**Economic Consequences of Mandatory Adoption of IFRS in the Netherlands**

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**Chapter 1 Introduction**

This thesis examines the capital market effects of mandatory adoption of International Financial Reporting Standards (IFRS) in the Netherlands. From 2005 and onwards, all listed firms in in EU-countries were obliged to adopt IFRS in their consolidated financial statements. By mandating IFRS, the EU aimed to achieve harmonization in financial information presented by all listed companies in their member states in order to ensure a high degree of transparency and comparability of financial statements and hence an efficient and cost-effective functioning of the capital market (European Community, 2002).

Proponents of IFRS argue that widespread adoption of IFRS yields a variety of advantages for investors. IFRS are believed to offer more accurate, complete and timely information for investors compared to the local counterparts they replace, resulting in better informed markets. Also small investors are more likely to compete with larger, better informed investors. Hence reducing the risk when trading with a better informed counterparty. Another perceived advantage of widespread international adoption of IFRS is the increase in consistency and comparability between firms, which could make it less costly for investors to adjust for international differences. In general, proponents argue that widespread adoption of IFRS reduces risk for investors, resulting in more efficient capital markets (Ball, 2006). According to disclosure theory, increased disclosure and greater comparability should lead to a lower cost of equity capital and increased market liquidity[[1]](#footnote-1).

Whether adoption of IFRS has led to an increase in disclosure quality and consequently in lower cost of equity capital and increased market liquidity has been a subject of debate ever since. At the time of introduction, there was skepticism on these expected positive capital market effects on mandatory adoption of IFRS. Although there had been evidence on positive capital market effects of voluntary adoption of IFRS (e.g. Leuz and Verrecchia, 2000; Barth et al. 2008), the findings of these studies do not necessarily apply to mandatory adoption because voluntary adopters had chosen themselves, after weighing their costs and benefits of voluntary adoption. Firms that applied IFRS for the first time in 2005, were forced. Studies that have performed research on the capital market effects of mandatory adopters show mixed results (e.g. Hail and Leuz, 2007; Bevers, 2009; Li, 2010). Another argument is that the quality of reporting does not solely rely on the quality of accounting standards, but also on factors such as countries’ legal institutions that enforce these standards (Leuz et al. 2003; Li, 2010). Another cause for concern on mandatory adoption of IFRS is the use of fair value accounting, which plays a more prominent role compared to Dutch GAAP.

Although the arguments against or in favor of mandatory adoption of IFRS are numerous, it still remains an empirical question whether mandatory adoption has resulted in positive capital market effects. In this thesis I test whether mandatory adoption of IFRS has had a positive effect on the cost of equity capital. The sample used is comprised of all Dutch listed firms in the period from the year 2002 until 2010. According to disclosure theory, there should be a negative relationship between the cost of equity capital and increased disclosure. In other words, greater disclosure will lead to a reduction of the cost of equity capital. In order to see whether mandatory adoption of IFRS has led to an increase in the cost of equity capital, I will test the following hypothesis:

*H1: Mandatory adoption of IFRS has a negative relationship with the cost of equity capital.*

In order to test this hypothesis, I will perform a regression analysis with the cost of equity capital as a dependent variable, a set of control variables and most importantly, an indicator variable for mandatory adoption of IFRS. To estimate the cost of equity capital, I will use the estimation model of Easton (2004). One limitation of estimating the cost of equity capital using an estimation model such as the one proposed by Easton (2004), is that these models are based on analysts’ forecasts about a firm’s future cash flows. Using analysts’ forecasts could result in measurement errors and biases in cost of equity capital estimates. According to disclosure theory, a decrease in information asymmetry is associated with the cost of equity capital. To find possible support for the conclusion made with regard to the cost of equity capital I will perform a secondary regression on a proxy for information asymmetry. As a secondary analysis, following Li (2010), I will test whether mandatory adoption has led to a decrease of the bid-ask spread, which is a widely used proxy for information asymmetry in prior research. According to disclosure theory, the level of disclosure is negatively related with information asymmetry and the bid-ask spread. Therefore I will test the following hypothesis:

*H2: Mandatory adoption of IFRS has a negative relationship with the bid-ask spread.*

Following Li (2010), I will perform a regression with the relative bid-ask spread as a dependent variable. I will use a set of control variables and an indicator variable for the mandatory adoption of IFRS. If the theory on disclosure holds, the findings with regard to the bid-ask spread should roughly reflect the same effects as is observed with the cost of equity capital. Higher levels of disclosure result in lower information asymmetry among investors, which results

Prior studies on mandatory adoption of IFRS have shown some evidence on positive capital market effects (e.g. Bevers, 2009; Li, 2010, Christensen et al., 2013). These studies are mostly based on one or two post-mandatory adoption years, capturing only short-term effects of mandatory IFRS adoption. Differences in chosen sample sizes, country samples and chosen variables in regression have resulted in different conclusions in prior research. Using a larger sample of six mandatory adoption years I capture long-term effects of mandatory adoption. By using more years in the sample, firm-year observations occurring during the financial crisis are included as well.

This thesis will be outlined as follows. Chapter 2 discusses the theoretical link between disclosure and its cost and benefits and will review the general disclosure theory. Although this thesis will focus on the firm-specific benefits of disclosure (i.e. reduced cost of equity capital and increased market liquidity), other theories on firm-specific costs and economy-wide costs and benefits of disclosure will be addressed as well. This is done to be able to put things into perspective when interpreting results of the performed analyses. Chapter 3 will focus on prior research that is specifically relevant for the main hypothesis. Differences between domestic GAAP and IFRS, and prior research on capital market effects, their used research methods and their limitations. This is useful in forming expectations with regard to the dependent variables in our research. Furthermore, discussing used research methods and limitations in prior research will give insights in what issues should be taken into account when conducting research. Chapter 4 will be devoted to estimating the cost of equity capital and its limitations. The results of this research will be highly dependent on the chosen estimation method. Chapter 5 goes more into detail on which variables are chosen and how specific data is obtained and calculated. The results from regressions will be discussed in chapter 6. In chapter 7, I will draw my conclusions, account for limitations and show possible directions for further research.

**Chapter 2 Corporate Disclosure Theory**

**2.1 Introduction**

The research, presented later in this thesis, will focus solely on the relationships between disclosure, market liquidity and cost of equity capital and does not intend to analyze to which extent the benefits exceed the costs or vice-versa. However, with interpreting the results of the research, it will be important to bear in mind that besides cost of equity capital and market liquidity effects, other (economy-wide) costs and potential benefits exist as well. Chapter 2 draws on the literature reviews provided by Healy and Palepu (2001), Botosan (2006) and Leuz and Wysocki (2008) supplemented with more recent literature.

Many theories exist about the costs and benefits of disclosure. Corporate disclosures are expected to lower cost of equity capital and improve market liquidity. Also, disclosure can improve firm value by affecting manager’s decisions. On the other hand, disclosure may impose costs for firms. These costs can be either direct or indirect. For instance, preparation costs of annual reports are direct costs. Indirect costs are, for instance, costs associated with the usage of information by competitors.

**2.2 Benefits of Disclosure**

**2.2.1 The link between information and market liquidity**

A firm-specific benefit of increased disclosure widely supported by the disclosure literature is improved market liquidity[[2]](#footnote-2). The benefit of improved market liquidity is generally motivated by the following theory. Information asymmetry among investors, which means that less informed investors have to trade with better or *privately* informed investors, introduces adverse selection into share markets. Consequently, lesser informed investors lower their price at which they are willing to buy to adjust for potential losses from trading with better or privately informed investors. On the other hand, the counterparty is willing to sell for a higher price. This price protection introduces bid-ask spreads[[3]](#footnote-3). Both information asymmetry and adverse selection reduce the amount of shares investors are willing to trade. This results in a lower liquidity of share markets. (Leuz and Wysocki, 2008).

Following the disclosure theory, increased[[4]](#footnote-4) disclosure should mitigate information asymmetry and adverse selection costs, resulting in improved market liquidity. According to Verrecchia (2001) corporate disclosure mitigates adverse selection problems and increases market liquidity by “leveling the playing field among investors”. This works in two ways. First, an increase in *public* information makes it more difficult to become *privately* informed. Due to this, the chance for an uninformed investor to trade with a better, privately informed counterparty becomes smaller. In the second place, greater disclosure reduces uncertainty about the value of a firm, which is also a potential advantage an informed investor might have (Leuz and Wysocki, 2008). Both effects reduce the degree of price protection, which in turn leads to an improvement in market liquidity.

Several empirical studies support the hypothesis of improved market liquidity through increased disclosure. For instance, Welker (1995), Healy et al. (1999) and Leuz and Verrecchia (2000) all show evidence for the existence of a positive relationship between the level of disclosure and market liquidity proxies*.* In his sample of 2,048 US firm-year observations from 1983 through 1991, Welker (1995) finds a significant negative relationship between analysts’ ratings of firms’ disclosures (which serves as proxy for information quality), and bid-ask spreads. His study finds that firms in the lowest third of the analysts’ ratings show approximately 50 percent higher bid-ask spreads than firms in the highest third. Healy et al. (1999) show evidence, for their sample of disclosure increasing US firms in the period 1978-1991, that voluntary disclosure is accompanied by an improvement of market liquidity for firms’ shares, with relative bid-ask spreads as proxy for market liquidity. Leuz and Verrecchia (2000) find a significant association between firms’ disclosure policies and their market liquidity proxies share turnover and bid-ask spread, similar to the theory mentioned above. They used a sample of German firms that voluntarily switched from German GAAP to either IAS or US GAAP. Those international accounting regimes required firms to disclose significantly more information than under German GAAP. For these firms, higher trading volumes and lower relative bid-ask spreads were observed.

**2.2.2 The link between information and the cost of equity capital**

Besides an increase in market liquidity, another important capital-market benefit used in disclosure literature is that an increase in disclosure reduces a firm’s cost of equity capital. The cost of equity capital is the minimum rate of return common shareholders require for providing capital to the firm (Botosan, 2006). In disclosure research, this negative link between disclosure and cost of equity capital is explained using either information asymmetry or estimation risk.

The most dominant stream suggests that information asymmetry and adverse selection create trading costs for investors, which make investors less willing to buy shares (i.e. lower market liquidity). To overcome the reluctance to buy shares, the firm needs to compensate for this and offers capital at a discount. Discounting results in less proceeds to the firm and hence higher cost of equity capital (Leuz and Verrecchia, 2000). Simply put, investors pay less for shares with higher transaction costs, resulting in a higher cost of equity capital. Increased disclosure mitigates information asymmetry and adverse selection problems, lowering transaction costs. As a result, this lowers the cost of equity capital. According to disclosure literature this indirect link between accounting information and the cost of equity capital through information asymmetry is only present when there is some sort of capital market imperfection (e.g. Hughes et al. 2007; Lambert et al. 2012; Armstrong et al. 2011). In these studies, models with perfect market competition show that information asymmetry has no separate effect on the cost of equity capital.

The other stream links disclosure and cost of equity capital with estimation risk. In asset pricing, estimation risk refers to an element of risk that arises because investors are uncertain about the parameters of a security’s return or payoff (Botosan, 2006). Because investors base their parameter estimations (e.g. expected future cash flows) on available information, their confidence level depends on the amount and quality of their information set (Botosan, 2006). With estimation risk being non-diversifiable for investors (e.g. Coles et al., 1995), lower levels of disclosure will lead to higher estimation risk and consequently to higher cost of equity capital.

Studies conducting empirical research on the relationship between disclosure level and cost of equity capital face the methodological challenge that both disclosure level and especially cost of equity capital are difficult to measure. Disclosure level is often measured using analysts’ perceptions’ or self-constructed disclosure scores (e.g. Botosan, 1997). In other studies, the level of disclosure isn’t measured but expected to be higher beforehand, e.g. in situations when there are significant changes in disclosure policies. The cost of equity capital is measured with the use of different estimation methods. Cost of equity capital is either estimated directly by using estimation models, or indirectly by investigating proxies for information asymmetry, market liquidity, transaction costs or estimation risk. With the indirect method, the effect on the cost of equity capital is derived from these proxies. These methodological differences can in part be explanatory for the fact that empirical studies on the relationship between cost of equity capital and disclosure show mixed results.

Botosan (1997) shows a significant association between greater disclosure and lower cost of equity capital. She measured the level of disclosure by using a self-constructed voluntary disclosure score index, in which points are assigned when certain information is disclosed. The negative relation between a firm’s disclosure score and the cost of equity capital was only found for firms with low analyst following. For firms with high analyst following no significant results with regard to this relationship were found. Suggesting that the extent of analyst following is associated with information asymmetry and consequently the cost of equity capital. This view is also supported by Bowen et al. (2008), who show evidence of a negative relationship between analyst coverage and cost of equity capital, which is achieved through reduction of information asymmetry. Botosan and Plumlee (2001) suggest that the relationship between disclosure level and cost of equity capital may vary by type of disclosure. They can’t find any significant relationship between *overall* disclosure level and cost of equity capital. However, when limiting analyses to different types of disclosure they conclude that cost of equity capital decreases when disclosure levels in annual reports increase. They also show that, in contradiction to theory, more timely disclosures lead to an increasing cost of equity capital. A possible explanation for the latter result is that greater timely disclosure leads to an increase in stock volatility, which could result in higher cost of equity capital. Hail (2003) finds for his sample of Swiss firms low levels of cost of equity capital for firms which are more forthcoming in disclosing information. For this study, Switzerland was perceived to be serving as a suited environment because disclosure requirements are relatively low, and variation in disclosure policies high. Francis et al. (2008) find a significant negative relation between their self-constructed voluntary disclosure score and cost of equity capital. However, when conditioning for earnings quality, the cost of equity capital effect of voluntary disclosure disappears completely, or is reduced significantly. This suggests an important role for earnings quality in influencing voluntary disclosure decisions and their perceived outcomes (Francis et al., 2008).



