The relationship between earnings quality and the cost of equity capital

Evidence from the Netherlands in the period 2012-2016

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Abstract

For companies to operate and expand it is important to have access to capital. Capital can be obtained in the form of debt or equity. For capital providers, dispensing capital in either form – debt or equity – means a commitment to a certain level of risk. This risk is compensated for with a risk premium. This risk premium is a cost of companies obtaining capital. Therefore, for companies to obtain capital at the lowest possible cost, the risk premium needs to be brought to a minimum. Prior literature offers many factors that influence the cost of capital. This research tests earnings quality and firm performance as factors that influence the cost of equity capital. Cost of equity capital was measured using the Capital Asset Pricing Model (CAPM), earnings quality was measured using a natural logarithm of discretionary accruals as a proxy, and firm performance was measured using the lagged return on equity ratio. The relationships between earnings quality and cost of equity and firm performance were tested using a sample of 61 Dutch listed firms over a 5-year time period, resulting in 305 firm-year observations. Using OLS regression models, the outcomes of this research show that, contrary to prior literature, there is no significant relationship between earnings quality and the cost of equity capital, nor do the results show that firm performance significantly lowers the cost of equity. There are several potential explanations as to why this research finds contrasting results. The first being the data that is used. This research limits the data to the Dutch market only and leaves out certain companies that rely heavily on regulation. On the Dutch stock-market these are the majority. Secondly, this research limits the calculation of earnings quality to the CAPM. This model has known limitations, which are discussed. Other studies have primarily used different measurement models. Lastly, this study has used only one measurement for earnings quality, being the natural logarithm of discretionary accruals.

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1. Introduction

At the time of writing this research, the world has largely overcome the damages of the financial crisis that began in 2007. By 2008, every country on the globe had experienced severe damage in every aspect of the economy and growth of companies largely stagnated (The World Bank, 2017). Companies need capital to finance their operations and expansion, but during the financial crisis many firms saw an increase in the cost of obtaining capital (Persakis, Iatridis, 2015). The price of obtaining capital, is called the cost of capital. Capital can come in the form of equity or debt, hence the distinction between cost of equity and cost of debt is made. According to prior works of Eliwa, Haslam, and Abraham (2016) and Persakis and Iatridis (2015), the cost of capital is influenced by two major attributes: earnings quality and audit quality. Earnings quality is the precision of the reported earnings figure. Earnings that are considered to be of good quality should be able to predict future earnings (Spicelan, Sepe, Nelson, & Tan, 2012, p. 22). The main question of this research is: Does earnings quality influence the cost of equity capital in the Netherlands? This research question is supported by the sub question: Does firm performance influence the cost of equity capital in the Netherlands?

Previous empirical literature, such as the works of Persakis and Iatridis (2015), has considered the behaviour of the cost of capital before and during the financial crisis. Most of this work focusses on Anglo-Saxon However, to the best of my knowledge, no study has analysed how earnings quality affects cost of capital in the period *after* the financial crisis of 2008 in the Netherlands. Over the past centuries, financial crises came and went away (Centraal Bureau voor de Statistiek , 2017). However, it is important to look at the behaviour of the cost of capital and its two major attributes – cost of equity, the cost of obtaining and issuing equity, and cost of debt, the cost of obtaining and issuing debt – around a financial crisis. Cost of capital is in turn affected by earnings quality. Therefore, it is important to not only understand the behaviour of earnings quality before and during a financial crisis, but also after a crisis. Furthermore, the actual performance of a firm could also be an indicator for the cost of equity as proven by Konecny and Zinecker (2017). This leads to the development of two hypotheses: H_1 is "Earnings quality has a significant negative effect on the cost of equity capital" and H_2 is "Firm performance has a significant negative effect on the cost of equity capital".

To examine the hypotheses of this study, two linear regression models were used that examined the relationship between the dependent variable – cost of equity – and the independent variables – earnings quality and firm performance. To control for other factors influencing the relationship between earnings quality and cost of equity, the control variables size, leverage, sales growth and industry are used in two combined models and in separate sub-models per control variable.

Based on the existing literature, it is expected that earnings quality improved after the financial crisis, which in turn improved (decreased) the cost of debt and cost of equity. Furthermore, a growing economy meant an overall increase in firm

performance. Chapter two provides further explanation of the expectations of this study.

Contrary to prior literature, this thesis fails to find significant proof of the expected relationship between earnings quality and the cost of equity in both the full and the sub-models. Also, this thesis fails to find a relationship between firm performance, as measured using the ROE ratio, and the cost of equity. However, certain limitations are present in this thesis. The first being that this thesis uses the CAPM to estimate the cost of equity, a model that has been criticized by various researchers. Comparable studies have used other measurement models, such as the price-earnings growth model. The descriptive statistics show that the distribution of the data is comparable. Furthermore, this thesis only focuses on the Dutch market which limits the amount of observations. Other studies researching this topic have focussed on larger markets, or larger sample sizes. Also, this thesis only uses accruals quality as a measurement of earnings quality. As there are other methods to proxy earnings quality, these could present different outcomes. Chapter 5 presents a more in-depth analysis of the limitations of this thesis.

The remainder of this thesis is organised as follows: chapter 2 analyses the existing literature on earnings quality and explains how this construct influences the cost of capital. Chapter 3 describes the sample and introduces the models and variables used to test the hypotheses. Chapter 4 subsequently outlines the results of the regression model and the robustness tests. Finally, chapter 5 offers the conclusions of the research and its limitations, and addresses areas for further research.

2. Literature Review

This section provides a review of established works by researchers in similar fields of study. Important definitions for this study are explained using established theories and previous research, and the literature is critically reviewed to extract the assumptions that are tested by this research.

2.1 Earnings Quality

2.1.1 What is Earnings Quality

In short, Earnings Quality is the quality of the earnings figure presented in the annual report of a company. The annual report, and therefore the earnings figure, is the responsibility of management. Management is responsible for providing financial and non-financial information that is correct and without material misstatements to the stakeholders and management is subsequently responsible for providing stakeholders with financial and non-financial information and assuring that it is true, or at least without material misstatements.

The use of accounting information in the capital market is fundamental and due to the many stakeholders that rely on accounting information, the quality of the reporting is important. Dechow, Ge, and Schrand (2009) defined earnings quality as follows: 'Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker.' They rightfully noted three additional features: 1) earnings quality is only defined in the context of a specific decision model, 2) earnings quality depends on whether or not it is informative about the firm's financial performance, and 3) the quality of earnings is jointly determined by the relevance of underlying financial performance to the decision and by the ability of the accounting system to measure performance. Based on the statements above it is clear that earnings quality is made up of a combination of information asymmetry and earnings management.

2.1.1.1 Information asymmetry

From the aforementioned definitions, it is clear that that earnings quality is essentially connected with information quality. Information quality and the distribution of information in particular have been extensively discussed in the existing literature. The main theory explaining how information affects equity prices is the theory of information asymmetry, also known as the 'lemons' problem (Akerlof, 1970). It occurs when one party has more information than another party, usually in the same transaction. An example is the case of an entrepreneur seeking funds from investors for the development of a technology. The investors can only base their decision to invest on the information supplied by the entrepreneur. If the entrepreneur has more

information about the technology than the investor, there is information asymmetry. Bebczuk (2003) simplified the definition of asymmetric information as *'a financial contract where the borrower has information that the lender ignores or does not have access to'* (Bebczuk, 2003, p. 5).

Both earnings quality and audit quality strongly influence the reliability of information, because corporate disclosure is vital for the performance of an efficient market (Healy & Palepu, 2001). Lambert, Leuz, and Verrechia (2012) argued that in a capital market with perfect competition, information asymmetry plays no role. Perfect competition is a competition in which all investors have homogeneous levels of information, and thus homogenous beliefs about the performance of firms. In this case, it does not matter if some investors have more information than others, as the cost of capital will be determined by the average precision of investors. However, in a capital market with imperfect competition (i.e., the real world, where one group of investors is better informed than another group), information asymmetry plays a key role in determining the cost of available capital, because lower information asymmetry reduces information risk and may in turn reduce the cost of capital (Chatham, 2004).

Previous research has also been conducted to test what role information plays in the relationship between earnings quality and cost of capital. In 2000, the Securities and Exchange Commission (SEC) enacted the 'Regulation Fair Disclosure' to prevent companies from disclosing select pieces of information to a select group of investors. Voices arose both for and against this regulation, and the primary concern was the cost of capital for firms (Lambert, Leuz, & Verrechia, 2012).

There are two types of information asymmetry identified by Akerlof (1970): adverse selection and moral hazard. Adverse selection occurs when the lender cannot distinguish 'good' investments from 'bad' investments. Moral hazard occurs when the user appropriates funds differently than expected by the investor, causing a different rate of return than initially calculated by the investor.

Adverse Selection

As mentioned above, in situations of adverse selection the investor cannot distinguish good investments from bad investments before entering into an investment agreement/contract. Researchers have overlapping definitions and explanations of adverse selection, but the bottom line is that 'adverse selection is the situation in which there is a difference in information between two parties before the deal is agreed upon' (Akerlof, 1970; Bebczuk, 2003; Spence, 1973). A deal between a person that takes high health risks and an insurer, or between an entrepreneur and investor, exemplify the case of adverse selection. One party allows for more risky investments, while the other party is more risk averse. If there are two investment opportunities with equal rates of return, the investor will prefer the safer investment, whereas a business manager will choose the riskier one (Bebczuk, 2003). The investor and entrepreneur will try to mask the investment opportunity from other investors and businesses, thereby creating asymmetric information. As a result of not fully disclosing

the information, the cost of debt will increase. Thus, withholding information has negative consequences for both investors and entrepreneurs (Bebczuk, 2003).

Moral Hazard

Moral hazard occurs when the funds of an investor are used differently than initially agreed upon. While adverse selection takes place *before* entering into an agreement, moral hazard takes place *after* the agreement has been finalised. After the investor has injected capital into a business, the business can choose to undertake actions without the consent or knowledge of the investor. This is typically referred to as 'hidden actions' (Mirrlees, 1999; Hölmstrom, 1979; Grossman & Hart, 1983). A business may also acquire information that it does not supply to the investor, referred to as 'hidden information' (Mirrlees, 1999; Hölmstrom, 1979; Grossman & Hart, 1983). An example is information about a bad trade debtor that is not shared with the investor.

All in all, it could be said that adverse selection is a form of information asymmetry pre-investment and moral hazard is a form of information asymmetry post-investment.

