in New Zealand). Daske et al. (2008) and Armstrong et al. (2010) investigated multiple countries and conclude that the adoption of IFRS has positive influences on disclosure quality. Barth et al. (2012) examined the disclosure quality of two accounting regimes: the IFRS in the European capital market, and the US GAAP in the US. In this way, they involved the US. They conclude that the US GAAP provides better disclosure quality in comparison with IFRS.

The introduction of IFRS has positive influences for the capital market. The users of annual reports have more valuable, relevant, comparable, and transparent information (Ball 2006). This is in contrast with the studies of Richards and Van Staden (2011) and Jang and Rho (2016), which have contradictory outcomes about the adoption of IFRS. They provide evidence that the adoption of IFRS decreases the readability of annual reports. This is not in accordance with purpose of IFRS. The purpose of IFRS is to make accounting information more usable and understandable for users. My expectation is based on a study by Barth et al. (2012) that claims annual reports based on the US GAAP are more readable and understandable. The second hypothesis is as follows:

H2: US GAAP annual reports are more readable (and understandable) than IFRS annual reports

The second hypothesis examines the disclosure quality of the US GAAP-based annual reports and IFRS-based annual reports by measuring readability. The US GAAP and IFRS have the same comparable accounting information (Barth et al. 2012). A more readable (and understandable) annual reports means a lower BOG index.

3.9 Summary

Previous studies have found that there is an association between the readability of annual reports and firm-specific characteristics. The readability of annual reports is positively associated with firm-specific characteristics. Annual reports provide information that is crucial for investors to understand

and assess a firm when making investment decisions. Diamond and Verrecchia (1991) show a link between disclosure quality and the cost of capital. They conclude that disclosure quality influences the cost of capital. The cost of capital embodies the equity and debt of a firm. The focus of this thesis is on the equity, which is relevant for investors.

The two accounting regimes (IFRS and US GAAP) aim to reduce the differences in disclosure quality and began a project together to achieve this goal (IASB 2015). The studies by Richards and Van Staden 2011 and Jang and Rho 2016 examined the effect of the adoption of IFRS on readability of annual reports and provide evidence that it has a negative influence. This is not in accordance with the studies by Daske et al. (2008) and Armstrong et al. (2010), however. They showed that the adoption of IFRS provided great benefits for the European capital market by measuring other subjects than just readability. Barth et al. (2012) examined the accounting quality of IFRS and the US GAAP and concluded that the US GAAP provides greater accounting quality.

The first hypothesis examines the association between the readability of annual reports and the COE. The second hypothesis examines the difference in disclosure quality of IFRS-based and the US GAAP-based annual reports by using the readability measurement tool.

4 Research design and data

In the previous chapter, the hypotheses were developed to answer the research question. In this chapter, the readability measurement tool (the BOG index) and the measurement tool for the COE (the PEG) are explained. Subsequently relevant control variables, Libby boxes, sample size, and data are also described.

4.1 The readability measurement tool: BOG Index

The BOG index is a readability measurement tool that analyses the readability of a text. The conventional readability tools, Fog and F-K index, measured readability by examining the complexity of words and the length of sentences. The BOG index is measured by using computer software StyleWriter, which consists of a dictionary containing 200,000 words. Each word is graded in the following categories: easy to hard, unusual or common, informal or formal, poor or good style, and technical or non-technical. The software measures also whether there are hidden verbs, passive verbs, unneeded phrases, and other style problems in the written text. The measurement tool not only looks at the writing style of the writer but also offers recommendations to increase the readability of, and the pleasure to read, a text (Wright 2013).

The BOG index formula consists of the following three elements:

$$BOG\ index = Sentence\ BOG + Word\ BOG - Pep$$

The first element of the BOG index, Sentence BOG, calculates the average sentence length for the entire text and identifies sentence issues. The average sentence length is squared and divided by the standard long sentence that is limited to 35 words. Whereby, longer sentences decrease the readability and pleasure to read (Wright 2013). The formula of the first element is as follows:

$$Sentence\ BOG = \frac{(Average\ Sentence\ length)^2}{Long\ Sentence\ limit}$$

The second element of the BOG index, Word BOG, analyzes the entire text and highlights difficult words, passive verbs, wordiness, abstract words, and plain English style problems in the textual

content. The software analyzes the first 250 words and calculates the results, with each word having been assigned a value. The conventional readability methods identify word difficulty by the length of word. The drawback of the traditional methods is that longer words can be understandable for the reader, but are assigned as difficult by the measurement tool. The Word BOG avoids this problem because words such as “remembering,” “conference,” or “telecommunication” are understandable to the common reader. These words are not classified as difficult by the BOG index. The traditional readability measurement tools identify short words as not difficult. The Word BOG does not consider the length of a word, and identifies words such as “gelid,” “regna,” or “latria” as difficult (Wright 2013). The formula for the second element is as follows:

$$\text{Word BOG} = \frac{(\text{Specialist} + \text{Heavy words} + \text{Style problems} + \text{Abbreviations}) * 250}{\text{Number of Words}}$$

The final element, Pep, analyzes the text and offers recommendations to improve readability, to use clear sentences, to replace words with interesting words, and to make adjustments according to the audience and writing task. The Pep element contains 20 different writing tasks and 3 different audiences: public, in-house, and specialist. Traditional readability measurement tools do not adapt to the readers’ circumstances or the writing task (Wright 2013):

$$\text{Pep} = \frac{(\text{Names} + \text{Interest Words} + \text{Conversational}) * 25}{\text{Numbers of words}} + \text{Sentence Variety}$$

General BOG index scoreboard (varies across audience and writing task):

Score range	Score description
0 – 20	Brilliant
21 – 50	Good
51 – 70	Fair
71 – 100	Poor
101 – 130	Bad
131 – 1000	Terrible
1000+	Jargon

A lower readability score indicates that the annual reports are better to read and understand for the reader. The readability software BOG index (Stylewriter 4.0 software) is an independent variable that measures the readability of annual reports. Section 4.4 includes a regression model to examine the association with the dependent variable.

4.2 The cost of equity measurement tool: Price-earnings growth ratio model

Previous studies in finance and accounting use different models to calculate the COE (Ohlson and Juettner-Nauroth 2005; Claus and Thomas 2001; Gebhardt et al. 2001; Easton 2004). These models are divided into two groups to estimate the expected return in current stock value and analyst forecasts: the RIV and AEG. In section 2.7, the differences between these two approaches are discussed.

In this thesis, the PEG is used to measure the COE of firms. The PEG model is superior to other models, such as the Price-earnings ratio (PE) model (Botosan 2004). The PEG model uses accounting data, which are more accurate, and provide a more reliable and unbroken outcome (Botosan and Plumlee 2002). Hail and Leuz (2005) used the PEG model in their research and find that the PEG model is appropriate and practicable. The PEG model is chosen also because it calculates the COE based on future earnings. Investors emphasize earnings and the earnings growth rate rather than the book value of the equity (Ohlson and Juettner-Nauroth 2005). The PEG model is chosen because of its high construct validity, in comparison with other measurement tools, to measure the COE (Botosan and Plumlee 2005). The model is a reliable proxy to calculate the COE because it uses accounting data instead of historical realized returns, like Capital Asset Pricing Model CAPM does (Artiach and Clarkson 2010). The PEG model takes firm-specific risk, which is associated with the firm's earnings and future returns, into account. The COE measured with the PEG model is a dependent variable that measures the rate of return for equity holders. The variable is included in the regression model in section 4.4.

