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The value of voluntary disclosure

- A study of the relationship between voluntary disclosure quality, earnings quality and cost of equity capital

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Abstract

During the last twenty years a substantial amount of research has been done with regard to whether or not a company can decrease its cost of equity capital by improving its voluntary disclosure. This essay study the relationship between voluntary disclosure, earnings quality, and cost of equity capital for firms listed on the Nasdaq OMX Stockholm large cap during the full year of 2006. The study shows a positive correlation between voluntary disclosure and the cost of equity capital, which indicates that Swedish companies get a higher cost of equity capital by disclosing more voluntary information to the market and investors. Furthermore, a positive relation between voluntary disclosure and earnings quality is found which implies that companies with better earnings quality have better voluntary disclosure. The relation between earnings quality and cost of equity capital is not statistically significant indicating that earnings does not affect the cost of equity capital for Swedish companies. The results of the study should be interpreted with caution given concerns with regard to validity caused by subjectivity in the voluntary disclosure proxy and the time difference between the annual reports release date and the announce date of the earnings per share used in the proxy for cost of equity capital.

Keywords: Voluntary disclosure, earnings quality, cost of equity capital

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1. INTRODUCTION

In today's globalized world, companies do not only compete with firms from the home country, but also with firms based all around the world. The importance of being cost efficient is therefore highly prioritized, and high up on CEO's agendas. In this type of setting, one way for firms to become more cost efficient is to lower their cost of equity capital. A possible way of lowering the cost of equity capital, which has been discussed frequently in economic literature lately, is to improve the voluntary disclosure quality. Voluntary disclosure is the amount of information companies choose to disclose to investors and the general market, which they are not obliged to report due to prevailing legislation. Could it be that companies can use voluntary disclosure to increase the value of the company by a decreasing their cost of equity capital, or is this simply an idea that is too good to be true?

The results from prior studies have confirmed that a negative correlation exists between the voluntary disclosure quality and cost of equity capital³. On the other hand, other studies have also shown that a positive connection can be found⁴. Furthermore, a recent study by Francis et al. (2008) have indicated that good voluntary disclosure quality in fact is not the driving force behind lower cost of capital, but that the driving force instead is good earnings quality. The relation between the three measures in their study indicate that a good voluntary disclosure quality comes from good earnings quality, and that the effect of voluntary disclosure quality on the cost of equity capital in fact comes from the effect of which earnings quality has on cost of equity capital.

Most previous research on this topic has been done on the U.S. market, and so far no research exists on the Swedish market with the exception of a study by Meltzer and Sigonius (2010). Their study only investigates the relationship between voluntary disclosure quality and cost of equity capital. In contrast to Meltzer and Sigonius (2010), this paper study the relationship between voluntary disclosure quality, earnings quality, and cost of equity capital on the Swedish market with the purpose of controlling if the relationship described by Francis et al. (2008) also can be found on the Swedish market. Therefore, the paper of Francis et al. (2008) has been used as base in terms of important frameworks even though certain elements are discarded or performed differently to better cohere with characteristics of the Swedish market. Given the purpose of the study, the following research question has been formulated:

³ Botosan, C.A. (1997) p. 323-349

⁴ Kim, O. and Verrecchia, R.E. (1994) p. 41-67.

What is the relationship between voluntary disclosure quality, earnings quality, and the cost of equity capital on the Swedish market?

The research question implies three main objects that need to be investigated. They are (i) what type of relationship (complementary or substitutive) exist between voluntary disclosure quality and earnings quality, (ii) whether the variation in voluntary disclosure quality is related to the variation in the cost of equity capital, and (iii) whether any explanation power found in (ii) still exists when controlling for earnings quality. The research question is later used to formulate three hypotheses which lay the foundation for the methodology used in the study.

This paper is outlined as follows; it starts with a short background on the research question, which is followed by the purpose that underlies the research question (see above). Thereafter, the theoretical framework is presented which later on will help define the hypotheses of the study. Following the theoretical framework, the methodology is presented where population, sample, collection methods, and general methodological approaches are described. Next, a description of regression models formulated to test the study's hypotheses are presented. Results from each hypothesis test is presented and analyzed. Finally, the main findings of the study are presented in the conclusion, which also leads to suggestions for further research within the area.

2. THEORETICAL FRAMEWORK

2.1 Estimation risk

The estimation risk exists according to Botosan (2006) when there is an uncertainty regarding the assumptions or information available to investors directly associated to the future yield of an investment. The estimation risk can also occur when there is not enough information available to the investor when faced with an investment opportunity. This type of estimation risk is based upon the principal-agent theory⁵. The principal-agent theory will in this paper be used with the investors representing the principals, while the companies' managers represent the agents. The agent performs a mission for the principal and they are both assumed to be profit maximizing individuals, which is why the principal experiences a risk in that the agent might act in accordance to his or hers own profit maximizing interest and not the principals'. This measure of risk is then priced by the principal, who in turn gives the agent incentives to

⁵ Rees, R. (1985) p. 3-26

reduce the principals experienced level of risk connected to the investment. Jensen and Meckling (1976) states that these efforts generate costs for the agent and that these costs must be considered in contrast to the benefits they can generate. The underlying theory for this reasoning is that an efficient market is pricing an asset based on the total average of investors' expectations of the specific assets' future cash flows (Fama 1970). Lang and Lundholm (1996) further elaborate around the potential benefits companies can get from increasing their level and quality of voluntary disclosure. They argue that analysts are able to make more precise forecasts of future earnings and that companies thereby can satisfy investors' expectations to a higher degree. Lang and Lundholm (1996) claims in accordance to Levitt (1998) and Foster (2003) that by revealing more and better information to investors, companies can consider it a competitive advantage and may be better off disclosing previously withheld information.

Important to note in this context is that Leftwich et al. (1981) argues that there are several ways in which companies can reduce the estimation risk. Apart from increasing the information available to the financial markets and investors discussed in their thesis, companies can include external people in the board making investors better off. The reason for this is that the objective judgment of the board may make the agents act more in line with the firms' interests. The third option is to list companies to a stock exchange, and thereby forcing them to obey general disclosure principles which might be higher than previously required. Based on that the estimation risk is non-diversifiable, all these three methods would imply a lower cost for equity capital.

2.2 Voluntary disclosure and cost of equity capital

A decision to disclose information is not only associated with positive effects for the companies, but there are also costs and risks directly associated to voluntary disclosure. Verrecchia (2001) discuss the potential threat of disclosing sensitive information to the public as competitors can take advantage of such information. This would result in a lower competitive power in the long run as corporate secrets to a higher degree will be indirectly handed to competitors as well. Miller and Bahnson (2004) find that the costs linked to disclosing more information are minor in comparison to the benefits it may generate. They mention the possibility for an asset to be given an information related risk premium on an otherwise uninformed market. Therefore, the voluntary disclosure could be seen as a potential competitive advantage for companies.

Studies performed by Grossman and Hart (1980), Milgrom (1981) and Verrecchia (1983) look at the managers' private information of the company as exogenous and come to the conclusion that disclosure alleviates the markets information asymmetries. This lead firms with higher asymmetry levels to compensate by disclosing more information, thus making shareholders more informed about the company. The studies conclude that a firm's voluntary disclosure is correlated inversely with its quality of earnings. This intuitive relationship does however not take into consideration the actual level of quality of the disclosed information. The rationality in the market would of course take less notice of information based upon poor disclosure quality. Francis et. al (2008) argues that such an argument illustrates the need to endogenize the disclosure choice and that the disclosed information revealed by managers is dependent on the quality of the information (and information system) produced by the company. This is in itself imposing a trend in increasing disclosures, growing in the same pace as disclosures increase among companies. The trend will have such effect that the market is likely to interpret information not being disclosed by companies as bad information since there is no reason, except for the costs attached to generate information, to withhold good financial information.

Previous studies have shown both complementary as well as substitutional relationships between firms' voluntary disclosures and the quality of their publicly released financial information. Complementary relationships mean that the two variables voluntary disclosure and the quality of the financial information are separate but share the same joint interest and thus sustain a relationship; it can complement each other to achieve the same purpose. A substitutional relationship is a type of dependency between variables that indicate that one variable rather than complementing the other is instead substituting the other. In this case meaning that a high level of voluntary disclosure is used when the quality of financial information is poor and the other way around⁶. Lang and Lundholm (1993) used scores presented by the Association for Investment Management and Research (AMIR) to describe voluntary disclosure and the correlation between annual earnings and returns as the proxy for the quality of the financial information. They found that firms with low correlation between earnings and returns have higher AMIR scores, thus reporting a substitutive relation. Tasker (1998) presents similar evidence of a substitutive relation when using conference calls as a proxy for voluntary disclosure and a self composed proxy describing the quality of information given in the financial statements. In contrast to Lang and Lundholm (1993) and

⁶ Newbold et al. (2003) p 83-84

Tasker (1998); Waymire (1985), Cox (1985), Imhoff (1978) as well as the most recent study in the area performed by Francis et al. (2008) all show upon a complementary relation between voluntary disclosure and quality of financial information on U.S. companies.

Another theory applicable to the area of voluntary disclosure is the signaling theory presented by Spence (1973). He elaborates on how information asymmetry can be overcome on the labor market. Given labor of good and bad quality; the employer experiences a risk in choosing among possible workers. By using a mean, for example education, the worker who is good can signal that he or she is willing to signal quality by passing the education or simply by starting the education. A bad quality worker would not do this since he or she is unlikely to pass the education and therefore have a higher alternative cost to education. The theory can also be applied to voluntary disclosure, where good firms who disclose more information probably have less to hide. Thereby, the company can indicate better quality in line with the labor example of Spence (1973). The signaling theory should therefore indicate that good companies with good quality in earnings would disclose more than poor companies in terms of earnings quality.

There are two major underlying theories for why there should be a negative correlation between voluntary disclosure and cost of equity capital. One of these theories is based on the idea that better voluntary disclosure leads to higher market liquidity, which will give a lower cost of equity capital because of either a higher demand for that security or lower transaction costs⁷. The other theory put focus on the concept that a better voluntary disclosure will decrease the estimation risk of the security for investors, and consequently decrease the cost of equity capital⁸. Given these two theories, one of the first papers to cover the relationship between voluntary disclosure and cost of equity capital where the actual cost of equity capital is estimated, rather than some other measure that is positively correlated with the cost of equity capital, was performed by Botosan (1997). Her paper came as an effect of the lack of empirical evidence with regard to whether or not voluntary disclosure has a negative correlation with cost of equity capital. In her paper, Botosan was able to show that a negative correlation exists between the level of voluntary disclosure for a firm and its cost of equity capital, but she only finds this result for one of her sub samples; firms with a low number of analysts following them (NoAnalyst)⁹. Her results can still be seen as evidence supporting the

⁷ Diamond, D.W. and Verrecchia, R.E. (1991) p. 1325-1359

⁸ Barry, C.B. and Brown, S.J. (1985) p. 407-422

⁹ Botosan, C.A. (1997) p. 323-349

two theories above since estimation risks will most likely be fairly low when the number of analysts following a firm is high, and the effect of voluntary disclosure is therefore marginalized. Furthermore, the firms that will have high analysts following tend to be large firms, which generally have traded shares characterized by high liquidity and once again the effect of voluntary disclosure is assumed to be marginalized.