Agency theory

Directly linked to the theory of information asymmetry is the agency theory, also referred to as the principal-agency theory. In the agency theory, two parties, a principle and an agent, look at risk in different ways in the same business transaction or relationship (Eisenhardt, 1989). The owners of a business are the principals and the managers of a business are the agents. The principals delegate tasks to agents (Jensen & Heckling, 1976). The agency problem occurs when the agent has to make decisions in the principal's best interest, but the agent wishes to make decisions in his or her own best interest (Healy & Palepu, 2001). An example of the agency problem is the case of a business manager (agent) who invests in order to secure long-term growth, minimising short-term profits, when investors (principals) actually prefer short-term returns. Another example is the case of managers paying extraordinary high salaries to themselves from the funds granted to them by investors. In these cases, the self-interest of both parties cannot be satisfied simultaneously, hence creating the agency problem (Jensen & Heckling, 1976). An agency problem can have two outcomes: moral hazard and adverse selection, which have been previously discussed.

In the context of this research, the relationship between the firm's management and ownership results in an agency problem. The shareholder is the principal, while the firm's management is the agent. The ownership and control of the firm's operations are separated from one another. A stock compensation plan could limit the gap between shareholders and managers because 'an executive compensation plan is an agency contract between the firm and its manager that attempts to align the interests of owners and manager by basing the manager's compensation on one or more measures of the manager's performance in operating the firm.' (Scott, 2003) With a stock compensation plan, the manager is also directly linked to the capital market.

Because the capital market relies on the quality of information provided by the firm, the manager has an incentive to provide high quality information. The downside of this form of compensation, often referred to as equity-based compensation, is that a manager usually has very little influence over the movement of the shares (Hayes & Schaefer, 1999). However, providing this type of compensation overall increases the value of the firm (Abowd, 1989; Larcker, 1983).

2.1.1.2 Earnings management

The concept of 'earnings management' has been extensively explored in academic and accounting literature. Healy and Wahlen (1999, p. 6) defined earnings management as follows:

> 'Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either 1) mislead some stakeholders about the underlying economic performance of the company or 2) to influence contractual outcomes that depend on reported accounting numbers.'

There are several aspects of this definition that merit discussion. For example, judgment can be used in many ways to influence financial reporting. Judgement is the basis for estimating various future economic events that will be presented in financial reports, such as provisions for debts, expected lives of assets, future pension obligations, and deferred taxes. Furthermore, managers must choose what depreciation method will be used, what inventory cost method will be used, what stock levels will be held, and what payable and receivable terms will be exercised in a way that they fulfil their duty towards owners, and other stakeholders.

According to this definition, earnings management is arguably meant to mislead stakeholders about the underlying performance of the company. An example is the bank that demands a certain profit margin; management can present its income in such a way that this margin can be realised. In other words, earnings management is about the activities managers undertake in order to direct earnings to a predefined point. The points towards which earnings can be managed include income minimisation, income maximisation, income smoothing, and taking a bath (Scott, 2003). Income minimisation and maximisation occurs when earnings in the reporting period are lower or higher than the reality, at the expense of future periods. Income smoothing occurs when managers make earnings patterns stable or present smooth growth to make the company look stable. Taking a bath refers to when the firm reports a loss in the period by accounting for future accrual expenses in order to report profits in future periods.

Positive accounting theory

Academic literature has identified different incentives for managers to engage in earnings management. The positive accounting theory of Watts and Zimmerman (1990) suggests that managers of a firm act rationally and will choose accounting practices and policies that are in their own best interest. Managers act on different

incentives, and they may not be very incentivised to maximise firm value. Watts and Zimmerman (1990) outlined two different hypotheses under positive accounting theory according to which managers are likely to make decisions. The bonus plan hypothesis predicts that managers who have a bonus plan are incentivised to increase their bonus in the current year. The second hypothesis is the debt covenant hypothesis, under which the lender of capital has to ensure that the borrower is capable of reimbursing the debt on terms identified in the debt covenant. Therefore, the borrower is incentivised to provide performance figures that comply with the debt covenant.

Bonus Incentives and Earnings Management

Previous studies have demonstrated, in line with the positive accounting theory hypothesis on bonuses, that managers are likely to engage in earnings management in order to increase their current and future bonuses (Healy, 1985; Holthausen, Larcker, & Sloan, 1995). Healy (1985) noted that a typical bonus arrangement is a linear bonus scheme that follows earnings. The bottom of this scheme is the threshold that has to be achieved and the top is the maximum bonus that can be received. When a manager is on the bottom, or not likely to reach the bonus threshold, the manager is likely to delay current earnings and incur them in following years. When a manager reaches the top, the manager is likely to transfer or postpone some earnings to future years in order to secure future bonuses.

Debt Covenant Incentives and Earnings Management

Violation of a debt covenant costs money; to avoid these violation costs, a manager is incentivised to manage earnings when violation is likely (Sweeney, 1994). Debt covenants exist to assure the lender that the borrower is able to pay back the loan. Debt covenants therefore have performance measures such as ratios that have to be met, because the lender cannot directly monitor the borrower's activities. The ratios are in place to reduce the moral hazard agency problem. Dichev and Skinner (2002) found that more firms just meet covenants than firms that fall below the covenants. This shows that firms tend to circumvent a violation of debt covenants. However, when firms are in distress, they tend to manage earnings downward for signalling purposes in order to renegotiate debt covenants (DeAngelo, DeAngelo, & Skinner, 1994).

The importance of earnings

Academic researchers and the Financial Accounting Standards Board, abbreviated as FASB, (Concepts Statement No.1, FASB 1978 paragraph 34 and following) agree that earnings quality is of interest to those who use financial reports for contracting purposes and for investment decision making. When accounting standard boards look for feedback on their set standards, they look for outputs in annual reports, including the reported earnings. Earnings, and metrics derived from earnings, are also often used for compensation agreements and debt/equity financing agreements. The quality of

the reported earnings is therefore important. For example, overstated earnings, used as an indicator of a manager's performance, can result in overcompensation to the manager. Overstated earnings can also hide deteriorating solvency ratios, misinforming investors or lenders to allocate their funds. From a broader perspective, low-quality earnings are not desirable because misallocated capital reduces economic growth.

2.1.2 Measures of Earnings Quality

Because the quality of reported earnings defines how useful the earnings are, it is important to effectively measure the quality of earnings. For the scope of this research, it is critical to investigate the different properties of earnings. Proxy indicators of earnings qualities include investor responsiveness to earnings and external indicators of earnings misstatements. As the 'properties of earnings' form the basis of research into earnings quality, this is the primary focus of this research. The specific properties of earnings that are examined are accruals and accruals quality, earnings persistence, and earnings smoothness (Dechow, Ge, & Schrand, 2009). The additional proxy indicators are not used because they require a deeper insight into earnings quality and are not relevant to the relationship between earnings quality and cost of capital.

Accruals quality

'Accruals quality tells investors about the mapping of accounting earnings into cash flows' (Francis, LaFond, Olsson, & Schipper, 2005, p. 296). Accruals are the assets or liabilities that concern transactions that take place over a year. Accrued assets can include prepaid expenses for costs that will be incurred in the next period – for example, prepaid insurance premiums – contributions or subscriptions, or sums of money that have to be claimed (Raad voor de Jaarverslaggeving, 2016, p. 326). Accrued liabilities can include previously paid sums of money that are in favour of the next period (Raad voor de Jaarverslaggeving, 2016, p. 379). Considering the nature of accrued statements in the annual report, there is risk of incorrect estimations and deliberate misstatement by management. It is therefore one of the key account balances used to steer results.

Existing literature on the topic of earnings quality has often used the proxy accruals quality. Aboody, Hughes and Liu (2005) as well as Francis, Nanda and Olsson (2008) used the natural logarithm of the absolute value of discretionary accruals as a measure of accruals quality. Discretionary accruals are accruals that are non-obligatory but are already recorded in the books. A good example of discretionary accruals are bonus payments to management in the next year, based on results in the current year. These reservations are often manageable and rely on assumptions from management.

This finding is aligned with Rodríguez-Pérez and van Hemmen (2010)'s study on discretionary accruals as earnings proxy, in which the researchers examined the relationship between debt levels and earnings management. They found that for less-

diversified firms (more transparent and less information asymmetry), debt reduces positive discretionary accruals, whereas for more diversified firms the debt impact becomes positive. The results also indicated that when debt increases marginally, managers are more incentivised to manipulate earnings and that diversification is the context for this accounting practice.

In their study, Francis, LaFond, Olsson, and Schipper (2004) investigated the relationship between cost of equity capital and seven attributes of earnings: accrual quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism. They studied a large database consisting of 1,471 US firms per year over a time span of 27 years from 1975 to 2001. They found a significant relationship between each earnings attribute and the cost of equity capital. The only exceptions were conservatism and predictability. Furthermore, they found evidence for the fact that accruals quality and other accounting-based proxies explain more of the variation in estimating the cost of equity than do market-based proxies. In 2005, Francis, LaFond, Olsson, and Schipper revisited the study and used only accruals quality as a proxy for information risk. They used a sample between 1970 to 2001 of 91,280 firm year observations. The model used to measure the accruals quality was a modification proposed by McNichols (2002) of Dechow and Dichev's (2002) model. The main finding of this 2015 revisited study was that a lower quality of accruals is related to higher levels of security betas and higher cost of equity capital.

The most evident differences between the two studies by Francis, LaFond, Olsson, and Schipper are that the 2005 study utilised only one proxy to measure earnings quality: accruals quality. The 2004 study, on the other hand, used seven proxies. Furthermore, the 2005 study featured a notable redefinition of the control variable size. In the earlier study, size was measured as the natural logarithm of market value, while in the latter study size was measured as the natural logarithm of total assets. The researchers also shortened the time period over which the different variables were constructed from ten to five years. Moreover, the 2005 study addressed the issue of innate and discretionary accruals differently than the 2004 study. As a result of these differences, the overall research model was significantly different in the 2005 study than in the 2004. However, in both studies the researchers were convinced that there was a relationship between earnings quality and cost of equity capital.

Gray, Koh, and Tong (2009) conducted the exact same research methodology as Francis, LaFond, Olsson, and Schipper (2005), but for a sample of Australian firms. Their primary result was the same as Francis et al.: there is a significant negative relation between the quality of accruals and the cost of equity. However, several studies have also produced contrary results. For example, Core, Guay, and Verdi (2008) found that accruals quality is not a priced risk factor. In addition, their results demonstrated that accruals quality does not predict short-term (one-year or less) future earnings.

With a slight adjustment to the research conducted by Core, Guay, and Verdi (2008) (i.e., controlling for low-priced returns by including a dummy variable in the equation instead of excluding low-priced returns), Kim and Qi (2010) found that accruals quality is in fact a priced-risk factor. This finding indicates that Core et al.'s

research results were significantly influenced by low-priced returns (Eliwa, Haslam, & Abraham, 2016).