The PEG model consists of three variables: price of the share in present period (P_0), earnings per share based on the one-year ahead forecast (EPS_1), and the two-year ahead forecast (EPS_2). The model

calculates the COE by calculating the difference in the EPS_1 and EPS_2 divided by the current price of the share. The squared roots of the expected growth rate are taken to have the COE (Easton 2004):

$$R_e = \sqrt{\frac{EPS_2 - EPS_1}{P_0}}$$

Where:

R_e : COE

EPS_1 : earnings per share based on the one-year ahead forecast

EPS_2 : earnings per share based on the two-year ahead forecast

P_0 : current price of the share

The PEG model has shortcomings; EPS_2 is required to be higher than EPS_1 because the model cannot take negative EPS differences ($EPS_2 - EPS_1$) into account. If it does not comply with this requirement, it is removed from the sample size (Easton 2004). There were 10 negative differences in earnings differences in the sample size ($EPS_2 - EPS_1$), which have been removed.

4.3 Control variables

There are various variables that need to be controlled for in the regression equation used to measure the association between readability and the COE. In this thesis, the following variables are controlled, (based on previous studies): firm size, market-to-book (MTB), financial leverage (FL), complexity, Return on Asset (ROA), special items (SI), and long-term growth in earnings. Not controlling these type of variables can influence the results and have an impact on the conclusions drawn.

- Firm size (SIZE): The size of a firm refers to the operations of the firm. Firm size is measured as the logarithm value of net sales of a firm (Li 2008). The SIZE variable influences the readability of the annual report because in large firms these are longer and more complex. This can lead to an increase in the readability score (BOG index), which means the report is more difficult to read.

- Market-to-book ratio: The MTB is calculated by the market value divided by the book value of the firm. The reason to control for this variable is that there is a different growth rate between firms. Growth firms may have more complex annual reports because of their uncertain business models. Firms with a higher growth rate may have an increased readability score for their annual reports (Li 2008). A higher readability score is a less readable annual report.
- Financial leverage: The FL control variable is calculated for a firm by dividing the total debt by the total assets. The reason to control for this variable is because firms with high FL may increase the readability of their annual reports (Jensen and Meckling 1976). Firms with a higher FL disclose more in their annual reports, which may decrease the readability score. Such a firm will disclose more because the debt holders ask for more relevant information. This may lead to a more readable annual report.
- Complexity (SGEO and SBUSS): The complex structure of firms influences the readability of the annual reports. The variables are measured by the number of business segments (SBUSS) and geographic segments (SGEO) (Lehavy et al. 2011). Firms with a more complex structure may increase the readability score of the annual reports, leading to a less readable report.
- Return on Asset: ROA is included in the regression model to control the performance of firms. The variable is calculated by net income divided by total assets (Lang and Lundholm 1993). Well-performing firms need to explain less, which may lead to a decrease in the readability score. Thus, the annual reports are more readable. Less performing firms have to disclose and explain more, which could lead to a less readable annual report and thus a higher readability score.
- Special items: These have an influence on the readability of annual reports. The SI variable is calculated by the number of SI divided by total assets (Li 2008). Firms that disclose more SI may create transparency; however, they have to disclose more, which may lead to a more complex annual report. This, in turn, may lead to a higher readability score, and thus a less readable annual report.
- Long-term growth in earnings (YEARS): The variable YEARS influences the readability of the annual report. It is measured by using I/B/E/S five-year earnings growth rate (Rjiba n.d.). Firms

with a higher growth in earnings need less explanation, which may lead to a decrease in the readability score, meaning the annual reports are more readable.

4.4 Models to test the hypotheses

The first hypothesis tests the relation between the readability of annual reports and the COE. The readability of annual reports is measured using the BOG index (BOG), and the COE is measured by the PEG model (COE). The dependent variable is COE, the independent variable is BOG, and control variables are: SIZE, YEARS, MTB, FL, SBUSS, SGEO, ROA, and SI. The regression model j represents firm, and t represents year.

$$COE_{jt} = intercept_0 + BOG_{jt} + YEARS_{jt} + MTB_{jt} + ROA_{jt} + FL_{jt} + SGEO_{jt} + SBUSS_{jt} + ROA_{jt} + SI_{jt} + SIZE_{jt} + \varepsilon_{jt}$$

The second hypothesis examines the readability of annual reports based on IFRS and the US GAAP to investigate if the readability of the two accounting regimes is on the same level. To test the second hypothesis, the two-sample t-test is used to examine the average readability of annual reports based on IFRS and the US GAAP. The two-sample t-test examines if the means of the two populations differ from each other (Snedecor and Cochran 1989). The two-sample t-test model consists of the two different sample means (Y), and standard deviation (S):

$$Two\text{-}sample\ t\text{-}test = \frac{Y_1 - Y_2}{\sqrt{\frac{S1^2}{N_1} + \frac{S2^2}{N_2}}}$$

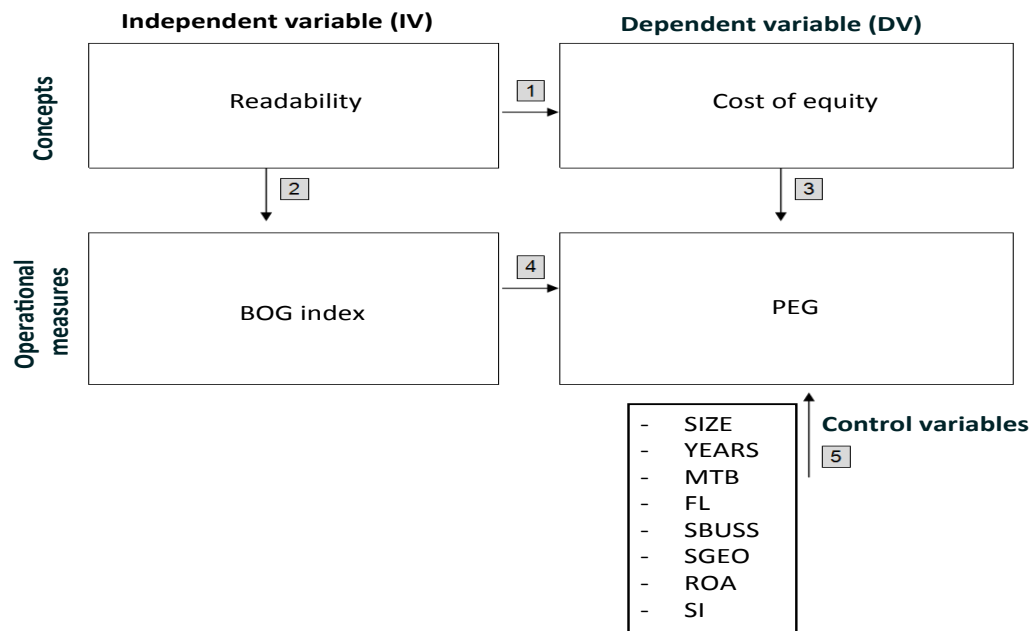
The software STATA calculates the mean of the population, standard deviation, and examines the second hypothesis.

4.5 Libby boxes

The Libby boxes provide a summarized overview of the regression model. Link 1 presents the theoretical association between the readability of the annual reports and the COE. Link 1 is expected to be negative: higher readability of the annual reports is expected to lead to lower COE. Link 2 relates

readability to the independent variable, the BOG index. Link 3 relates the consequential concept, the COE, to the dependent variable, the PEG. Link 4 is the empirical test that examines the negative association between readability and the COE. Link 4 is expected to be positive: decrease in the BOG index (more readable annual report) leads to decrease in COE. Link 5 presents the control variables (Libby et al. 2002).

Figure 1: Libby Boxes



The construct validity may be high because the readability measurement tool, the BOG index, avoids validity concerns that exist with traditional readability measures, such as Fog and F-K index (Bonsall et al. 2017). The PEG model measures the COE of firms and is widely used by various studies. The model takes firm-specific risk associated with the firm’s earnings and future returns into account, and is a reliable proxy to calculate the COE (Artiac and Clarkson 2010).

The external validity may be low due to the small sample size, because it only takes two years (2013 and 2016) into account, and the focus is only on two countries (US and UK). The internal validity of this study could be harmed by the omission of correlated variables that may have an influence on the dependent variable. Thus, the internal validity may be low.