Literature presented on the voluntary disclosure subject have one common perception; investors with different levels of information regarding a firm is not coherent with increased investments in the firm's equity. Firms therefore aim to disclose information since it decreases their cost of equity capital. Despite the general view of advantages received from disclosing information there are also certain disclosure of negative information which leads to an increased cost of equity capital. Recent literature also determines three main costs associated to voluntary disclosure; Diamond and Verrecchia (1991) names risk sharing as a typical example of such negative information which can be seen as a cost, Baiman and Verrecchia (1996) names agency costs as a second, Hayes and Lundholm (1996) as well as Principe (2004) identifies proprietary costs as the third. These costs have a negative influence on the gathered positive effect of the disclosed information. The costs are making firms become more prudent and not by default strive towards being fully open and forthcoming towards the market with all information as discussed by Healy and Palepu (2001). The result from Botosan and Plumlee (2002) both indicate a positive and negative relation between voluntary disclosure and cost of equity capital. This since voluntary disclosure relating to annual reports get a negative correlation with cost of equity capital, but for all other voluntary disclosure they find a positive correlation between voluntary disclosure and cost of equity capital.

Another article that indicates a positive relation between voluntary disclosure and cost of equity capital is Kim and Verrecchia (1994). They explain the positive relation by arguing that increased voluntary disclosure leads to increased information asymmetry, which comes from that certain traders are able to make superior judgments about companies based on the voluntary disclosure compared to other traders. Regardless which of the costs; proprietary, agency or risk sharing prudence is the most influential part for disclosure the connection between voluntary disclosure and cost of equity capital has by the major part of previous research, been characterized by a negative correlation (allotment of information is good for firm's equity investments).

Another paper worth mentioning with regard to the correlation between voluntary disclosure and cost of equity capital is Botosan (2006) who makes a comprehensive summary of research performed in the area of voluntary disclosure and cost of equity capital. The overriding conclusion from Botosan is that greater voluntary disclosure results in lower cost of equity capital. She also stresses that this conclusion should be seen in context of that the review she has made does not cover research including other attributes of information, such as earnings quality.

2.3 Earnings quality and cost of equity capital

When estimating firms' cost of equity capital, a group of measures have proven to be particularly good. These groups consist of different types of earnings metrics. Francis et al. (2003) studied how well earnings and non-earnings metrics were at valuing equity across 16 different industries in the U.S. during the period 1990 to 2000. Their conclusion is that earnings is the best measure for explaining the value of equity. The result that earnings is the premier source for explaining equity value and that it also is a premier source of firm specific information, is also concluded and shared by Liu et al. (2002). The finding that earnings carry a high degree of explanation power with regard to equity value and specific firm characteristics is used by Francis et al. (2004) as the motive for researching whether earnings also negatively correlates with the cost of equity capital. They perform the study during a 27-year period ending in 2001 on U.S. listed companies. The conclusion of Francis et al. (2004) is that average earnings have a statistically reliable negative association with cost of equity capital. More specifically, Francis et al. (2004) conclude that among the earnings metrics tested in the study, the metric with highest effect on cost of equity capital is accrual quality. This indirectly indicate that earnings variability also has a large effect on cost of equity capital given the strong association between earnings variability and accruals quality found by Dechow and Dichev (2002).

2.4 Voluntary disclosure, earnings quality and cost of equity capital

The finding that earnings, more specifically accruals quality and earnings variability, have a high effect on cost of equity capital and that voluntary disclosure quality also seem to have some sort of effect on cost of equity capital led to a study by Francis et al. (2008), where the relationship between these three measures were further investigated. The study was performed on 677 U.S. listed firms and covered the year of 2001. The conclusions of their paper are that firms with better earnings quality have higher voluntary disclosure quality (showing a

complementary relationship), a negative association exists between voluntary disclosure quality and cost of equity capital, and when the effect of voluntary disclosure quality on cost of equity capital is conditioned on earnings quality it is significantly reduced or even vanish completely. Finally, Francis et al. (2008) points out that it is not possible to make any general conclusions from their findings because the study only covers one year and one market.

Research of the relationship between voluntary disclosure quality and cost of equity capital on the Swedish market is limited to only one previous study performed by Meltzer and Sigonius (2010). In their thesis, they do not get any conclusive results for what sort of relationship exists between voluntary disclosure quality and cost of equity capital on the Swedish market for the years 2005, 2007 and 2008. The reason why no conclusion can be made is that they get a positive correlation for one year, a negative correlation for another year, and finally the result have no satisfactory significance for a third year. These results should be considered with some caution because the Capital Asset Pricing Model (CAPM) has been used when estimating cost of equity capital. When studying the relationship between voluntary disclosure and cost of equity capital, it is not suitable to use the CAPM to estimate the cost of equity capital since the CAPM assumes that the priced risk factors are known and limited to the ones in the model (of which voluntary disclosure is not a factor)¹⁰.

3. METHODOLOGY

3.1 Methodological approach

In this study, a quantitative methodological approach is used to test a set of hypothesis by modeling with regressions in a similar way to studies like Botosan (1997) and Francis et al. (2008). This particular format is used since it allows for testing of the relationship between different accounting and financial measures. The starting point in this study is that some kind of relationship does exist between voluntary disclosure quality, earnings quality, and cost of equity capital, which the modeling using regressions aim to determine the nature of.

3.2 Sample

3.2.1 Population

The study examines companies listed on the Nasdaq OMX Stockholm large cap list during the full year of 2006. Companies listed on the large cap in 2006 all had a market capitalization

¹⁰ Botosan, C.A. (2006) p. 31-40

corresponding to more than one billion Euros¹¹. This population consists of firms with enough accessible data to allow for an assessment of the relationship between the three metrics assessed in the study, even after the elimination of some companies (see 3.2.4 *Elimination* for further elaboration). The reason for choosing the largest companies in Sweden and not smaller companies is based on the article published by Skogsvik (1998) proclaiming that large Swedish international companies show a clear tendency to disclose more voluntary information in their annual reports which in turn indicates that they invest more money and time in presenting voluntary disclosure. This means that the large companies should be more interested in knowing whether or not voluntary disclosure is valuable or not. Also, by choosing large listed companies, the selected companies are individually comparable in terms of general requirements of disclosure since they are all required to follow the Swedish legislation and international reporting standards (IFRS) based on a minimum requirement. Another reason for the limitation to companies listed on the Nasdaq OMX Stockholm large cap is the decision to create a new proxy for voluntary disclosure, tailored for Swedish companies. Because of the rather timely way of creating the proxy, these 46 companies were considered as the maximal amount possible to evaluate with high quality and precision during the time span available for this master thesis.

The reason for choosing year 2006 is a desire to examine the relationships during a rather stable year in order to reduce the risk of results being biased due to extreme market conditions and fluctuations. It was therefore important not to let the economic downturn in Swedish and Worldwide financial markets during 2008 influence the results. The implementation of the new disclosure requirements of IFRS on the 1st of January 2005 is also a factor which may influence companies' levels of disclosure. Therefore, 2006 represents a period one year after the implementation of IFRS, which lead to avoiding potential initial or transactional errors which may occur when companies are forced to adapt to new disclosure standards. Petersen and Plenborg (2006) argue that IFRS rules reduce the differences in voluntary disclosure between companies. The choice of 2006 is therefore made in order to make the study comparable and useful for future studies within the area, despite that IFRS rules may have a reduced effect in difference in voluntary disclosure among companies.

¹¹ Nasdaq OMX Stockholm's homepage

TABLE 1
Descriptive data about the sample and variables

Variable	N	Mean	Std. Dev.	10%	25%	Median	75%	90%
Voluntary disclosure raw values Total	46	9.115	2.178	6.175	7.688	8.675	10.325	11.970
Raw values 1: summary of historical results	46	4.208	1.056	3.105	3.500	4.000	4.800	6.000
Raw values 2: other financial measures	46	0.543	0.631	0.000	0.000	0.000	1.000	1.150
Raw values 3: non-financial measures	46	2.859	1.253	1.500	2.000	2.500	3.750	4.500
Raw values 4: projected information	46	1.505	0.911	0.425	0.938	1.250	2.000	2.650
Voluntary disclosure (VolDisc) Total	46	0.579	0.138	0.393	0.488	0.551	0.656	0.760
VolDisc 1: summary of historical results	46	0.701	0.176	0.518	0.583	0.667	0.800	1.000
VolDisc 2: other financial measures	46	0.272	0.315	0.000	0.000	0.000	0.500	0.575
VolDisc 3: non-financial measures	46	0.408	0.179	0.214	0.286	0.357	0.536	0.643
VolDisc 4: projected information	46	0.376	0.228	0.106	0.234	0.313	0.500	0.663
Cost of equity capital (CofE)	46	0.090	0.030	0.049	0.072	0.087	0.109	0.128
Earnings Quality (EarnQual)	46	0.044	0.041	0.013	0.018	0.027	0.051	0.111
Size, market capitalization (MVE) in SEK billions	46	75.114	144.312	9.335	13.740	21.199	59.073	200.936
Book-to-Market (BM)	46	0.415	0.224	0.170	0.239	0.349	0.585	0.769
Return on Assets (ROA)	46	0.145	0.099	0.049	0.077	0.122	0.197	0.293
Analysts following (NoAnalyst)	46	22.283	15.997	7.700	11.000	19.000	28.250	42.000

Table 1 shows descriptive data about the sample. The raw voluntary disclosure scores show a mean value of 9.115 out of the maximum 24¹². In order to make the raw values better suited for regressions, VolDisc is presented as a proxy for voluntary disclosure. VolDisc show values derived by scaling the raw disclosure scores by the maximum score of the sample firms. The maximum score in the sample was 15.75 and the minimum score was 5.5. This means that the company with the highest score in raw values were given the index value of one (VolDisc = 1.00), by the same reasoning the company with the lowest raw value were given the indexed value of 0.35 (VolDisc = 0.35). Raw values divided in sub categories show that the mean is highest in category 1, reflecting summary of historical results, followed by category 3, category 4 and category 2. The sub scores of the raw values show that there are large differences in the separate mean values, the mean of category 2 is only, 12.90% of the mean value in category 1. The standard deviation of 2.178 indicates that there are not very large differences in terms of scores between sampled companies. Looking at the sub parts of VolDisc, there are large variations in VolDisc category 2 indicating that firms in comparison to other categories tend to have either high or low values. This can also be seen as the median value within category 2 is zero, meaning that more than half of the companies in the sample show a value of zero in this category. Worth noting is that this sub category is more volatile by nature since it is the sub category with the least number of individual measures leading to points in the raw value of voluntary disclosure.

¹² For specific company scores see APPENDIX A.

Table 1 also illustrates the mean for the proxy of cost of equity capital calculated from the PEG-ratio. The mean is 9.0% for the 46 companies in the sample with a standard deviation of 3.0%.

The proxy for the quality of earnings, EarnQual, looking at the variability in earnings during the last 6 years show a mean of 0.044 with a standard deviation almost as high; 0.041. The median value of 0.027 and the 75th percentile value of 0.051 indicate that the majority of firms are below the mean in the sample with a few companies having very high variability in earnings forcing the mean to be higher than the median value.