Mouselli, Jaafar, and Goddard (2013) further studied whether accruals quality is a priced risk factor. When using the model of Dechow, Sloan, and Sweney (1995) on a British sample of listed firms, they found that accruals quality is in fact a priced risk factor according to the Fama and French three-factor model. However, when they used a two-stage cross-sectional regression, there was no statistical proof that accruals quality is a priced risk factor for British shares.

Accruals quality is a highly-researched topic. Many researchers are convinced that accruals quality is a priced risk factor that can be influenced by the equity market and in turn has an influence on the cost of equity capital. Some researchers, however, insert accruals quality into alternative research models and conclude the opposite.

Aboody, Hughes, and Liu (2005) have studied the relationship between earnings quality, insider trading as a mediating variable, and cost of equity capital. As proxies for earnings quality, they used the modified Jones model (Jones, 1991) for measuring nondiscretionary accruals, as well as the model of Dechow and Dichev (2002). To measure the cost of equity capital, they utilised the three-factor model by Fama and French (1993). Aboody, Hughes, and Liu (2005) found that accruals quality is a priced risk, but their most important finding was that insider trading is a statistically significant factor. Accruals quality measures information risk and insider trading is purely based on information asymmetry; thus, there is an important mediating effect.

In their later research, Francis, Nanda, and Olsson (2008) added a new variable to their initial model: voluntary disclosure. They measured two relationships: the relationship between voluntary disclosure quality and earnings quality, and the relationship between voluntary disclosure quality and the cost of equity capital. They found a statistically significant and positive relationship between earnings quality and voluntary disclosure. This finding indicates that companies with high earnings quality have more extensive voluntary disclosure than firms with lower earnings quality. They also found a statistically significant negative relationship between voluntary disclosure quality and cost of equity capital, indicating that more extensive voluntary disclosure leads to a lower cost of equity capital. However, Francis, Nanda, and Olsson (2008) found that the effect of voluntary disclosure on cost of equity was partially or fully reduced (depending on the cost of capital proxy) when they applied their conditions on earnings quality.

Mouselli, Jaafar, and Hussainey (2012) similarly explored the relationship between accruals quality and disclosure quality. They examined if the two complement or substitute each other when explaining time-series variation in portfolio returns. They found a positive relationship between accruals quality and disclosure quality and their findings suggest that firms with higher disclosure quality are less engaged in earnings management. Furthermore, through asset pricing tests they found that a disclosure quality factor and an accruals quality factor explain time-series variation in stock returns in comparable portfolios. This finding indicates that disclosure quality and accruals quality can be substituted.

There have been various methods to calculate the non-discretionary accruals. These are: the Industry model (Dechow & Sloan, 1991), the Healy (1985) model, the DeAngelo (1986) model, the Jones (1991) model, and the modified Jones model (Dechow, Sloan, & Sweeney, 1995). Each of these models is further specified below.

The industry model

Dechow and Sloan (Dechow & Sloan, 1991) introduce the industry model to estimate earnings management and thereby estimate earnings quality. The industry model does not directly model the determinants of a firm's non-discretionary accruals, but instead assumes that the variation in determinants is common for all companies in that same industry (Dechow, Sloan, & Sweeney, 1995). The industry model equation to calculate non-discretionary accruals looks as follows (Dechow & Sloan, 1991):

$$NDA_t = \gamma_1 + \gamma_2 median_1(TA_t)$$

$median_1(TA_t)$ = the median value of total accruals scaled by total assets in year *t* for all non-sample firms in the same 2-digit SIC code.

Both Gammas γ_1 and γ_2 are calculated by ordinary least square (OLS) regression on the observations in the estimation period. Because this model assumes that non-discretionary accruals are constant, it does not have much power. This is the main reason that the industry model is not often used in scientific literature and will not be used in this research.

The Healy (1985) model

Healy suggested that managers generally actively manage accruals to hide poor performance or to shift portions of incidental good results to subsequent years. Healy (1985) assumes that earnings management takes place annually, either upwards or downwards. Furthermore, Healy (1985) argues that the average of the total accruals of the research period is a valid representation of non-discretionary accruals. In other words, the non-discretionary component of total accruals is calculated on the basis of previous total accruals, assuming the non-discretionary accruals have a constant pattern. Healy's model is formulated in the following equation (Dechow, Sloan, & Sweeney, 1995):

$$NDA_{it} = \frac{\Sigma_{it} TA_{it}}{T_i}$$

Where:

NDA_{it}	=	Estimated non-discretionary accruals in year *t* for firm *i*
TA_t	=	Total accruals in year *t* for firm *i*
T_i	=	Number of years included in the estimation period for firm *i*

Nevertheless, Guay, Kothari and Watts (1996) compare several non-discretionary accrual models and find that the Healy model is not very effective in isolating discretionary accruals. They argue that this is due to opportunism, firm performance or noise from outside factors.

The DeAngelo (1986) model

The Healy (1985) and the DeAngelo (1986) model have features in common, such as both models use the total accruals as a starting point for calculating the non-discretionary accruals. The DeAngelo (1986) model is an expansion on the Healy model. It expands the Healy model by setting the previous year as the comparison timeframe and then assuming that there has been no earnings management in the previous year. The equation will then look as follows:

$$NDA_{it} = TA_{it-1}$$

On the other hand, Dechow, Sloan, and Sweeney (1995) note that the difference in both the Healy and the DeAngelo models is to be found in the estimation period. If total non-discretionary accruals follow a white-noise period around a constant mean, the Healy model is more appropriate. If the total non-discretionary accruals follow a randomized pattern, the DeAngelo is most appropriate. In a different study, Dechow (1994) argues that non-discretionary accruals more likely to follow a white noise process than a random process.

The Jones (1991) model

An expansion on the assumption that non-discretionary accruals follow economic circumstances is made by Jones (1991). Jones' model accounts for these changes in economic circumstances by adding revenues and changes in tangible assets to the equation. Jones adds the change in revenues and the level of gross fixed-assets, scaled by lagged total assets to avoid heteroscedasticity. The Jones model (1991) then looks as follows:

$$NDA_{it} = \alpha_1 \left(\frac{1}{A_{it-1}}\right) + \alpha_2(\Delta REV_{it}) - \alpha_3(PPE_{it})$$

Where:

NDA_{it}	=	Estimated non-discretionary accruals in year *t* for firm *i*
ΔREV_t	=	Revenues in year *t* minus revenues in year *t-1* scaled by total assets in year *t-1* for firm *i*
PPE_t	=	Gross Plant Property and Equipment in year *t* scaled by total assets in year *t-1* for firm *i*
A_{t-1}	=	Total assets in year *t-1* for firm *i*
$\alpha_1, \alpha_2, \alpha_3$	=	Firm-specific parameters

The firm-specific parameters can be calculated by denoting the ordinary least squares (OLS) estimates of $\alpha_1, \alpha_2, \alpha_3$ based on time-series observations. Dechow, Sloan, and Sweeney (1995) mention that the Jones (1991) model is successful in explaining around 25% of variation in total accruals.

A big drawback of the Jones (1991) is that it has great dependency of a firm's revenues, while those can be manipulated through misstatement of accounts receivables. Because the original Jones model, stated above, uses changes in accounts receivable as a determinant of nondiscretionary accruals, the issue of using a firm's revenue arises. This issue is mitigated by Dechow, Sloan, and Sweeney (1995) with the introduction of the Modified Jones model.

The Modified Jones (1995) model

As mentioned earlier, Dechow, Sloan, and Sweeney (1995) identified several problems with the Jones (1991) model and therefore they introduced the Modified Jones model. The problem Dechow, Sloan, and Sweeney (1995) found was that changes in accounts receivables alone would be categorized as a determinant of non-discretionary accruals. In order to mitigate this problem, Dechow, Sloan, and Sweeney (1995) proposed to use cash revenue as opposed to reported revenue. The altered equation is as follows:

$$NDA_{it} = \alpha_1 \left(\frac{1}{A_{it-1}}\right) + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) - \alpha_3(PPE_{it})$$

ΔREC_t = Account receivables in year *t* minus account receivables in year *t-1* for firm *i*

The Modified Jones model also uses a cross-sectional analysis, whereas the original Jones (1991) model uses a time-series analysis. Also, the error term is included in order to cover for the margin of error within the model.

Throughout the existing literature, the Modified Jones model is the most widely adopted model. Dechow, Sloan, and Sweeney (1995) analyzed the ability of the Healy, DeAngelo, Jones, Industry and Modified Jones model to inspect earnings management. They find that all of the models that have been tested are well-specified, but have low testing power. The Modified Jones model has the highest testing power of all.

Discretionary accruals calculation

This study uses discretionary accruals as input for the earnings management variable. In order to calculate the discretionary part of accruals, meaning a non-obligatory accrual liability such as a management bonus for example, this study uses a variation of the Modified Jones model. Earlier in this chapter the advantages and disadvantages of several methods have been discussed.

The utilization of this adaptation of the Modified Jones model is a stepwise process. The first step being to calculate total accruals for every sampled firm in the

sample period by using the equation as shown in the DeAngelo model, then obtaining the firm-specific parameters by regressing the formula in equation, then plugging in the previously obtained firm-specific parameters in the model equation as shown in the equation below and lastly, subtracting the calculated non-discretionary accruals component from the total accruals.

$$Accruals\ Quality = TCA_{ct} / Assets_{ct} = \beta_1 (CFO_{c,t-1} / Assets_{c,t}) + \beta_2 (CFO_{c,t} / Assets_{c,t}) + \beta_3 (CFO_{c,t+1} / Assets_{c,t}) + \beta_4 (\Delta Rev_{c,t} / Assets_{c,t}) + \beta_5 (PPE_{c,t} / Assets_{c,t}) + v_{c,t}$$

Where:

TCA	= total current accruals for firm c, in year t.
Assets	= average total assets in year t and t-1.
CFO	= cash flow from operations in year t.
ΔRev	= change in revenues of firm c between years t and t-1.
PPE	= gross PPE of firm c in year t.

Other proxies of earnings quality

As stated earlier, the seminal research of Francis, LaFond, Olsson, and Schipper (2004) researched seven proxies of earnings quality. After accruals quality there are two other earnings quality proxies that are often used to measure the quality of earnings; earnings smoothness (Francis, LaFond, Olsson, and Schipper (2004); Eliwa, Haslam, Abraham (2016); McInnis (2010); Bhattacharya, Daouk, and Welker (2003); Tucker and Zarowin (2006); Collins, Kothari, Shanken, and Sloan (1994)) and earnings persistence (Francis, LaFond, Olsson, and Schipper (2004); Dechow, Ge, and Schrand (2009); Sloan (1996); Nissim and Penman (2001); Fairfield and Yohn (2001); Soliman (2008)).