4.6 Sample and data

To examine the relation between readability and the COE, the US S&P 500 index is used. This index consists of the 500 most important firms registered on the New York Stock Exchange and NASDAQ. The largest 50 firms were chosen, which represents 10 percent of the S&P 500. The annual reports of the firms are available on their respective websites, and the sample period is the years 2013 and 2016. The reason for the year 2013 is because it is after the crisis period, which can influence the readability of annual reports in a negative way. The annual reports from 2016 are the most recent available. The annual reports are PDF documents. Unfortunately, the BOG index software cannot measure this type of document. To solve this problem, the PDF documents were converted to Word documents by Adobe Acrobat software. It was then possible to use the BOG index. The financial data of the firms are presented in the Data stream and WRDS databases, and can be found with the ISIN code or CUSIP. The ISIN and CUSIP codes are unique codes that identify a firm and the related financial information. The STATA software was used to calculate the variables and examine the relation between the dependent and independent variable.

The second hypothesis examines the relation between the readability of annual reports based on IFRS or the US GAAP. The sample size of the IFRS annual reports consists of the largest 50 firms based on their market capitalization from the LSE. The UK was selected because their native language is the same as the US. Two US firms were replaced, Schlumberger and National Grid PLC; Schlumberger is present in the S&P 500 also, and National Grid PLC have not released their annual report for 2016 yet. To measure the readability of the annual reports, the BOG index software was used. When the BOG score of the annual reports was identified for 2016, the software STATA can be used to examine if the average readability scores are comparable. The list of the included US and UK firms and the BOG index is presented in appendices A and B.

For the first hypothesis, there are a total of 79 observations used to examine the relation between the COE and readability. Unfortunately, there are 11 missing values. For the second hypothesis, there are 100 observations used to examine whether the disclosure quality of the two accounting regimes is comparable. In Table 1, these 100 observations are divided into different sectors.

Table 1: Sample size by sector for Hypothesis 2

Sector	US Obs	UK Obs	Total
Communication	2	3	5%
Consumer Good / Service	11	13	24%
Energy	3	5	8%
Financials	7	11	18%
Health	9	4	13%
Industrial	6	13	19%
Media	3	1	4%
Technology	9		9%
Total	50	50	100%

4.7 Summary

The BOG index measures the readability of annual reports. The PEG model measures the COE. The model that tests the first hypothesis is a regression model. The total observation included 100 observations; however, there were 11 missing values and 10 negative values, which the PEG model does not accept. Therefore, the total number of observations for the first hypothesis is 79. For the second hypothesis, a two-sample t-test was used. There was a total of 100 observations. The financial data of the observations are available on the Data stream and WRDS databases. The annual reports of the observations are available on the websites of the firms.

5 Empirical results and analysis

In this chapter, the data analysis is discussed for the first and second hypothesis. The descriptive statistics, the Pearson correlations of the variables, and the regression analysis for the first hypothesis are presented in sections 5.1 to 5.3. For the second hypothesis, the descriptive analysis, the Pearson correlations, and the two-sample t-test are presented in sections 5.4 to 5.6. In section 5.7, the findings are interpreted and compared with previous studies.

5.1 Hypothesis 1: Descriptive statistics

H1: Readability of the annual report is negatively associated with the cost of equity.

The data analysis for the first hypothesis consists of 79 observations from the S&P 500 from the years 2013 and 2016. The S&P 500 is based on the US GAAP. I have excluded 21 observations from the sample size of 100 because there were no data or they had a negative PEG value. Table 2 provides descriptive statistics for the dependent, independent, and the control variables. The mean value of the dependent variable COE is 0.086, with a standard deviation of 0.026. This indicates that the average COE for the S&P 500 is 8.6 percent. This is below the average rate of return of 10 percent, which is required by investors (Francis et al. 2005). The independent variable BOG has a mean value of 66.367. The MTB ratio shows an average value of 5.416 and a standard deviation of 4.821. The variable YEARS shows a mean value of 11.85 percent earnings growth. The average value of the FL is 25.3 percent, and the variable SIZE has a mean value of 11.853. The complexity variables, SGEO and SBUSS, have a mean value of respectively 0.934 and 1.444. The ROA and SI have mean values of respectively 8.3 and -0.7 percent.

Table 2: Descriptive Statistics Hypothesis 1

Variable	Obs	Mean	Std. Dev.	0,25	0,50	0,75	Min	Max
COE	79	0.086	0.026	0.070	0.083	0.098	0.029	0.158
BOG	79	66.367	5.369	62	66	71	55	78
MTB	79	5.416	4.821	2.415	3.609	7.125	0.009	21.511
YEARS	79	11.853	10.976	5.530	8.945	16.890	-11.430	33.260
FL	79	0.253	0.129	0.178	0.235	0.340	0.000	0.552
SIZE	79	11.268	1.168	10.613	11.214	11.766	8.779	14.728
SGEO	79	0.934	0.869	0.000	1.099	1.386	0.000	3.091
SBUSS	79	1.444	0.961	0.000	1.609	2.197	0.000	3.135
ROA	79	0.083	0.054	0.042	0.084	0.117	-0.035	0.219
SI	79	-0.009	0.014	-0.010	-0.004	0.000	-0.051	0.005

The sample, from S&P 500, consists of 79 observations for the years 2013 and 2016. The data are from Data stream and WRDS. The COE is measured using the PEG model. The BOG variable measures the readability of the annual report. The MTB ratio is calculated by the market value divided by the book value. The variable YEARS is measured by the 5-year growth in earnings. Financial leverage is measured by the total debt divided by total assets. The variable firm size (SIZE) is measured by the natural logarithm of net sales. The complexity, SGEO and SBUSS, are calculated by the number of segments. Return on assets is calculated by the net income divided by total assets. Special item is calculated by the number of SI divided by total assets.

5.2 Hypothesis 1: Pearson correlation

Table 3 presents the correlation between the dependent (COE), independent (BOG), and the control variables (YEARS, MTB, ROA, SIZE, FL, SI, SGEO, and SBUSS). The significant correlations of the variables are marked with an asterisk (*). One asterisk refers to being significant at 1%-level and two asterisks refer to being significant at 5%-level. There is a positive correlation between the readability score and the COE; however, the BOG variable is not significantly correlated with the COE. The magnitude (0.0327) is small. A less readable annual report is not significantly associated with a higher COE. Nevertheless, the control variable YEARS does have a significant correlation at the 5%-level with the COE. This indicates that a growth in earnings leads to a higher COE. Also, the variable ROA is significantly correlated with the COE. A higher performance leads to a lower COE. The other control variables (MTB, SIZE, FL, SI, SGEO, SBUSS) are not significantly correlated with the COE.

The variable that has a positive significant association with the readability score (BOG) is the FL. This indicates that an increase in FL leads to an increase in the readability score. This is a less readable annual report.

Table 3: Pearson correlation for Hypothesis 1

	COE	BOG	YEARS	MTB	ROA	SIZE	FL	SI	SGEO	SBI
OE	1.000									
OG	0.0327	1.000								
EARS	0.2500**	-0.0552	1.000							
ITB	-0.0339	0.1549	0.1850	1.000						
OA	-0.2597**	-0.0570	0.2593**	0.5748*	1.000					
IZE	0.0696	-0.0803	-0.3155*	-0.4796*	-0.5974*	1.000				
L	0.0011	0.2654*	-0.1827	0.4477*	0.0023	-0.0642	1.000			
I	-0.2257	-0.0581	-0.0758	-0.3025**	0.0624	0.2584**	-0.3290*	1.000		
GEO	0.0323	0.1154	-0.0717	0.1358	-0.0507	-0.0676	0.1979	-0.2125	1.000	
BUSS	0.0352	0.0943	0.0256	0.1414	-0.0594	-0.0854	0.1747	-0.2506**	0.8350*	1.000

* Significant at 1%-level

** Significant at 5%-level

5.3 Hypothesis 1: Regression analysis

The data that are used for the regression model have to meet the OLS assumptions: normal distribution assumption, multicollinearity assumption, homoscedasticity assumption, and autocorrelation assumption.