The firms in the sample are Sweden's largest stock exchange listed companies. However, the difference in size is substantial as illustrated by the measure of size, reflecting market capitalization. The median value is 21.199 billion SEK while the 90th percentile value is equivalent to 200.936 billion SEK. The mean of 75.144 billion SEK and standard deviation of 144.312 billion SEK all describe the sample to have a couple, much larger companies seen to market capitalization.

3.2.2 Gathering of data

3.2.2.1 Compustat database

The Compustat database has been used to collect historical data in order to calculate earnings quality. The study uses a measure of earnings quality by calculating the variability, standard deviation, of firms' earnings over time. Data of earnings before extraordinary items and total assets, as a mean over the accounting year, has been collected for the examined timeframe. The gathered data was chosen from the 'Compustat global – fundamentals annual' database and the search was limited to the time period between years 2000 to 2006 to make the variability measure historically reliable. Since the study focuses on annual reports and the events surrounding them, annual data was used reflecting full accounting years in correspondence to the information stated in annual reports.

The Compustat database was also used to collect the closing share prices for companies on the date they released their annual reports for 2006, or 2006/2007, for companies implementing broken calendar year reporting. The share price data was collected from the Compustat Global – Securities Daily database.

3.2.2.2 I/B/E/S database

When implementing the PEG-ratio based model to imply cost of equity capital, data such as analysts' forecasts of earnings per share has been gathered from the I/B/E/S database. Since the study is based on analysts' beliefs of future development in earnings in direct connection to firms' annual reports, historical and unadjusted details were used. Data was collected from forecasts being made in close connection after the release of annual reports and the earnings forecasting period was chosen as one and two years ahead in the future. Other research studies; Botosan and Plumlee (2005) as well as Guay et al. (2005) use four or five years earnings per share forecasts in order to in larger extent meet the PEG-ratio criteria of positive earnings and positive growth forecasts between years. In contrast to the other studies mentioned above, this study chose to use one and two year forecasts of earnings per share. This selection was made in order to ensure quality forecasting data, released in close connection to annual reports. Compared to companies examined by Botosan and Plumlee and Guay et al. (2005) the Swedish companies examined in this study were not as frequently followed and forecasted by analysts.

3.2.2.3 Annual Reports

Reported voluntary disclosures were read and rated for each company in the study. Based on the selected criteria's, 46 annual reports from non-financial companies listed on the Stockholm Stock exchange and on the Large Cap have been read and evaluated. 42 of the annual reports were collected from the Companies official homepages and 4 (Kungsleden, Hufvudstaden, Faberge and Castellum) were received by mail, sent from investor relations responsible at those companies.

The Annual reports have also been used to collect the information base for control variables. Information regarding market capitalization, and posts reflecting earnings before interest and taxes (EBIT), book value of owners' equity and the companies' assets are examples of such data.

3.2.2.4 Sveriges Riksbank's historical foreign currency exchange rates

In order to recalculate collected data to be in the same currency, the Swedish Krona (SEK) Sveriges Riksbank's homepage¹³ was used, more precise their function for retrieving historical closing mid prices for foreign exchange rates. Data was collected for corresponding

¹³Sveriges Riksbank's homepage

dates to the information announced (separate for each company) in Annual reports, I/B/E/S and Compustat to give a comparable measure.

3.2.2.5 Skatteverket's share history

Skatteverket's homepage¹⁴ and their listings of historical events affecting the share and share capital was used in order to adjust data gathered in Compustat and I/B/E/S for companies who made splits of their shares thus affecting company's share price and earnings per share forecast. The companies that were affected by such events are; Atlas Copco¹⁵, Hexagon¹⁶, Meda¹⁷, Nobia¹⁸ SCA, Svenska Cellulosa Aktiebolaget¹⁹ and Scania²⁰.

3.2.3 Elimination

Out of the 67 companies listed on the OMX Stockholm Large Cap (see APPENDIX B.), 15 were eliminated because they are companies within the banking and insurance industry. The reason for eliminating them is that their financing decisions are affected by somewhat different factors than industrial firms²¹. Two companies (Oriflame and Vostok Nafta) are missing annual reports corresponding to the year of 2006 and these were not possible to obtain from other sources. These two were therefore also eliminated. Husqvarna does not have historical data publicly available since it was separated from Electrolux in 2006 and was therefore also eliminated. Out of the remaining 49 Swedish non-financial companies listed on OMX Stockholms Large Cap list, three companies (ABB, Autoliv, and Lawson) were eliminated due to the fact that their annual reports were made in accordance to U.S. GAAP and not IFRS which have separate rules for information being disclosed in annual reports.

The sample therefore consists of 46 companies.

3.3 Hypotheses

To achieve the purpose of the study, four hypotheses have been formulated based upon the theoretical framework. Previous research discussed in the theoretical framework section has shown both a complementary and a substitutive relation between voluntary disclosure and earnings quality. Given the inconclusive nature of previous studies, two hypotheses are

¹⁴Skatteverket's homepage

¹⁵Skatteverket's homepage

¹⁶Skatteverket's homepage

¹⁷Skatteverket's homepage

¹⁸Skatteverket's homepage

¹⁹Skatteverket's homepage

²⁰Skatteverket's homepage

²¹Sengupta, P. (1998) p. 459-474

formulated in order to examine the characteristics of the relationship between voluntary disclosure and quality of earnings on the Swedish market:

H1a: (Complementary hypothesis) Voluntary disclosures are increasing in a firm's earnings quality.

H1b: (Substitutive hypothesis) Voluntary disclosures are decreasing in a firm's earnings quality.

Theories of estimation risk and the idea of higher market liquidity due to better voluntary disclosure indicate a negative correlation between voluntary disclosure and cost of equity capital. An opposite relation is assumed if the voluntary disclosure costs (risk sharing, agency and proprietary) are higher than the positive effect of the disclosed information. Research on the relationship between voluntary disclosure and cost of equity capital has shown both positive and negative relations. This is the reason for choosing to examine the connection between them without on forehand stating the nature of the connection. The hypotheses are formulated as follows:

H2a: Variation in firms' voluntary disclosure is negatively connected to variation in the cost of equity capital.

H2b: Variation in firms' voluntary disclosure is positively connected to variation in the cost of equity capital.

Depending on if a relation can be determined between cost of equity capital and voluntary disclosure in the hypotheses above, a further control of its relation will be performed through an insertion of control variables. Francis et al. (2008) shows that the effect of voluntary disclosure on cost of equity capital diminishes when earnings quality is included as a control variable. The following hypothesis is used to determine the relation:

H3: Controlling for earnings quality, variation in firms' voluntary disclosure does not affect variation in the firms' cost of equity capital.

3.4 Voluntary disclosure, earnings quality, and cost of equity capital

3.4.1 Voluntary disclosure

There are several ways in which one could estimate the voluntary disclosure of firms, but research has shown that self-constructed measures tend to be superior to other solutions. Self

constructed measures tend to better capture relevant information²². Furthermore, a self-constructed measure gives the freedom to adjust what measures are included in the disclosure score, so that it actually reflects the voluntary items that companies have chosen to disclose.

In this study the voluntary disclosure quality is therefore estimated through a self-constructed measure, which is done by evaluating the selected firms' annual reports from year 2006. The evaluation is based on whether or not the annual report includes certain important features. These features have been derived by applying the conclusions from Skogsvik (1998) on what voluntary disclosure information affects the cost of equity capital the most. He conclude that by using a valuation model as the starting point one can find certain disclosure elements, which will be relevant for the cost of equity capital. These elements include explicit forecast of net income for the next period, information about negative transitory components of net income for the last period, and information about advantageous firm characteristics. Furthermore, the way prior studies like Botosan (1997), Francis et al. (2008), Banghøj and Plenborg (2008) performed their evaluations have also served as a point of reference with regard to what measures are typically included in an evaluation of the voluntary disclosure. Hence, the reasoning and theoretical background resulted in the list presented in APPENDIX C. The list of the proxy for measuring voluntary disclosure has been divided into four different parts; summary of historical results, other financial measures, non-financial measures and projected information.

The summary of historical results consists of six measures. The first four; return on assets (ROA), profit margin (PM), asset turnover (TAT) and return on equity (ROE) are all typical in terms of evaluating firms' historical consistency. A good historical summary on these measures should lead to an increased certainty among investors knowing that the disclosing company has a historically good or poor track record. The two other measures adding up to the summary of historical results are; trends in the industry and discussion of the corporate strategy. They are also valuable in order to understand and interpret fluctuations, challenges and the way the companies are able to adjust or refine their strategy over time. Typically, firms in the sample present five to ten year summaries of historical annual data. The reason that ten years is preferable to five years is that many industries tend to experience long cyclical trends. The ratios are examples of basic profitability measures.

²² Healy, P. and Palepu, K. (2001) p.405-440; the most common solution besides self-constructed measures of voluntary disclosure is to use a measure provided by an external party. In Sweden, this can be exemplified by the evaluation made by Kanton in the competition called 'Årets Börsbolag' annually ordered by Aktiespararna.

Other financial measures represent the second grouping of voluntary disclosure. These are financial measures which are commonly used among investors and analysts when performing equity valuation estimates. Thus, these measures represent a connection to firms' cost of equity capital.

Non-financial measures are also included as an evaluated part in the voluntary disclosure proxy. These measures are not included in the typical financial statements, but rather discussed and used to complement the raw financial values presented in the historical summary and other financial measures. This information is important when valuing a company's future outlook since information regarding market share, growth and barriers to entry can have large values for the company.

Projected information is also considered important since managers' forecasts are an indication of what the company believes about its future. Even though there is an obvious risk of biased information it is still a qualified estimation.

3.4.2 Earnings quality

Earnings quality is also a measure where there is no clear consensus on how it should be measured. In a study on U.S. data that is similar to the one in this paper, Francis et al. (2008) use four different measures to estimate the earnings quality. These measures are accruals quality, earnings variability, absolute abnormal accruals, and a combined measure that is made up of the factor score from the previous three measures. The starting point for the study performed in this paper is to use the same four measures since previous research has proven that they have a large effect on the cost of equity capital²³.

After a screening of the required data to compute accruals quality, earnings variability, and absolute abnormal accruals against the dataset available from Compustat for the companies in the study it becomes clear that the only measure that is possible to calculate in a way that makes it reliable is earnings variability. The reason why the accruals quality is not possible to calculate is due to a lack of firms with a large enough number of historical years for the data needed to calculate it. For absolute abnormal accruals, the problem instead is that a classification of the sample into industry groups will only give one group that is large enough to use in the calculations of this metric. The other industry groups that results from the sample will be too small to be useful. The fact that neither accruals quality nor the absolute abnormal

²³ Francis et al. (2004) p. 967–1010; Francis et al. (2005) p. 295–327

accruals will be used has the effect that the metric based on the factor score from accruals quality, earnings variability, and absolute abnormal accruals is not possible to calculate either. The metric to estimate earnings quality from here on in the study is therefore earnings variability²⁴.