Earnings Smoothness

McInnis (2010) researched the relationship between earnings quality and the cost of equity capital by using earnings or income smoothness as a proxy for earnings quality. Earnings smoothing is the series of accounting techniques to even out possible fluctuations in net income. McInnis used an extensive sample of 682,435 firm-month observations between 6,076 unique US firms. To measure earnings smoothness, he used the standard deviation of net earnings deflated by the standard deviation of net cash flows from operating activities. His results revealed a statistically insignificant relationship between earnings smoothness and average stock returns (a proxy for cost of equity capital). McInnis therefore concluded that analysts often have an overoptimistic bias of long-term future earnings projections.

Only two studies have found that the use of discretionary accruals to smooth earnings is associated with higher quality and more informative earnings. Bhattacharya, Daouk, and Welker (2003) analysed a cross-country sample for

measuring earnings smoothness. They found that in countries with a high rate of earnings smoothing, there is a higher cost of equity. Tucker and Zarowin (2006) concluded that smoothing earnings makes earnings more informative. Their study split firms into a high and a low smoothing group, where the high smoothing group consisted of firms with a stronger negative correlation between discretionary accruals and unmanaged earnings than the low smoothing group. The result was that the high smoothing group had more informative earnings because the changes in current stock returns are reflected in future earnings, as prescribed by Collins, Kothari, Shanken, and Sloan (1994). However, this is not a cross-country study as it focuses only on U.S. firms. According to the general research on earnings, more informative earnings will lead to a lower cost of capital (Financial Accounting Standards Board, 1978).

In short, there is limited compliant research concerning earnings smoothness and its effect on cost of capital. This thesis will therefore fill the gap by analysing this relationship in the Netherlands.

Earnings Persistence

As its name suggests, earnings persistence is concerned with the stability and consistency of earnings from one year to another. Dechow, Ge, and Schrand (2009) explained earnings persistency as follows: if one firm has more persistent earnings than another, then the current earnings of the first firm are more useful as a measure of future performance and will give smaller valuation inconsistencies than those of the other firm. In other words, more persistent earnings are earnings of higher quality.

There are two streams of literature concerning earnings persistence. The first stream of literature assumes that persistent and stable earnings are better inputs for equity valuation models and are therefore of higher quality. The second stream of literature questions whether earnings improve equity valuation outcomes at all.

Sloan (1996) divided total earnings into a total accruals and cash flow component. He argued that the cash flow component is more persistent than the accrual component. This conclusion has since been affirmed by many additional researchers (e.g., Nissim & Penman, 2001; Fairfield & Yohn, 2001; Soliman, 2008).

2.2 Cost of Capital

The term ‘cost of capital’ incorporates all costs associated with the financing of a business. The main sources of finance for a business are equity and debt; thus, cost of capital can be divided into cost of debt and cost of equity (Arnold, 2008). The exact cost of capital that a company incurs depends on the risk of investing in shares or bonds of that company. For example, investing in shares of an established company such as Volkswagen or Unilever is generally less risky than investing in shares of an Internet start-up. Therefore, the expected return for the investor is lower for an established company than for an Internet start-up. There are two perspectives in cost of capital literature: that of the investor, and that of the business firm (Schlegel, 2014). However, since the aim of this research is to advise businesses on how earnings quality affects

the cost of capital, this research only looks at the business perspective. From the investor perspective, the cost of capital is the additional premium investors expects for the risk taken to invest in the business. The combination of the expected risk premium and the regular return is referred to as the expected rate of return. From the business perspective, the expected rate of return is a cost of capital that the business must earn in order to be profitable to investors (bondholder and shareholders) who take the risk of investing funds into the business (Arnold, 2008).

2.2.1 Cost of Equity

The cost of equity is the rate of return that equity investors expect after investing in the shares of a company. It is generally a compensation for the required risk of investing in a stock. Francis, Olsson, and Schipper (2006) define the cost of equity capital as the ex-ante return that is demanded by investors of equity. An accurate cost of equity measure is important due to the two primary end users. The first, the company's management, requires an accurate measure for effective capital budgeting. The second user, the investor, needs an accurate estimate in order to accurately valuate the shares. The third group of end-users of cost of equity capital consists of researchers, who need an accurate estimate of the cost of equity capital in order to examine various effects related to a company's cost of raising equity capital. In short, there is a broad public interest in accurate measurements of the cost of equity (Botosan & Plumlee, 2005).

There are various models for calculating the cost of equity capital. The most frequently used models are the CAPM (capital asset pricing model) by Sharpe (Sharpe, 1964), Fama & French's (1992) three-factor model, and the APT (arbitrage pricing theory) by Ross (1976). These three models are all ex-post approaches, meaning that the cost of equity capital can be calculated by analysing historical data of realised returns (Francis, Olsson, & Schipper, 2006). Ex-ante approaches, on the other hand, involve forecast-based proxies. They reflect investor's expectations of earnings. This approach is often referred to as the implied cost of capital (ICC). For this research, the focus is limited to ex-post approaches.

There are several forms of equity financing that a company can engage in in order to amass capital. The forms of external equity financing used most often are publicly exchanging shares and privately exchanging shares. Publicly exchanged shares are offered on a stock exchange after an initial public offering (IPO) or seasoned offering has taken place. Investors can then acquire shares of a company in exchange for funds. This is usually a costly option and is therefore undertaken primarily by larger companies (Euronext, 2017). Privately exchanging equity is an often-cheaper form of financing (Kamer van Koophandel Financieringsdesk, 2017). It is therefore more suitable for small and medium sized enterprices (SME's). The number of shareholders concerned with public equity financing is very large, whereas the number of shareholders vested in private equity is considerably lower. Thus, the cost of public equity is high, but the number of investors is also large. Meanwhile, the cost of private

equity is low, but the number of investors is also smaller.

2.2.1.2 Cost of Debt

The cost that a firm faces for issuing debt contracts is referred to as the cost of debt. There are many methods a company can choose from to collect capital in the form of debt. The most important forms of external financing are bank credit line, bank loan, factoring, mortgage loan, credit insurance, leasing, and SME credit (if applicable), as well as (exchange) traded debt as in bonds (Euronext, 2017; Kamer van Koophandel Financieringsdesk, 2017). The cost of issuing debt financing is usually low as it helps form a tax shield for corporate taxation; however, the potential bankruptcy costs are high. Due to the fact that the relationship between earnings quality and cost of debt is viable for an entirely separate study, this research focusses primarily on the relationship between earnings quality and the cost of equity. Therefore, the cost of debt will not bet further researched.

2.2.2 Measures of Cost of Equity

Previous research has an ongoing debate about the most accurate method of researching the cost of equity and has failed to reach consensus (Botosan, 2006). There are basically two types of measurements; measurements with predetermined priced-risk factors and measurements that use future cash flows as a means of using the future cash flows to estimate expected equity return. While many researchers agree that the basis of the cost of equity consists of a few primary elements such as a risk premium and a risk-free rate, debate is ongoing about which measurement incorporates these basics the best and which method shows the most reliable and valid value (Botosan, 2006).

Capital Asset Pricing Model

The capital asset pricing model (CAPM) is a measurement that incorporates the principles listed above. The CAPM uses the risk-free rate of an asset and adds the required risk premium multiplied with a security beta to account for volatility of the asset.

$$\bar{r_a} = r_f + \beta_a(\bar{r}_m - r_f) + \varepsilon$$

Where:

$\bar{r}_a$ = the estimated return of security a;

r_f = the risk-free rate, often a long-term government borrowing rate;

β_a = the security beta of security a;

$\bar{r}_m$ = the estimated market return.

Given its practical nature, that is the variables are available and computable, it is a useful method to calculate the cost of equity. On the other hand, many researchers have criticised this method of calculating the cost of equity because in practice, the link

between estimated risk and security betas is quite weak (Lakonishok, 1993; Botosan, 2006). Moreover, to use the CAPM, one must calculate the market's expected risk premium, which in reality often lacks accuracy. In fact, to be able to estimate the market's expected risk premium, users use historical numbers, which provide inaccurate forecasts.

Also, a crucial element of the CAPM is the levered security beta. An advantage of the levered security beta is that a level of macroeconomic risk is included in the model, because the covariance of stock return and market return are divided by the variance of the market return. Therefore, market risk is included in the model. However, a disadvantage of the security beta is that it is measured at a point in time, while the actual security beta changes continuously. It is therefore not constant but changes over time.

However, due to the practicality of the model it is used in many researches, including this research. In order to make a forecast, a trend is followed based on historical figures. This inherently means that a forecast is not completely accurate. The pragmatic advantage of the CAPM is that the historic variables are readily available and testable. Furthermore, the model provides validity because it measures the cost of equity while taking into account risk and historical data. Granted, the CAPM lacks reliability due to the fact that the forecast power is limited. However, the fact that it is conceptually the most feasible and pragmatic option, it is the model of choice for this research.

Fama and French Three-Factor Model:

Fama and French (1993) proposed an addition of two factors to the CAPM to control for size and valuation of a firm. Then the formula looks as follows:

$$\bar{r_a} = r_f + \beta_1\left(\bar{r}_m - r_f\right) + \beta_2(SMB) + \beta_3(HML) + \varepsilon$$

Where:

$\bar{r}_a$ = the expected return of security a;

r_f = the risk-free rate, often a long-term government borrowing rate;

$\beta_{1,2,3}$ = the security beta of security a;

$\bar{r}_m$ = the expected market return.

SMB = (Small Minus Big) Historic excess returns of small-cap firms over large-cap firms

HML = (High Minus Low) Historic excess returns of values stocks (high market-to-book ratio) over growth stocks (low market-to-book ratio)

Their revised model has been statistically proven to be more accurate than the CAPM (Fama & French, 1993). However, their two-factor model is also not without limitations, as the three-factor model presents the same limitations as the CAPM. The three-factor model also relies on assumptions that are often statistically not accurate enough (Botosan, 2006).

A second type of method calculates the cost of equity capital by computing the internal rate of return (IRR) by using the current stock price and a proxy for future cash flows. A frequently used model in this type of methods is the residual income model used by researchers such as Gebhardt, Lee, and Swaminathan (2001) and Hail (2002) to calculate the prospective cost of capital by incorporating an accounting based formula of residual income. The formula is as follows:

$$V_0 = BV_0 + \sum_{t=1}^{\infty} \frac{RI_t}{(1+r)^t}$$

Where:
V_0 = the value of the security at point t=0
BV_0 = the book value of the security at point t=0
RI_t = present value of the security at a certain time period
r = the discount rate

This formula forecasts the residual income of a company, such as undistributed earnings after paying the cost of capital. These forecasts are discounted to a net present value, and added to a firm's total book value after subtracting the dividend pay-out to reach the cost per share. This method also has limitations; the largest being that often it is difficult to measure forecasted dividends.