*Figure 1 Diagrammatic representation of related theoretical literature (Botosan et al., 2004).*

Figure 1, which is drawn from Botosan et al. (2004), shows the theoretical framework on the link between disclosure and cost of equity capital discussed until now. The dashed line on the left side of the diagram shows the estimation risk stream of research. This line of research shows that an increase in both public and private information leads to a lower cost of equity capital through reduced estimation risk. The other stream of research is captured by the dotted and solid lines on the right. This stream suggests that greater *private* information increases information asymmetry amongst investors (and market liquidity and adverse selection problems), resulting in a higher cost of equity capital. On the other hand, more *publicly* availableinformation makes it more costly to get more *privately* informed, which results in a lower cost of equity capital. Generally, prior empirical research on the link between disclosure and cost of equity capital tends to focus on public information and does not consider private information. However, omission of the variable private information does not change the negative association between public information and cost of equity capital, assuming that the association between public and private information is negative. But not considering private information makes it hard to conclude which of these variables explain observed results (Botosan et al, 2004). The study conducted by Botosan et al. (2004) is one exception. They investigate the association between the quality of public *and* private information and cost of equity capital. They find a negative relationship between public information precision and cost of equity capital, but this effect is more than cancelled out by the positive association between private information precision and cost of equity capital. Their study also concludes that both public and private information are positively correlated, implying that a model should include both variables, otherwise risking an omitted variable bias. Another study that focuses on both private in public information is the one conducted by Easley and O’Hara (2004). They conclude that differences in the structure of disclosed information, (i.e. public and private information) affect cost of equity capital. Investors demand higher returns for stocks that have greater private information and less public information than for stocks that show the opposite information structure. Another important implication of the study of Easley and O’Hara (2004) is that firms can influence the level of their cost of equity capital by disclosing a higher quantity of information, or more precise information. Firms can achieve this by selecting their accounting standards and disclosure policies. Attracting (more) analyst following is another way for a firm to lower cost of equity capital, with the presumption that analysts provide precise and reliable information. Another factor by which a firm can influence its cost of equity capital is the market where the stock is listed for trading. Investors learn from prices, and the way how quickly and accurate information is reflected in prizes can differ amongst markets. These factors mentioned by Easley and O’Hara (2004) give useful insights that cost of equity capital can be determined by other factors than a firm’s product market decisions.

**2.2.3 Other benefits**

Another stream of research, which isn’t captured in figure 1, expects that corporate disclosure alters the distribution of future cash flows by affecting managers` decisions in a positive way. Agency theory suggests that increased transparency and better governance improves managers’ decisions and reduces opportunistic behavior, both positively affecting firm value (Leuz and Wysocki, 2008). For instance, Lambert et al. (2007) show that a firm’s cost of equity capital is influenced by the quality of its disclosed accounting information, both directly as indirectly. Directly by improving market participants *expectations* about the distribution of future cash flows, lowering estimation risk and ultimately the cost of equity capital. And indirectly by changing managers’ real decisions, which alter the distribution of cash flows.

**2.3 Costs of Disclosure**

The research presented later in this thesis will focus on firm-specific benefits of disclosure. However, to be able to place things into perspective, it is also important to take costs into consideration when evaluating the results. In general, the firm-specific costs of disclosure are either direct or indirect. Costs associated with the preparation and dissemination of financial reports are direct costs. These costs can be significant and have grown larger since the increasing importance of reporting regulation and its enforcement. The direct costs are even larger when the opportunity costs of those involved in the disclosure process are included (Leuz and Wysocki, 2008). These costs can be particularly significant for smaller firms, which is illustrated by e.g. Bushee and Leuz (2005). They show that the costs of complying to a change in disclosure regulation mandated by the U.S. Securities and Exchange Commission (SEC) outweigh the benefits for smaller U.S. firms. De George et al. (2013) find evidence for an increase of audit fees due to mandatory IFRS adoption of 8% for a sample of Australian firms. They find evidence for disproportional higher costs for smaller firms as well.

Corporate disclosure has indirect costs as well. Information disclosed in e.g. annual reports can be used to the advantage of other parties like competitors, tax authorities and labor unions. Consequently, firms can become less forthcoming in disclosing information. These costs are often referred to as ‘proprietary costs’. This is illustrated by Cohen (2002), who finds evidence that high proprietary costs are associated with a lower precision (“quality”) of reported accounting earnings. In contrary, there can be situations in which a competitive threat may not limit firms in disclosing information. Firms may disclose information to prevent entry of new competitors (Leuz and Wysocki, 2008). Or firms may disclose information about market demand to prevent overproduction (Kirby, 1988). These examples illustrate the complexity of the relationship between proprietary costs and disclosures. Another related argument is that increased disclosure could result in indirect costs when certain financial criteria aren’t met, e.g. solvability requirements in covenants with bank. (Leuz & Wysocki, 2008).

**2.4 Externalities of Disclosure**

The previous sections have discussed theories on the firm-specific benefits and costs of disclosure. But a branch of the disclosure literature distinguishes positive and negative effects of disclosure that go beyond the disclosing firm itself. In economic theory, these effects are called externalities and can generally be defined as follows:

“*A cost or benefit that arises from production and falls on someone other than the producer, or a cost or benefit that arises from consumption and falls on someone other than the consumer is called an externality.” (Parkin, 2005).*

Externalities can be either negative or positive. Externalities arise when economic agents trade off their private cost and benefits in their production or consumption decisions, but don’t compensate for the social costs. If the social costs exceed the private costs, a negative externality arises. When the social benefits exceed the private benefits, a positive externality arises. This theory can also be applied to the disclosure theory.

One example, mentioned in section 2.3, is that the disclosure of information can be beneficial for competing firms. But disclosure of information can also affect other, non-competing parties in other industries. For instance, information about best practices or trends in consumer behavior and technology can be useful for other non-competing firms’ decision making and could also help in solving their agency problems. Disclosed information on e.g. operating performance of one firm can serve as a benchmark for outside investors in assessing the managerial efficiency of other firms. This could lower the costs of monitoring. Although the individual contribution of a firm’s disclosure of these *information transfers* is relatively small, the aggregate effect of all individual contributions can be large. These aggregate effects on the economy are still largely unexplored. Most of the work in this area has focused on information transfers in capital markets (Leuz and Wysocki, 2008).

The accounting literature on information transfers has shown that information provided by one firm often affects the demand and share price of other firms. Lambert et al. (2007) conclude that disclosure of each firm has impact on investors’ covariances of other firms, which leads to a lower estimation risk and eventually in a lower cost of equity capital for these other firms. Jorgensen and Kirschenheiter (2007) find a similar result, for disclosure of information on a firms’ sensitivity to a market-wide risk factor. However, besides positive externalities, negative externalities can occur as well. One example is that disclosure of one firm can attract investors away from other firms and lower the price efficiency of other firms in markets that are not perfectly competitive (Fishman and Hagerty, 1989). A firms’ *mis*reporting activity may have negative externalities as well, by influencing the decision making of investors or other firms, by giving false information on e.g. consumer trends, new technologies, investment opportunities and so on (Sidak, 2003).

The examples given above show that the theory on externalities of disclosure is an interesting, but complex subject. Disclosure activities can create small private costs on the disclosing firms, however the aggregate effects can be substantial. Generally, individual firms cannot internalize and will not compensate for the social costs of their disclosure activities, and will only trade off their private costs. Hence firms will not provide a socially optimal level of disclosure (Leuz and Wysocki, 2008). Externalities provide one reason to justify mandatory disclosure regulation, which is the subject of the next paragraph.

**2.5 Mandatory disclosure regulation**

It is important to note that existing capital-market benefits of disclosure alone do not justify mandatory disclosure regimes. In a situation where the benefits exceed the costs, a disclosing firm has the incentive to disclose more information voluntarily. This is illustrated by the ‘unraveling’ argument (e.g. Ross, 1979). The basic idea behind the unraveling argument is that, firms that don’t disclose information are considered as ‘bad’ firms by investors. This forces these firms to disclose more information to become considered as ‘good’. In equilibrium all firms will be forced to voluntarily disclose information, making a mandatory regime seem redundant. In addition, firms are able to make a tradeoff between the costs and benefits and are better informed about these tradeoffs than regulators and standard setters, which could lead to a sub-optimal market solution. In practice however, firms don’t disclose all their information.

Given the reasons mentioned above, an economic justification for a mandatory regime has to consider why a market solution will not lead to a desired level of disclosure. And consequently, for a mandatory regime it is important that it will lead to a better social desirable level of disclosure than a market solution would provide. The disclosure literature uses three arguments to justify mandatory disclosure (Leuz and Wysocki, 2008): the existence of externalities, economy-wide cost savings from regulation, and strict sanctions serving as a commitment device.

As noted before, externalities occur when the social values of information differ from the values of information of reporting firms. When this is the case, firms trade of their firm-specific benefits and costs and do not provide the desirable level of disclosure. The level of disclosure produced by firms can either be greater or less than the socially optimal level. Regulating disclosure mitigates this problem of under- or overproduction of information.

Another argument is that mandatory disclosure regulation serves as a commitment device (e.g., Rock 2002). Without disclosure regulation to commit to, either in good or bad times firms have incentives to manipulate or omit information. However, a mandatory disclosure regime provides a form of commitment and forces companies to disclose information in both good and bad times. This should lead to a reduction in information asymmetry and uncertainty (Verrecchia, 2001) and ultimately lead to positive effects on cost of equity capital and market liquidity.

A third argument given in disclosure literature is that producing a sufficient level of information can be very expensive. Furthermore, the penalties that private contracts can impose are low. If these penalties are not sufficient, a strongly enforced mandatory disclosure regime can be beneficial. E.g. there can be situations in which a firm doesn’t seek beneficial disclosure commitments. Large shareholders and corporate insiders may extract private advantages from controlling the firm. Corporate insiders can be reluctant to commit to a sufficient disclosure level if this would hurt their private benefits, even if this would be beneficial for firm value. Investors react to this behavior by lowering the share price of the disclosing firm, which eventually creates costs for shareholders (Jensen and Meckling, 1976).

**2.6 Mandatory adoption of IFRS**

A growing body of disclosure literature provides mixed arguments on whether or not mandatory adoption of IFRS yields any positive capital market effects. Although it remains an empirical question, it is still useful to consider these arguments against or in favor of potential effects of mandatory IFRS adoption.

Arguments stating that mandatory adoption of IFRS yields positive capital market effects often start with the assumption that introduction of IFRS requires companies to disclose a higher level of financial disclosure than under most local accounting standards. Assuming this is correct, this would imply an increase in market liquidity and a reduction of cost of equity capital, similarly to the theory mentioned at the beginning of this chapter. Another argument in favor of positive capital market effects is that introduction of IFRS improves comparability of firms. Yip and Young (2012) show that, for their sample of European firms from 17 countries, comparability between IFRS adopting countries has improved in their post-IFRS period (2005-2007) compared to their pre-IFRS period (2002-2004). Additionally, Barth et al. (2012) find evidence that mandatory IFRS adopters have greater comparability with US firms reporting under US-GAAP when they apply IFRS than when they applied non-US domestic standards in the pre-IFRS period. Increased comparability doesn’t imply a higher quality and level of information per se, but the financial information of firms gets more useful for investors. This results in lower information asymmetries and lower estimation risk for investors, both leading to a reduction in cost of equity capital and an increase in market liquidity (Hail and Leuz, 2007).

Prior studies show doubts about the assumption that IFRS increases information quality and comparability of firms, raising questions on whether IFRS yields any (positive) capital market effects. Although there is some empirical evidence that voluntary adoption of IFRS reduces cost of equity capital (e.g. Leuz and Verrecchia, 2000, Barth et al. 2008), it doesn’t necessarily apply to mandatory adoption, because firms that voluntarily adopt IFRS self-select after weighing their own costs and benefits (Leuz and Wysocki, 2008). Mandatory adopters are forced to adopt these rules.

The effectiveness of legal institutions enforcing the accounting standards plays an important role as well. Prior studies suggest that high quality standards alone do not automatically lead to a reduction in cost of equity capital or an improvement in market liquidity, but also the countries’ legal system is important to consider (Ball et al., 2003). Firms within countries with weak legal enforcement of accounting standards are more likely to use accounting standards to their own discretion and manipulate earnings (Burgstahler et al., 2006). Li (2010) concludes that reduction of the cost of equity capital due to mandatory adoption of IFRS is only present in countries with above average enforcement levels. Leuz et al. (2003) support the view that the quality of financial reporting is not dependent on the quality of accounting standards alone. They identify factors such as investor protection laws and enforcement as important factors that influence the quality of financial reporting. Also, under IFRS (just like any other set of accounting principles), firms have the possibility to interpret and apply these standards according to their own choices. This is illustrated by a study of Daske et al. (2013), who studied IAS/IFRS adopters from 1990 through 2005 and made a distinction between firms that adopted IAS/IFRS “seriously” and firms that adopted IAS/IFRS as a “label”. One concern is that firms adopt IFRS solely in name without making material changes to their reporting policies (Ball, 2006). Daske et al. (2013) show that the economic consequences were different across these groups. “Serious” adopters showed lower cost of equity capital effects and increased market liquidity, where “label” adopters did not. They concluded that simply adopting to IFRS does not mean a reduction in cost of equity capital and increase market liquidity per se.

Numerous studies investigate the relationship between adoption of IFRS and its impact on earnings management[[5]](#footnote-5). These findings are mixed. Barth et al. (2008) find for their sample of 327 firms from 21 countries that voluntary adopted IFRS in the period 1994-2003 show less earnings management, more timely loss recognition and more value relevance of earnings. Christensen et al. (2008) compared two groups of German firms: firms that had incentives to increase transparency and adopted IFRS voluntarily before 2005 and firms that did not have incentives to adopt and were forced to comply in 2005. They observed a reduction in earnings management for firms that already had adopted IFRS voluntarily. However, for firms that were forced to adopt IFRS for the first time in 2005 no significant reduction in earnings management had been observed. Christensen et al. (2008) suggest that not just the accounting standards quality alone influence the quality of disclosure but also a firm’s reporting incentives. Ahmed et al. (2012) compare a broad sample of European mandatory adopters with a benchmark sample of firms from countries that did not adopt IFRS in 2005. Relative to their benchmark group, they found significant increases in earnings management for mandatory adopters. These results also hold for countries with strong legal enforcement. Overall, Ahmed et al. (2012) conclude that accounting quality declined after mandatory adoption of IFRS, and they suggest that positive economic consequences (such as decreased cost of equity capital) associated with mandatory adoption of IFRS may be driven by other factors than increased disclosure (e.g. increased comparability). Capkun et al. (2012) find a decrease in earnings management for voluntary adopters (similar to Barth et al. 2008), and an increase in earnings management for mandatory adopters (similar to Ahmed et al. 2012). Although the outcomes of Capkun et al. (2012) are similar to aforementioned studies, the difference in outcomes for early and mandatory adopters is attributed to other factors than firms’ reporting incentives. Although they observe an initial decrease for early adopters, they observe an increase in earnings management for this group after 2005, similar to the increase in earnings management by mandatory adopters. Therefore they attribute this increase of earnings management to the greater flexibility of IFRS standards during the transition period around 2005, instead to firms’ reporting incentives.

Another cause for concern on the adoption of IFRS is its stronger emphasis on fair value accounting. At the time of introduction, Ball (2006) mentioned potential problems of fair value in practice. One of his concerns was that fair value accounting leaves room for managerial influence in estimating fair value, therefore making information less useful for investors. Also the recent financial crisis has led to a debate on the widespread use of fair-value accounting. Opponents stating that widespread use of fair value could have contributed to the financial crisis. On the other hand, fair value is believed to be just the messenger (Laux and Leuz, 2010). Although it is not the purpose of this thesis to asses fair value and its role in the financial crisis, it may be useful to control for the financial crisis when studying the relationship between mandatory adoption of IFRS and the cost of equity capital. This will be addressed in chapter 5.