3.4.2.1 Earnings Variability

Earnings variability is measured as the standard deviation of the sample firms' earnings during the period 2001 to 2006. Earnings are defined as earnings before extraordinary items with the addition of scaling that value against firms' average total assets. High values of EarnQual will indicate a poor earnings quality.

$$EarnQual_j = STD\ DEV\left(\frac{NIBE_{j,t}}{Assets_{j,t}}\right)$$

$NIBE_{j,t}$ = firm j's net income before extraordinary items (Compustat #18) in year t

$Assets_{j,t}$ = firm j's average total assets in year t and t-1

The fact that the earnings variability is estimated over a long period, 2001 to 2006, have the effect that a more valid proxy for the earnings quality is created. The reason for this is that the influence from window dressing or transitory managerial incentives in the annual reports will diminish.

3.4.3 Cost of equity capital

The cost of equity capital can be defined as the return that the equity holders require on the capital that they have put into the company²⁵. This return is an assessment of how risky the investors believe that the investment is, which can be exemplified by a model like the CAPM where the cost of equity capital is the sum of the risk-free rate of return and the return that relate to the covariance of the firm in relation to the market²⁶.

The CAPM is one of many ways that the cost of capital can be estimated through, but due to its common use in practice it is being seen as the first option when trying to estimate the cost of equity capital²⁷. The fact that there is no perfect way of assessing what the cost of equity capital actually is for stock exchange listed companies makes it a matter that has been

²⁴ From here on earnings variability and earnings quality will be used as synonyms. In tables, earnings variability/quality will be shortened as EarnQual.

²⁵ Berk, J. and DeMarzo, P. (2007) p. 141-142

²⁶ Berk, J. and DeMarzo, P. (2007) p. 636-637

²⁷ Berk, J. and DeMarzo, P. (2007) p. 363

extensively discussed in the literature²⁸. The effect is that several different ways have been used in previous research. For example, Botosan (1997) use the EBO valuation formula and Francis et al. (2008) use the out price target and dividends forecasts to estimate the cost of equity capital. Both these formulas have been proven to be robust ways of estimating the cost of equity capital. Another method that has been proven as a robust way of estimating the cost of capital is the PEG-ratio method²⁹.

The starting point for methods to use in this study is therefore the three methods mentioned above and the commonly used CAPM. After searching through the Compustat database it became obvious that for the Swedish market it is not possible to get sufficient data to use the EBO valuation formula or the out price target and dividend forecasts to estimate the cost of equity capital. This leaves the PEG-ratio method and the CAPM as most suitable. Out of these two, the CAPM is disregarded because the model is built on an assumption of the priced risk factors being known and limited to the factors of the model, which do not include the measure of voluntary disclosure quality or earnings quality³⁰. Therefore, the method that has been used in this study is the PEG-ratio Method as described by Easton (2004). This means that analyst forecasts of the earnings per share for the full year for one and two years into the future has been used together with the share price at the issuance of these forecasts. For most companies this implies that the forecasts that have been used are the ones' that were made at the beginning of the second quarter year 2007, and the share price of the firm that prevailed on the release date of the annual reports. The reason for using these forecasts and share prices is that most companies present their annual report during the first quarter³¹, and consequently any effects of the voluntary disclosure quality should be reflected in those figures. For firms that for some reason released their annual report later than during the first quarter, e.g. broken financial year, an adjustment was made so that the forecasts closest following the release of the annual report were used as well as the corresponding share price. Finally, it is worth mentioning two crucial assumptions that are made in the particular version of the PEG-ratio Method that is used in this study. These assumptions are that the dividend for the coming year will be zero and that the growth in abnormal returns beyond the forecast horizon is zero³². The formula that the PEG-ratio Method results in is the following:

²⁸ Bodie et al. (2009) p. 279-310

²⁹ Botosan, C.A. and Plumlee, M.A. (2005); Easton, P.D. (2004)

³⁰ Botosan, C.A. (2006) p. 31-40.

³¹ See Appendix for information on release date of annual reports for firms in the study.

³² For a discussion of the effect of these assumptions see 6. Validity and sturdiness of results

$$\rho_{E,j} = \sqrt{\frac{eps_{j,2} - eps_{j,1}}{P_{j,0}}}$$

$\rho_{E,j}$ = firm j 's cost of equity capital

$P_{j,0}$ = firm j 's Stock price at forecast date

$eps_{j,2}$ = firm j 's forecast of earnings per share second quarter year 2008

$eps_{j,1}$ = firm j 's forecast of earnings per share second quarter year 2007

The only modification to the method that has been used by Botosan and Plumlee (2005) is that instead of earnings per share forecasts for four and five years into the future forecast for one and two years into the future has been used. The reason for this modification is that not enough data exists for forecasts of earnings per share for four and five years into the future, which is reached for forecasts for one and two years into future.

3.5 Regression models

3.5.1 (H1a) and (H1b)

Firstly, testing of whether a complementary (H1a) or substitutive (H1b) relationship exists between a firm's voluntary disclosure (*VolDisc*) and earnings quality (*EarnQual*) is performed. Given the formulation of H1a, a negative correlation should exist between voluntary disclosure and cost of equity capital. This results in the following hypothesis

$$H_0: \beta_{neg_corr_I} \geq 0$$

$$H_1: \beta_{neg_corr_I} < 0$$

The formulation of H1b is the opposite, where a positive correlation should exist between voluntary disclosure and cost of equity capital. This gives the following hypothesis:

$$H_0: \beta_{pos_corr_I} \leq 0$$

$$H_1: \beta_{pos_corr_I} > 0$$

Conditional testing based on other firm characteristics that have been argued to relate to firms' voluntary disclosure is also performed. This is done in order to test the validity of the above described unconditional tests. Based on Bamber and Cheon (1998), firm size measured as the logarithm of firm market value of equity at the beginning of year 2006 (*lnMVE*) is included as a control variable for firm specific variables that affect disclosure policy. The

expectation based on prior research is a positive correlation between firm size and voluntary disclosure³³. The resulting hypothesis is:

$$H_0: \beta_{lnMVE} \leq 0$$

$$H_1: \beta_{lnMVE} > 0$$

Furthermore, growth is controlled for through the logarithm of firm book-to-market ratio measured at the beginning of year 2006 (lnBM). Growth is expected to have a negative association with voluntary disclosure since firms with better growth opportunities want to disclose less about these, which implies that a positive relation should exist between lnBM and voluntary disclosure³⁴. This gives the following hypothesis:

$$H_0: \beta_{lnBM} \leq 0$$

$$H_1: \beta_{lnBM} > 0$$

Prior research also suggests that disclosure quality is positively correlated with the number of analysts following and firm performance (ROA). Analysts following is calculated as the number of analysts that issued at least one earnings forecast about the firm during year 2006 and firm performance is estimated by the return on assets calculated as the earnings before interest and taxes (EBIT) during year 2006 divided by average total assets for year 2006³⁵. Finally, in prior literature poor performance has been shown to correlate with disclosure. To control for this phenomenon return on assets (ROA) is once again used³⁶. The above mentioned control variables will therefore have the following hypotheses:

Number of analysts (NoAnalyst):

Return on assets (ROA):

$$H_0: \beta_{NoAnalyst} \leq 0$$

$$H_0: \beta_{ROA} \leq 0$$

$$H_1: \beta_{NoAnalyst} > 0$$

$$H_1: \beta_{ROA} > 0$$

The testing will be performed both through pairwise correlation between all the above mentioned metrics (see table 2) and a regression with and without the control variables (see table 3). The regressions without (1) and with (2) control variables for H1a presented below:

$$(1) VolDisc_j = \alpha + \beta_{neg_corr_1} \times EarnQual_j + \varepsilon_j$$

$$(2) VolDisc_j = \alpha + \beta_{neg_corr_1} \times EarnQual_j + \beta_{lnMVE} \times lnMVE_j + \beta_{lnBM} \times lnBM_j + \beta_{NoAnalyst} \times NoAnalyst_j + \beta_{ROA} \times ROA_j + \varepsilon_j$$

³³ Francis et al. (2008) p. 53-99

³⁴ Bamber and Cheon (1998); Francis et al. (2008)

³⁵ Lang and Lundholm (1993) p 246-271

³⁶ Lang and Lundholm (1993); Skinner (1994); Nagar, Nanda, and Wysocki (2003)

For H1b the regressions without (3) and with (4) control variables looks as follow:

$$(3) VolDisc_j = \alpha + \beta_{pos_corr_1} \times EarnQual_j + \varepsilon_j$$

$$(4) VolDisc_j = \alpha + \beta_{pos_corr_1} \times EarnQual_j + \beta_{lnMVE} \times lnMVE_j + \beta_{lnBM} \times lnBM_j + \beta_{NoAnalyst} \times NoAnalyst_j + \beta_{ROA} \times ROA_j + \varepsilon_j$$

3.5.2 (H2a) and (H2b)

To test for the correlation between a firm's voluntary disclosure and cost of equity capital ($\rho_{E,j}$) two hypotheses are presented. The first one (H2a) is that in accordance with the findings of Botosan (1997), Diamond and Verrecchia (1991), and Barry and Brown (1985) a negative relation exists between voluntary disclosure and cost of equity capital. This results in the following hypothesis:

$$H_0: \beta_{neg_corr_2} \geq 0$$

$$H_1: \beta_{neg_corr_2} < 0$$

The second hypothesis (H2b) is based on another line of research that suggests a positive correlation between voluntary disclosure and cost of equity capital³⁷. This gives the following hypothesis:

$$H_0: \beta_{pos_corr_2} \leq 0$$

$$H_1: \beta_{pos_corr_2} > 0$$

Based on the two above hypotheses the two following regressions are used to see if a negative (5) or a positive (6) relationship exists between voluntary disclosure and cost of equity capital (see table 4):

$$(5) \rho_{E,j} = \alpha + \beta_{neg_corr_2} \times VolDisc_j + \varepsilon_j$$

$$(6) \rho_{E,j} = \alpha + \beta_{pos_corr_2} \times VolDisc_j + \varepsilon_j$$

3.5.3 (H3)

The final hypothesis (H3) that is tested checks whether any statistically significant correlation found when testing for H2a and H2b, still exists when earnings variability and other control variables are introduced. Francis et al. (2008) show that when earnings quality is used as a control variable voluntary disclosure does not have any statistically significant effect in explaining cost of equity capital. The lost explanation power of voluntary disclosure when earnings quality is introduced implies the following hypothesis test for H3:

³⁷ Botosan and Plumlee (2002); Kim and Verrecchia (1994)

H₀: $\rho\text{-value} \leq 10\%$ when control variable is introduced

H₁: $\rho\text{-value} > 10\%$ when control variable is introduced

The first control variable that is introduced is earnings quality (*EarnQual*), which is in line with Francis et al. (2008). The relation between earnings quality and cost of equity capital is expected to be negative³⁸, which results in the following hypothesis for the earnings quality proxy:

H₀: $\beta_{EarnQual} \leq 0$

H₁: $\beta_{EarnQual} > 0$

The tests with earnings quality will result in three regressions where the other factors are cost of equity capital (7), voluntary disclosure and cost of equity capital (8), and finally voluntary disclosure, cost of equity capital and all other control variables (9).