A frequently used measure of cost of equity in existing literature is the Price Earnings Growth (PEG) ratio model as developed by Easton (Easton, 2004). This model has been frequently used in prior works such as those of (Eliwa, Haslam, & Abraham 2016; Francis , LaFond, Olsson, & Schipper, 2004; Persakis & Iatridis, 2016). There are various formulae of the PEG model, all modifications to the original. The price-earnings growth model, in its original form is as follows:

$$r_{PEG} = \sqrt{\frac{E(eps_{t+2}) - E(eps_{t+1})}{P_t}}$$

where:
$E\,eps_t$ = expected earnings per share at period t
P_t = price of the share at period t.

The reason that the PEG ratio model is often being used in existing literature is that the PEG model combines a stock's current performance and a stock's future performance to give more relevance to the value of the stock. The PEG model takes into account a stock's forecasted growth (or reduction) which is information that is fundamental for equity investors to assess their risk spread. The lower the PEG ratio, the more a stock is undervalued given the information about its potential growth. When the analysts' forecasts are precise enough, this model provides a clear view at the true value of a stock. The way the PEG ratio model is calculated is by dividing the

Price Earnings ratio, which looks at a stock's current performance, by the forecasted growth rate of a company.

Another frequently used measure of cost of equity is a modification on the PEG ratio model by Easton (2004). This modification incorporates dividend pay-out in the formula. However, as established earlier in this section, it has been proven difficult to forecast future dividend pay-outs.

This thesis however, does not use the PEG model or any adaptations on the PEG model. The primary reason not to use the PEG model is that it is not possible to find data on expected earnings per share which is information that is not always readily available for all firms in the dataset.

2.3 Relationship between Earnings Quality and Cost of Equity

The cost of capital is greatly influenced by the quality and the amount of information that is available to capital investors. As Dechow, Ge, and Schrand (2009) rightfully noted, the higher the quality of the earnings, the more an investor is informed with the historic, current, and future performance of the company. As discussed earlier, management can alter the end result of a profit and loss statement (earnings), which is referred to as earnings management. Therefore, without proper auditing and other contextual information, the earnings figure alone does not significantly affect the cost of capital.

From the review of the various forms of measurement to determine the quality of the earnings in the sections above, it is clear that the foundation of earnings quality lies in the quality of the information it represents. Chatham (2004) stated that the more symmetric the information is, the lower the information risk, which in turn causes a reduction in the cost of capital. This is the case because more investors have access to the same quality of information. Information can be made asymmetrical by managers who disclose wrong information. Journals with which this usually occurs are accruals. Therefore, the quality of accruals represents the quality of the information balance sheets present, which in turn presents earnings quality. To test if information is symmetric, the accruals quality will be tested. As established before the accruals are journal entries that are often used to manipulate financial statements and cause asymmetry.

The cost of equity capital is affected by earnings quality because investors demand a certain return as risk premium according to the quality of the information that is provided to them. If the quality of the information of earnings is high, that is, if the earnings figure provides honest information about the current and future performance of the company, the riskiness of the capital investment is mitigated and the risk premium will therefore be lower than investments with limited available information.

As previously stated, earnings with high quality have the ability to accurately project and predict future earnings. The predictability of earnings is negatively related to the cost of capital. To test this relationship, Affleck-Graves, Callahan, and Chipalkatti (2002) studied the relationship between earnings predictability and the bid-ask spread

measure of cost of capital. They found that firms with less predictable earnings have a significantly higher cost of equity capital than comparable firms with more predictable earnings. In their research, Francis, LaFond, Olsson, and Schipper (2004) revealed that accruals quality, persistence, and value relevance are strongly positively related with the cost of equity. Moreover, they found that earnings quality has the largest cost of capital effect out of the seven earnings attributes.

Because accrual assets and liabilities are an important determinant of earnings, it is important to consider them in this research. Francis et al. (2005) found that firms with lower accruals quality (i.e., long collection periods) have higher ratios of interest expense to interest-bearing debt and lower debt ratings than firms with higher accruals quality. Essentially, the relationship between accruals quality and the cost of capital for businesses is directly linked to information and how well that information is available to investors. Easley and O'hara's work (2004) revealed that the more information is publicly available, the lower the return on investments will be, and vice versa. This means that the more informed investors are, the lower the cost of capital will be, because the less information is available to traders, the less shares they hold.

From the studies outlined above, it is clear that earnings quality influences the cost of capital. With stable and predictable earnings, the future performance of the firm and the future cash flows can be forecasted. Furthermore, the more accurately investors can forecast a company's earnings and assess its performance, the more likely the company will be to secure capital at a lower price (Affleck-Graves, Callahan, & Chipalkatti, 2002).

2.4 Relationship between firm performance and cost of equity

In order for firms to obtain capital in the form of equity capital or debt capital, the price is based on the performance of the firm, among many other variables. This means that in order for an investment to be attractive not only does the cost of equity has to be reasonable, also the return on that equity must be higher than the cost of the equity. The performance of the firm therefore plays a role in determining at what cost capital can be obtained. For a firm, it is therefore not only important to provide quality information, but also to provide information that is favourable. This view is supported by Pouraghajan, Tabari, Ramezani, Mansourinia, Emamgholipour, and Majd (2012) who researched the effect of firm performance on listed companies in Iran. What they found was that listed companies with higher ROA and ROE have significantly lower cost of capital. There is discrepancy between the Iranian and Dutch market as the form of accounting standard is different. In Iran, Iranian GAAP is applicable for listed firms whereas in the Netherlands IFRS is required for listed firms.

Moreover, despite the difference in accounting standards, the general theory could still hold when measuring economic performance on a share as the difference between the return on equity and the cost of equity (Konecny & Zinecker, 2017). Therefore, regardless of the accounting standard, a capital provider will require a large enough spread between the ROE (firm performance) and the cost of equity.

2.5 Hypotheses development

The relationship between earnings quality and the cost of equity capital has been researched by a great body of research in different geographic situations i.e. (Aboody, Hughes, & Liu, 2005; Eliwa, Haslam, & Abraham, 2016; Francis J. , LaFond, Olsson, & Schipper, 2004; Persakis and Iatridis, 2016). These researches all concluded that the cost of equity capital is negatively related to earnings quality. The primary theoretical reason behind the aforementioned negative relationship is that lower earnings quality presents more information asymmetry, increasing the risk to investors and thereby increasing the cost of capital.

The primary reason for low earnings quality is active involvement from a firm's management in determining the annual report and the annual earnings figure. Earnings management primarily takes place in the accruals journals of the balance sheet, moving costs and earnings to different periods. Therefore, the tested measurement proxy for earnings quality is accruals quality.

Active earnings management may lead to false statements in the annual report. This causes information asymmetry between well-informed and less-informed investors. Information asymmetry is a priced risk factor, meaning that the risk involved with information asymmetry may lead to a change in stock price. As investors expect to be compensated for taking this risk, the cost of equity rises for a firm.

The Dutch stock market requires the use of IFRS or other equivalent accounting standard (US, China, Canada, Japan GAAP as these are also based on IAS) (Euronext , 2018). However, almost every company trading on the Euronext Amsterdam uses IFRS. Therefore, country-specific variance is not expected to have a strong influence on the outcome of this research.

To test if the prior research findings hold for the Dutch capital market, the following hypothesis is formulated:

H_1: Earnings quality has a significant negative effect on the cost of equity capital.

As earnings of a firm improve, the more attractive the firm becomes for equity investors. As the performance rises, the return on equity rises. This will consequently mean that the risk premium, which is the difference between return of a riskier stock investment and the return of a risk-free security, will increase. It is therefore more favourable to invest in a riskier security.

For a well performing firm, it is increasingly favourable to provide well performing equity to investors as the cost of obtaining the required capital is lower than for an underperforming firm. For an investor, it is increasingly favourable to invest capital in a well performing firm than in an underperforming firm.

This expectation is supported by empirical evidence from the Iranian stock market. One that can be qualified as developing. Pouraghajan, et al. (2012) identified a negative relationship between ROE as a measure of firm performance and the cost

of equity capital. Based on the idea that well performing firms would have an easier time obtaining capital than badly performing firms, the same findings are expected to hold in a Dutch sample. To test if this is the case, the following hypothesis is formulated:

H_2: Firm performance has a significant negative effect on the cost of equity.

3. Methodology

3.1 Method of data analysis

In order to test the hypothesis, it is important to determine which method of data analysis is most suitable for this research. As this research focusses on testing the aforementioned hypothesis, this research can be categorised as explanatory research. Explanatory research has the advantage of reproduction if deemed necessary. Moreover, in quantitative, explanatory research there is restricted room for subjectivity, as the hard data provides little space for personal interpretation. However, causal relations could be explained statistically while when occurring in the sample it may well be coincidence. Furthermore, as the relationship is established and proven, it can still be difficult to identify the cause and the impact of the relationship (Saunders, Lewis, & Thornhill, 2009; Dudovskiy, 2016). Despite the existing disadvantages of causal explanatory research, it is still identified as the best method of testing the hypothesis.

The previous paragraphs have outlined the variables that resulted from the literature study in order to test the hypothesis. There are several quantitative research methods often used in finance research, among which the multiple regression is the most prominent (among others Bhattacharya, Ecker, Olsson, & Schipper, 2012; Eliwa, Haslam, & Abraham, 2016; Francis J. , LaFond, Olsson, & Schipper, 2004; Persakis & Iatridis, 2015). The multiple regression is an adequate method of finding relationships between various independent variables and a dependent variable.

Because the aim of this research is to find values for the dependent variables that are continuous and metric variables, a linear, multiple regression model is most suitable. Furthermore, El Ghoul, Guedhami, Kwok, and Mishra (2011), and Hail (2002) have conducted studies on the relationship between accounting disclosure quality and cost of equity. Both researchers utilised similar control variables in their models, such as leverage (debt/equity), historical security betas, and different measures of size (market capitalisation and balance total). Persakis and Iatridis (2015), Francis, LaFond, Olsson, and Schipper (2004), El Ghoul, Guedhami, Kwok, and Mishra (2011), Hail (2002), and Eliwa, Haslam and Abraham (2016) also used a linear, multiple regression model with similar control variables to test similar hypotheses. The multivariate

analysis in this research is performed by calculating the coefficients in the following two regression models:

$$\bar{r}_{i,t} = \beta_0 + \beta_1 EQ_{i,t} + \beta_2 Size_{i,t} + \beta_3 Growth_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Industry_{i,t} + \varepsilon_{i,t}$$

$$\bar{r}_{i,t} = \beta_0 + \beta_1 Performance_{i,t-1} + \beta_2 Size_{i,t} + \beta_3 Growth_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Industry_{i,t} + \varepsilon_{i,t}$$

The variables are further explained in sections 3.1.1.

Note that in the model testing H_2 the time period is -1. This lag is put in place in order to reduce causality problems in the model. This study intents to test the effect of performance on the cost of equity, not the effect of cost of equity on firm performance. Therefore, by using another time indication, the model will test the desired hypothesised relationship.