**2.7 Summary**

Many theories exist about costs and benefits of corporate disclosure. Prior studies generally have shown a negative relationship between increased disclosure and cost of equity capital and a positive relationship between increased disclosure and market liquidity. Although these concepts are well developed in disclosure literature, this doesn’t necessarily mean that this notion is applicable to mandatory adoption of IFRS. There are mixed views on whether or not implementation of IFRS yields positive (if any) capital-market effects. Switching accounting regimes alone doesn’t necessarily lead to a higher level or quality of disclosure. A firms’ commitment to accounting regimes could be influenced by its reporting incentives, making enforcement an important issue to consider in research on the capital-market effects of IFRS. Furthermore, IFRS has been associated with increased earnings management, which could imply a lower level of disclosure, and consequently negative capital market effects. On the other hand, IFRS has been associated with increased comparability for firms, which could imply positive capital market effects.

This thesis focuses on the capital-market effects of mandatory IFRS adoption, i.e. cost of equity capital and market liquidity. It is important however to keep in mind that the study performed in this thesis doesn’t try to analyze the extent to which the economic benefits exceed the costs. Therefore, results should be interpreted cautiously. Although there are doubts that the mandatory introduction of IFRS will lead to any positive capital market effects, it remains an empirical question. The next chapter will be focusing on prior empirical research on mandatory IFRS adoption.

**Chapter 3 Prior research on mandatory adoption of IFRS**

**3.1 Introduction**

This chapter can be divided into two parts. The first part will focus on the differences between Domestic GAAP and IFRS at the time of mandatory adoption and beyond, to illustrate the extent of change at the time of implementation. Prior empirical research on mandatory adoption of IFRS will be the focus of the second part, to see how the effects of mandatory adoption and its capital market effects have been researched in the past and which methods and issues should be taken into account in performing the research of this thesis.

**3.2 Differences between domestic GAAP and IFRS**

There have been several studies on the differences between domestic GAAP and IFRS. For instance, Bae et al. (2008) studied differences in accounting standards with IFRS for 49 countries during 1998-2004. Based on surveys and review of prior literature, they identified a list of 21 common recurring differences[[6]](#footnote-6) between domestic GAAP and IFRS. For each identified difference, they checked whether or not this difference was observed for each country in their sample. The number of observed differences between domestic GAAP and IFRS ranged from 1 (the United Kingdom) to 18 (Luxemburg). The Netherlands showed a relative small amount of differences (4). France (12), Germany (11) and Italy (12) showed a relative higher amount of differences compared to the mean (9).

Ding et al. (2007) construct two measures of accounting differences between domestic standards and IFRS and studied their relationship with institutional settings. *Absence* measures the extent to which certain accounting rules are missing in domestic standards compared to IFRS. *Divergence* measures the extent to which domestic accounting rules treat certain accounting issues differently. Ding et al (2007) base their study on a large survey performed by Nobes (2001). This survey was published by seven large audit firms and was performed in 62 countries in which audit partners were asked to benchmark their local standards against IFRS. For each country the differences from 80 accounting measures are listed in 4 broad categories (Nobes, 2001)[[7]](#footnote-7):

1. Accounting may differ from what is required by IAS because of the absence of specific rules on recognition and measurement;
2. No specific rules requiring disclosures;
3. Inconsistencies between national and IAS rules that could lead to differences for many enterprises in certain areas; and
4. In certain enterprises, these other issues could lead to differences from IAS.

Ding et al. (2007) define *absence* as differences from the first en second categories, and *divergenc*e as differences from the third and fourth category. Ding et al. (2007) show that the *absence* is higher in countries with less developed equity markets and with a higher concentration of ownership. *Divergence* is positively associated with economic development and the strength of the accounting profession. They conclude that regulating bodies do not exist in isolation but in complex capital markets and legal environments, and that accounting rules are generally fit to this environment. Therefore Ding et al. (2007) suggest that, merely adopting IFRS may not be sufficient to substantially improve reporting quality and harmonization between countries, unless changes are made simultaneously to the capital market and legal environment. Ding et al. (2007) also document that *absence* is positively related with earnings management, suggesting that increasing the coverage of accounting issues in standards is essential to improve reporting quality. In this study the Netherlands showed *absence* of accounting rules compared to IFRS (ranging from 0 to 40) in 10 cases, and divergence in 23 accounting rules (ranging from 1 to 38).

Nobes (2006) focuses on consolidated statements of EU listed companies from 2005, to identify both motives and possibilities for international differences to continue after widespread mandatory adoption. He identifies multiple reasons for countries to differ in accounting rules and reasons for international differences to survive even after adoption of mandatory adoption of IFRS. Suggested reasons for international differences in accounting standards include differences in financing systems, legal systems and tax systems. Nobes (2006) also suggests multiple reasons for these international differences to survive even after mandatory adoption of IFRS. These reasons were as follows: (1) Different versions of IFRS; the IFRS version of the IASB differs from the EU-endorsed IFRS. (2) Different translations of IFRS; in translating IFRS difference could arise when leaving out words or translating words differently. (3) Gaps in IFRS; international difference will continue due to unattained matters in IFRS. (4) Options in IFRS standards; IFRS includes multiple standards that have options from which to choose from. (5) Vague criteria and interpretations in IFRS; IFRS standards include criteria that can be interpreted differently in different countries. (6) Estimations in IFRS; estimation practices can be different between adopting countries. (7) First-time adoption issues; IFRS 1 includes transition options which could result in international differences. (8) Imperfect enforcement: the degree of enforcement differs between countries. These reasons suggest that mandating IFRS for multiple countries in Europe did not necessarily result in full harmonization and comparability between countries.

In the year of mandatory adoption of IFRS, i.e. 2005, Ernst & Young (2005) made a comparison between Dutch GAAP and IFRS which applies to the annual reports of 2005. The differences were subdivided into three categories: *principles of accounting policies and valuation, presentation and notes to the financial statements.* For the differences applicable to the annual reports of 2005, 367 differences were found. In 216 of these cases IFRS is more stringent, in 98 cases Dutch GAAP. In 53 cases IFRS and Dutch GAAP were conflicting. The results of the comparison are summarized in the table below.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Conflicting | | | | | IFRS more stringent | | | | | Dutch GAAP more stringent | | | | |
|  | **2005** | **2004** | **2003** | **2002** | **2001** | **2005** | **2004** | **2003** | **2002** | **2001** | **2005** | **2004** | **2003** | **2002** | **2001** |
| Principles | 40 | 17 | 13 | 19 | 18 | 137 | 72 | 68 | 75 | 77 | 42 | 31 | 22 | 21 | 22 |
| Presentation | 13 | 7 | 6 | 7 | 7 | 29 | 21 | 19 | 21 | 18 | 23 | 14 | 12 | 12 | 13 |
| Notes |  |  |  |  |  | 50 | 31 | 28 | 30 | 30 | 33 | 16 | 16 | 15 | 11 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total | 53 | 24 | 19 | 26 | 25 | 216 | 124 | 115 | 126 | 125 | 98 | 61 | 50 | 48 | 46 |

*Table 3.1 Difference between IFRS and Dutch GAAP (Ernst & Young, 2005).*

Notable differences between 2004 and 2005 are the large rise in conflicting cases between principlesof IFRS and Dutch GAAP and cases in which IFRS is more stringent. This is caused by the fact that in 2005 many changes were enforced in IFRS, which weren’t enforced in Dutch GAAP (yet). The observed differences between Dutch GAAP and IFRS are spread out across all subjects. Some subjects show a large amount of differences, e.g. tangible fixed assets (15 differences), other financial assets (13), pension provisions (16), mergers and acquisitions (10) and foreign currency (16) (Ernst & Young, 2005).

Another survey performed by Ernst & Young (2006), studied the implementation of IFRS in 2005, by reviewing the 2005 financial statements of some of the largest companies in the world to see how they have applied IFRS. The overall observations of this study were as follows (Ernst & Young, 2006)[[8]](#footnote-8):

1. *The implementation of IFRS has been a resounding success overall*. According to Ernst & Young (2006), the implementation of IFRS meant that companies were faced with significant new accounting and reporting recognition, measurement and disclosure requirements. These challenges have been successfully dealt with.
2. *The IFRS financial statements for 2005 retained a strong national identity.* The changes in firms’ financial statements resulting from the change from local GAAP to IFRS were mainly related to recognition, measurement and disclosure of items in financial statements rather than the form or presentation of the financial statements. The financial statements kept a strong national identity. This was due to the absence of an adequate IFRS standard dealing with presentation of financial statements. Also, the use of IFRS was yet to be evolved by first time adopters of IFRS, resulting in companies that adopted IFRS in such a way that minimizes changes in financial reporting as when they did under local GAAP.
3. *IFRS implementation has required extensive judgment to be applied in the selection and application of IFRS accounting treatments and this restricts consistency and comparability.* According to Ernst & Young (2006), IFRS consists of some standards that allow for alternative accounting treatments to be applied[[9]](#footnote-9). Consequently, the judgment of management plays an important role in the choice for certain accounting policies, which threatens comparability and consistency among companies. One of the most apparent examples subject to managerial judgment is valuation at fair value. IFRS contains more specific requirements than local GAAPs involving valuations and lean more towards fair value than most local GAAPs. Various assumptions and methods can be used in estimating fair value resulting in less consistency and comparability between firms’ financial statements.
4. *Companies do not seem confident that IFRS financial information is sufficient, or in some cases entirely appropriate, for the purpose of communicating their performance to the markets.* In 2005, there was a widespread use of alternative non-IFRS measures in firms’ financial disclosures, suggesting that there is a gap between IFRS and what managements believe is necessary to disclose.
5. *IFRS financial statements are significantly more complex than financial statements based on national accounting standards. This complexity threatens to undermine the decision usefulness of IFRS financial statements.* The greater complexity of IFRS compared to national GAAPs is caused by both more extensive recognition and measurement rules[[10]](#footnote-10) in

IFRS, and from the far greater number of required disclosures in IFRS. IFRS has become more complex over time. Ernst & Young (2006) believes that a reduction in the number of required disclosures is needed to improve the transparency and understandability of financial statements; more information doesn’t necessarily lead to greater transparency and better understanding.

Jermakowicz and Gornik-Tomaszewski (2006) performed a survey among 112 EU public traded companies that had to adopt IFRS, showing a somewhat different perspective compared to Ernst & Young (2006). This survey indicates the following:

1. A majority of respondents have adopted IFRS for more than just consolidation purposes, but also for individual accounts;
2. The process is costly, complex and burdensome;
3. Companies do not expect that implementing IFRS lowers their cost of equity capital;
4. The more comprehensive the approach to conversion, the more respondents tend to agree with the benefits and costs of the transition;
5. Companies expect increased volatility of their results;
6. Identified challenges in convergence are the complexity of IFRS, the lack of implementation guidance and uniform interpretation; and
7. A majority of respondents would not adopt IFRS if it was not required by EU regulation.

When connecting the studies mentioned above with the relationship between the quality of disclosure and cost of equity capital it is not directly obvious whether mandatory adoption of IFRS in 2005 could have resulted in any positive capital market effects. Although Ernst & Young (2005) shows that there are significant differences between Dutch GAAP and IFRS, this does not necessarily imply that the level of information increased drastically when IFRS became mandatory for listed companies. Furthermore, even if IFRS contained greater levels of disclosure compared to Dutch GAAP, mandatory adoption could initially have had negative effects on cost of equity capital through decreased decision usefulness, lesser comparability and consistency, and lack of best practices as observed by Ernst & Young (2006). In addition, international differences and the possible existence of these differences after mandatory adoption could be an indication that the increase in comparability is not as big as expected at first.

Also, for the benefit of a smooth transition between IFRS and local GAAP, IFRS 1 *First-time adoption of International Financial Reporting Standards* allows firms to use various exemptions from the requirements of other standards. The objectives of IFRS 1 are: to ensure that an entity’s first IFRS financial statement is transparent and comparable over the presented periods; provides a suitable starting point for later financial statements; and can be generated at costs that do not exceed the benefits of users. This could imply that a study on mandatory adoption research and its capital market effects should cover more than just the first year of mandatory adoption, because the first year does not fully reflect the change from local GAAP towards IFRS. The studies mentioned in the next paragraph mainly include one or two mandatory adoption years in their sample[[11]](#footnote-11).

**3.3 Prior Empirical Research on mandatory adoption of IFRS**

Hail and Leuz (2007) studied the capital market effects of mandatory IFRS reporting in the EU. Their sample covered the fiscal years ending on or after January 2001 through December 31 2005. This sample therefore includes one post-mandatory adoption year. 21,656 firm-year observations from 5,863 unique EU firms were used, as well as a worldwide benchmark of 82,943 firm-year observations from 21,710 firms. In analyzing the effects on cost of equity capital and three market liquidity proxies, Hail and Leuz (2007) found mixed results. For the cost of equity capital, some evidence was found that the cost of equity capital is lower for all firms adopting IFRS and especially for those that adopted IFRS for the first time. However, the effects on the cost of equity capital were modest and dependent on the choice of benchmark sample. For the proxies for market liquidity, stronger results were found.

In their regression analysis Hail and Leuz (2007) included a dummy variable for mandatory adoption of IFRS (, which is the main variable of interest. For firms that adopted IFRS voluntarily before 2005, a dummy variable was included as well (, because these are likely to see smaller capital market effects compared to those that adopt IFRS in 2005 for the first time. Special attention is paid to the years leading up to mandatory adoption. It is possible that firms adopt IFRS in anticipation of the reporting requirement, to signal their superior quality over other firms. Moreover, market participants may update their assessment of IFRS once it becomes clear that IFRS becomes mandatory, and that reverting back to local GAAP isn’t possible anymore. Based on Armstrong et al. (2007), they chose the endorsement date of actual IFRS by the European Financial Reporting Advisory Group (EFRAG), i.e. June 19, 2002. For these firms an indicator variable is included as well (. Hail and Leuz (2007) perform the following regression analysis:

(1)

Where:

cost of equity capital and market liquidity proxies;

voluntary adopter dummy variable;

EFRAG endorsement dummy variable;

dummy variable for first-time adopters;

= set of control variables;

the constant;

parameter of the nth independent; and

error term.

stands for the cost of equity capital and three market liquidity proxies (i.e. bid-ask spreads, the illiquidity measure of Amihud (2002) and the proportion of zero return days[[12]](#footnote-12)). For the cost of equity capital, Hail and Leuz (2007) control[[13]](#footnote-13) for the risk-free rate, firm size, financial leverage, return variability, and forecast bias. For the market liquidity proxies, firm-size, return variability, and share turnover are used as control variable.