$$(7) \rho_{E,j} = \alpha + \beta_{EarnQual} \times EarnQual_j + \varepsilon_j$$

$$(8) \rho_{E,j} = \alpha + \beta_{VolDisc} \times VolDisc_j + \beta_{EarnQual} \times EarnQual_j + \varepsilon_j$$

The other control variables that are introduced are size (lnMVE) and growth (lnBM), which are two known risk factors. Based on Jagannathan and McGratten (1995), the expected relation between lnMVE and cost of equity capital is a negative relation because larger firms tend to have lower cost of equity capital. This gives the following hypothesis:

H₀: $\beta_{lnMVE} \geq 0$

H₁: $\beta_{lnMVE} < 0$

In accordance with prior research, the correlation between lnBM and cost of equity capital is projected to be positive³⁹. This result in the following hypothesis:

H₀: $\beta_{lnBM} \leq 0$

H₁: $\beta_{lnBM} > 0$

Based on these hypotheses, the final regression that will be tested is the one below:

$$(9) \rho_{E,j} = \alpha + \beta_{VolDisc} \times VolDisc_j + \beta_{EarnQual} \times EarnQual_j + \beta_{lnMVE} \times lnMVE_j + \beta_{lnBM} \times lnBM_j + \varepsilon_j$$

³⁸ Francis et al. (2003); Francis et al. (2004); Francis et al. (2008); Liu et al. (2002)

³⁹ Fama, E.F and French, K.R. (1996) p 55-84

4. RESULTS

4.1 Results from voluntary disclosure regressions

The two hypotheses H1a and H1b, which covers the relation between voluntary disclosure and earnings quality, are tested by controlling the pairwise correlation between voluntary disclosure, earnings quality, and other control variables (table 2). Furthermore, these hypotheses are tested by regressing voluntary disclosure on earnings quality and other control variables (table 3).

TABLE 2

Tests of the relation between voluntary disclosure and earnings quality

Pairwise correlations between VolDisc, EarnQual and control variables

	VolDisc	EarnQual	lnMVE	lnBM	ROA	NoAnalyst
VolDisc	1	-0.391	0.106	0.435	-0.385	0.013
<i>sig. (1-tailed)</i>		<i>0.004</i>	<i>0.242</i>	<i>0.001</i>	<i>0.004</i>	<i>0.465</i>
EarnQual	-0.397	1	-0.010	-0.280	0.371	0.061
<i>sig. (1-tailed)</i>	<i>0.003</i>		<i>0.472</i>	<i>0.030</i>	<i>0.006</i>	<i>0.342</i>
lnMVE	0.134	0.083	1	-0.203	0.184	0.885
<i>sig. (1-tailed)</i>	<i>0.188</i>	<i>0.291</i>		<i>0.088</i>	<i>0.110</i>	<i>0.000</i>
lnBM	0.424	-0.302	-0.150	1	-0.649	-0.272
<i>sig. (1-tailed)</i>	<i>0.002</i>	<i>0.021</i>	<i>0.160</i>		<i>0.000</i>	<i>0.034</i>
ROA	-0.352	0.543	0.028	-0.664	1	0.181
<i>sig. (1-tailed)</i>	<i>0.008</i>	<i>0.000</i>	<i>0.428</i>	<i>0.000</i>		<i>0.114</i>
NoAnalyst	-0.002	0.157	0.865	-0.183	0.011	1
<i>sig. (1-tailed)</i>	<i>0.496</i>	<i>0.149</i>	<i>0.000</i>	<i>0.111</i>	<i>0.471</i>	

Pearson's pairwise correlations are illustrated above the diagonal
Spearman's pairwise correlations are illustrated below the diagonal

As can be seen in table 2, a significant negative correlation exists between voluntary disclosure and earnings quality with p -values of 0.004 (Pearson) and 0.003 (Spearman). The magnitudes of these correlations are -0.391 (Pearson) and -0.397 (Spearman). This result indicates that on a 1% significance level H_0 for H1a can be rejected, but not for H1b. Another result found in table 2 is that all control variables show positive correlation with voluntary disclosure, except return on assets, but only the growth and return on assets results carries statistical significance (p -value below 0.10). These findings implies that on a 1% significance level H_0 can only be rejected for the growth metric, but not for the size, return on assets, and number of analyst earnings forecasts. The same is true for significance levels of 5% and 10%. With regard to the correlation between earnings quality and the other metrics, it only shows statistically significant correlation with growth (negative) and return on assets (positive).

TABLE 3**Regression of VolDisc on EarnQual and control variables**

	excl. EarnQual	incl. EarnQual
EarnQual	-	-0.830
<i>t-test</i>	-	-1.704
<i>sig. (1-tailed)</i>	-	0.048
lnMVE	0.048	0.038
<i>t-test</i>	1.373	1.106
<i>sig. (1-tailed)</i>	0.089	0.138
lnBM	0.080	0.077
<i>t-test</i>	1.745	1.728
<i>sig. (1-tailed)</i>	0.045	0.046
ROA	-0.297	-0.176
<i>t-test</i>	-1.195	-0.695
<i>sig. (1-tailed)</i>	0.120	0.246
NoAnalyst	-0.002	-0.001
<i>t-test</i>	-0.731	-0.507
<i>sig. (1-tailed)</i>	0.235	0.308
Adjusted R²	18.8%	22.4%

Table 3 shows coefficient estimates, t-statistics, and one tailed significances obtained from regressions of voluntary disclosure on earnings quality and other factors expected to influence voluntary disclosure levels. The regression is performed both including and excluding earnings quality. The results in table 3 confirm that a negative correlation exist between earnings quality and voluntary disclosure that is statistically significant (ρ -value of 0.048) even when other firm-specific control variables are introduced. Furthermore, the inclusion of earnings quality as an independent variable in the regression, increase adjusted R² values compared to when it is left out. The results in table 3, lead to that H₀ for H1a can be rejected on a 5% significance level, but that it cannot be rejected for H1b. The results also confirm the positive correlation between growth and voluntary disclosure, where H₀ can be rejected on a 5% significance level. The other control variables show coefficient estimates with the wrong sign (ROA and NoAnalyst) and do not have significance good enough to reject H₀.

To sum up, the results presented in table 2 and 3 lead to that H₀ can be rejected for H1a and growth, but not for H1b, size, return on assets, and number of analysts' earnings forecasts.

4.2 Results from cost of equity capital regressions

The results from regressing cost of equity capital on voluntary disclosure, earnings quality, and two other well-known risk factors (size and growth) are presented in table 4.

TABLE 4

Tests of the relation between cost of equity capital and voluntary disclosure

Regressions based on VolDisc and EarnQual

	Excluding Risk Factors			Including Risk Factors		
	VolDisc	EarnQual	Both	VolDisc	EarnQual	Both
VolDisc	0.057	-	0.062	0.072	-	0.076
<i>t-test</i>	1.774	-	1.766	1.992	-	1.984
<i>sig. (1-tailed)</i>	0.042	-	0.042	0.027	-	0.027
EarnQual	-	-0.037	0.045	-	-0.031	0.042
<i>t-test</i>	-	-0.328	0.380	-	-0.258	0.347
<i>sig. (1-tailed)</i>	-	0.372	0.353	-	0.399	0.365
lnMVE	-	-	-	-0.006	-0.004	-0.006
<i>t-test</i>	-	-	-	-1.485	-1.042	-1.468
<i>sig. (1-tailed)</i>	-	-	-	0.073	0.152	0.075
lnBM	-	-	-	-0.006	0.002	-0.006
<i>t-test</i>	-	-	-	-0.644	0.225	-0.587
<i>sig. (1-tailed)</i>	-	-	-	0.262	0.412	0.280
Adjusted R²	4.6%	-2.0%	2.7%	5.1%	-3.7%	3.1%

Table 4 indicates that voluntary disclosure has a positive correlation with cost of equity capital given the coefficient estimate of 0.057 and p-value of 0.042. Furthermore, the results lead to that H_0 for H2b can be rejected on a 5% significance level. This also implies that it is not possible to reject H_0 for H2a. It should be noted that the explanatory power of the regression of cost of equity capital based on voluntary disclosure is low (adjusted R^2 is equal to 4.6%). The results with regard to the relation between earnings quality and cost of equity capital is that there is no significantly relevant relation between them, which is indicated in table 4 by the fact that the coefficient estimates for earnings quality is not significant on a 10% level in any of the regressions. The H_0 for the final hypothesis (H3) cannot be rejected based on the result in table 4 since voluntary disclosure has a significance level that is better than 10% in all regressions ($p\text{-value} \leq 0.042$). With regard to the hypotheses for size and growth, it can be concluded that H_0 for size can be rejected on a 10% significance level in two out of three regressions and that H_0 for growth cannot be rejected on a 10% significance level. An important observation about the results in table 4 is that the adjusted R^2 is low for all regressions (5.1% or lower), which indicate that none of the regressions are good at explaining the variation in cost of equity capital. It is also worth mentioning that the F-distribution is only significant at a 10% level for the regression of cost of equity capital on voluntary disclosure. This implies that in all the other regressions it is not possible to reject the hypothesis that the coefficient estimates are not equal to zero.

5. ANALYSIS

The research question, stated in the first part of the thesis, is to determine the relationship between voluntary disclosure quality, earnings quality and the cost of equity capital on the Swedish market. From that question, hypotheses have been formulated in order to make a statistically viable description of the relations. Below follows an analysis, where the aim is to further describe, analyze and interpret the results presented above.

As stated in the results, the H1a hypothesis is confirmed and the H1b hypothesis is rejected since a negative correlation between earnings quality and voluntary disclosure is found that is significant on a 1% significance level (see table 2). The relation between earnings quality and voluntary disclosure is therefore characterized as complementary, which suggests that companies with poor earnings quality also have low voluntary disclosure quality. The opposite is therefore true for companies with good earnings quality, who tend to have high voluntary disclosure quality. The complementary relation between earnings quality and voluntary disclosure also exists when firm specific control variables are added. It is then significant on a 5% level, as seen in table 3. The conclusion of a complementary relation between earnings quality and voluntary disclosure is in line with findings of Waymire (1985), Cox (1985), Imhoff (1978) and Francis et al. (2008). At the same time, it is in contradiction to results presented by Lang and Lundholm (1993) and Tasker (1998) who suggest a substitutive relation.

When analyzing voluntary disclosure with regard to the firm specific control variables, it is only for the growth variable that H_0 can be rejected. This rejection implies that a negative association exists between growth and voluntary disclosure quality, which is in line with the theory that firms with better growth opportunities want to disclose less voluntary information⁴⁰. The fact that the other control variables do not show any significant association at conventional levels with voluntary disclosure in the regression is not in line with expectations, but a result that has been seen in other studies⁴¹. Two possible explanations for the statistical insignificance are outliers and the size of the sample, to investigate this further lies outside the scope of this study.

The result that companies with better voluntary disclosure are also those who have the highest earnings quality is in line with the idea that a lower cost of equity capital for firms with high

⁴⁰ Bamber and Cheon (1998); Francis et al. (2008)

⁴¹ Nagar, Nanda, and Wysocki (2003) p.283-309

voluntary disclosure quality might not exist due to the disclosure choices of the firms, but rather because of firms' better earnings quality. This issue is investigated through the assessment of the unconditional effects of voluntary disclosure on cost of equity capital (H2a and H2b) and the conditional effects (H3). To begin with, the result that the H2b hypothesis is validated and H2a is rejected implies that a positive correlation exists between voluntary disclosure and cost of equity capital. This contradicts much of the previous research on this area, e.g. Botosan (1997).