Model validity

In order to test the validity of the research model, the following assumptions are tested in order to assess the goodness of fit of the linear regression model. 1) there must be a linear relationship between the dependent and independent variable. This is tested by plotting the standardised residuals against the predictor variable to indicate if there is a linear or curvilinear relationship between the two. 2) multiple regression makes the assumptions that the variables are normally distributed. 3) multicollinearity is problematic and should be limited as much as possible because it undermines the statistical significance of the independent variable. It is tested with the VIF-statistic in SPSS. A measure of correlation is the Pearson correlation coefficient (ρ) (Wilcox, 2003). For the Pearson correlation coefficient, the values lie between -1 and +1, which indicate a completely negative linear relationship (-1) to a completely positive linear relationship (+1). This research uses the Pearson correlation coefficient to identify to which extent variables are correlated with each other.

Multicollinearity occurs when there is high correlation among the independent variables and is often considered one of the main problems in multiple linear regression (Good & Hardin, 2003). The problem that multicollinearity poses is that regression coefficients reflect wrong values and many of the independent variables fail to be statistically significant. To measure multicollinearity in this research, the Variance Inflation Factor (VIF) is used. The debate is still ongoing in science as to what extend the VIF needs to be cut off. Some researchers argue the any value above 10 shows excessive multicollinearity, others argue that the limit lies at 5 or less. Any higher and the regression coefficients – in this case Pearson coefficients – are likely to be poorly estimated.

3.1.1 Cost of equity

To measure the cost of equity, this research uses the variables previously identified by many researchers such as Krishnan (2003), Francis et al. (2005), Easton (2004), El Ghoul, Guedhami, Kwok, & Mishra (2011), Hail (2002), and Persakis and Iatridis (2015).

The method this research will use to calculate the cost of equity capital is the CAPM. The formula for the Capital Asset Pricing Model is the following:

$$\bar{r}_{i,t} = r_{f,t} + \beta_{i,t}(\bar{r}_{m,t} - r_{f,t})$$

Where:
$\bar{r}_{I,t}$ = the expected return of firm i in year t;
$r_{f,t}$ = the risk-free rate in year t;
$\beta_{i,t}$ = the security beta of firm i in year t;
$\bar{r}_{m,t}$ = the expected market return in year t.

The variables in the formula are estimated as follows. The risk-free rate, as mentioned earlier, is often a long-term US Treasury Bill. However, as this thesis focuses primarily on the Dutch market, this thesis uses the 10-year Dutch state treasury bill, with data taken from the IEX.nl database. The variable security beta is calculated using the following formula:

$$\beta_{i,t} = \frac{Covariance\ (r_{i,t}, r_{m,t})}{Variance\ (r_{m,t})}$$

The calculation of the firm returns and market returns requires historical stock and stock market information. Historical stock returns information was primarily retrieved from the website of Yahoo Finance. To calculate the historical stock returns, the stock price at the end of each month was used, in the period 2012-2016. The historical stock return information that was not found in the Yahoo Finance database due to delistings of several firms in the dataset, was taken from the Euronext historical database. Historical market return information was taken from the Euronext historical database. This also was the monthly market return and was calculated using the monthly AEX closing level for the same time period as the stock returns.

3.1.2 Earnings quality

The independent variable 'earnings quality (EQ)' has been extensively studied and has been defined through various calculations.

As stated in the literature review, this study will use accruals quality as a measure of earnings quality. The formula for earnings quality in this research is the same as described by (Dechow, Sloan, & Sweeney, 1995) and used in the seminal works of Francis, LaFond, Olsson, and Schipper (2004). Accruals quality is measured by

estimating the discretionary accruals. In order to measure the discretionary portion of accruals, first the total accruals are estimated and the non-discretionary accruals are then subtracted. Dechow, Sloan, and Sweeney (1995) use the following equation to estimate total accruals:

$$TA_{it} = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it})$$

Where:

TA_{it}	=	Total accruals in year *t* for firm *i*
ΔCA_{it}	=	Change in current assets in year *t* for firm *i*
ΔCL_{it}	=	Change in current liabilities in year *t* for firm *i*
$\Delta Cash_{it}$	=	Change in cash and cash equivalents in year *t* for firm *i*
ΔSTD_{it}	=	Change in debt included in current liabilities in year *t* for firm *i*
Dep_{it}	=	Depreciation and amortisation expense in year *t* for firm *i*

The equation outlined above will be used for calculating the total accruals. After calculating the total accruals, there are different models for seperating the non-discretionary accruals portion from the total accruals. These are: the Industry model (Dechow & Sloan, 1991), the Healy (1985) model, the DeAngelo (1986) model, the Jones (1991) model, and the modified Jones model (Dechow, Sloan, & Sweeney, 1995). Each of these models has been specified in the literature review section.

This research will use the modified Jones model (Dechow, Sloan, & Sweeney, 1995) to calculate the non-discretionary accruals (NDA). This model is outlined below.

$$NDA = \alpha_1 \left(\frac{1}{A_{it-1}}\right) + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) + \alpha_3(PPE_{it})$$

Where:

A_{it-1}	= average total assets for firm i, in year t-1.
ΔREV	= change in revenues of firm c between years t and t-1.
ΔREC	= change in receivables for firm i between years t and t-1.
PPE	= gross PPE of firm c in year t.

3.1.3 Firm performance

This research studies not only the effect of earnings quality on a firm's cost of equity, but also how the reported performance affects the cost of equity. In other words, not only the effect of the quality of the reported earnings on cost of equity, but also the effect of the actual bottom-line figures reported on the cost of equity. The independent variable firm performance is calculated as the return on equity (ROE). This is measured by dividing the net income after tax by the total shareholder equity.

3.1.4 Control variables

A likely shortcoming of this research is that not all theoretical links and variables are included in this linear regression model, or that other variables are influencing the examined effect. To control for these effects, various control variables have been put in place.

The first control variable is firm size. Previous studies have consistently included firm size as a control variable researching effects on earnings management and earnings quality (Badolato, Donelson, & Ege, 2014). It is believed that smaller firms are more likely to manage earnings because larger firms have tighter internal controls in their administrative organisation. Therefore, the expected relationship will be negative.

The second control variable is leverage. Leverage will be included to ensure that external factors related to debt, such as debt obligations and commitments are minimised (Lin, Li, & Yang, 2006). Furthermore, prior studies conclude that external financing and leverage are significantly related to earnings management and information asymmetry (DeAngelo, DeAngelo, & Skinner, 1994). For this reason, the expected relationship between the debt ratio and the cost of equity is positive.

The third control variable in this research is sales growth (Growth). Shin, Kang, Hyun, and Kim (2014) argue that firms that have higher sales growth are more likely to have higher profit margins, resulting in more space for active earnings management. Doukakis (2014) suggests that firms with high sales growth are more likely to engage in accrual-based earnings management. Therefore, sales growth is expectedly positively related to earnings management and therefore to cost of equity capital.

The fourth and final control variable is industry (Industry). To control for the influence of the type of industry the sampled firms are in. The variable industry is measured by coding the categorical variable of the industry code into dummy variables. These dummy variables are: mining, construction, manufacturing, transportation, wholesale trade, retail trade, and services.

Table 1: Variable overview

Variable	Type	Measured as:
Cost of Equity	Dependent variable	Capital Asset Pricing Model. r = expected return on equity.
Earnings quality	Independent variable	Natural logarithm of discretionary accruals.
Firm performance	Independent variable	Ratio of net income/total shareholder's equity (ROE ratio).
Size	Control variable	Natural logarithm of total assets.
Growth	Control variable	Sales growth in % between year t and t-1.
Leverage	Control variable	Ratio of total debt/total assets (debt ratio).
Industry	Control variable	Coded into six dummy variables to control for industry effect.

3.2 Dataset

This study focusses on publicly traded companies in the Netherlands. The main stock exchange is the Euronext Amsterdam consisting of 130 listed companies. The time period this research aims to investigate is 2012-2016. The financial crisis became a global crisis in 2008 and consensus has been reached that the financial crisis ended globally in 2012. Since then most global economies, including the Netherlands, have experienced growth and overall economic success. However, it is important to only include firms in the sample that have experienced the financial crisis, therefore the firms in the sample have been actively traded on the Amsterdam stock exchange in the period before 2012. All firms that do not comply with International Financial Reporting Standards (IFRS) were excluded from the research. Other exclusions include the following NACE codes:

06 and 19 – extraction of crude petroleum and natural gas and manufacturing of coke and specific petroleum products respectively, removed from the sample because of specific accounting valuation methods. For instance, the valuation of oil and gas reserves is done using reserve recognition accounting, an industry specific valuation method.

35-39 – utility providing companies. Removed from the sample due to high levels of regulation in this market.

64-69 – financial service providers, removed due to regulation in the market, different valuation methods and different risk factors.

The companies above have been removed from the sample to create a homogenous sample for the research. As a result of these exclusions, the sample was reduced to 61 firms and 305 firm-year observations. This can be seen in the table below. Appendix 1 presents the full list of companies in this research.

To secure reliability of the data, the primary source of data will be the Orbis database, provided by the University of Twente. Certain information was not directly available through the Orbis database. This is particularly the case for the stock Snowworld NV which changed its name from Fornix Biosciences NV in 2013. The missing information is then taken directly from the annual report as published by the company.

Table 2: Sample selection.

Criterion	**N**
Listen on Euronext Amsterdam	130
Exclude industries (NACE 06, 19, 35-39, 64-69)	-65
Exclude inactive firms in period from 2008 or before	-4
Total sample size	**61**

4 Results

In the following chapter the results of the analysis will be displayed and explained. The chapter will begin with an analysis of the data in the sample, describing the statistics. Following this, the regression models have been tested and the results of these regression analyses are displayed in this chapter as well.

4.1 Descriptive Statistics

The descriptive statistics will be used to provide an insight in the basic features of the data. In table 3 the descriptive statistics of the dependent variable, independent variables and control variables are presented.

Table 3: Descriptive statistics

Variable	N	Mean	Median	Std. Dev.	Min	Max
Dependent variable						
CoE (as CAPM)	305	0.2350	0.0762	0.26112	0.011	0.94
Independent variables						
EQ (ln of DA)	305	10.7980	11.1976	2.52058	2.65	16.51
DA (€thousand)	305	222.736	13.148	1,339.36	-9,153	14,734
PERF	244	0.087848	0.11685	0.16389	-0.0732	0.598
Controle variables						
GROWTH	305	0.0031	0.0191	0.23312	-1.58	0.73
LEVERAGE	305	1.1611	1.1456	0.41870	0.07	2.83
SIZE (€million)	305	6,022.724	889.984	11,445.840	0.328	80,412.3
SIZE (ln of total assets)	305	13.4935	13.699	2.50329	5.79	18.2

Table 3 shows the descriptive statistics of the dataset. CoE is measured as the CAPM. EQ is measured as the natural logarithm (ln) of total discretionary accruals (DA). Performance (PERF) is measured as the return on equity (ROE). As the performance is measured with a lag of a year (t-1), the total observations are 61 less than the rest of the variables. Variable size is measured as the natural logarithm of total assets and total assets in millions of euro's. Smallest in size is Alumexx NV, largest in size is Altice Europe NV, followed closely by Heineken NV.