Daske et al. (2008) examined the economic consequences of mandatory IFRS reporting around the world by analyzing the effects on market liquidity, cost of equity capital and Tobin’s *q[[14]](#footnote-14)* using a large sample of 3,100 firm-year observations from 26 countries. Daske et al. (2008) state that these should reflect, among other things, changes in the quality of financial reporting and therefore possible improvements around adoption of IFRS. On average, a decrease of the cost of equity capital (and a corresponding change in Tobin’s *q*) was found, but only when the possibility of these effects occurring before the mandatory adoption date is accounted for. This suggests that the market anticipates the economic consequences of the mandate. With regard to market liquidity, mandatory adopters experienced significant improvements, ranging from 3% to 6%.

Following Hail and Leuz (2007), Daske et al. (2008) used the mean of four estimation models to serve as the cost of equity capital. For determining the market liquidity, 4 different proxies of market liquidity were used. IFRS adopters were divided into three categories: mandatory, early and late voluntary adopters. Also a binary indicator variable is created for first-time adopters, which should capture the average effect on firms that were forced to adopt IFRS for the first time. The variables for voluntary adoption are used to isolate firms that adopted IFRS before it became mandatory. The distinction between early and late voluntary depends on whether a firm adopted IFRS before or after the announcement of the mandatory adoption date[[15]](#footnote-15), two interaction terms with mandatory adoption observations are therefore included in the regression. This is done to capture the possible period-specific capital market effects of early or late voluntary adopters. These variables combined lead to the following regression model:

. (2)

Where:

market liquidity proxies, the cost of equity capital and Tobin’s *q* proxies;

dummy variable for firms that adopt IFRS before announcement date;

dummy variable for firms that adopt IFRS after announcement date but before 2005;

dummy variable for all observations after 2005;

interaction term;

interaction term; and

= dummy variable for firms that adopt IFRS for the first time in 2005; and

All other variables have already been defined.

Following Hail and Leuz (2007), for the cost of equity capital, Daske et al. (2008) control for firm size, financial leverage, the risk-free rate, return variability and forecast bias. In the liquidity regression, control variables are firms size, share turnover and return variability. To control for general trends and changes in the dependent variables, a sample of firms from countries where adoption of IFRS is not mandated is included.

Lee et al. (2008) compared the cost of equity capital of 17 countries in the period 1995-2006, and concluded that in countries with low regulation and low reporting incentives no evidence of a reduction in cost of equity capital was observed. They do however observe a reduction of the cost of equity capital for countries in which the regulation and the reporting incentives to disclose were already high. These findings do not support the notion that predicts greater benefits due to large differences between local GAAP and IFRS, but do support the view that a firms’ reporting incentives and level of enforcement of these rules play an important role in whether or not adoption of accounting standards results in a reduction of cost of equity capital. Lee et al. (2008) do state that this conclusion is based on two adoption years, and they expect that the lower-quality domestic GAAP countries will eventually benefit after a longer period. Lee et al. (2008) give special attention to the United Kingdom. For firms in the United Kingdom, a significant reduction in the cost of equity capital was observed. Lee et al. (2008) did not attribute this reduction to the change in accounting standards, which were roughly the same. They documented that the reduction in cost of equity capital was mainly observable for firms that had greater foreign demand, and suggest that greater cross-border comparability could be an important driver for the reduction in the cost of equity as well. To come to their conclusions Lee et al. (2008) use the following regression:

. (3)

Where:

the implied cost of capital for company *i* in year *t;*

enforcement level;

is a dummy variable for firm-year observation in the post-adoption period;

set of control variables;

country dummies; and

industry dummies.

All other variables have previously been defined.

is one of the five individual or aggregate dummy variables for which individual scores of 1 (0) are assigned for countries where the values of outsider rights, equity market importance and disclosure quality are above (below) the European average, and ownership concentration and earnings management are below (above) the European average. The aggregate score is a sum of the individual scores. for market value, book-to-market value, leverage, growth, R&D expenses and percentage of closely held shares. are country dummies and are industry dummies.

The study performed by Bevers (2009) limited his sample to Dutch listed companies, resulting in a sample of 62 companies and 203 firm-year observations. Firms that already adopted IFRS voluntarily before 2005 were eliminated from the sample. He found that the cost of equity capital was reduced due to mandatory adoption of IFRS with 106 basis points. He regressed the cost of equity capital with an indicator variable for mandatory adoption of IFRS and a set of control variables:

. (4)

Where:

cost of equity capital;

mandatory adoption dummy;

return variability;

leverage;

book-to-market ratio;

return on assets;

US-cross listing;

firms size; and

consumer price index (inflation).

All other variables have previously been defined.

Bevers (2009) used a single estimation model (Easton, 2004). The most important variable in the regression is the dummy variable for adoption of IFRS. This variable is denoted as “1” when IFRS is applied, and “0” when Dutch GAAP is applied. Bevers (2009) controls for return variability, leverage, book-to-market ratio, return on assets, US-listing, total assets and consumer price index. Bevers (2009) only included control variables if these variables had significant value in at least 2 or more papers from his literature review.

Bevers (2009) identified some possible limitations in his research. The use of one single model in estimating the cost of equity capital is one of its limitations. Using other estimation methods could result in other outcomes. Another limitation of this research is that the years 2005 and 2006 were used as post-adoption period. These were relatively good years for the Dutch economy. Bevers (2009) states that the inclusion of later, relatively worse years could possibly lead to other outcomes.

Li (2010) tested whether the mandatory adoption of IFRS in 2005 has led to a reduction in cost of equity capital European listed companies. Using a large sample of 6,456 firm-year observations of 1,084 EU firms during the period 1995 to 2006[[16]](#footnote-16), she found significant evidence that on average the cost of equity capital reduced by 47 basis points. In an additional analysis, she also found that this reduction is only present in countries with strong legal enforcement. Li (2010) measured the quality of enforcement using the average score of the efficiency of the judicial system, rule of law and corruption from La Porta et al. (1998). Interestingly, the Netherlands scores 10 out of 10 on this scale. Following Li’s (2010) conclusion on enforcement, could imply that a lower cost of equity capital can be expected for the Netherlands. Although Dutch firms are included in Li’s (2010) sample, no conclusions are drawn for the Netherlands or any other individual country in her sample. Another finding of Li (2010) is that that information comparability and increased disclosure are the mechanics behind the observed reduction in cost of equity capital, which supports the theory discussed in chapter 2.

In her analysis, she regressed the cost of equity capital on an indicator variable for adopter type (i.e. mandatory vs. voluntary), an indicator for the time period (pre- versus post 2005), the interaction between these two indicators and a set of control variables. This resulted in the following regression analysis:

(5)

Where:

the average of 4 different cost of equity capital estimation models;

mandatory adopter dummy for firms that adopt IFRS for the first time in 2005;

post adoption dummy for observations years occurring in or after 2005;

interaction term;

dummy variable for firms that have private placement (US-listing dummy);

a dummy variable equal to one if a firm trades its shares in a U.S. over-the-counter market (U.S. listing dummy);

dummy variable for firms that trade on the NYSE, NASDAQ or AMEX (US-listing dummy);

inflation;

return variabilty

dummy variables for type of industry; and

dummy variables for countries.

The cost of equity capital was measured using the mean of four different estimation models. Voluntary adopters were included in the regression to serve as a control group which, according to Li (2010), helps in isolating the effect of mandatory adoption of IFRS. The reduction in cost of equity capital was observed with mandatory adopters. For voluntary adopters, firms which already adopted IFRS before it became mandatory, no significant change in cost of equity capital was observed. Li (2010) included three US cross-listing variables (*PP, OTC* and *EXCH).* Firms that are also listed in the US have to comply with US GAAP as well, which could have positive effects on the cost of equity capital. Following prior research Li (2010) also controls for return variability, type of industry and country indicators. In an additional analysis a dummy variable for firms in countries that show higher enforcement levels (i.e. compared to the mean) is included in the regression model above.

Because of possible measurement errors and potential biases in estimating cost of equity capital, Li (2010) performed the same analysis with the bid-ask spread as an alternative dependent variable. Proxies for information asymmetry, like the bid-ask spread, do not have to be estimated using models and are directly observable. For instance, they do not rely on analyst forecasts as many models in estimating the cost of equity capital do. In this sensitivity analysis, Li (2010) did not found any conflicting results.

Li (2010) identified some caveats in her research. Firstly, as prior research suggests (Easton and Monahan, 2005), the cost of equity capital is hard to estimate reliably. Therefore, her results should be interpreted cautiously. Secondly, the post-mandatory IFRS period in the sample is spread out over the years 2005 and 2006, which could be a too short period of time to cover the long-term effect on the cost of equity capital. Another important caveat mentioned in the study of Li (2010) is that it focused solely on the effect on the cost of equity capital. However, as theory suggests, there are other possible direct and indirect benefits and costs associated with mandatory adoption of IFRS. Li (2010) notes that this should be taken into account when interpreting the results of her research.

Christensen et al. (2013) focus on the market liquidity effects of mandatory IFRS adoption using a sample of 45 IFRS countries (of which 25 are EU and 20 non-EU benchmark countries), in the period ranging from the first quarter of 2001 until the last quarter of 2009. The study of Christensen et al. (2013), suggests that strong institutions and legal systems (enforcement) play an important role in assessing whether or not changes in accounting regimes result in positive capital market effects. However, they only find evidence for a significant improvement in market liquidity for countries in which mandatory adoption of IFRS was accompanied with a significant *change* in enforcement. Countries that already had high levels of enforcement that showed no significant change in enforcement at the time of mandatory IFRS adoption showed no significant increase in market liquidity. Therefore Christensen et al. (2013) conclude that changes in enforcement are crucial for documenting effects on market liquidity, and not the change in accounting regime per se. They do however emphasize that their conclusion does not imply that mandatory adoption of IFRS plays no role at all. It is possible that the increase in market liquidity would have been smaller without IFRS adoption, or that IFRS was a pre-condition for the enforcement changes that took place. To come to their conclusions Christensen et al. (2013) use the following regression method. In this regression, the single IFRS dummy is replaced with three separate dummies for countries that switched to IFRS.

(6)

Where:

market liquidity proxies;

dummy variable for countries that made substantive change in enforcement;

dummy variable for countries that did not make substantive changes;

dummy variable for countries that did adopt IFRS but are not from the EU;

set of country, industry and year controls (e.g. regulatory quality, country size);

All other variables have previously been defined.

Christensen et al. (2013) use the bid-ask spread and a self-constructed liquidity variable[[17]](#footnote-17) as proxies for market liquidity. denotes firm-year observations from countries which showed a substantive change (i.e. improvement) in enforcement along with the implementation of IFRS. stands for the remaining European countries without enforcement changes. stands for non-European countries that switched to IFRS reporting. denotes a set of firm-specific control variables (e.g. size and return variability) and denotes a set of country, industry and year controls (e.g. regulatory quality, country size).

To measure enforcement change, Christensen et al. (2013) used public sources combined with a survey asking questions about financial reporting enforcement changes in their sample period to national regulators, technical partners at a large audit firm (PWC) and academics. Based on this method they identified five countries which showed a substantive change in enforcement, namely Finland, Germany, the United Kingdom, Norway and the Netherlands. These countries created new enforcement agencies, tightened penalties for violations of accounting standards, increased resources available for supervisory authorities and moved to a risk-based random sampling proactive review process for financial statements (Christensen et al., 2013). Because these five countries did not engage in a proactive review process before mandatory adoption of IFRS, Christensen et al. (2013) use this as a key indicator of a substantive enforcement change[[18]](#footnote-18). Significant improvements in market liquidity were only observed in these countries. Countries that already showed a high level of regulatory quality[[19]](#footnote-19) but did not make any changes to their enforcement bundled with introduction of IFRS did not show a significant improvement, even when these countries showed large differences between national GAAP and IFRS[[20]](#footnote-20). Although the study of Christensen et al. (2013) focuses solely on market liquidity, it supports the notion that capital market effects are only observable in countries with substantive enforcement changes. This could possibly imply that positive cost of equity capital effects are only observed in these countries as well. A decrease in the cost of equity capital can therefore be expected in the Netherlands.

**3.4 Control variables**

As the regressions shown in the previous paragraph already suggest, there are other factors besides the mandatory adoption of IFRS that influence the cost of equity capital. Control variables in prior research on mandatory adoption are generally used to capture cross-country differences, year-to-year differences and firm-specific characteristics that influences firm’s risk as perceived by investors. Common recurring control variables in prior research are listed below.

* Risk-free rate: the cost of equity capital is comprised of the risk free rate and the equity risk premium (Botosan, 2006)[[21]](#footnote-21). Consequently, the value of the cost of equity capital depends partly on the risk-free rate. Therefore, many studies on the cost of equity capital control for the risk-free rate.
* Inflation: all analyst forecasts are expressed in nominal terms and local currency. In studies that include cross-country analyses it is therefore necessary to control for international differences in inflation rates (e.g. Hail and Leuz, 2007). Bevers (2009) included a variable for inflation to control for macro-economic developments. It is expected that higher inflation rates will lead to higher interest rates, which will result in a higher cost of equity capital.
* Firm size: disclosure research suggests that larger firms are better connected with analysts and institutional investors, therefore resulting in a lower information asymmetry between a firm and its investors (Gode and Mohanran, 2003). Therefore, firm size is expected to be negatively associated with the cost of equity capital.
* Financial leverage: leverage is the ratio of the book value of long term debt and cost of equity capital. Firms with high leverage ratios are expected to show higher levels of cost of equity capital due to the higher risks for investors (Bevers, 2009).
* Return variability: it is believed that investors perceive firms with smoother earnings to be less risky than firms that show less smooth earnings. Generally, it is therefore expected that firms with high return variability are expected to show a higher cost of equity capital. This is illustrated by the research done by Francis et al., (2004) and Verdi (2006), who find evidence for a negative relationship between earnings smoothness and cost of equity capital.
* US-listing: it is expected that a firm with a US-listing experiences a lower cost of equity capital. Hail and Leuz (2009) examine whether cross-listing in the U.S. influences the cost of equity capital for foreign firms. They find evidence that foreign firms with U.S. cross-listings show a lower cost of equity capital. Firms that are listed in the U.S. have to comply with US GAAP as well, which are known for their high level disclosure requirements (Bevers, 2009).
* Forecast bias: this control variable tries to capture international differences in local forecast bias. Because costs of equity capital estimates often depend on analysts’ forecasts, one concern is that international differences in analyst tendencies and behavior can influence results when including multiple countries in one sample (Hail and Leuz, 2007).
* Book-to-market ratio: the book-to-market ratio is the ratio of the book value and market value of equity. A high book-to-market ratio could reflect lower growth opportunities, lower accounting conservatism, or high perceived risk. It is therefore expected that the book-to-market ratio is positively related with risk and ultimately cost of equity capital.
* Return-on-assets: if the return on assets is high, investors expect a firms’ risk to be low. This will lead to a lower cost of equity capital (Bevers, 2009).
* Type of industry indicator variables: Gebhardt et al. (2001) conclude that industry characteristics play an important role in explaining cross-sectional differences in firms’ cost of equity capital.
* Country indicator variables: the effects of disclosure can be different between countries. In cross-country analysis it is therefore important to recognize these differences. E.g. the outcome of adopting accounting standards is not only determined by the quality of the standards, but also by a country’s legal institutions and level of enforcement[[22]](#footnote-22). In prior research, enforcement levels have been measured using enforcement scores from other research, such as the scores from La Porta et al. (1998) or Kaufman et al. (2009).