The positive connection between voluntary disclosure and cost of equity capital contradicts theories regarding estimation risk. The estimation risk theory that a decreased information asymmetry should lead to a lower cost of equity capital is not observed for the firms in the sample. The positive connection also contradicts theory about the negative correlation between voluntary disclosure and cost of equity capital built on the idea that better voluntary disclosure leads to higher market liquidity, which in turn give a lower cost of equity capital through higher demand of the security.

The results in the study support the idea that costs related to voluntary disclosure (risk sharing, agency and proprietary) have a negative influence on the gathered positive effect of the disclosed information. This study indicates that the costs are larger than the positive effects received from the disclosed information.

Information asymmetry theories can also explain the findings; increased voluntary disclosure would mean that investors with superior abilities to use the increased amount of information will be able to assess the company in a better way than others. The effect of the difference in abilities to make use of more information is that increased voluntary disclosure give higher information asymmetry among investors. Therefore, increased voluntary disclosure leads firms to suffer from higher cost of equity capital.

The validation of the H2b hypothesis is in line with the discussion presented by Verrecchia (2001) where the cost and risk related to voluntary disclosure due to the potential threat of competitors' ability to take advantage of information and through that harm the company. It indicates that Swedish firms are worse off, having higher levels of cost of equity when disclosing more financial information, due to competitors taking advantage of this information.

Based on the results, hypothesis (H3) stating that the effect of variability in voluntary disclosure on the variability of cost of equity capital diminish or disappears when control

variables are introduced cannot be rejected. The relation between earnings quality proxied by earnings variability and cost of equity capital proxied by the PEG-ratio does not cohere with findings from prior research which rather indicates a very strong positive correlation, even proclaiming earnings quality to be the premier source for explaining equity value in firms.

Earnings quality is also regarded as the premier source of firm specific information which support the complementary relationship found between the earnings quality proxy and voluntary disclosure in this paper. The complementary relationship between disclosure and earnings quality imply that any correlation found between voluntary disclosure and cost of equity capital could possibly be explained by earnings quality. This is also the findings of Francis et al. (2008), but as shown by the rejection of H3 the same conclusion cannot be made for the Swedish sample.

When further controlling the relationship between voluntary disclosure and cost of equity capital with well known control variables such as size and growth the positive correlation between voluntary disclosure and cost of equity capital still exists. Furthermore, none of these control variables show any statistically significant effect on voluntary disclosure which seems odd given their well established correlation to cost of equity capital in prior research.

TABLE 5
Analysis of the components in our voluntary disclosure proxy

Correlations between VolDisc scores and sub-parts					
	VolDisc Total	VolDisc 1	VolDisc 2	VolDisc 3	VolDisc 4
Voluntary disclosure (VolDisc) Total	1	0.771	0.264	0.663	0.403
<i>sig. (2-tailed)</i>		<i>0.000</i>	<i>0.076</i>	<i>0.000</i>	<i>0.006</i>
VolDisc 1: Summary of historical results	0.654	1	0.256	0.268	0.138
<i>sig. (2-tailed)</i>	<i>0.000</i>		<i>0.086</i>	<i>0.071</i>	<i>0.361</i>
VolDisc 2: Other financial measures	0.276	0.206	1	-0.101	-0.218
<i>sig. (2-tailed)</i>	<i>0.064</i>	<i>0.169</i>		<i>0.504</i>	<i>0.146</i>
VolDisc 3: Non-financial measures	0.561	0.151	-0.137	1	-0.033
<i>sig. (2-tailed)</i>	<i>0.000</i>	<i>0.316</i>	<i>0.365</i>		<i>0.826</i>
VolDisc 4: Projected information	0.341	0.037	-0.251	-0.129	1
<i>sig. (2-tailed)</i>	<i>0.020</i>	<i>0.809</i>	<i>0.092</i>	<i>0.392</i>	
Pearson's pairwise correlations are illustrated above the diagonal Spearman's pairwise correlations are illustrated below the diagonal					
<i>Variable</i>	VolDisc Total	VolDisc 1	VolDisc 2	VolDisc 3	VolDisc 4
<i>Regressions of Voldisc subscores on earnings quality</i>					
EarnQual	-0.115	-0.106	-0.017	-0.052	0.000
<i>t-stat</i>	<i>-2.814</i>	<i>-3.423</i>	<i>-0.856</i>	<i>-1.544</i>	<i>-0.010</i>
<i>sig. (2-tailed)</i>	<i>0.007</i>	<i>0.001</i>	<i>0.397</i>	<i>0.130</i>	<i>0.992</i>
<i>Regressions of cost of equity capital on Voldisc subscores</i>					
CofE	0.057	0.031	-0.012	0.041	0.022
<i>t-stat</i>	<i>1.774</i>	<i>1.216</i>	<i>-0.829</i>	<i>1.653</i>	<i>1.088</i>
<i>sig. (1-tailed)</i>	<i>0.042</i>	<i>0.115</i>	<i>0.206</i>	<i>0.053</i>	<i>0.141</i>

Table 5 shows a broken down analysis of the components of the voluntary disclosure proxy and how it correlates with earnings quality and cost of equity capital. The table shows that the previous described findings of the relation between voluntary disclosure and earnings quality and cost of equity capital is somewhat different for the different sub groups of VolDisc. It becomes clear that the sub group VolDisc 1 measure is the driving force for the correlation between total VolDisc and earnings quality while the other three subgroups are not strongly correlated to earnings quality. Similarly, the sub group VolDisc 3 is the driving force for the correlation between total voluntary disclosure and cost of equity capital. These two observations of sub groups can to some extent explain why earnings quality, when introduced as a control variable, does not affect voluntary disclosures effect on cost of equity capital.

6. VALIDITY AND RELIABILITY OF RESULTS

The results can be discussed in terms of validity and reliability. Reliability is a way of determining the study's authenticity where a high level of reliability implies that it is replicable. When performing regression analysis, the reliability is usually not a problem. However, this study contains a self composed voluntary disclosure proxy, based on subjective judgment of annual reports and is therefore further discussed in part 6.1. Validity indicates how well the study actually measure what it intends to measure and can therefore be described as how well the operationalization of the study examine the empirical phenomenon it intends to examine⁴². Therefore, validity is the main issue investigated and discussed in the following text.

6.1 Voluntary disclosure

The self composed proxy VolDisc used to measure companies' level of voluntary disclosure is based on theories discussing which of the potential voluntary disclosure parts is believed to be of most importance to investors. The question regarding whether or not VolDisc manages to represent the most important voluntary disclosure is difficult to answer with certainty. In comparison, VolDisc is similar to the proxy used by Francis et al (2008) thus making it comparable and also adding some type of validity and reliability to it. Therefore, results reached for companies in the sample should not differ much from the results Francis' would have shown for the same companies.

⁴² Ryan, B., Scapens, R.W. och Theobald, M. (2002) p.141

The level of subjectivity in the assessment leading to raw points in VolDisc is a potential source for reduced reliability. VolDisc is not a binary scored proxy. Companies can receive between 0 to 1 points with steps of $(1/20)$ of a point in between the maximum and minimum potential score. To reduce the risk of firms being unfairly scored, guidelines were made for each measure. Moreover, notes on why each company was awarded a certain score and where the stated information could be found were kept and reexamined. This routine made the risk of systematical error in raw voluntary scores significantly reduced.

Another issue is the measure itself. VolDisc is composed of four sub groups as discussed earlier. These sub groups contain different number of measures and since the total measure of VolDisc hands each measure equal weight, some of the four sub groups gets less significance in VolDisc. This is also seen in table 1, showing descriptive statistics. One can argue that each sub group of VolDisc should be worth equally in the total score and that the original proxy favors certain groups. Especially group two who reflects other financial measures have small influence on the total VolDisc score. To reduce the risk of using a VolDisc score not reflecting voluntary disclosure optimally, an optional proxy named VolDisc_op was created. VolDisc_op is based on the same raw scores obtained from annual report readings as VolDisc does; the difference is the calculation of total scores. VolDisc_op hands the four sub groups of the VolDisc proxy equal weights in the total score. This premises companies who disclose information within each of the four sub groups. The score within each sub groups was scaled by the maximum point scored by the best company in each group. The scores in each sub group were then added to represent the total score of VolDisc_op. Results on the relation between cost of equity capital and the optional voluntary disclosure proxy VolDisc_op are shown in table 6 below.

TABLE 6

Tests of the relation between cost of equity capital and voluntary disclosure (optional)

Regressions based on VolDisc_op and EarnQual

	Excluding Risk Factors			Including Risk Factors		
	VolDisc_op	EarnQual	Both	VolDisc_op	EarnQual	Both
VolDisc_op	0.014	-	0.015	0.018	-	0.018
<i>t-test</i>	1.177	-	1.124	1.275	-	1.239
<i>sig. (1-tailed)</i>	0.123	-	0.134	0.105	-	0.111
EarnQual	-	-0.037	0.016	-	-0.031	0.015
<i>t-test</i>	-	-0.328	0.132	-	-0.258	0.123
<i>sig. (1-tailed)</i>	-	0.372	0.448	-	0.399	0.452
lnMVE	-	-	-	-0.005	-0.004	-0.005
<i>t-test</i>	-	-	-	-1.280	-1.042	-1.264
<i>sig. (1-tailed)</i>	-	-	-	0.104	0.152	0.107
lnBM	-	-	-	-0.003	0.002	-0.003
<i>t-test</i>	-	-	-	-0.317	0.225	-0.295
<i>sig. (1-tailed)</i>	-	-	-	0.377	0.412	0.385
Adjusted R²	0.8%	-2.0%	-1.4%	0.0%	-3.7%	-2.4%

Table 6 shows the nature of the relations between voluntary disclosure, cost of equity capital and earnings quality. The regression shows the same coefficient estimates as with VolDisc. It can be seen that VolDisc_op shows lower significance than VolDisc. Therefore, no conclusions can be made other than that the two proxies does not differ much in the regressions. The adjusted R-square received when using VolDisc_op values indicate that the regressions do not explain much of the variation in cost of equity capital.

6.2 Earnings quality

Reliability is of relatively small concern with regard to the earnings quality metric given that the input for it is collected from Compustat. Therefore, any issues will rather concern the validity of the earnings quality measure, which is proxied by earnings variance. Francis et al. (2008) control for the problem with validity of their earnings quality measure by using four different proxies for earnings quality, but they conclude that the results they get are valid for all four measures. This implies that using earnings variability as the proxy for earnings quality should not be a problem. Furthermore, it can be concluded that the values for earnings quality (see table 1) are not extreme since they are fairly similar to the ones found by Francis et al. (2008) for 677 U.S. companies. Other than the issues presented above, a problem which could arise is that data retrieved from Compustat is incorrect. This is seen as unlikely since Compustat is a widely used source for information collection in research papers.