For the cost of equity (CoE) calculation (CAPM), the first thing that is noticeable is that on average the cost of equity is 0.23, meaning the expected return of investing in the researched equities is on average 23%. Furthermore, the highest expected return is 94%. This is the case for Pharming Group NV, which is historically proven to be a volatile stock with a high beta. Furthermore, the lowest expected return is the stock Alumexx

N.V. with an expected return of 1.1%. Almumexx N.V. has also been proven to be a volatile stock.

When compared to other studies, such as Eliwa, Haslam, and Abraham (2016) the expected return for Dutch companies appears to be higher than in their British dataset. This has several reasons. The first being the different method in calculating the CoE. This study calculates the CoE using the CAPM, whereas the study of Eliwa, Haslam, and Abraham (2016) calculates CoE using the Price-Earnings Growth (PEG) method. It is therefore expected that there are different outcomes. The PEG method is considered to have more accuracy in providing an expected return, because it uses forecasted inputs as a basis instead of historical data.

Using the PEG model, Persakis and Iatridis (2015) found that before the economic crisis – the period 2005-2007 – the mean CoE was 0.18669. In the period during the economic crisis – the period 2008-2012 – the mean CoE was slightly higher at 0.19549. The mean found in this research' data (0.2350) is therefore slightly higher. A possible reason for this deviation is the different method for calculating the CoE. Also, Persakis and Iatridis (2015) used a sample cluster of Austrian, Belgian, Danish, Finnish, French, German, Dutch, Norwegian, Spanish, Swedish, and Swiss companies. Including different markets will affect the mean value of the CoE. Another possible reason for a differing mean value is the time-period in which these studies differ. After the financial crises, markets across the globe have experienced economic growth and stability. This has as a result that the actual and expected returns are likely to be higher than during the financial crisis.

The earnings quality (EQ), measured as the natural logarithm of discretionary accruals provides an easy visualisation of the higher and lower values. The EQ has increased from a maximum of 14.87 in 2012, to 16.51 in 2016. Also, the mean has grown from 10.77 in 2012 to 10.91 in 2016 with a total average of 10.798. While the number itself is not very descriptive in its meaning, it does show a tendency of decreased quality. As a benchmark, Eliwa, Haslam, and Abraham (2016) provides mean and median values of 8.4 and 5.9 respectively, although the study of Eliwa, Haslam, and Abraham took place in a different environment over a larger time period and with a larger sample size.

Other studies, such as Persakis & Iatridis (2015), found that in the period leading up to the financial crisis of 2008, earnings quality has improved. Showing lower discretionary accruals using various methods of calculating earnings quality, including the modified-Jones model used in this thesis.

Expressed as €thousands the discretionary accruals in this dataset are described as follows. The max is 14,734 thousand, meaning the maximum accrued assets is 14,734 thousand. The minimum is accrued liabilities, resulting in a minimum DA of -9,153 thousand. On average the DA is positive, showing a mean value of roughly 222 thousand. As can be seen the difference between the minimum and maximum value are far apart. Therefore, the natural logarithm of discretionary accruals standardises the data which makes for comparable data.

Firm performance (PERF), measured as the return on equity shows that on average the return on equity invested is 8.78%. The maximum ROE is 59.81% and the lowest return is -7.32%. In a study researching the effects of the financial crisis on bank performance, Berger and Bouwman (2013) found means ranging from 9-15% depending on the sub-sample of the US banking sector. Studies (Persakis & Iatridis, 2015) in similar markets like the Dutch stock market found a mean ROE of 8.162, which is more in line with this study.

The highest recorded sales growth (GROWTH) is 0.73. This means a growth of 73%. The lowest growth, being a decrease, is a decrease of 158%. The mean development for sales growth shows a clear dip in 2014, meaning in that year, more sales decline was measured than sales growth. On average sales growth was 0.0031, meaning 0.3%. Eliwa, Haslam, and Abraham (2016) found a mean of 0.5%, showing that despite the difference in markets, the growth figures are not very far apart.

The firm leverage (LEVERAGE) shows an overall mean of 1.1611. This shows that on average, firms in the sample have assets primarily financed by debt rather than equity. A debt/equity ratio higher than 1 does not mean that the total debt is more than 100% of the total balance. It means that the company's liabilities surpass the book value of the company's shareholder equity. Research by Eliwa, Haslam, and Abraham (2016) shows a mean of 1.82, meaning a slightly higher mean than this sample. However, the time period and the researched market are different from this study. The mean of the data by Eliwa, Haslam and Abraham is, however, largely in line with this study's data.

Firm size (SIZE) is measured using the natural logarithm of total assets in the regression, for an easy comparison between all firms. The descriptive statistics look at how the bare data is dispersed and show that on average, total assets are €6 billion. The median is €889.984 million. This is largely due to a few very large companies listed on the Dutch stock exchange AEX that are present in this sample namely, Unilever, Heineken and Philips among others. There are also companies with a smaller market capitalisation such as Alumexx NV. Since these figures are market-specific, there is little use in comparing these figures to other studies that focus predominantly on other markets.

Correlation

The correlation coefficients for all of the researched variables are shown in table 4. The correlation coefficients are measured using Pearson's Correlation coefficient (r). It is a measure of strength of the relationship between the various variables. The Pearson's Correlation coefficient shows how much the variables correlate with each other. The correlation coefficient is one of the ways in which we can address multicollinearity.

Table 4: Correlation matrix.

		(1)	(2)	(3)	(4)	(5)	(6)
(1)	CoE	1					
(2)	EQ	-0.025	1				
(3)	PERF	-0.013	0.111	1			
(4)	GROWTH	-0.053	-0.000	0.063	1		
(5)	LEVERAGE	0.025	0.278**	-0.180**	-0.020	1	
(6)	SIZE	0.013	0.863**	0.138*	-0.024	0.308**	1

*The table provides the pairwise Pearson correlation coefficients between all variables. **, and * indicates a significant correlation at the 1% and 5% level respectively.*

Table 4 shows the correlations between the variables. It is visible that the relationship between leverage and earnings quality is positive and significant. This would imply that when a firm has a higher debt/equity ratio, their earnings quality is likely to be higher. This is in line with research by Lin, Li, and Yang (2006) who argue that because firms with higher debt/equity ratios have to comply with more strict ratio obligations and are under more scrutiny from investors, their reporting will be more extensive and of a higher quality.

Moreover, leverage and performance are negatively correlated with a correlation coefficient of -0.180. This means that the better a firm performs, the lower it relies on external financing.

Furthermore, it is visible that between size and leverage there is a significant positive correlation of 0.308 which could implicate that firms with higher debt ratios are bigger in size.

Another correlation worthy of mentioning is the correlation between size and earnings quality. With a correlation coefficient of 0.863 it is in line with findings of Badolato, Donelson, and Ege (2014) who argue that, due to tighter internal controls, larger firms are more likely to report higher-quality earnings and perform less earnings management than smaller firms. Hence, the correlation is in line with expectations.

The variable size is also positively correlated with performance with a correlation coefficient of 0.138. This implies that the larger the firm, the higher the firm performance.

Another measure for multicollinearity is the VIF statistic. The general consensus suggests that a VIF statistic between 1 and 10 to show no multicollinearity. Hair, Black, Babin, and Anderson (2009) and Vatcheva, Lee, McCormick, and Rahbar (2016) suggest that a VIF statistic between 1 and 5 is likely to show the least amount of multicollinearity. A VIF statistic of 5 would be the maximum that Hair, Black, Babin and Anderson (2009) deem an acceptable amount of multicollinearity in a dataset. The highest VIF measure is 4.286 for earnings quality and confirms that all measurements are below the recommended maximum of 5.

4.2 Regression results

The regression results of the OLS model and the effect of each separate variable are displayed in table 5. For both models, the full model has been tested first, including all the control variables. After that, to test how the results change per control variable, the model has been tested using sub-sets of the model where the relation is tested using independent control variables. The results of the regression coefficient are the numbers that are not parenthesized, the parenthesized numbers represent the t-statistics which are significant when the probability (p-value) is below 0.1.

Relationship between cost of equity and earnings quality

Table 5 presents the results of the OLS regression analysis for determining the relationship between CoE and EQ as hypothesized in chapter 2. The full model shows no relationship between EQ and CoE. This result does not fit with the expectation stated in chapter 2. Since EQ is measured as the natural logarithm of discretionary accruals, a higher value for EQ implicates more discretionary accruals, hence lower quality earnings. Therefore, a negative relationship between EQ and CoE, as hypothesized, is represented by a positive direction in the results table. The result of the full model, establishing no relationship, is contradictory to the findings in discussed in chapter 2 from Francis et al. (2004) and Persakis and Iatridis (2015) and others. Also, the sub-models, where the dependent variable and independent variable are tested with a single control variable each time, show no significant relationships.

Relationship between cost of equity and firm performance

The full model 2 does not show a significant relationship between the cost of equity and firm performance. In fact, the sub-models also fail to provide a significant relationship between cost of equity and firm performance. Therefore, we cannot say with statistical significance and certainty that the cost of equity is influenced by a firm's performance, measured as the return on equity.

Table 5: Regression results.

Model 1: $r_{CAPMc,t} = \beta_0 + \beta_1 Accruals\ quality_{c,t} + \beta_2 Size_{c,t} + \beta_3 Growth + \beta_4 Leverage + \beta_5 Industry_{c,t} + \varepsilon_{c,t}$

Model 2: $r_{CAPMc,t} = \beta_0 + \beta_1 Performance_{c,t-1} + \beta_2 Size_{c,t} + \beta_3 Growth + \beta_4 Leverage + \beta_5 Industry_{c,t} + \varepsilon_{c,t}$

	Model 1 full model	Sub-1	Sub-2	Sub-3	Model 2 full model	Sub-4	Sub-5	Sub-6
Constant	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(2.332)	(3.986)	(3.523)	(2.452)	(2.511)	(14.607)	(4.718)	(2.611)
EQ	-0.139	-0.025	-0.035	-0.141				
	(-1.216)	(-0.433)	(-0.578)	(-1.244)				
Performance					-0.007	-0.010	-0.009	-0.015
					(-0.113)	(-0.169)	(-0.150)	(-0.260)
Growth	-0.049	-0.053			-0.052	-0.052		
	(-0.853)	(-0.916)			(-0.893)	(-0.903)		
Leverage	0.025		0.035		0.021		0.024	
	(0.409)		(0.583)		(0.339)		(0.406)	
Size	0.124			0.135	0.006			0.015
	(1.075)			(1.188)	(0.100)			(0.259)
Industry	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R2	-0.007	-0.005	-0.005	-0.001	-0.013	0.000	0.002	-0.006
Highest VIF	4.004	1.001	1.084	3.917	1.170	1.004	1.033	1.019
N	305	305	305	305	244	244	244	244

**** significance at 0.01 level (2-tailed); ** significance at 0.05 level (2-tailed); * significance at 0.1 level (2-tailed).*

Table 5 presents the results of the regression formulae models 1 and 2. The full regression model results with all control variables incorporated are shown in columns 'full model'. The sub-models 1-6 are regression analyses using the same dependent and independent variable, but only one control variable separately. The values presented are the betas. The values within parentheses below the betas are the corresponding t-values.