**3.5 Summary**

Prior research has shown mixed results on whether mandatory adoption of IFRS resulted in positive capital market effects. These results are highly dependent on chosen sample sizes, control variables, estimation models for the cost of equity capital, chosen proxies for market liquidity and institutional settings and enforcement in chosen countries. Common recurring caveats mentioned by prior research are limited sample sizes and possible biased cost of equity capital measures. Another possible caveat of prior research is that years occurring during the financial crisis are not included. This research will include a larger sample and will include more adoption years, and will include crisis years as well. This will be addressed in chapter 5. However, it is important to gain a more thorough understanding in the estimation of the cost of equity capital, which is the variable of main interest, and its limitations.

It is not immediately clear what to expect with regard to cost of equity capital effects in the Netherlands. Existing differences between Dutch GAAP and IFRS do not necessarily imply improvement in cost of equity capital. However, relatively high enforcement levels in the Netherlands (Li, 2010), and a change in enforcement bundled with IFRS introduction in the Netherlands (Christensen et al. 2013) do suggest a suitable environment for a decrease of cost of equity capital.

**Chapter 4 Cost of equity capital**

**4.1 Introduction**

There are many ways in estimating the cost of equity capital. This section will review popular estimation methods that are commonly used in (mandatory) disclosure research. These estimation models all use the same starting point but have different forms due to different assumptions they make.

**4.2 Estimating the cost of equity capital**

The cost of equity capital is the minimum rate of return equity investors require for providing capital to the firm. It is comprised of the risk free rate of interest and a premium for the firm’s non-diversifiable risk as is shown in the following equation (Botosan, 2006):

(7)

Where stands for the cost of equity capital, denotes the risk-free rate and the risk premium. Cost of equity is also referred to as the risk-adjusted discount rate investors apply when discounting expected future cash flows to determine the current stock price. This is captured in the classic dividend discount formula:

(8)

where denotes current stock price, expected future cash flows and the risk adjusted discount rate (cost of equity capital). Although the current price of stocks is directly observable, the future cash flows and the cost of equity capital are not. Both components cannot be observable from realized prices or returns, and therefore need to be estimated (Botosan, 2006).

Prior to the late 90’s, the cost of equity capital in academic research was mostly estimated using variations of the capital asset pricing model (CAPM) and the asset pricing theory of Fama and French (1993)[[23]](#footnote-23). These models generally use realized returns to proxy for expected returns. The widespread use of realized returns to estimate the cost of equity capital was partly necessary due to the fact that expected returns are not directly observable. However, using realized returns results in estimates that are imprecise. In addition, Elton (1999) shows that average realized returns differ significantly from expected returns over long periods of time. E.g. Fama and French (1997) tested both CAPM and APT models and concluded that both models showed standard errors of more than 3% per year.

To overcome these shortcomings, more recent models use an alternative approach in estimating the cost of equity capital; the implied cost of equity capital. The implied cost of equity is the internal rate of return that equates the present value of the market’s expected future cash flows to current stock price (Botosan, 2006). In other words, these estimation models are deduced from the dividend discount formula of equation (8). Commonly, these models use analyst’ forecasts on earnings and dividends per share to proxy for expected future cash flows.

The dividend discount formula is based on an infinite series of expected future cash flows. For practical purposes, an explicit forecast period is specified by most estimation models. To capture the infinite nature of equation (8), estimation models introduce a terminal value, which is an estimate of the value of the firm based on the residual income earned *after* the explicit forecasting period. The issue of introducing a terminal value is addressed differently, resulting in different estimation models. Models based on analyst’ forecasts that are popular models in (mandatory) disclosure research will be discussed in this section[[24]](#footnote-24).

**4.2.1 Gebhardt, Lee and Swaminathan (2001)**

Due to the limitations of determining cost of equity capital using realized returns in prior academic literature, Gebhardt et al. (2001) developed a model that did not rely on realized returns or traditional asset pricing models. In their study, they developed a model to estimate the cost of equity capital based on the dividend discount formula of equation (8). Their model looks as follows:

(9)

Where:

= stock price for year ;

= book value per share for year ;

= cost of equity capital; and

= forecasted return on equity for year .

For the first three years, Gebhardt et al. (2001) assume that analysts’ forecasts of earnings and book value are equal to the market’s expectations. For the next nine years, firms’ earnings are forecasted by mean reverting the toward the industry median. This is done to capture the notion that in the long run, firms tend to become more like their industry peers. Beyond the forecast period of twelve years, it is assumed that the final term remains constant in perpetuity. In practice, to compute the implied discount rate, Gebhardt et al. (2001) adjust this parameter until the implied price is equal to the current market price

Compared to models based on realized returns, the model of Gebhardt et al. (2001) shows significant lower cost of equity levels for a larger sample of US firms in the period 1979 through 1995. They also document a significant industry effect in their implied risk premium. For their sample period, certain industries show consistently higher cost of equity capital rates compared to others[[25]](#footnote-25). This suggests that industry membership is an important characteristic in cost of capital estimations. Gebhardt et al. (2001) also find significant evidence that higher cost of equity estimates are associated with firms with higher book-to-market ratios, higher forecasted growth rates and lower dispersion in analyst forecasts, suggesting that these variables could be important in explaining cross-sectional differences from year to year.

Gebhardt et al. (2001) also identify some limitations to their approach. These limitations are mostly the result of choices made with regard to the forecast horizon and terminal value. Gebhardt et al. (2001) warn for possible measurement errors in their cost of equity capital. E.g. their cost of equity capital measure could possibly be biased downward for growth firms, or upward for mature firms, due to the assumption of future *ROE* reverting to the industry median after three years. They also identify their study period of 17 years as a possible too short period of time. Identified correlations with their cost of equity capital measure could possibly not hold when using a longer study period.

**4.2.2 Claus and Thomas (2001)**

Claus and Thomas (2001) studied the equity risk premium (the in equation 7) for a large sample of firms from the United States, Japan, Canada, Germany, France and the United Kingdom. Rather than using historical information, they estimate this equity premium from the discount rate that equates the market valuations and expectations of future cash flows. Similar to Gebhardt et al. (2001), they conclude that their estimate is significantly lower than those estimates based on historical data. For each year between 1985 and 1998, they find that the equity premium is around three percent, compared to the 8 percent generally showed by earlier estimates based on historical data. These results were similar for all countries in their sample. To estimate the equity risk premium, Claus and Thomas use the following model.

(10)

Where:

inflation;

= forecasted earnings per share for year ;

cost of equity capital.

All other variables have previously been defined.

The model of Claus and Thomas (2001) is a special case of the residual income valuation model as well. It uses actual book values per share and forecasted earnings per share up to five years ahead to derive the expected future residual income series. At time it is assumed that the residual income grows at rate *g* which is equal to expected inflation. This leads to the estimation model in equation (8). Claus and Thomas (2001) subtract the risk-free rate from the cost of equity capital to obtain the equity risk premium. To calculate the cost of equity capital, one must enter values for until the formula equals the stock price. Claus and Thomas (2001) deduct the risk-free rate from the cost of equity capital to obtain the equity premium.

As well as with the other models in this chapter, it is assumed that analysts’ forecasts are equal to the market expectations. Claus and Thomas (2001) do acknowledge that possible errors in these forecasts could result in a biased estimate. They observed that overestimation of forecast earnings per share increased over time (i.e. the further the forecasted year, the higher the overestimation of earnings by analysts). Therefore they conclude that their estimate is likely to be biased upward.

**4.2.3 Ohlson and Juettner-Nauroth (2005)**

Ohlson and Juettner-Nauroth (2005) developed a model which was based on the residual income valuation model of Ohlson (1995). This model relates firm price to expected earnings per share, short-term growth rate in earnings per share, long term growth in earnings per share and the cost of equity capital. They assume that the present value of dividends per share determines the firm’s price per share, similar to the classic dividend discount formula. Ohlson and Juettner-Nauroth (2005) include one-year ahead forecasted earnings and dividends per share as well as forecasted short- and long-term abnormal earnings growth. This results in the following valuation formula (OJ Model):

(11)

They solve equation (11), to express the cost of equity capital as a function of the forward earnings per share and measures of growth in expected cost of equity capital:

(12)

where:

;

abnormal growth;

= expected dividends per share for year

cost of equity capital.

All other variables have previously been defined.

To operationalize this equation, Gode and Mohanram (2003) assume that is equal to . Also, to operationalize this approach it is necessary to assume that analysts’ forecasts of and approximate the markets’ expectations. According to Gode and Mohanram (2003) one advantages compared to other models is the limited use of forecasted variables. This model does not need forecasts of book values or return on equity, and no forecasted dividends beyond one year. Furthermore, the cost of equity capital is directly determined by formula, and does not have to be approximated until the value equates current stock price. Following Gebhardt et al. (2001), Gode and Mohanram (2003) evaluate the resulting risk premium with frequently cited risk factors: systematic risk (β), earnings variability, unsystematic risk, leverage, size and industry membership. Their results show that is correlated with these risk factors in the expected direction. Comparing the OJ model with the model of Gebhardt et al. (2001) they also conclude that the latter shows stronger correlations with realized returns, especially for one-year and two-year ahead returns, while both perform well in predicting three-year ahead returns. Overall, Gode and Mohanram (2003) results show that the model of Gebhardt et al. (2001) has higher correlations in their regressions compared to the OJ model.

**4.2.4 Easton (2004)**

Easton (2004) constructs a special case of the abnormal earnings growth valuation model of Ohlson and Juettner-Nauroth (2005). It uses a one-year and two-year ahead expected earnings per share as well as expected dividends per share in period . Dividends are set equal to a constant fraction of forecasted earnings. This leads to the following valuation model for the current price:

(13)

Derived from this equation, Easton (2004) states that the cost of equity capital can be estimated using the following formula:

(14)

Where:

cost of equity capital.

All other variables have already been defined.

This is the modified PEG ratio model, where denotes the cost of equity capital which can be estimated using approximation. Practically that means that the value of the cost of equity capital can be obtained by inserting values for until the formula equates 0.

Easton (2004) also adds two extra assumptions to the valuation formula of Ohlson and Juettner-Nauroth (2005): and  **(**i.e. no growth in abnormal earnings beyond the forecast horizon). This model uses expected one-year and two-year expected earnings per share. This results in the following formula:

(15)

Where:

cost of equity capital.

All other variables have previously been defined.

Although equation 13 seems more practical (it is calculated directly by formula), Easton (2004) states that the two restrictions included in this equation bias the median estimate of the cost of equity capital downward with 0.6 percent. The studies of Hail and Leuz (2007), Daske et al. (2008), Bevers (2008) and Li (2010) all use the modified PEG ratio model (equation 12) to compute the cost of equity capital. For the method of Easton (2004) to be operational, the two-year expected earnings per share has to be larger than the one-year expected earnings per share. If this is not the case the model cannot be solved, eventually leading in possible eliminations.

**4.3 Limitations of estimating cost of equity capital using analyst forecasts**

The models described in this section are popular means to estimate the cost of equity capital. However, there are mixed views on the empirical validity of these models. The models described above all assume that analysts’ forecasts are equal to the markets’ expectations. Variables used in the models, i.e. expected earnings per share and dividends per share , are obtained by using analysts’ forecasts, which possibly introduces measurement error if the market has different beliefs (Botosan, 2006). Prior research documents that analysts’ forecasts are biased upward, especially for the mid- and the long-run (e.g. Das et al. [1998], Claus and Thomas [2001], Richardson et al [2004] Easton and Sommers [2007]). Which suggests that resulting cost of equity capital measures are biased upward. Therefore, possible conclusions drawn from estimation models should be interpreted with caution.

Several studies evaluate the cost of equity capital measures by examining their correlation with realized returns or proxies for risk derived from finance literature. Easton and Monahan (2005) examined seven proxies[[26]](#footnote-26) for the cost of equity capital and concluded that none of them were positively associated with realized returns, suggesting that the proxies used are unreliable[[27]](#footnote-27). Contrary to Easton and Monahan (2005), Gebhardt et al. (2001) and Gode and Mohanram (2003) show a positive relation between portfolio rankings based on cost of equity capital estimates and average portfolio stock returns. Other studies evaluate the relation between cost of equity capital estimates and proxies for risk. Botosan and Plumlee (2005) evaluate five alternative proxies for cost of equity capital and their relationship with risk factors such as leverage, firm size and market beta, and conclude that these proxies are related to some extent these risk factors. According to Botosan and Plumlee (2005) the estimation model of Easton (2004) is one of the models that are best associated with their risk factors.

Guay et al. (2011) focus on the measurement errors in cost of equity capital estimates that are caused by errors in analysts’ forecasts of short-term and long-term earnings. They tested the relationship between cost of equity capital estimates and realized returns and did not find a significant relation. They conclude that analysts’ forecasts are ‘sluggish’, and propose two methods to mitigate this problem by incorporating adjustments for measurement errors in analysts’ forecast. In the first method, Guay et al. (2011) form portfolios of stocks on the basis of prior stock price performance, and calculate the median portfolio forecast error[[28]](#footnote-28) for each portfolio. This median portfolio forecast error is used to adjust the forecasted earnings per share for all firms in the corresponding portfolio, ultimately leading to an adjusted cost of equity capital estimate. In the second method, Guay et al. (2011) perform a regression analysis where the forecast errors are regressed on lagged annual returns and firm characteristics. The coefficients resulting from this regression are used to obtain the expected forecast errors which are used to adjust the cost of equity capital measures. The adjusted cost of equity capital measures resulting from these two methods, show a significant positive correlation with realized returns, with the first method showing the strongest relationship. The adjusted measures based on Gebhardt et al. (2001) and Claus and Thomas (2001) show relatively strong positive correlations with future returns. The adjusted estimates based on the OJ model and the PEG model (Easton, 2004) show relatively weak relations with future returns, suggesting that the approach of Guay et al. (2011) is less suitable for these two estimates. Similar to the second approach of Guay et al. (2011), Larocque (2013) corrects analysts’ forecasts with expected forecast errors from a regression model, to compute the adjusted cost of equity capital using three popular estimation models.[[29]](#footnote-29) She does not find that correcting cost of equity capital estimates in this way leads to a better association with expected returns. Hou et al. (2011) try to address the problems arising from using analyst’ forecasts by not using them at all. Instead, they developed a cross-sectional regression model to forecast future earnings of individual firms. To compute their expected earnings forecasts for a firm, Hou et al. (2011) multiply their independent variables[[30]](#footnote-30) with regression coefficients that are based on a pooled regression made on these independent variables from previous ten years of data. According to Hou et al. (2011) their model yields superior forecasts of earnings compared to the ones made by analysts with respect to forecast bias (lower), coverage (higher), and earnings response coefficient (higher)[[31]](#footnote-31). Additionally, they conclude that cost of equity estimates based on their forecasts show a positive correlation with realized returns.