First, the normal distribution for the variables assumption is checked by histogram. The variables PEG, BOG, ROA, SIZE, YEARS, SI, and FL have a normal distribution. The variables SBUSS and SGEO have a skewed distribution and are outside the acceptable range of ± 2 . An acceptable range of skewness and kurtosis is ± 2 (Trochim & Donnelly 2006). To have a normal distribution, a natural logarithm function was used for the variables SGEO and SBUSS. Then, a check was made for the outliers and winsorized the outliers at level 1% and 99%. Second, a test was performed for the multicollinearity assumption of the variables. The result of the test is presented in Appendix C.

To quantify the severity of multicollinearity a, the variance inflation factor (VIF) was measured. A VIF value of 5 or higher indicates that an independent variable is highly correlated with another independent variable. This can harm the regression model (Ringle et al. 2015). The VIF value for the

variables of Hypothesis 1 is under 5, which provides evidence that there is no multicollinearity (see Appendix C).

Next, the homoscedasticity assumption was checked. Homoscedasticity means that the variance of the errors is constant. If the homoscedasticity assumption does not hold, this leads to heteroscedasticity. A plot was made of the residual-fitted values, which indicates there is no constant variance of errors. To be certain, the homoscedasticity was re-tested, this time using the Breusch-Pagan test. The test provided evidence that there is heteroscedasticity, (see Appendix C). To solve the problem of heteroscedasticity, the regression model is with robust standard errors. To test the autocorrelation assumption, the Feasible Generalized Least Squares was used. The test provided evidence that there is no autocorrelation.

The first hypothesis examines the association between the readability of annual reports and the COE. The dependent variable is the COE, the independent variable is the readability score (BOG), and the control variables are as follows: the MTB, size (SIZE), FL, complexity (SBUSS and SGEO), ROA, SI, and YEARS. The following regression model tests the association between readability score and the COE for the firms with the highest market value of the S&P 500:

$$COE_{jt} = intercept_0 + BOG_{jt} + YEARS_{jt} + MTB_{jt} + ROA_{jt} + FL_{jt} + SGEO_{jt} + SBUSS_{jt} + ROA_{jt} + SI_{jt} + SIZE_{jt} + \varepsilon_{jt}$$

The first hypothesis examines the association between the BOG index variable and the COE. In Table 4, the related coefficients and the t values are presented. The value of the coefficient of the BOG index is -0.0001 with a t value of -0.10. This indicates an increase in the BOG variable leads to a decrease in the COE, given that all other variables are held constant. In this analysis, a less readable annual report (high BOG index) will result in a lower COE. This is not consistent with the expectation that a lower BOG index (better readability) will lead to a lower COE. The magnitude of the coefficient is small, however, and the association is not significant.

The values of the coefficient and t value for the control variables are: YEARS (0.0007; t=1.53), MTB (0.0009; t=0.82), ROA (-0.2194; t=-2.01), FL (-0.0131, t=-0.33), SGEO (-0.0001; t=-0.02), SBUSS (-0.0001; t=-0.00), SI (-0.1416; t=-0.58), SIZE (-0.0008; t=-0.17).

The control variable ROA has a significant influence on the COE. An increase in the ROA results in a decrease of the dependent variable COE. This is consistent with the expectation that firms with a higher ROA, and thus a higher performance, need to explain less, leading to a decrease in the readability score and a lower COE.

The variables YEARS, MTB, FL, SGEO, SBUSS, SI, and SIZE are not significant. The variables SIZE, SBUSS, and SGEO are measured using the natural logarithm because of their skewed distribution. The R-squared, adjusted R-squared, and the F-statics are respectively 0.1845, 0.0378, and 1.64.

Table 4: Regression analyses

$$COE_{jt} = intercept_0 + BOG_{jt} + YEARS_{jt} + MTB_{jt} + ROA_{jt} + FL_{jt} + SGEO_{jt} + SBUSS_{jt} + ROA_{jt} + SI_{jt} + SIZE_{jt} + \varepsilon_{jt}$$

Variable	Expected Sign	Coefficient	T value
BOG	+	-0.0001	-0.10
YEARS	-	0.0007	1.53
MTB	+	0.0009	0.82
ROA	-	-0.2194*	-2.01
FL	-	-0.0131	-0.33
SGEO	+	-0.0001	-0.02
SBUSS	+	-0.0001	-0.00
SI	+	-0.1416	-0.58
SIZE	+	-0.0008	-0.17
Constant		0.1042	1.46
Obs	79		
R-squared	0.1845		
Adj. R-squared	0.0378		
F-statics	1.26		

* Significant at 5%-level

5.4 Hypothesis 2: Descriptive statistics

H2: US GAAP annual reports are more readable (and understandable) than IFRS annual reports

The annual reports of the firms from the US and UK were downloaded, after which the readability software could scan the documents. In appendices A and B, the readability score (BOG index) of the individual observations are presented. For the US GAAP-based annual reports, Kraft Heinz has the lowest BOG index for their annual reports for 2013. Kraft Heinz and Chevron both have the lowest BOG index in 2016. A lower BOG index assumes a more readable and understandable annual report. In 2013, Comcast has the highest BOG index for their annual reports. In 2016, this was the Goldman Sachs Group. For IFRS-based annual reports, in 2016, Banco Bilbao has the highest BOG index and WPP the lowest BOG index.

In Table 5, the average BOG index per sector is presented for 2013 and 2016. The “Media” sector has the highest BOG index for 2013 and 2016. This may assume that the annual reports of the “Media” sector are more difficult to read and understand for a general reader. The annual reports of the “Consumer Good/Service” sector have the lowest BOG index for 2013. Their annual reports are relatively easier to read and understand. The “Energy” sector has the lowest BOG index in 2016.

Table 5: Average BOG index per sector for 2013 and 2016 for the US GAAP-based annual reports

Sector	Obs	Average score 2013	Average score 2016	Change
Communication	2	64.50	63.50	1.60%
Consumer Good/Service	11	59.73	62.73	-5.00%
Energy	3	63.00	60.67	3.70%
Financials	7	67.57	68.29	-1.10%
Health	9	62.00	62.00	0.00%
Industrial	6	68.17	66.17	2.90%
Media	3	69.33	68.33	1.40%
Technology	9	66.00	67.11	-1.70%

The average BOG index for the UK and US firms are presented in Table 6. The BOG index of the annual reports for the US firms has a mean value of 66.18 with a standard deviation of 5.340. The higher the BOG indexes, the more difficult the annual reports are to read and to understand for a regular person.

The UK annual reports have a mean value of 60.62 and a standard deviation of 5.467. The mean value indicates that the annual reports of UK firms are more favorable to read and understand in comparison with the US firms.

Table 6: Average BOG index for US and UK firms in 2016

Variable	Obs	Mean	Std. Dev.	25%	50%	75%	Min	Max
BOG score US 2016	50	66.18	5.340	63	66	70	54	78
BOG score UK 2016	50	60.62	5.467	57	60	64	50	78

6.5 Hypothesis 2: Pearson correlation

In Table 7, the Pearson correlation between the UK BOG and US BOG is presented. The value of the correlation between the UK BOG and US BOG is 0.3296 and significant at a 5%-level. The correlation between the readability scores is positive.