Concluding, the two full models, as well as the sub-models, do not provide a relationship between de dependent and independent variable. This is not coherent with the hypotheses and prior literature that has been discussed in chapter 2 of this thesis. The combination of control variables also does not affect the significance of the relationship between the dependent and independent variables in both models.

It goes to show that the relationship that has been hypothesized in chapter 2 does not hold true for the Dutch market. The point of this research was to find if the relationship that has been proven in several other markets holds for the Dutch stock market. The answer to that is negative, because the regression results show no relationship at all.

5. Conclusions

5.1 Findings and implications

This research examines the effects of earnings quality and firm performance on the cost of equity for Dutch companies listed on the Amsterdam stock exchange. Earnings quality is measured by a natural logarithm of a company's discretionary accruals using the Modified Jones model (Dechow, Sloan, & Sweeney, 1995). Firm performance is measured by using the ROE as a measurement of performance. Cost of equity is operationalized using the capital asset pricing model. The relationships in the two models are tested with a sample of 305 firm year observations between 2012 and 2016. To reduce causality problems, the independent variable performance is lagged one year. Consistent with earlier literature (i.e. Eliwa, Haslam and Abraham, 2016; Persakis and Iatridis, 2015), a multiple linear regression model is implemented using the ordinary least squares method.

5.1.1 Summary of findings

To investigate the relationship between cost of equity and earnings quality and firm performance this thesis uses two hypotheses. These hypotheses study the effects of both the quality of earnings and the performance of a firm on the cost of equity capital.

The data is derived primarily from the Orbis database and financial websites finance.yahoo.com and Euronext.com. The data shows certain resemblance and certain differences when compared to other studies. This study, as well as other, comparable studies show that during the financial crisis of 2008, earnings quality appears to increase, and decrease in the period thereafter.

The first hypothesis tests the relationship of earnings quality and cost of equity. A large body of literature suggests that the quality of earnings has a significant negative effect on the cost of equity. Despite the large body of research that supports this finding in other geographic areas and markets, in this study the hypothesis is rejected in the full model due to the fact that there is no relationship observed, instead of the hypothesized significant and negative relationship.

The second hypothesis investigates the relationship between firm performance and cost of equity. Although prior literature, suggests a negative significant relationship, this thesis shows that no relationship has been identified using both the full model and the sub-models. Therefore, the full model and the sub-models fail to accept H_2.

All in all, it can be said that the regression models two and sub-models four, five and six fail to show a relationship between firm performance and the cost of equity. However, with the right control variables, the hypothesized relationship between earnings quality and cost of equity capital has been confirmed.

5.2 Theoretical implications

This research paper has provided valuable combinations between older literature and more recent publications on earnings quality and firm performance and their relationship with cost of capital in various markets. This thesis adds value to existing literature in various ways.

First, despite the large body of literature in various geographic areas, there is little publicized work about earnings quality and its relationship with cost of capital in the Dutch market. As studies on cost of capital are important elements of corporate finance literature, this paper will add to the ever-growing body of corporate finance literature focused on the Netherlands.

Secondly, this study does not differentiate between large cap and small cap companies, making for a total view of a market. This includes different industries, company sizes and time periods. Various previous studies have focused primarily on large-cap markets such as the S&P 100. It is therefore, interesting to notice how the tested hypotheses are effective on smaller capital markets as well.

Concluding, the outcome of this research, although no significant effects have been measured, is valuable to the consisting body of existing literature on this topic. Knowing that using the methodology from this thesis does not yield significant relationships, future research can extend this thesis using different measurement models.

5.3 Practical implications

As this thesis shows evidence for supporting hypothesis H_1 in sub-models one and two, this thesis provides a practical implication for firms looking to decrease their cost of equity. This study helps managers realize the effects that earnings management could have on the cost of equity. This thesis proves that in order to decrease the cost of equity, the portion of accruals that is discretionary and directly influenced by managerial decisions, such as bad debt provisions or provisions for warranties, has to be minimized. Therefore, preparing transparent financial statements that provide as little managerial estimation as possible could result in lower cost of capital estimates.

Practically this means that there is no significant proof that the level of discretionary accruals a firm reports on its balance sheet, negatively affects the cost of equity capital. Nor does the reported ROE appears to affect the cost of equity capital. As the cost of equity capital is frequently used as part of a weighted average cost of capital valuation method, it is important for practitioners to know what does and what does not affect the value of the return on equity.

5.4 Research limitations

Even though the results of this study show some valuable insights, this study does have several limitations. The first limitation is the measurement of the cost of equity. This study uses CAPM as a measurement for cost of equity. However, the CAPM has various drawbacks.

First of all, the CAPM uses a risk free-rate as a fixed number, in reality this risk-free rate changes daily. The risk-free element of the equation therefore already varies with reality and creates volatility in the model. Furthermore, the CAPM is based on historical market returns. The model therefore inherently lacks the ability to look forward, which is what individual investors and analysts alike strive for. Another drawback of the CAPM is that it assumes that investors can borrow at risk-free rate and risk-premium rate, which is not the case. Despite these limitations to the CAPM, it is still a widely-used model chosen by researchers worldwide. The reason being that it consists of variables that are computable with information that is mostly readily available.

A second limitation to this study is the accuracy of the model used to measure the discretionary accrual, which is often debated (i.e. Dechow et al., 1995; Subramanyan, 1996 and Kothari et al., 2005). This research uses the Modified Jones model, which according to Dechow et al. (1995) requires the use of cross-sectional time-series data. The availability of this exact type of data is limited. Therefore, in order to maintain a large enough sample size, this requirement of Dechow et al. (1995) could not completely be fulfilled.

Thirdly, using discretionary accruals as a proxy for EQ is and will always be an estimation. As mentioned earlier in this paper, there are myriad ways to measure EQ, all being nothing more than an estimation. It could always be possible that management steers earnings in a way that falls outside of the measurement units of EQ proxies. As this study only focused on EQ based on accrual-based earnings management, other forms of earnings management and EQ are inherently missed in this research. Therefore, the results should be treated with caution.

Another limitation is the Dutch context of this research. This is a limitation to the applicability of the results. Due to the fact that the level of earnings quality relies highly on institutional and regulatory differences across countries (Leuz, Nanda, & Wysocki, 2003), these results might therefore not be attributable to the situations in different countries.

Finally, even though multiple effects have been controlled with the means of control variables, other incentives may be in place to affect the quality of earnings, firm performance and the cost of capital. These could include for example, management incentives such as bonuses for achieving certain KPI's or steering stock prices in order to satisfy investors. These examples have not been controlled for in this research.

Furthermore, although significant results were obtained, the risk of type 1 error – that is falsely rejecting the hypotheses – remains intact. This is due to the sample choice, the time and geographical setting and also the choice of control variables, which might be an influence in the obtained result (Doukakis, 2014).

In future research, it would be relevant to test other proxies of earnings quality, such as earnings persistence. Furthermore, it would be interesting and valuable for future studies to research the same relationships in a more elaborate setting. For instance, a EU-wide sample or a longer time period.

Also, this study did not research if the outcomes are similar for private companies. As most privately owned firms could have different incentives to manage their earnings than publicly traded companies, the relationship between EQ, firm performance and the cost of equity capital could be significantly different.

Furthermore, this thesis has not performed robustness checks and alternative measures for the cost of equity and earnings quality. Several other, comparable studies have used other measurements for the cost of equity such as the PEG and Gordon sustainable growth model (Eliwa, Haslam, & Abraham, 2016; Francis, Nanda, & Olsson, 2008; Persakis & Iatridis, 2015). In order to test the robustness of the results of this study, using different measurement approaches on the same dataset is recommended.

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Appendix 1 List of companies in the sample

1	Koninklijke Ahold Delhaize N.V.	32	Corbion N.V.
2	Koninklijke Philips N.V.	33	Brunel International N.V.
3	Altice Europe N.V.	34	ASM International N.V.
4	Randstad N.V.	35	Amsterdam Commodities N.V.
5	Heineken N.V.	36	Wessanen N.V.
6	Heineken Holding N.V.	37	BE Semiconductor Industries N.V.
7	Akzo Nobel N.V.	38	Kendrion N.V.
8	ASML Holding N.V.	39	Neways Electronics International N.V.
9	Koninklijke DSM N.V.	40	Beter Bed Holding N.V.
10	Veon Ltd	41	Ordina N.V.
11	Koninklijke Bam Groep N.V.	42	Nederlandsche Apparatenfabriek ‘Nedap’ N.V.
12	Koninklijke KPN N.V.	43	Batenburg Techniek N.V.
13	Wolters Kluwer N.V.	44	Hydratec Industries N.V.
14	Unilever N.V.	45	Galapagos N.V.
15	PostNL N.V.	46	DPA Group N.V.
16	Arcadis N.V.	47	AFC Ajax N.V.
17	Gemalto N.V.	48	ICT Group N.V.
18	Sligro Food Group N.V.	49	Pharming Group N.V.
19	Hunter Douglas N.V.	50	Holland Colours N.V.
20	Aalberts Industries N.V.	51	C/Tac N.V.
21	Oranjewoud N.V.	52	Koninklijke Brill N.V.
22	Koninklijke Boskalis Westminster N.V.	53	Envipco Holding N.V.
23	OCI N.V.	54	Snowworld Holding N.V.
24	SBM Offshore N.V.	55	N.V. Koninklijke Porceleyne Fles
25	Heijmans N.V.	56	TIE Kinetix N.V.
26	Fugro N.V.	57	Esperite N.V.
27	TKH Group N.V.	58	Roodmicrotec N.V.
28	Koninklijke Vopak N.V.	59	AND International Publishers N.V.
29	Stern Group N.V.	60	Alumexx N.V.
30	Accell Group N.V.	61	Value8 N.V.
31	TomTom N.V.		