**4.4 Summary**

The models described in this section are all derived from the classic dividend discount formula, which is based on the markets’ expectations of future cash flows. One general similarity amongst these models is that they all use analysts’ forecasts, which are assumed to be equal to the expectations of the market. Using analysts’ forecasts is not without risk because of potential biases and measurement errors, which could have an impact on the estimated value of the cost of equity capital. Despite these limitations, costs of equity capital estimates based on analyst forecasts are still widely used.

In the analysis of this thesis, the cost of equity capital will be estimated using the simplified method of Easton (2004) of equation 13. This PEG method of Easton (2004) is a widespread used model in voluntary and mandatory disclosure research. This estimate is biased upward compared to the modified PEG ratio model of equation 12. However, it is more practical in use because the cost of equity capital is directly calculated by formula, and does not have to be determined by interpolation. Furthermore, this estimate requires less data inputs compared to all other models discussed in this section. Also, according to the assessment of multiple cost of equity capital estimates done by Botosan and Plumlee (2005), the model of Easton (2004) was best correlated with other factors associated with risk.

More recent studies have developed ways in determining corrections for forecast errors by using the mean forecast error or expected forecasts errors from regressions, or do not use analyst forecasts at all such as the method of Hou et al. (2011). These methods will not be used in this research, due to the high probability of more necessary eliminations and the limited sample size. The use of such models will be a recommendation for further research.

**Chapter 5 Research Design**

**5.1 Introduction**

Contrary to prior research, this research will cover more pre- and post-adoption years and therefore also include years occurring during the financial crisis. This will have implications for the research design, which will be explained in this chapter.

**5.2 Estimation method**

In this research, the cost of equity capital will be estimated using the estimation method proposed by Easton (2004).

(16)

Where:

cost of equity capital;

= expected earnings per share;

= current stock price.

Easton (2004) states that this method can be useful for researchers interested in explaining the effects of changes in financial accounting regimes on the cost of equity capital. Furthermore this estimation method needs input for only two variables to estimate the cost of equity capital. This reduces the chance of necessary eliminations in case data is missing. In order for this formula to be operational it is necessary that the two-year ahead expected earnings per share is larger than the one-year ahead expected earnings per share. If the opposite is the case eliminations must be made.

**5.3 Regression Analysis**

Following prior research, the effect of mandatory adoption on the cost of equity capital will be investigated using a regression analysis. In order to single out the effect of mandatory adoption of IFRS on the cost of equity capital, it will be necessary to include control variables in the regression model. In developing a regression model the regression model of Bevers (2009) will serve as the basis from which the final regression model is drawn.

The regression method used by Bevers (2009) is as follows:

.

(17)

Where:

cost of equity capital;

IFRS dummy variable;

return variability;

leverage;

book-to-market ratio;

return on assets;

US-listing dummy;

firm size;

consumer price index;

the constant; and

the parameter of the nth independent.

In this research, the dummy variable *IFRS* will be the variable of our main interest. This variable will have the value of “1” if the observation falls in the mandatory adoption period, i.e. after the 31st of December 2005. And “0” if otherwise. If introduction of IFRS increased disclosure quality and comparability, there should be a negative relationship between this coefficient and the cost of equity capital, according to disclosure quality. Simply put, the variable *IFRS* should have a negative sign to be able to conclude that mandatory adoption has led to a lower cost of equity capital.

In order to control for the possible effects of the financial crisis on the cost of equity capital, I will include a dummy variable *CRISIS*, which will have the value of “1” if a firm-year observation falls into the period ranging from 2008 to 2010, and “0” if otherwise. It is expected that years occurring during the financial crisis show significant higher cost of equity capital levels. Therefore a positive relationship is expected. I remove from the regression model of Bevers (2009), because this controls for macro-economic developments as well. Furthermore, Bevers (2009) did not find a significant relationship for this variable.

Following Bowen et al. (2008), I add an independent variable *ANALYSTFOLLOWING* to control for possible effects of analyst following on the cost of equity capital. Botosan (1997) and Bowen et al. (2008) suggest that higher analyst following reduces cost of equity capital by reducing information asymmetry. Therefore, a negative relationship between this variable and cost of equity capital is expected.

I include a control variable *RISK-FREE* which controls for the risk-free rate, because the risk-free rate is part of cost of equity capital, and is also a reccurring control variable in prior research. The variable for the risk-free rate should have, a priori, a positive relationship with the cost of equity capital.

In contrast to Bevers (2009), the variable which controls for firms with a US-listing will not be included. For his sample of Dutch firms, Bevers (2009) did not find a significant correlation between US-listings and the cost of equity capital, and did not contribute to his model.

When including the *CRISIS* term, removing the control variable for US-listings and *CPI*, and adding the variables *RISK-FREE* and *ANALYSTFOLLOWING* I come to the following regression model:

(18)

Where:

crisis dummy variable;

number of analyst following;

= risk-free rate; and

error term.

The other variables have already been defined.

As an additional sensitivity analysis I will perform a regression on a proxy for information asymmetry for the same sample. Namely, the bid-ask spread. According to disclosure theory, the bid-ask should have a positive relationship with disclosure quality. From lower bid-ask spreads, a higher cost of equity capital is inferred. If the regression on the cost of equity capital shows a decrease of the cost of equity capital due to adoption of IFRS, the regression on the bid-ask spread could support the conclusion on the cost of equity capital if it shows a decrease in the bid-ask spread (i.e. decrease in information asymmetry) due to adoption of IFRS as well. I will perform this regression with the control variables that are used by Christensen et al. (2013). These are firm size, share turnover and return variability. The independent variable *BIDASK*, is the difference between the bid-price and ask-price. The variable *SHARETURNOVER* is obtained by dividing the market value of traded share by the market value of outstanding shares, and is expected to have a negative relationship with the bid-ask spread (i.e. higher share turnover is related with lower bid-ask spread levels. This results in the following regression model:

(19)

Where:

relative bid-ask spread; and

= share turnover.

The other variables have already been defined in this chapter.

**5.4 Variable measurement and data sources**

When estimating the cost of equity capital using the method of Easton (2004), historical data on stock prices and earnings per share estimates are needed. Following prior research, the cost of equity capital variable will be lagged for +7 months. This is done because financial statements are not directly available at year end, therefore the reaction and its consequences on the cost of equity capital of financial statement disclosure will be lagged. A period of +7 months will serve as a sufficient period of time to capture this lagged effect[[32]](#footnote-32). Consensus forecasted earnings per share necessary to estimate the cost of equity capital are gathered by the ‘Institutional Brokers Estimates System’ (I/B/E/S). Historical I/B/E/S data is available through the Wharton Research Data Service (WRDS). I/B/E/S publishes their forecasts on earnings on every third Thursday of the month. Because of this, the obtained closing stock prices will also be taken at the third Thursday of the month, i.e. each July. The closing stock prices will be obtained from Datastream.

The control variables *BMR, VAR* and *RISK-FREE* will also be lagged variables (+7 months) and will be obtained from Datastream. *BMR* will be calculated as the inverse of the market-to-book value[[33]](#footnote-33) as of the third Thursday of July. *VAR* will be determined by calculating the standard deviation of actual monthly stock returns from the 12 months up to July. Data necessary for this variable will be obtained from Datastream. For the *RISK-FREE RATE*, the yield on 10-year treasury bonds will be taken at every third Thursday of July.

Data for the control variables *LEV,* and *SIZE* will be obtained from Worldscope. Data for these variables are all derived from annual reports, and are therefore not lagged but are from year-end. The variable *LEV* will be determined by dividing a firm’s total assets with its’ total liabilities. The variable *SIZE* will be computed by taking the natural logarithm of a firm’s total assets. The variable *ROA* is directly available from Worldscope, and does not need transformation.

The variable *ANALYSTFOLLOWING* will be computed as the natural logarithm +1 of the number of one-year estimates on which the consensus estimates are based and are available together with these consensus estimates from I/B/E/S.

For the alternative regression I determine the relative bid-ask spread, *BIDASK,* as the difference between the bid- and ask-price divided by the mid-point. I compute the average relative bid-ask spread for the year by taking the average of weekly calculated relative bid-ask spreads. The weekly bid- and ask-price data necessary for this calculation are obtained from Datastream. In accordance with the cost of equity capital, this variable is lagged by 7 months.

The control variable *SHARETURNOVER* is the average of monthly share turnover for a year. The monthly share turnover is calculated by dividing the monthly value of shares traded by the market value of shares outstanding. Data necessary for the calculation of the share turnover are lagged by 7 months and obtained from Datastream. The variables *IFRS, SIZE,* and *VAR* in the bid-ask regression are determined in the same way as in the regression on the cost of equity capital. For an overview of all variables, necessary data and databases I refer to Appendix IV.

**5.5 Sample selection**

This thesis addresses the cost of equity capital effects of mandatory adoption in the Netherlands. Therefore, all Dutch listed firms in the period ranging from 2002 until 2010 will be included in the sample. This results in a sample which comprises of three pre-adoption years (2002-2004), three early post-adoption years (2005-2007) and three late post-adoption years that occur during the financial crisis (2008-2010). This should be a sufficient period of time to capture cross-sectional differences between pre- and post-adoption years, and crisis years. This sample of Dutch firms is obtained from Thomson One Banker. Due to the research design, a number of inevitable eliminations from this sample has to be made. Firstly, all financial institutions are removed from the sample. Due to their typology, financial institutions require different disclosure requirements and therefore need to be eliminated from our sample. Secondly, all firms that adopted IFRS voluntarily before the mandatory adoption date are eliminated. The database of Worldscope provides information on the adopted standards in firms’ annual reports. Firms that follow IFRS in their consolidated statements prior to 2005 will be eliminated from the sample. These ‘early adopters’ have chosen to adopt IFRS voluntarily, and were not forced to change from Dutch GAAP to IFRS in 2005. Including these firms could result in a self-selection bias. Thirdly, firms that are not listed during the entire sample period need to be eliminated from the sample. Firms that have fiscal years that don’t end at the 31st of December will be eliminated as well. And finally, firms that show a lower 2-year expected earnings per share than the 1-year expected earnings per share need to be eliminated as well. This is a result of the used estimation method of Easton (2004) mentioned in paragraph 5.2. Lastly, firms that show too much missing data with respect to the independent variable, i.e. more than two years of missing data on cost of equity capital, will be eliminated.

**Chapter 6 Data Analysis**

**6.1 Introduction**

This section will cover the data analysis and tries to provide sufficient evidence for reaching a conclusion on whether or not the cost of equity capital has declined due to mandatory adoption of IFRS. This chapter will focus on the results with regard to the cost of equity capital. Results of the cost of equity capital regression are discussed in section 6.2. To find supportive evidence for positive cost of equity capital effects, an alternative regression will be performed at the bid-ask spread. The results for this regression are discussed in section 6.3. the quality of the performed regressions will be discussed in section 6.4.

**6.2 Cost of equity capital analysis**

**6.2.1 Sample and eliminations**

As described in the previous chapter I have obtained a list of all Dutch listed companies from Thomson One Banker. This results in an initial sample of 174 firms. Due to the research design several companies have to be eliminated. Firstly, I eliminate firms that are not listed during the entire sample period. This results in elimination of 41 companies. Furthermore I eliminate 13 early adopters, from the remaining sample. Companies with missing data on independents (24), missing data on cost of equity capital (44), financial Institutions (5) and firms that show fiscal years not ending at the 31st of December are eliminated from the sample. The final sample consists of 46 fims. This elimination process is tabulated in table 6.1.

|  |  |  |
| --- | --- | --- |
| **TABLE 6.1 Overview of elimination of companies** | | |
|  | **Number of eliminations** | **Remaining observations** |
| **Total Number of companies** |  | **175** |
| Company not listed entire period | 41 | 134 |
| Early adopters | 13 | 121 |
| Insufficient or no data on independents | 24 | 97 |
| Insufficient or no data on cost of equity capital | 44 | 53 |
| Financial Institutions | 5 | 48 |
| Fiscal years not ending on 31/12 | 2 | 46 |
| **Total** | **129** | **46** |

However, several remaining companies have firm-year observations that do not include cost of equity capital values either due to the fact that they are missing or due to the properties of the estimation model (i.e. cases where ). This results in an additional elimination of 20 observations. Using a boxplot I identify 2 observations that are identified as extreme outliers for the cost of equity capital. These 2 observations are therefore excluded from the sample as well, which results in a sample of 392 observations.