Table 7: Pearson correlation Hypothesis 2

Variable	US BOG	UK BOG
US BOG	1.000	
UK BOG	0.3296**	1.000

* Significant at 1%-level

**Significant at 5%-level

5.6 Hypothesis 2: Two-sample t-test

The second hypothesis examines the readability of the two accounting regimes. The observations from the UK and US have been selected using their market capitalization. The readability of the annual reports is measured using BOG index software. The two-sample t-test examines if the average BOG indexes for the US and UK are on the same readability level in 2016. The histograms of the US and UK are presented in Appendix C. It shows normal distribution of the observations for the US and for the UK. Table 8 presents the information of the two-sample t-test. The total observation (Obs) is 100, and the degree of freedom (DOF) is 98. The difference (DIFF) between the two mean values is 5.56 with a standard deviation of 1.081. The t value is 5.1450. The annual reports of the UK firms,

based on IFRS, have a lower average BOG index in comparison with the annual reports of the US firms, based on the US GAAP (60.62 vs. 66.18). This indicates that IFRS-based annual reports are easier to read and understand.

Table 8: Two-sample t-test

Variable		Mean	Std. Err.	Std. Dev.
US BOG		66.18	0.755	5.340
UK BOG		60.62	0.773	5.466
DIFF		5.56		1.081
Obs	100			
DOF	98			
T-test	5.1450			

5.7 Main results

The first hypothesis investigates the association between the readability of the annual reports and the COE. The expectation is that readability is negatively associated with the COE. A lower BOG index indicates a more readable and understandable annual report, which leads to a decrease in the COE.

Table 4 provides information for the first hypothesis. It shows that an increase in the BOG variable leads to a decrease in the COE. This is not consistent with the expectation of this thesis. The coefficient is very small, however, and this relation is not significant. In this case, Hypothesis 1 is rejected.

This finding is not in accordance with the studies of Botosan (1997), because she find that disclosure quality has a statically significant negative association with the COE. In this thesis, disclosure quality is measured using the BOG index. Previous studies used other measurement tools or traditional readability tools to measure disclosure quality, e.g. analysts following, transparency, and Fog and F-K index.

Rjiba (n.d.) investigated the relation between the readability of annual reports and the COE. He measured readability using the Fog index. The COE was measured using four different archival

models. The average outcome of the models is used. The study provides evidence that there is a negative association between readability and the COE, which is significant. In this thesis, the BOG index is used to measure readability, and only one model (PEG) is used to measure the COE. Possibly reason can be that the BOG index has low construct validity.

The second hypothesis examines the readability of the US GAAP-based annual reports and IFRS-based annual reports. The expectation is that the US GAA- based annual reports are more readable in comparison with IFRS-based annual reports. The prediction of this thesis is based on the study by Barth et al. (2012). They imply that the US GAAP-based annual reports provide higher disclosure quality than IFRS-based annual reports. Disclosure quality is measured by comparing accounting amounts. In this thesis, it is assessed by measuring the readability of the annual reports using the BOG index software. This was done for the 50 largest firms of S&P 500 and LSE for 2016.

The two-sample t-test was used to examine whether there is difference between the mean BOG indexes for the IFRS- and US GAAP-based annual reports. Table 8 shows that there is a significant difference in the means of the BOG indexes of the annual reports. The test indicates that IFRS-based annual reports provide more readable and understandable annual reports in comparison with the US GAAP-based annual reports. This finding rejects Hypothesis 2.

The findings, that IFRS-based annual reports provide more readable and understandable annual reports in comparison with the US GAAP-based annual reports, are in accordance with Barth et al. (2012). Furthermore, the average BOG index of the US GAAP-based annual reports increased from 2013 to 2016 (see Appendix A). This implies that the annual reports based on the US GAAP have become less readable.

7 Conclusion, contribution, and limitation

This thesis investigates the association between the readability of annual reports and the COE for the 50 most important firms of S&P 500. Second, this thesis investigates the readability of annual reports based on the US GAAP and IFRS.

Previous studies have provided evidence that there is a relation between the readability of annual reports and firm-specific characteristics, such as performance, earnings persistence, analyst behavior, stock prices, and market reaction (Subramanian et al. 1998; Li 2008; Lehavay et al. 2011; Lee 2012; Franco et al. 2015). Botosan (1997) especially provides empirical evidence about the negative association between the disclosure quality of annual reports and the COE. This study focuses on the relation between the readability of annual reports and the COE. The readability was measured by computer software using the BOG index. The sample size of this study consists of 79 observations for the years 2013 and 2016. This study examined the association between the BOG index and the COE. The research question of this study is, "Does the readability of an annual report affect the cost of equity?" The answer to this research question is that there is no significant relation between the BOG index and the COE. The expectation of the first hypothesis is that there is negative association between the readability of an annual report and the COE. This negative association implies that better readability (lower BOG index) leads to a lower COE. This thesis provides evidence that a higher BOG index leads to a decrease in the COE, which means less readable and understandable annual reports. This is not consistent with our expectation. The coefficient is very small, however, and this relation is not significant. In this case, Hypothesis 1 is rejected.

The second hypothesis of this study examines the disclosure quality (measured by readability) of annual reports based on IFRS and the US GAAP. The IFRS and US GAAP have begun several joint projects to reduce the differences of annual reports. Previous studies show different results for the disclosure quality of the two accounting regimes. They also state that the adoption of IFRS has a negative influence on readability (Barth et al. 2012; Daske et al. 2008; Richards and Van Staden 2011). The sample size consists of 50 firms selected based on their market value on the LSE and the S&P 500 to examine the readability of their annual reports, using the BOG index. The expectation of the

second hypothesis is based on the study by Barth et al. (2012). This study concludes that the US GAAP-based annual reports provide higher disclosure quality, measured by the accounting amounts. To test the second hypothesis, the two-sample t-test was used to examine if there was a significant difference in the mean scores of the BOG index. The results show that there is a difference in the means of the BOG indexes. The UK sample has a lower BOG index than the US sample (60.62 vs. 66.18). The IFRS-based annual reports have a higher BOG index in comparison with the US GAAP-based annual reports. Furthermore, the mean BOG index for the US sample increased from 65.82 to 66.18 in the period 2013 to 2016, which indicates that their annual reports are more difficult to read and to understand.

This thesis contributes to the existing readability and disclosure quality literature. It provides evidence that the BOG index can be used to measure the readability of annual reports, but the validity of the concepts is questionable. Another contribution of this study is that the two accounting regimes are working together to decrease the differences in disclosure quality. This thesis offers an indication of the average BOG indexes of IFRS- and the US GAAP-based annual reports. The average BOG indexes in this thesis add value to the on-going debate about which accounting standards provide higher disclosure quality.

The first limitation of this thesis is the small sample size. The first hypothesis did not find a significant association between the COE and the BOG index. Second, only the UK was included to compare with the US. Other countries, such as Australia and Canada, based on their native language, could also be included.

Further research recommendations are based on increasing the sample size to examine the relation between readability and the COE. This can be done by including more countries that use IFRS. Also, the construct validity of the BOG index can be questioned and compared with other measurement tools to assess readability.