6.3 Cost of equity capital

The mean cost of equity capital (9.0%) found in this study is significantly lower than what both Botosan (1997) 20.1% and Francis et al. (2008) 16.6% derived in their studies on the U.S. market. On the Swedish market, the comparable study performed by Meltzer and Sigonius (2010) showed large fluctuations between the years examined (2005: 18.9%, 2007: 14.0% 2008: 1.6%). This implies that a thorough validity and reliability check needs to be done on the cost of equity capital proxy.

The actual numbers used for calculating the cost of equity capital (earnings per share forecasts and share price) were collected from the I/B/E/S database and are therefore considered reliable since they can easily be obtained again. The information gathered from I/B/E/S regarding share price is based on the current date's number of shares and therefore adjustments have been made for firms with specific historical events, such as splits and emissions, ensuring validity. Skatteverkets historical backlog for such events was used as a source to find which companies have made such adjustments to their shares and what the adjustments were. Correcting the share price in this way ensures that the earnings per share forecasts and share prices are based on the same share characteristics. Adjustments were also made when companies' earnings per share forecasts and share price were reported in different currencies. The exchange rates used for these adjustments were retrieved from Sveriges Riksbank's database of historical closing foreign exchange rates reflecting mid prices. Due to the use of closing quotes there is a risk of exchange rate volatility creating an error in the translated earnings forecast. This would have the implication of the error being transferred into the cost of equity capital measure. However, this is most likely an insignificant issue since volatility in these foreign exchange rates historically is modest during the maximum time span of the lag of one day.

Another issue with regard to the validity of the cost of equity capital measure is the use of the PEG-ratio as the proxy. Legitimacy of the PEG-ratio as a proxy for cost of equity capital is historically proven by Botosan and Plumlee (2005) and Easton (2004). They conclude that the PEG-ratio estimate is a good proxy for cost of equity capital.

Performing the study on Swedish companies has one problem in that earnings per share forecasts are not performed on a regular basis or especially in close connection to the annual report release date. In the original set of 46 companies which has been used for calculating all the results in the paper some of the forecasts are announced more than 14 days after the

annual report release date. This might be a problem since other information regarding the company might have been disclosed to the market and through that affecting the presumptions of the earnings per share forecasts. In order to control for this validity issue, the sample was reduced to only include companies who have earnings per share forecasts announced within less than 14 days after the annual report release date. The new condition results in a reduction of the sample size, from 46 to 28 companies. The new sample is referred to as the reduced sample (rs). The effect of the smaller time span for earnings per share forecast is therefore investigated by performing all previous regressions with the reduced sample. The results are presented in tables 7-10 and discussed below.

TABLE 7

Tests of the relation between voluntary disclosure and earnings quality (reduced sample)

Pairwise correlations between VolDisc_rs, EarnQual_rs and control variables

	VolDisc_rs	EarnQual_rs	lnMVE_rs	lnBM_rs	ROA_rs	NoAnalyst_rs
VolDisc_rs	1	-0.269	0.003	0.471	-0.456	0.019
<i>sig. (1-tailed)</i>		<i>0.083</i>	<i>0.494</i>	<i>0.006</i>	<i>0.007</i>	<i>0.463</i>
EarnQual_rs	-0.318	1	0.056	-0.377	0.507	0.015
<i>sig. (1-tailed)</i>	<i>0.049</i>		<i>0.389</i>	<i>0.024</i>	<i>0.003</i>	<i>0.470</i>
lnMVE_rs	0.030	0.047	1	-0.250	0.241	0.931
<i>sig. (1-tailed)</i>	<i>0.439</i>	<i>0.407</i>		<i>0.100</i>	<i>0.108</i>	<i>0.000</i>
lnBM_rs	0.455	-0.285	-0.163	1	-0.697	-0.242
<i>sig. (1-tailed)</i>	<i>0.008</i>	<i>0.021</i>	<i>0.203</i>		<i>0.000</i>	<i>0.107</i>
ROA_rs	-0.377	0.674	0.038	-0.707	1	0.191
<i>sig. (1-tailed)</i>	<i>0.024</i>	<i>0.000</i>	<i>0.424</i>	<i>0.000</i>		<i>0.166</i>
NoAnalyst_rs	0.030	-0.046	0.922	-0.116	-0.031	1
<i>sig. (1-tailed)</i>	<i>0.439</i>	<i>0.408</i>	<i>0.000</i>	<i>0.278</i>	<i>0.437</i>	

Pearson's pairwise correlations are illustrated above the diagonal
Spearman's pairwise correlations are illustrated below the diagonal

Table 7 shows that the conclusions made about the complementary relationship between voluntary disclosure and earnings quality still exist with the reduced sample but shows less statistical significance.

TABLE 8

Regression of VolDisc on EarnQual and control variables (reduced sample)		
	excl. EarnQual_rs	incl. EarnQual_rs
EarnQual_rs	-	-0.106
<i>t-test</i>	-	-0.120
<i>sig. (1-tailed)</i>	-	0.453
lnMVE_rs	0.008	0.008
<i>t-test</i>	0.155	0.155
<i>sig. (1-tailed)</i>	0.439	0.439
lnBM_rs	0.076	0.075
<i>t-test</i>	1.299	1.262
<i>sig. (1-tailed)</i>	0.104	0.110
ROA_rs	-0.038	-0.323
<i>t-test</i>	-1.035	-0.901
<i>sig. (1-tailed)</i>	0.156	0.189
NoAnalyst_rs	0.001	0.001
<i>t-test</i>	0.154	0.143
<i>sig. (1-tailed)</i>	0.440	0.444
Adjusted R²	14.8%	11.0%

When control variables are introduced in table 8, the significance becomes too poor for the complementary relation between voluntary disclosure and earnings quality to be confirmed. Worth noting is that in both table 7 and table 8, the results show less statistical significance which most likely is due to the small sample used.

TABLE 9

Tests of the relation between cost of equity capital and voluntary disclosure (reduced sample)

Regressions based on VolDisc_rs and EarnQual_rs

	Excluding Risk Factors			Including Risk Factors		
	VolDisc_rs	EarnQual_rs	Both	VolDisc_rs	EarnQual_rs	Both
VolDisc_rs	0.028	-	0.038	0.016	-	0.021
<i>t-test</i>	0.615	-	0.792	0.298	-	0.411
<i>sig. (1-tailed)</i>	0.272	-	0.218	0.384	-	0.343
EarnQual_rs	-	0.110	0.152	-	0.209	0.218
<i>t-test</i>	-	0.574	0.762	-	1.046	1.066
<i>sig. (1-tailed)</i>	-	0.286	0.227	-	0.153	0.149
lnMVE_rs	-	-	-	-0.007	-0.006	-0.007
<i>t-test</i>	-	-	-	-1.323	-1.275	-1.297
<i>sig. (1-tailed)</i>	-	-	-	0.099	0.108	0.104
lnBM_rs	-	-	-	0.006	0.013	0.010
<i>t-test</i>	-	-	-	0.511	1.104	0.800
<i>sig. (1-tailed)</i>	-	-	-	0.307	0.140	0.216
Adjusted R²	-2.4%	-2.5%	-4.0%	0.0%	4.0%	0.6%

Continuing with the relation between voluntary disclosure and cost of equity capital, it is still positive for the small sample (table 9) but no longer at a 10% significance level. The

interesting part of the results from the regressions of the small sample is mainly two things; the earnings quality proxy have a positive correlation to cost of equity capital, thus better earnings quality lead to lower cost of equity capital. Even though this result is not significant on a 10% level, it indicates a connection between earnings quality and cost of equity capital in line with theory. This is a sign of that the proxy for cost of equity capital is sensitive for time lag between annual report release dates and earnings per share forecasts announce dates. It also indicates that the original results in the study may be less valid due to the time lag for certain companies caused by the lack of frequent earnings per share forecasts performed by analysts on Swedish companies.

6.4 Extreme data

As illustrated in the scatter diagram below (Diagram 1), regarding firms cost of equity capital and voluntary disclosure score, it is possible to identify several outliers. These outliers are affecting the level of significance to show weaker correlations. However, the outliers are positioned in such a way that disregarding them would not change the positive correlation between voluntary disclosure and cost of equity capital. Disregarding the outliers would lead to a better significance for the positive relation between voluntary disclosure and cost of equity capital.

Diagram 1

Correlation between voluntary disclosure and cost of equity capital

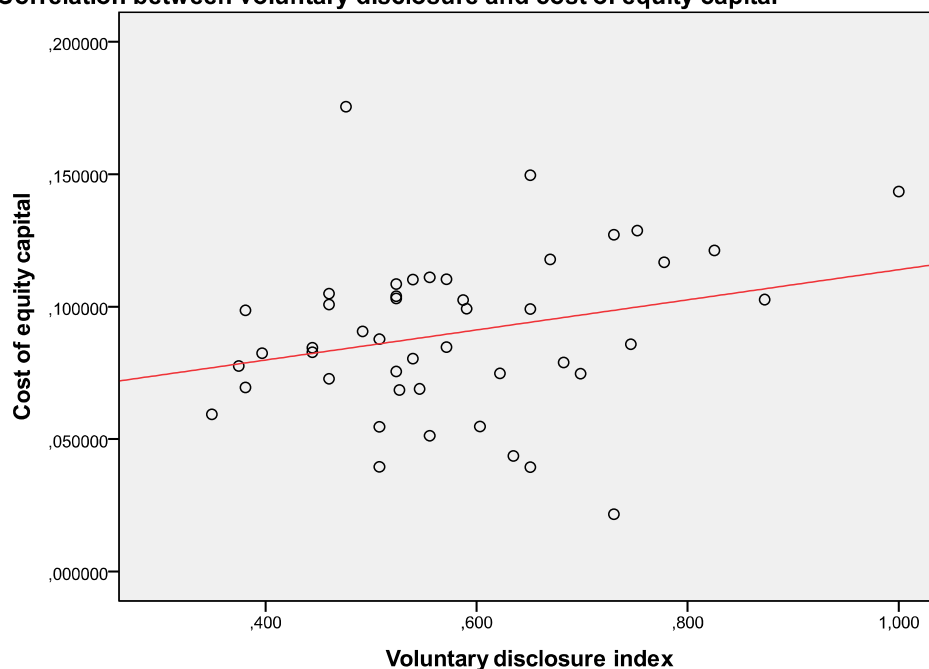
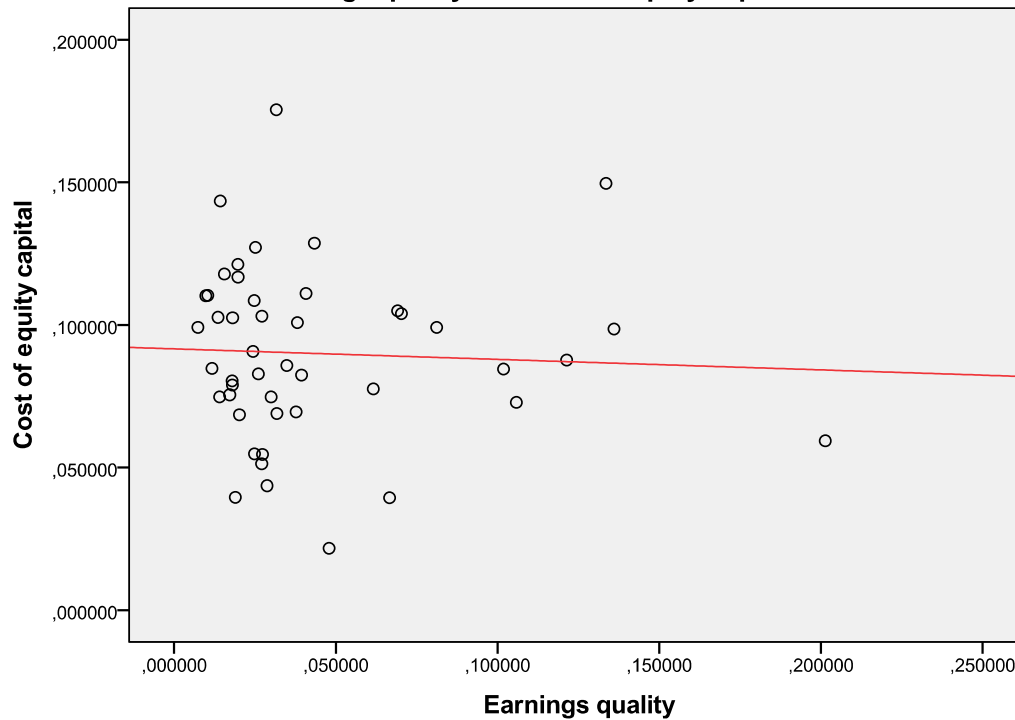