For the independent variables I use boxplots[[34]](#footnote-34) to spot extreme outliers as well. With the use of boxplots I identify and eliminate extreme outliers in the data for the independent variables. For the variables *LEVERAGE, SIZE*, *ANALYSTFOLLOWING*, and *RISKFREE* no extreme variables were found. Extreme outliers are found for the variables *VAR* (3) and *BMR* (1), and are eliminated from the sample. The extreme outliers found for the variable *ROA* (13), will not be eliminated from the sample. As will be shown in the analysis presented later in this chapter, the variable *ROA* will not have a significant contribution to the model and will eventually be left out. Elimination of *ROA*-outliers will therefore be unnecessary. An overview of the eliminations is shown in the table 6.2 presented below. The final sample[[35]](#footnote-35) will be comprised of 388 observations[[36]](#footnote-36).

|  |  |  |
| --- | --- | --- |
| **TABLE 6.2 Overview of elimination of observations** | | |
|  | **Number of eliminations** | **Remaining observations** |
| **Total Number of observations (46 \* 9)** |  | **414** |
| Missing COEC observations | 20 | 394 |
| COEC outliers | 2 | 392 |
| VAR outliers | 3 | 389 |
| BMR outliers | 1 | 388 |
| **Total** | **26** | **388** |

**6.2.2 Descriptive statistics**

This section will present descriptive statistics of the dependent and independent variables used in the regression analysis. Extra attention will be given to the dependent variable cost of equity capital.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.3 Descriptive Statistics** | | | | | | |
|  | **Measurment** | **N** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** |
| COEC | Decimals | 388 | ,0159 | ,2553 | ,107373 | ,0395280 |
| IFRS | Values of 1 or 0 | 388 | 0 | 1 | ,63 | ,469 |
| CRISIS | Value of 1 or 0 | 388 | 0 | 1 | ,33 | ,471 |
| VAR | Decimals | 388 | ,0255 | ,2272 | ,085373 | ,0400139 |
| LEV | Ratio, decimals | 388 | ,0349 | ,8948 | ,564217 | ,1648909 |
| BMR | Ratio, decimals | 388 | ,0689 | 1,9608 | ,579239 | ,3385342 |
| ROA | Ratio, decimals | 388 | -35,8814 | 62,3504 | 7,898957 | 7,6941535 |
| SIZE | Natural logarithmm | 388 | 17,6673 | 24,4916 | 21,101819 | 1,5517556 |
| ANALYSTFOLL. | Natural logarithm +1 | 388 | ,6931 | 3,7612 | 2,453008 | ,6003992 |
| RISKFREE | decimals | 388 | ,0286 | ,0464 | 0,038616 | ,0059568 |
| Valid N (listwise) |  | 388 |  |  |  |  |

Table 6.3presents the descriptive statistics for the sample of 388 observations. The average cost of equity capital for this sample is 10,7% with an average standard deviation of 3,9 %. The cost of equity capital ranges from a minimum of 1,6% to a maximum of 25,5%.

Figure6.1 **s**hows the development of the average cost of equity capital through time. When taking a glance we see a relatively strong decrease of the cost of equity capital during the pre-adoption period (2002-2004). In the first year of mandatory adoption (2005), the average cost of equity capital is about the same as in 2004 (9,42% in 2004 vs. 9,47% in 2005). In 2006 a decrease to 8,64% is observed. This may suggest that a decrease of the cost of equity capital is not directly observable due to the first-time adoption issues described in chapter 2. This is followed by an increase to 9,95% in 2007. In the period 2008-2010 a relatively large increase in the cost of equity capital is observable. For the years 2008, 2009 and 2010 the means of the cost of equity capital are 12,62%, 11,38% and 11,24% respectively. This finding may support the inclusion of the *CRISIS* variable as an independent variable in the regression analysis.

Table 6.4 shows the averages of the cost of equity capital specified by year, specified by the periods PRE-IFRS (2002-2004) vs. POST-IFRS (2005-2010) and averages specified by the periods 2002-2004, 2005-2007, and for the crisis years 2008-2010. On average, the cost of equity capital shows a lower mean in the pos t-adoption period (10,5%) compared to the pre-adoption period (11,22%). Whether or not this is caused by mandatory adoption of IFRS will be tested in the regression analysis. On average, the crisis-years (2008-2010) show a higher mean (11,72%) compared to the early mandatory adoption years 2005-2007 (9,34%), which also may support the inclusion of the *CRISIS* variable as well.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **TABLE 6.4 Distribution of the cost of equity capital** | | | | | | | | |
|  | |  | **COEC** | | | | | | |
|  | |  | **Count** | **Mean** | **Percentile 05** | **Percentile 25** | **Median** | **Percentile 75** | **Percentile 95** |
| **Pre vs. post** | PRE-IFRS | | 126 | ,1122 | ,0535 | ,0877 | ,1052 | ,1334 | ,1958 |
| POST-IFRS | | 262 | ,1050 | ,0530 | ,0817 | ,1001 | ,1242 | ,1796 |
| **Average per year** | 2002 | | 41 | ,1299 | ,0555 | ,0970 | ,1305 | ,1542 | ,2282 |
| 2003 | | 39 | ,1149 | ,0479 | ,0896 | ,1119 | ,1324 | ,1957 |
| 2004 | | 46 | ,0942 | ,0535 | ,0761 | ,0916 | ,1048 | ,1506 |
| 2005 | | 46 | ,0947 | ,0479 | ,0753 | ,0957 | ,1145 | ,1338 |
| 2006 | | 45 | ,0864 | ,0550 | ,0744 | ,0838 | ,0968 | ,1189 |
| 2007 | | 43 | ,0995 | ,0541 | ,0776 | ,1028 | ,1130 | ,1455 |
| 2008 | | 40 | ,1262 | ,0435 | ,0925 | ,1203 | ,1671 | ,1992 |
| 2009 | | 43 | ,1138 | ,0483 | ,0846 | ,1093 | ,1332 | ,1720 |
| 2010 | | 45 | ,1124 | ,0642 | ,0886 | ,1024 | ,1380 | ,1816 |
| **Periods** | 2002-2004 | | 126 | ,1122 | ,0535 | ,0877 | ,1052 | ,1334 | ,1958 |
| 2005-2007 | | 134 | ,0934 | ,0487 | ,0762 | ,0918 | ,1081 | ,1403 |
| 2008-2010 | | 128 | ,1172 | ,0536 | ,0879 | ,1110 | ,1426 | ,1921 |

**6.2.3 Correlation Matrix**

This section presents the Pearson Correlation matrix. The Pearson correlation matrix shows to which extent variables are correlated with each other and whether or not this correlation is significant. I use this correlation matrix to determine whether the independent variables in the dataset are correlated with the dependent in accordance with the expectations as described in section 3.4. If the correlation coefficients are insignificant or show the opposite sign, then this could be a concern when performing the regression analysis. Furthermore, the correlation matrix is a useful tool to spot multicollinearity between independents.

Table 6.5below shows that all variables are significantly correlated with the cost of equity capital at the 0,05 level, with exception of the IFRS dummy variable and the variable which controls for the risk-free rate. Although the variable *IFRS* shows a correlation with the expected sign (-), this correlation has a p-value of 0,093. This may be cause for concern while this independent is the main variable of interest. The variable *RISKFREE* shows a correlation of which the sign is opposite (-) to what is expected (+). Furthermore, this correlation with the independent *COEC* is insignificant with a p-value of 0,088. Also, the *RISKFREE* correlates strongly with the *CRISIS* dummy (-,691). These findings may be an indication that controlling for the risk-free rate may not be of any value in the regression analysis. All other variables correlate significantly in the expected direction. Another cause for concern is the significant high correlation (0,804) between the two independent variables *SIZE* and *ANALYSTFOLLOWING*. It may be necessary to remove either one of these variables from the regression.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.5 Pearson Correlations Matrix** | | | | | | | | | | |
|  | COEC | IFRS | CRISIS | VAR | LEV | BMR | ROA | SIZE | ANALYSTFOLL. | RISKFREE |
| COEC | 1 |  |  |  |  |  |  |  |  |  |
| IFRS | -,085 | 1 |  |  |  |  |  |  |  |  |
| CRISIS | ,174\*\* | ,487\*\* | 1 |  |  |  |  |  |  |  |
| VAR | ,476\*\* | -,007 | ,182\*\* | 1 |  |  |  |  |  |  |
| LEV | ,122\* | -,019 | ,007 | ,072 | 1 |  |  |  |  |  |
| BMR | ,216\*\* | -,010 | ,229\*\* | ,216\*\* | -,082 | 1 |  |  |  |  |
| ROA | -,187\*\* | ,157\*\* | -,156\*\* | -,240\*\* | -,290\*\* | -,350\*\* | 1 |  |  |  |
| SIZE | -,161\*\* | ,108\* | ,098 | -,248\*\* | ,352\*\* | -,029 | -,052 | 1 |  |  |
| ANALYSTFOLL. | -,140\*\* | ,097 | ,075 | -,180\*\* | ,192\*\* | -,273\*\* | ,059 | ,804\*\* | 1 |  |
| RISKFREE | -,087 | -,036 | -,691\*\* | ,066 | ,020 | -,131\*\* | ,215\*\* | -,023 | -,016 | 1 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | | | | |
| \*. Correlation is significant at the 0.05 level (2-tailed). | | | | | | | | | | |

**6.2.4 Regression analysis**

In this section I present the results from the regression analysis. The initial regression analysis is as follows:

(20)

The results of this regression are presented in Table 6.6 presented below.

The model summary in table 6.6 shows that the performed regression model has an adjusted R-square of ,267. This indicates that the best line of the regression model fits the data for 26,7%. Simply put, this model explains 26,7% of the variance in the cost of equity capital. The F-test in table 6.6 tests the null hypothesis that the independent variables in the model have no joint significant relationship with the dependent variable *COEC*. According to the F-test, this hypothesis is rejected (p<0,05), which indicates that a joint significant relationship exists between the independents in the model and the cost of equity capital. The F-test does not asses the independent variables individually. That’s why it is necessary to use the t-test, of which the t-statistic is presented in table 6.6. The t-test tests the null hypothesis that an individual independent variable has no significant relationship with the dependent variable. As is shown in the table, this hypothesis is not rejected for the variables *RISKFREE*, *ROA* and *ANALYSTFOLLOWING.* These three variables have large p-values of ,979(!), ,508 and ,333 respectively. This indicates that these independent variables have no significant relationship and may be removed from the regression. Removing the variable *RISKFREE*, does not improve the significance of either *ROA* or *ANALYSTFOLLOWING.* Removing either one of these two remaining insignificant variables does not result in a significant *ROA* or *ANALYSTFOLLOWING* variable. For all possible removal combinations of these three variables the p-values remain at roughly the same level (not tabulated). The insignificance of the independent variable *RISKFREE* is not that surprising when recalling the correlation matrix presented in section 6.2.3. This section already showed an opposite, small and insignificant correlation with the dependent. The correlation matrix also showed that for *ANALYSTFOLLOWING* a large significant positive correlation with *SIZE* was observed. Suggesting that either one of them is redundant. Removing *ANALYSTFOLLOWING* and keeping *SIZE* as an independent variable results in the best model (not tabulated). Although the correlation matrix did not raise concern with regard to the *ROA* it is not directly obvious why this variable is insignificant[[37]](#footnote-37).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
| **TABLE 6.6 Regression Results** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,533a | ,284 | ,267 | ,0338464 |  |  |  |
|  | a. Predictors: (Constant), RISKFREE, ANALYSTFOLLOWING, IFRS, VAR, LEV, BMR, ROA, SIZE, CRISIS | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | ,172 | 9 | ,019 | 16,648 | ,000b |  |
|  | Residual | ,433 | 378 | ,001 |  |  |  |
|  | Total | ,605 | 387 |  |  |  |  |
|  | a. Dependent Variable: COEC | | | | | | |  |
|  | b. Predictors: (Constant), RISKFREE, ANALYSTFOLLOWING, IFRS, VAR, LEV, BMR, ROA, SIZE, CRISIS | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | ,132 | ,038 |  | 3,506 | ,001 |  |
|  | IFRS | -,013 | ,005 | -,150 | -2,489 | ,013 |  |
|  | CRISIS | ,013 | ,008 | ,161 | 1,798 | ,073 |  |
|  | VAR | ,379 | ,052 | ,383 | 7,219 | ,000 |  |
|  | LEV | ,038 | ,012 | ,160 | 3,099 | ,002 |  |
|  | BMR | ,016 | ,006 | ,137 | 2,482 | ,014 |  |
|  | ROA | ,000 | ,000 | ,035 | ,662 | ,508 |  |
|  | SIZE | -,005 | ,002 | -,182 | -2,046 | ,041 |  |
|  | ANALYSTFOL. | ,005 | ,006 | ,082 | ,969 | ,333 |  |
|  | RISKFREE | -,013 | ,502 | -,002 | -,027 | ,979 |  |
|  | a. Dependent Variable: COEC | | | | | | |  |

The other independent variables in the original model behave in the predicted direction, and are all significant at the 0,05 level, except the dummy variable for the crisis, which is significant at the 0,10 level. The dummy variable of IFRS shows us that for every mandatory adoption year the cost of equity capital is reduced significantly with ,013. Which implies a reduction of 1,3% of the cost of equity capital due to mandatory adoption of IFRS. This conclusion is based on the original model. The regression results of the model from which the three variables are removed are presented in Table 6.7below. The regression equation of the final model is as follows:

(21)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.7 Regression results final model** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,530a | ,281 | ,270 | ,0337739 |  |  |  |
|  | a. Predictors: (Constant), SIZE, BMR, IFRS, VAR, LEV, CRISIS | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | ,170 | 6 | ,028 | 24,850 | ,000b |  |
|  | Residual | ,435 | 381 | ,001 |  |  |  |
|  | Total | ,605 | 387 |  |  |  |  |
|  | a. Dependent Variable: COEC | | | | | | |  |
|  | b. Predictors: (Constant), SIZE, BMR, IFRS, VAR, LEV, CRISIS | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | ,112 | ,026 |  | 4,311 | ,000 |  |
|  | IFRS | -,012 | ,004 | -,145 | -2,871 | ,004 |  |
|  | CRISIS | ,014 | ,004 | ,161 | 3,059 | ,002 |  |
|  | VAR | ,382 | ,047 | ,387 | 8,112 | ,000 |  |
|  | LEV | ,033 | ,011 | ,138 | 2,899 | ,004 |  |
|  | BMR | ,012 | ,005 | ,102 | 2,214 | ,027 |  |
|  | SIZE | -,003 | ,001 | -,110 | -2,240 | ,026 |  |
|  | a. Dependent Variable: COEC | | | | | | |  |
|  |  |  |  |  |  |  |  |  |

The results of the final regression model show us that there is a relatively small improvement in the adjusted R-square. This implies that the goodness-of-fit of the regression line has not drastically improved. The F-test statistic however shows a large increase, which indicates that the joint relationship between the independents in the final model better explain the variance in the cost of equity capital compared to the normal model. For all the individual independent variables in the final model, the significance has improved. All variables in this model are now significant at the 0,05 level. The coefficient of the independent variable *IFRS* in the final model is -,012. This indicates that mandatory adoption has resulted in a significant decrease of the cost of equity capital of 1,2%. With this finding it possible to accept the H1 defined in Chapter 1.

**6.2.5 Multicollinearity**

In this section I will test whether or not multicollinearity poses a threat[[38]](#footnote-38) to the multiple regressions presented in this chapter. I also assess whether removal of the three variables has improved the model with regard to multicollinearity. Multicollinearity exists when a strong correlation exists between two or more independent variables. If perfect collinearity between 2 or more variables exists, the values for both independents would be interchangeable. Ideally, all independent variables in a multiple regression should be uncorrelated. In practice however, this is rarely the case. As was already shown in the correlation matrix in section 6.2.3, several independent variables do have a significant correlation with each other. I test whether this observed multicollinearity between the independent variables could be a case for concern for the regression analyses in this section. I do this by taking a look at the variance inflation factor (VIF). The VIF is a measure of multicollinearity and is calculated as follows:

. (22)

Where:

variance inflation factor associated with independent ; and

= the R-square obtained for the regression of as dependent variable on the other independent variables in the original regression model.