References

- Aboody, D., Hughes, J., & Liu, J. (2005). Earnings quality, insider trading, and cost of capital. *Journal of Accounting Research*, 43(5), 651-673.
- Armstrong, C. S., Barth, M. E., Jagolinzer, A. D., & Riedl, E. J. (2010). Market reaction to the adoption of IFRS in Europe. *The Accounting Review*, 85(1), 31-61.
- Artiach, T. C., & Clarkson, P. M. (2014). Conservatism, disclosure and the cost of equity capital. *Australian Journal of Management*, 39(2), 293-314.
- Ball, R. (2006). International Financial Reporting Standards (IFRS): pros and cons for investors. *Accounting and Business Research*, 36(sup1), 5-27.
- Barnett, A., & Leoffler, K. (1979). Readability of accounting and auditing messages. *Journal of Business Communication*, 16(3), 49-59.
- Barth, M. E., Landsman, W. R., Lang, M., & Williams, C. (2012). Are IFRS-based and US GAAP-based accounting amounts comparable?. *Journal of Accounting and Economics*, 54(1), 68-93.
- Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics*, 50(2), 296-343.
- Bhattacharya, U., Daouk, H., Welker, M. (2003). The world price of earnings opacity. *Accounting Review* 78, 641-678
- Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency?. *Journal of Accounting and Economics*, 48(2), 112-131.
- Bloomfield, R. J. (2002). The "incomplete revelation hypothesis" and financial reporting. *Accounting Horizons*, 16(3), 233-243.
- Bloomfield, R. (2008). Discussion of "annual report readability, current earnings, and earnings persistence". *Journal of Accounting and Economics*, 45(2), 248-252.
- Bonsall, S. B., Leone, A. J., Miller, B. P., & Rennekamp, K. (2017). A plain English measure of financial reporting readability. *Journal of Accounting and Economics*, 63(2), 329-357.
- Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *The Accounting Review*, 323-349.
- Botosan, C. A., & Plumlee, M. A. (2005). Assessing alternative proxies for the expected risk premium. *The Accounting Review*, 80(1), 21-53.
- Botosan, C. A. (2006). Disclosure and the cost of capital: what do we know?. *Accounting and Business Research*, 36(sup1), 31-40.
- Clarkson, G., Jacobsen, T. E., & Batcheller, A. L. (2007). Information asymmetry and information sharing. *Government Information Quarterly*, 24(4), 827-839.
- Claus, J., & Thomas, J. (2001), Equity Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Markets, *Journal of Finance*, 56: 1629-1666.

- Corbey, M. (2010). Agent of Steward? Over mensbeeld en management control. *Maandblad voor Accountancy en Bedrijfseconomie*, 84(10), 487-492.
- Courtis, J. K. (1995). Readability of annual reports: Western versus Asian evidence. *Accounting, Auditing & Accountability Journal*, 8(2), 4-17.
- Courtis, J. K. (1998). Annual report readability variability: tests of the obfuscation hypothesis. *Accounting, Auditing & Accountability Journal*, 11(4), 459-472.
- Daske, H., L. Hail, C. Leuz, and R. Verdi. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research* 46 (5): 1085–1142.
- Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management review*, 22(1), 20-47.
- Diamond, D.W., & Verrecchia, R.E. (1991). Disclosure, liquidity, and the cost of capital. *Journal of Finance*, 1325-1359
- DuBay, W. H. (2007). Smart Language: Readers, Readability, and the Grading of Text.
- Easley, D., & O'hara, M. (2004). Information and the cost of capital. *The Journal of Finance*, 59(4), 1553-1583.
- Easton, P. (2004), PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital, *Accounting Review*, 79(1): 73-95.
- Easton, P. (2009). Estimating the cost of capital implied by market prices and accounting data. *Foundations and Trends® in accounting*, 2(4), 241-364.
- Epstein, M.J., & Palepu, K.G. (1999). What financial analysts want. *Strategic Finance*, (April), 42-52.
- Financial Accounting Standards Board (2002). *Memorandum of understanding*
- Financial Accounting Foundation. (2009). Comment letter on the SEC Roadmap, March 11.
- Franco, G., Hope, O. K., Vyas, D., & Zhou, Y. (2015). Analyst report readability. *Contemporary Accounting Research*, 32(1), 76-104.
- Francis, J. R., Khurana, I. K., & Pereira, R. (2003). Global Evidence on Incentives for Voluntary Accounting Disclosures and the Effect on Cost of Capital (September 15, 2003). University of Missouri at Columbia, College of Business Working Paper. Retrieved from <https://ssrn.com/abstract=456900>
- Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality, and cost of capital. *Journal of Accounting Research*, 46(1), 53-99.
- Fu, R., Kraft, A., & Zhang, H. (2012). Financial reporting frequency, information asymmetry, and the cost of equity. *Journal of Accounting and Economics*, 54(2), 132-149.
- Gebhardt, W., Lee, C., & Swaminathan, B. (2001), Toward an Implied Cost of Equity, *Journal of Accounting Research*, 39: 135-176.
- Gibbins, M., Richardson, A., & Waterhouse, J. (1990). The Management of Corporate Financial Disclosure: Opportunism, Ritualism, Policies, and Processes. *Journal of Accounting Research*, 28(1), 121-143. TT

- Gunning, R. (1969). The fog index after twenty years. *Journal of Business Communication*, 6(2), 3-13.
- Hail, L., & Leuz, C. (2006). International differences in the cost of equity capital: Do legal institutions and securities regulation matter? *Journal of Accounting Research*, 44(3), 485-531.
- Hassan, O., & Marston, C. L. (2010). Disclosure measurement in the empirical accounting literature—a review article. 15 July 2010. *Recuperado em*, 12.
- Healy, P. (1977). Can you understand the footnotes to financial statements. *Accountants Journal*, 56, 219-222.
- Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, 31(1), 405-440.
- Holley, C. L., & Early, J. (1980). Are financial statements easy to read?. *The Woman CPA*, 42, 9-13.
- International Accounting Standards Board (2002). IASB constitution (2000) as amended on 5 March 2002. www.iasc.org.uk/cmt/0001.
- Hope, O.-K. (2003). Disclosure practices, enforcement of accounting standards and analysts' forecast accuracy: an international study. *Journal of Accounting Research*, 41 (2) (May), 235-272.
- IASB (2015). The Conceptual Framework for Financial Reporting 2015. IASB, London.
- Jang, M. H., & Rho, J. H. (2016). IFRS adoption and financial statement readability: Korean evidence. *Asia Pacific Journal of Accounting & Economics*, 23(1), 22-42.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360.
- Lang, M., & Lundholm, R. (1993). Cross-sectional determinants of analyst ratings of corporate disclosures. *Journal of accounting research*, 246-271.
- Lambert, R., Leuz, C., Verrecchia, R. (2007). Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research* 45, 385-420
- Lawrence, A. (2013). Individual investors and financial disclosure. *Journal of Accounting and Economics*, 56(1), 130-147.
- Lee, C.M.C., Myers, J., and Swaminathan, B. (1999). What is the Intrinsic Value of the Dow? *Journal of Finance*, 54, (5), 1693-1741.
- Lee, Y. J. (2012). The effect of quarterly report readability on information efficiency of stock prices. *Contemporary Accounting Research*, 29(4), 1137-1170.
- Lehavy, R., Li, F., & Merkley, K. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, 86(3), 1087-1115.
- Lev, B. (1992). Information disclosure strategy. *California Management Review*, 34(4), 9-32.
- Levitt, A. (1997). The Importance of High Quality Accounting Standards. Securities and Exchange commission, Washington, D.C. September 29.

- Libby, R., Bloomfield, R., & Nelson, M. W. (2002). Experimental research in financial accounting. *Accounting, Organizations and Society*, 27(8), 775-810.
- Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics*, 45(2), 221-247.
- Li, X. (2009). Accounting conservatism and cost of capital: International analysis. *Working Paper*, Fox School of Business, Temple University
- Lo, K., Ramos, F., & Rogo, R. (2017). Earnings management and annual report readability. *Journal of Accounting and Economics*, 63(1), 1-25.
- Loughran, T., & McDonald, B. (2009). Plain English, readability, and 10-K filings. Working paper, University of Notre Dame.
- Loughran, T., & McDonald, B. (2014). Measuring readability in financial disclosures. *The Journal of Finance*, 69(4), 1643-1671.
- Marston, C. L., & Shrikes, P.J. (1991). The use of disclosure indices in accounting research: a review article. *British Accounting Review*, 23 (3) (September), 195-210.
- Miller, B. P. (2010). The effects of reporting complexity on small and large investor trading. *The Accounting Review*, 85(6), 2107-2143.
- Wright, N. (2013). *Towards A Better Readability Measure – The Bog Index*. Retrieved from <http://s3-eu-west-1.amazonaws.com/plcdev/app/public/system/files/36/original/TowardsABetterReadabilityMeasure.pdf>
- Ohlson, J.A. (1995). Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research*, 11, (2), 661-687.
- Ohlson, J.A. (2005). On Accounting-Based Valuation Formulae. *Review of Accounting Studies*, 10, 323-347.
- Ohlson, J.A. & Juettner-Nauroth. B. (2005), Expected EPS and EPS Growth as Determinants of Value, *Review of Accounting Studies*, 10: 349-365.
- Psaros, J. & Trotman, K. (2004). The Impact of the Type of Accounting Standards on Preparers' Judgments. *Abacus*, 40(1), 76-93.
- Richards, G., & van Staden, C. (2011). The readability of International Financial Reporting Standards-is Harmonisation having a negative impact? AFAANZ Conference Paper.
- Ringle, C. M., Wende, S., & Becker, J. M. (2015). SmartPLS 3. Boenningstedt: SmartPLS GmbH. Retrieved from <http://www.smartpls.com>.
- Rjiba, H. (N.d.). Annual Report Readability and the Cost of Equity Capital, Working paper. Retrieved from <https://documents.bsb-education.com/pdf/cig2014/ACTESDUCOLLOQUE/RJIBA.pdf>
- Schapiro, M., (2011). Roundtable on International Financial Reporting Standards in the United States, Washington, D.C., July 07.
- Schroeder, N., & Gibson, C. (1990). Readability of management's discussion and analysis. *Accounting Horizons*, 4(4), 78.