Diagram 2

Correlation between earnings quality and cost of equity capital



As shown in diagram 2, a scatter plot of the correlation between cost of equity capital and cost of equity capital a few outliers exist. However, it is once again not due to them that the nature of the relation is of poor significance. The plot illustrates that there is no clear connection; observations rather tend to be gathered between 0.00-0.05 in earnings quality and 0.05-0.15 mark in cost of equity capital without any statistically viable pattern.

6.5 Multicollinearity and specification bias

For the sample in this study there are two issues with regard to the statistics that need to be controlled for in order to assure the validity of the results. The first issue concern multicollinearity, which is the problem of having high correlation between two independent variables being used in regressions. This is problematic since it will result in high variance of the coefficient estimates, i.e. coefficient estimates will tend to have bad significance even when the relationship might be quite strong with the dependent variable⁴³. To control for this problem the correlation between independent variables have been examined (table 2) and it can be concluded that no problem with multicollinearity exists in our sample for any of the main independent variables.

⁴³ Newbold et al. (2003), p. 505-507

The second potential issue is specification bias, which covers the problem of getting biased results due to omission of one or several important predictor variables and through that make misleading conclusions about the relation of the variables used⁴⁴. In this study, the problem of specification bias has been controlled for by introducing well known control variables in all regressions.

7. DISCUSSION

The thesis results lend support for the H1a and H2b hypotheses, while no conclusions can be made about the remaining hypotheses. Support for the H1a hypothesis implies that a complementary relationship exists between voluntary disclosure and earnings quality. The backing of hypothesis H2b validates the positive relationship between voluntary disclosure and cost of equity capital. These findings indicate that even though there is a complementary relationship between voluntary disclosure and cost of equity capital, the connection found by Francis et al. (2008) on the U.S. market with regard to the diminishing effect of voluntary disclosure on cost of equity capital when introducing earnings quality as a control variable cannot be found in this study's Swedish sample.

These conclusions should be seen against the background of the study's sample, operationalization and the methodological approach before any general implications can be drawn from the findings on the Swedish market. It is also not until this has been done that any further reasoning can be made with regard to what implications this study can have for Swedish companies.

Initially, the general implications of the study can be judged based on the quality of the sample used to represent the population. Against the background of the systematical data gathering approach, reliability of the data, subjective element of the proxy for voluntary disclosure, access to earnings per share forecasts in connection to companies annual report release date, and the one year timeframe examined, the general implications of the analysis should be done with caution.

The results found in the study contradict earlier research on both the unconditional and conditional relationship between voluntary disclosure and cost of equity capital. This is another reason for why caution should be used before any general implications are drawn from the results.

⁴⁴ Newbold et al. (2003), p. 502-505

Furthermore, the general implications of this study's results are affected by how well the main variables are able to measure what they aim to represent. Voluntary disclosure and cost of equity capital are regarded as two of the most important variables in this study. Voluntary disclosure is a variable which is very difficult to measure due to the subjective nature of what different information is worth for investors. The validity of the voluntary disclosure proxy used in the study can still be seen as high given that the measures were based on previous studies and the findings of Skogsvik (1998). The validity of the cost of equity capital proxy is considered good due to the general acceptance in other studies⁴⁵ for the PEG-ratio. The problem in this study with regard to the PEG-ratio is the difficulty of getting earnings per share estimates that are announced in close connection to the annual report release date. This issue was further examined in section 6.3 Cost of equity capital, where the conclusion was made that the time lag might be a problem. The reduced sample showed a negative connection between earnings quality and cost of equity capital, in line with theory⁴⁶ but in contradiction to the original sample's results. Therefore, the validating support for making general implications from the study is further reduced.

To sum up, the study show interesting results that indicate that large Swedish firms might not benefit from more voluntary disclosure, but rather suffer from it in the form of higher cost of equity capital. This should be seen in the context of the discussions regarding validity made above.

8. CONCLUSION

The study shows a complementary relationship between voluntary disclosure and earnings quality due to the negative correlation found between them. Furthermore a positive connection is found between voluntary disclosure and cost of equity capital. This relationship is not affected by the inclusion of other variables (earnings quality, size and growth) that are known to effect cost of equity capital. The research question of this paper was:

What is the relationship between voluntary disclosure quality, earnings quality, and the cost of equity capital on the Swedish market?

Based on the findings in the paper, the main conclusion drawn is that disclosure quality relates to cost of equity capital in a positive way indicating that Swedish companies get a higher cost of equity capital by disclosing more voluntary information to the market and

⁴⁵ Botosan and Plumlee (2005); Easton (2004); Francis et al. (2008);

⁴⁶ Francis et al. (2004) Francis et al. (2003) Liu et al. (2002);

investors. Furthermore, a positive relation between voluntary disclosure and earnings quality is found which implies that companies with better earnings quality have better voluntary disclosure. The relation between earnings quality and cost of equity capital is not statistically significant indicating that earnings do not affect the cost of equity capital for Swedish companies. These conclusions should be seen with regard to concerns of validity caused by subjectivity of the voluntary disclosure proxy and the time difference between the annual reports release date and the announce date of the earnings per share used in the proxy for cost of equity capital.

9. FUTURE RESEARCH

Based on this study's findings, further research examining the connection between voluntary disclosure, earnings quality and cost of equity capital is needed to establish the relation on the Swedish market. The issue of finding a good proxy for cost of equity capital is essential in order to make future research valid and reliable. The proxy for voluntary disclosure is another problem several studies have highlighted including this one. The estimation and quantification of voluntary disclosure is a vast simplification of the company's total information flow to investors. The annual reports are only one part of the company's total information stream communicating to investors. It is also of interest to further investigate the same relation of variables on a larger sample, in specific sectors and on smaller firms.

Ultimately, if the relation between voluntary disclosure and cost of equity capital can be established it would be interesting to see if the findings can be transferred into a trading strategy.

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APPENDIX A.

Voluntary disclosure score

<u>Company</u>	<u>Score</u>	<u>Company</u>	<u>Score</u>
Alfa Laval	12.50	Modern Times Group, MTG	8.25
ASSA ABLOY	7.50	NCC	13.10
AstraZeneca	9.35	Nobel Biocare	8.00
Atlas Copco	8.50	Nobia	9.25
Axfood	8.75	Nokia	10.00
Boliden	11.50	Peab	8.50
Castellum	10.75	SAAB	9.30
Electrolux	13.75	Sandvik	6.50
Elekta	9.00	SAS	15.75
Eniro	5.90	SCA	13.00
Ericsson	7.25	SCANIA	12.25
Fabege	9.50	Seco Tools	6.25
Gefinge	7.50	Securitas	8.25
Hennes & Mauritz, H & M	6.00	Skanska	8.00
Hexagon	10.55	SKF	7.55
Holmen	9.80	SSAB	10.25
Hufvudstaden	8.00	Stora Enso	11.50
Höganäs	6.75	Swedish Match	7.75
JM	11.25	Tele2	7.50
Kungsleden	8.75	TeliaSonera	14.00
Lundin Petroleum	12.25	TietoEnator	7.00
Meda	5.75	Trelleborg	9.00
Millicom International Cellular	6.00	Volvo	11.00

APPENDIX B.

Companies listed on Nasdaq OMX Stockholm large cap list year 2006

<u>Company name</u>	<u>Company name</u>
ABB	Millicom International Cellular
Alfa Laval	Modern Times Group, MTG
ASSA ABLOY	NCC
AstraZeneca	Nobel Biocare
Atlas Copco	Nobia
Autoliv	Nokia
Axfood	Nordea Bank
Boliden	Old Mutual
Castellum	OMX
D. Carnegie & Co	Oriflame Cosmetics
Electrolux	Peab
Elekta	Ratos
Eniro	SAAB
Ericsson	Sandvik
Fabege	SAS
Getinge	SCA
Hennes & Mauritz, H & M	SCANIA
Hexagon	Seco Tools
Holmen	Securitas
Hufvudstaden	Skandinaviska Enskilda Banken
Husqvarna	Skanska
Höganäs	SKF
Industrivärden	SSAB
Investor	Stora Enso
JM	Swedbank
Kaupthing Bank	Swedish Match
Kinnevik	Svenska Handelsbanken
Kungsleden	Tele2
Latour	TeliaSonera
Lawson Software	TietoEnator
Lundbergföretagen	Trelleborg
Lundin Petroleum	Volvo
Meda	Vostok Nafta
Melker Schörling	

APPENDIX C.

Voluntary disclosed information examined

1. Summary of historical results

- a. Return on assets or sufficient information to compute ROA (net income, tax rate, interest expense, and total assets)
- b. Net profit margin or sufficient information to compute PM (net income, tax rate, interest expense, and sales)
- c. Asset turnover or sufficient information to compute TAT (sales and total assets)
- d. Return on equity or sufficient information to compute ROE (net income and total equity)
- e. Trends in the industry
- f. Discussion of corporate strategy

2. Other financial measures

- a. Free cash flow (or cash flow other than those reported in SCF)
- b. Economic profit, residual income type measure
- c. Cost of capital (WACC, hurdle rate, EVA target rate)

3. Nonfinancial measures

- a. Percentage of sales in products designed in the past few (3–5) years
- b. Revenues from new products/services are discussed?
- c. Market share
- d. Units sold (or other output measure, e.g., production)
- e. Unit selling price
- f. Growth in units sold (or growth in other output measure, e.g., production)
- g. Growth in investment (expansion plans, number of outlets, etc.)
- h. Barriers to entry are discussed (e.g. patents, trademark, etc.)

4. Projected information (for company as whole)

- a. Forecasted market share
- b. Cash flow forecast
- c. Capital expenditures, R&D expenditures, or general investment forecast
- d. Profit forecast
- e. Sales forecast
- f. Other output forecast
- g. Industry forecast (of any kind)