- Schroeder, M. (2002). SEC proposes rules to improve disclosure by public firms. *Wall Street Journal* May 1": C5.
- Securities & Exchange Commission (SEC). (1998). A Plain English Handbook: *How to create clear SEC disclosure documents*. Washington, D.C.: U.S. Securities and Exchange Commission. Retrieved from <https://www.sec.gov/pdf/handbook.pdf>
- Securities and Exchange Commission (SEC). (2007). *Concept Release on Allowing U.S. Issuers to Prepare Financial Statements in Accordance with International Financial Reporting Standards*. Release Nos. 33 8831, 3456217. Washington, DC: SEC.
- Securities and Exchange Commission (2008). Roadmap for the Potential Use of Financial Statements Prepared in Accordance with International Financial Reporting Standards by U.S. Issuers; Proposed Rule. Retrieved from <https://www.sec.gov/news/speech/2008/spch082708ebw.htm>
- Securities & Exchange Commission (SEC). (2010). Important information about EDGAR. Retrieved from <http://www.sec.gov/edgar/aboutedgar.htm>
- Smith, M., & Taffler, R. (1992). Readability and understandability: Different measures of the textual complexity of accounting narrative. *Accounting, Auditing & Accountability Journal*, 5(4).
- Snedecor, G., & Cochran, W. (1989). *Statistical methods*. Eight Ed. Ames.
- Subramanian, R., Insley, R. G., & Blackwell, R. D. (1993). Performance and readability: A comparison of annual reports of profitable and unprofitable corporations. *The Journal of Business Communication* (1973), 30(1), 49-61.
- Trochim, W., & Donnelly, J. (2006). *The research knowledge methods base*.
- Van Beest, F., Braam, G., & Boelens, S. (2009). Quality of Financial Reporting: measuring qualitative characteristics. *Nijmegen Center for Economics (NiCE). Working Paper*, 09-108.
- Van der Meulen, S., Gaeremynck, A., & Willekens, M. (2007). Attribute differences between US GAAP and IFRS earnings: An exploratory study. *The International Journal of Accounting*, 42(2), 123-142.
- White, M.J., (2017). A U.S. Imperative: High-Quality, Globally Accepted Accounting Standards. Retrieved from https://www.sec.gov/news/statement/white-2016-01-05.html#_ednref9
- Whittington, G. (2008). Fair value and the IASB/FASB conceptual framework project: an alternative view. *Abacus*, 44(2), 139-168.
- You, H., & Zhang, X. J. (2009). Financial reporting complexity and investor underreaction to 10-K information. *Review of Accounting Studies*, 14(4), 559-586.
- Zhang, G. (2001). Private information production, public disclosure, and the cost of capital: Theory and implications. *Contemporary Accounting Research*, 18(2), 363-384.

Appendix A: US firms based on market capitalization S&P 500

Firm Name	Sector	BOG score 2013	BOG score 2016
Apple	Technology	71	69
Microsoft	Technology	61	66
Amazon	Consumer Good/Service	57	65
Facebook	Technology	59	61
Exxon Mobil	Energy	64	64
Johnson and Johnson	Pharmaceutical	62	64
JP Morgan Chase and Firm	Financials	68	66
Google	Technology	59	60
Wells Fargo and Firm	Financials	57	60
General Electric	Industrials	75	72
AT&T	Communications	61	58
Bank of America	Financials	68	63
Wal Mart Stores	Consumer Good/Service	59	59
Procter and Gamble	Consumer Good/Service	62	65
Pfizer	Pharmaceutical	72	73
Chevron	Energy	65	56
Coca Cola	Consumer Good/Service	65	65
Verizon Communications	Communications	68	69
Home Depot	Consumer Good/Service	55	75
Oracle	Technology	73	72
Comcast	Media	76	69
Walt Disney	Media	59	63
Cisco Systems	Technology	70	71
Citigroup	Financials	67	67
Intel	Technology	66	68
Merck and Firm	Pharmaceutical	71	74
Philip Morris International	Consumer Good/Service	56	54
UnitedHealth Group	Health Care	70	68
Visa	Financials	72	70
Pepsico	Consumer Good/Service	64	63
IBM	Technology	66	66
Altria Group	Consumer Good/Service	62	62
Amgen	Pharmaceutical	72	70
Mastercard	Financials	72	74
3M	Industrials	66	67
Boeing	Industrials	63	61

McDonald's	Consumer Good/Service	60	63
Medtronic	Health Care	72	70
Kraft Heinz	Consumer Good/Service	56	56
Abbvie	Pharmaceutical	74	68
Charter Communications	Media	73	73
Honeywell International	Industrials	73	65
Schlumberger	Energy	60	62
United Technologies	Industrials	71	70
Celgene	Pharmaceutical	71	72
Bristol Myers Squibb	Pharmaceutical	68	67
Goldman Sachs Group	Financials	69	78
Priceline Group	Consumer Good/Service	61	63
Union Pacific	Industrials	61	62
Broadcom	Technology	69	71
Average Score		65.82	66.18

Appendix B: UK firms based on market capitalization LSE

Firm Name	Sector	BOG score 2016
Royal Dutch Shell Plc	Energy	54
Toyota Motor Corporation	Industrials	67
Hsbc Holdings Plc	Financials	64
Total S.A.	Energy	59
British American Tobacco Plc	Consumer Good/Service	54
BP Plc	Energy	64
Glaxosmithkline Plc	Health	53
Banco Santander S.A.	Financials	64
BASF SE	Industrials	56
Astrazeneca Plc	Health	72
Diageo Plc	Consumer Good/Service	53
Vodafone Group Plc	Communications	56
Unilever Plc	Consumer Good/Service	58
Reckitt Benckiser Group Plc	Consumer Good/Service	60
Lloyds Banking Group Plc	Financials	62
Prudential Plc	Financials	59
Glencore Plc	Industrials	64
Telefonica Sa	Communications	59
Rio Tinto Plc	Industrials	58
Banco Bilbao Vizcaya Argentaria S.A.	Financials	78
Shire Plc	Health	71
Imperial Brands Plc	Consumer Good/Service	63
Barclays Plc	Financials	67
Royal Bank Of Scotland Group Plc	Financials	67
BT Group Plc	Communications	57
PJSC Lukoil	Energy	62
Compass Group Plc	Consumer Good/Service	53
BHP Billiton Plc	Industrials	70
Standard Chartered Plc	Financials	61
CRH Plc	Industrials	66
Compagnie De Saint-Gobain	Industrials	61
Associated British Foods Plc	Consumer Good/Service	57
Aviva Plc	Financials	59
WPP Plc	Consumer Good/Service	50
Bae Systems Plc	Industrials	62
Sky Plc	Media	56
Relx Plc	Consumer Good/Service	63

Ryanair Holdings Plc	Consumer Goods	57
Experian Plc	Industrials	54
Anglo American Plc	Industrials	60
Tesco Plc	Consumer Good/Service	59
Rolls-Royce Holdings Plc	Industrials	55
Legal & General Group Plc	Financials	60
SSE Plc	Energy	61
Mitsubishi Electric Corporation	Industrials	65
Wolseley Plc	Industrials	60
London Stock Exchange Group Plc	Financials	64
International Consolidated Airlines Group	Consumer Good/Service	60
Kerry Group Plc	Consumer Good/Service	59
Smith & Nephew Plc	Health	58
Average Score		60.62

Appendix C: information about the hypotheses

Histogram of UK and US BOG

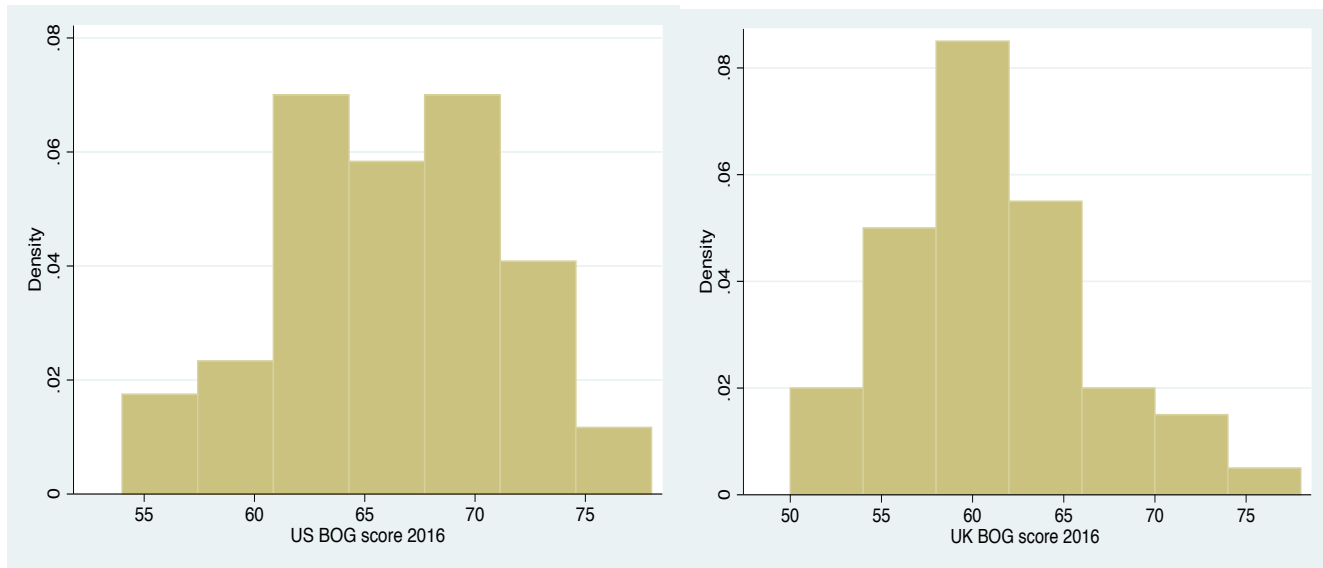


Table VIF value

Variable	VIF
LSGEO	3.12
LSBUSS	3.12
ROA	2.60
MTB	2.36
SIZE	2.25
FL	1.69
SI	1.41
YEARS	1.21
BOG	1.10
MEAN VIF	2.09

Bresch-Pagan

test

chi2(1):	0.47
Prob > chi2:	0.4941

Appendix D: Summary table

Papers related first hypothesis

Paper	Study	Sample	Research method	Main findings
Subramanian, Insley and Blackwell (1998)	Examines the association between the readability of annual reports and performance	Total sample size: 60 firms. Consist of 30 well performed firms and 30 bad performed firms in the year 1988	Measuring the readability of the annual reports by RightWriter software	The performance of the firm is associated with the readability. Good performing firms have more readable annual reports than bad performed firms.
Li (2008)	Examines the readability of the annual report, firm performance and earnings persistence	Total sample size: 55,719 firms between the 1994-2004	Archival research. Readability has been measured by the Fog index and the length of the document	The annual reports that are hard to read and understand are associated with lower earnings. Annual reports that are more readable are associated with persistent positive earnings
Lehavy, Li and Merkley (2011)	Examines the effect of readability of 10-k files on the behavior of financial analysts	Total sample size: 33,604 firms' annual report between 1995-2006	Archival research. Readability has been measured by the Fog index	Less readable annual reports influence the behavior of the analyst. It increases the effort of the analyst to interpret the result of the annual report. The analyst report of a less readable annual report is more informative to investors.
Lee (2012)	Examines the	Total sample:	Archival	Less readable

	association between the quarterly reports and efficiency of stock prices	74,481 quarterly reports between 2001-2007	research: OLS regression. Readability has been measured by the Fog index and the length of document	quarterly reports decrease the efficiency of the stock prices for the investors.
--	--	--	---	--

Papers related to first hypothesis

Paper	Study	Sample	Research method	Main Findings
Diamond and Verrecchia (1991)	Examines the association between the disclosure, information asymmetry and cost of capital	Using one firm	Experimental study	A firm that discloses information to the capital market. The investors have more relevant information to assess a firm. This action of the firm attracts more investors, which increases the liquidity of firms. These will also decrease the cost of capital.
Botosan (1997)	Examines the association between the cost of equity and the disclosure quality	The total sample size consist of 122 observations, which is divided in low analysts following and high analyst following	Archival research: OLS regression	There is an association between the cost of equity and disclosure quality. Firms with low analyst following gain most from higher disclosure quality
Easley and O'Hara (2004)	Examines the relation between quality	Using a theoretical model	Multiasset rational expectations	The quality and quantity of the information

	of the information and the coast of capital		equilibrium model	have influence on the cost of capital. By disclosing information with higher quality information asymmetry is reduced
--	---	--	-------------------	---

Papers related to second hypothesis

Paper	Study	Sample	Research method	Findings
Barth, Landsman, Lang and Williams (2012)	Examines the accounting amount of the IFRS based annual reports and the US GAAP based annual reports	Total sample size: 8,214 between 1995-2009	Archival research: OLS regression	The US GAAP amounts have more value relevance than the IFRS amounts.
Daske, Hail, Leuz and Verdi (2008)	Examines the effect of the adoption of IFRS on the market liquidity, cost of capital and Tobin's 1	Total sample size: 105,527 firm events over 26 countries between 2001-2005	Archival research: OLS regression	The adoption of IFRS is positively associated with the market liquidity and this led to increase in the market liquidity. The cost of capital decreased and the Tobin's q increased.
Armstrong, Barth, Jagolinzer and Riedl (2010)	Examines the consequences of the adoption of IFRS for the European stock market	Total sample size: 31,296 firm events for 1,956 firms between 2002-2005	Archival research: OLS regression	The adoption of IFRS leads to an increase in information quality. The investors' benefits from this event.
Richards and van Staden	Examines the relation	Total sample size: 180 annual	Archival research:	The adoption of the IFRS

(2011)	between the IFRS and the readability of annual reports	reports from New Zealand between 2006-2010	multivariate regression model. Readability is measured by Fog index, F-K index, Flesch and Smog	reduced the readability of the annual reports caused by more complex words
Jang and Rho (2016)	Examines the relation between adoption of the IFRS and readability of annual reports	Total sample size: 1000 annual reports between 2009-2010	Archival research: multivariate regression model. Readability measured by Flesch Reading Ease	The adoption of the IFRS reduced the readability of the annual reports in South Korea