Due to the properties of the VIF, a value of the of 0 with the other independent variables should result in a VIF of one, on the other hand, a of 1 will results in an infinite VIF[[39]](#footnote-39). Simply put, the VIF for an independent should be close to one.

The VIF-values for the independents in both models are presented in table 6.8 below. In the original model the VIF-values for the variables *SIZE, ANALYSTFOLLOWING*, *CRISIS* and *RISKFREE* show reasonably high VIF values. Comparing the original model with the final model, removal of the variables *RISKFREE*, *ANALYSTFOLLOWING*, and *ROA* results in a lower average VIF for the final model. For each individual independent variable, lower VIF values are observed as well. Therefore it is safe to conclude that removal of three independent variables from the original model has resulted in a final model that suffers less from multicollinearity, and that therefore the final model is preferable over the original.

|  |  |  |  |
| --- | --- | --- | --- |
| **TABLE 6.8 Overview of VIF values** | | | |
|  |  | **Collinearity Statistics** | |
| **Model** | **Independent** | **Tolerance[[40]](#footnote-40)** | **VIF** |
| *Original* | IFRS | ,522 | 1,914 |
| CRISIS | ,237 | 4,214 |
| VAR | ,672 | 1,487 |
| LEV | ,708 | 1,413 |
| BMR | ,625 | 1,600 |
| ROA | ,696 | 1,436 |
| SIZE | ,240 | 4,164 |
| ANALYSTFOLL. | ,266 | 3,765 |
| RISKFREE | ,331 | 3,017 |
|  | **Avg. VIF** | | **2,557** |
| *Final* | IFRS | ,739 | 1,354 |
| CRISIS | ,681 | 1,468 |
| VAR | ,830 | 1,205 |
| LEV | ,833 | 1,200 |
| BMR | ,890 | 1,124 |
| SIZE | ,776 | 1,289 |
|  |  | **Avg. VIF** | **1,273** |

**6.3 Bid-ask spread analysis**

**6.3.1 Alternative analysis on the bid-ask spread**

This section presents the results of the alternative regression on the bid-ask spread:

.(23)

The bid-ask regression analysis has been performed on the same sample of 46 firms and 388 firm-year observations as the primary regression analysis. For 2 companies in this sample, data for bid-ask spread and share turnover calculation was missing, leading to elimination of 18 observations. Boxplot analysis for extreme outliers does not lead to additional eliminations; therefore the final sample for this regression is 370 firm year observations from 44 companies.

**6.3.2 Descriptive statstics**

The descriptive statistics for the variables in this regression are presented in table 6.9 below. The average bid-ask spread for the sample is 0,0057.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.9 Descriptive Statistics** | | | | | | |
|  | **Measurement** | **N** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** |
| BIDASK | Logarithm | 370 | -7,7308 | -2,6609 | -5,635703 | ,9761507 |
| BIDASK (nominal) | Decimals | 370 | ,0004 | ,0699 | ,005677 | ,0065797 |
| IFRS | Value of 1 or 0 | 370 | 0 | 1 | ,68 | ,469 |
| CRISIS | Value of 1 or 0 | 370 | 0 | 1 | ,1027 | ,30398 |
| SIZE | Natural Logarithm | 370 | 17,6673 | 24,4916 | 21,102812 | 1,5834277 |
| SHARETURNOVER | Natural Logarithm | 370 | -1,3363 | 3,2570 | 1,759324 | ,7630546 |
| VAR | Natural Logarithm | 370 | -3,6672 | -1,4821 | -2,570490 | ,4503251 |
| Valid N (listwise) |  | 370 |  |  |  |  |

Figure 6.2 shows the trend of the bid-ask spread during the sample period. A overall decrease in the bid-ask spread is observable for the post-mandatory adoption years, with exception for the first crisis year 2008, which shows a relatively large increase for the bid-ask spread. The years 2009 and 2010 show similar levels for the bid-ask spread as before the crisis. This is a possible indication that the dummy variable for crisis years, which is assigned to the years 2008 through 2010, is only applicable for the year 2008.

Table 6.10 below shows us that for the post-adoption period, the bid-ask spread has declined compared to the pre-adoption period. Pre-adoption years show an average bid-ask spread of ,0075 compared to a bid-ask spread of ,0048 for post-adoption years. For the early mandatory adoption years (2005-2007) the average bid-ask spread is ,0040, where the crisis years (2008-2010) show a higher average of ,0056. However, the latter average is strongly biased by the high average in 2008. It seems that the reaction to the bid-ask spread is mainly observed in 2008. Therefore, I only assign values of 1 for the *CRISIS* variable to firm-year observations occurring in the year 2008. This is contrary to the *CRISIS* variable in the cost of equity capital regression.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.10 Distribution of the bid-ask spread** | | | | | | | | |
|  | | **BIDASK** | | | | | | |
| **Count** | **Mean** | **Percentile 05** | **Percentile 25** | **Median** | **Percentile 75** | **Percentile 95** |
| **Pre vs. post** | PRE-IFRS | 120 | ,0075 | ,0013 | ,0028 | ,0056 | ,0105 | ,0202 |
| POST-IFRS | 250 | ,0048 | ,0007 | ,0013 | ,0029 | ,0060 | ,0158 |
| **Average per year** | 2002 | 39 | ,0108 | ,0012 | ,0041 | ,0079 | ,0170 | ,0267 |
| 2003 | 37 | ,0062 | ,0017 | ,0021 | ,0052 | ,0084 | ,0142 |
| 2004 | 44 | ,0058 | ,0011 | ,0020 | ,0046 | ,0083 | ,0145 |
| 2005 | 44 | ,0044 | ,0009 | ,0017 | ,0038 | ,0063 | ,0089 |
| 2006 | 43 | ,0036 | ,0006 | ,0013 | ,0034 | ,0055 | ,0081 |
| 2007 | 41 | ,0040 | ,0007 | ,0013 | ,0029 | ,0059 | ,0080 |
| 2008 | 38 | ,0082 | ,0009 | ,0019 | ,0043 | ,0078 | ,0399 |
| 2009 | 41 | ,0050 | ,0006 | ,0012 | ,0026 | ,0046 | ,0177 |
| 2010 | 43 | ,0040 | ,0007 | ,0010 | ,0018 | ,0055 | ,0147 |
| **Periods** | 2002-2004 | 120 | ,0075 | ,0013 | ,0028 | ,0056 | ,0105 | ,2020 |
| 2005-2007 | 128 | ,0040 | ,0007 | ,0014 | ,0034 | ,0059 | ,0084 |
| 2008-2010 | 122 | ,0056 | ,0007 | ,0012 | ,0027 | ,0062 | ,0183 |

**6.3.3 Correlation matrix**

Table 6.11 shows the Pearson correlation matrix for the bid-ask regression. All independent variables show significant correlations with the dependent *BIDASK,* except the independent *CRISIS* (p=,245). This can be problematic when performing the regression analysis. This insignificance is likely due to the fact that this dummy variable is associated with one single year in the sample. Another cause for concern is the possible multicollinearity due to the high correlation (,500) of *VAR* with the *CRISIS* variable. As an addition, the cost of equity capital is included in the bottom line. This shows that there is a significant positive correlation between the bid-ask spread and the cost of equity capital (,250). This positive correlation confirms the notion that higher information asymmetry (i.e. bid-ask spread) is associated with higher cost of equity capital.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.11 Pearson Correlation Matrix** | | | | | | | |
|  | BIDASK | IFRS | CRISIS | SIZE | SHARETURNOVER | VAR | COEC |
| BIDASK | 1 |  |  |  |  |  |  |
| IFRS | -,285\*\* | 1 |  |  |  |  |  |
| CRISIS | ,061 | ,234\*\* | 1 |  |  |  |  |
| SIZE | -,807\*\* | ,101 | 0,52 | 1 |  |  |  |
| SHARETURNOVER | -,739\*\* | ,240\*\* | 0,082 | ,516\*\* | 1 |  |  |
| VAR | ,340\*\* | 0,059 | ,431\*\* | -,266\*\* | 0,019 | 1 |  |
| COEC | ,250\*\* | -0,077 | ,162\*\* | -,161\*\* | -0,030 | ,450\*\* | 1 |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | |

**6.3.4 Regression Analysis**

The results of the regression analysis are shown in table 6.12. The results of the regression are quite strong with an adjusted R-square of ,857 and large F-value of 442,485. The cost of equity capital regression showed a much lower R-square (,270 ) and F-value (24,850). The difference is likely due to the fact that the bid-ask spread is directly observable and are not a result of (biased) estimates.

Furthermore, both dependent and independent variables are significant at the 0,01 level. All variables show significant relationships with the dependent *BIDASK*, and all signs are as predicted. Contrary to the correlation matrix, the variable *CRISIS* does show a significant relationship with *BIDASK* Consequently no variable will be removed from this regression.

The variable of main interest, *IFRS*, does show a negative relationship with *BIDASK*. Which indicates that the bid-ask spread has significantly improved due to mandatory adoption of IFRS. With this result, the alternative hypothesis *H2*, as defined in chapter 1, is accepted. Taking the positive significant correlation with the cost of equity capital in mind (see section 6.3.3), this conclusion supports the conclusion made with regard to the cost of equity capital.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.12 Regression results** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,927a | ,859 | ,857 | ,3694209 |  |  |  |
|  | a. Predictors: (Constant), VAR, SHARETURNOVER, IFRS, CRISIS, SIZE | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | 301,933 | 5 | 60,387 | 442,485 | ,000b |  |
|  | Residual | 49,676 | 364 | ,136 |  |  |  |
|  | Total | 351,609 | 369 |  |  |  |  |
|  | a. Dependent Variable: BIDASK | | | | | | |  |
|  | b. Predictors: (Constant), VAR, SHARETURNOVER, IFRS, CRISIS, SIZE | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | 3,312 | ,279 |  | 11,870 | ,000 |  |
|  | IFRS | -,323 | ,043 | -,155 | -7,434 | ,000 |  |
|  | CRISIS | ,261 | ,073 | ,081 | 3,556 | ,000 |  |
|  | SIZE | -,319 | ,015 | -,517 | -20,925 | ,000 |  |
|  | SHARETURNOVER | -,570 | ,031 | -,446 | -18,570 | ,000 |  |
|  | VAR | ,400 | ,051 | ,184 | 7,851 | ,000 |  |
|  | a. Dependent Variable: BIDASK | | | | | | |  |

**6.3.5 Multicollinearity**

Table 6.13 shows the VIF values for the regression on the bid-ask spread. A VIF-value greater than one is an indication that the model is biased due to multicollinearity. The VIF values for the bid-ask model are greater than one but still show acceptable levels. Therefore, using an alternative model with omission of certain variables will not be necessary.

|  |  |  |  |
| --- | --- | --- | --- |
| **TABLE 6.13 Overview of VIF values** | | | |
|  |  | **Collinearity Statistics** | |
| **Model** | **Independent** | **Tolerance** | **VIF** |
| *Original* | IFRS | ,892 | 1,121 |
| CRISIS | ,744 | 1,345 |
| SIZE | ,636 | 1,573 |
| SHARETURNOVER | ,674 | 1,485 |
| VAR | ,704 | 1,421 |
|  | **Avg. VIF** | **1.389** |

**6.4 Regression quality analysis**

**6.4.1 Construct validity**

Construct validity refers to the extent to which conclusions can be drawn from behavior of measures of interest. In other words, is the measure of interest a good construct of what it portrays to be? In this case the question is whether or not the estimate of Easton (2004) is a good construct for the cost of equity capital. The secondary regression on the bid-ask spread does not only show supporting evidence for the conclusion that mandatory adoption of IFRS leads to a reduction of the cost of equity capital. The positive association between the cost of equity capital and the bid-ask spread as shown in table 6.11, also confirms that the used measure of Easton (2004) is a relatively good construct for the cost of equity capital. A negative correlation would have been a concern because that would imply that lower information asymmetries are associated with higher cost of equity capital as measured by Easton (2004). Luckily, this is not the case. Furthermore, prior research presented by Botosan and Plumlee (2005) shows that the method of Easton (2004) is best associated with risk factors and is therefore one of the best constructs for the cost of equity capital[[41]](#footnote-41).

**6.4.2 Removing the crisis variable**

In addition to prior research, I have included a dummy variable *CRISIS* in both regression analyses. This is done to control for the years occurring in the financial crisis (2008-2010). This variable does not make a distinction between single years in this crisis period and may be a somewhat artificial way to control for these years. Furthermore, a dummy variable for the *CRISIS* has not been used in prior research. Although the *CRISIS* variable shows an expected positive relation with the cost of equity capital, I perform the same final regression model on the cost of equity capital presented in table 6.7 without the *CRISIS* variable. This results in a regression model with an insignificant IFRS dummy (p=,126) and a lower adjusted R-square (,254) compared to the final model (,270). The resulting regression is shown in table 6.14. The results from this regression suggest that controlling for economically worse years is inevitable.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.14 Regression results final model without *CRISIS*** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,513a | ,264 | ,254 | ,0341413 |  |  |  |
|  | a. Predictors: (Constant), SIZE, BMR, IFRS, VAR, LEV | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | ,159 | 5 | ,032 | 27,350 | ,000b |  |
|  | Residual | ,445 | 382 | ,001 |  |  |  |
|  | Total | ,605 | 387 |  |  |  |  |
|  | a. Dependent Variable: COEC | | | | | | |  |
|  | b. Predictors: (Constant), SIZE, BMR, IFRS, VAR, LEV | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | ,100 | ,026 |  | 3,835 | ,000 |  |
|  | IFRS | -,006 | ,004 | -,068 | -1,535 | ,126 |  |
|  | VAR | ,409 | ,047 | ,414 | 8,735 | ,000 |  |
|  | LEV | ,033 | ,012 | ,136 | 2,823 | ,005 |  |
|  | BMR | ,016 | ,005 | ,134 | 2,958 | ,003 |  |
|  | SIZE | -,002 | ,001 | -,095 | -1,909 | ,057 |  |
|  | a. Dependent Variable: COEC | | | | | | |  |

Removing the crisis dummy from the secondary bid-ask regression does not lead to large changes in adjusted r-square, beta’s or p-values. This may be an indication that controlling for the crisis in the bid-ask regression is not necessary per se. However, the small differences between the original bid-ask model and the bid-ask model without the crisis variable may be the consequence of the fact that the crisis dummy only covers one year in this regression, therefore playing a smaller role compared to the cost of equity capital regression. Regression results after removal of the *CRISIS* variable are presented in table 6.15.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.15 Regression results bid-ask model without *CRISIS*** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,924a | ,854 | ,852 | ,3752672 |  |  |  |
|  | a. Predictors: (Constant), LnReturnVariability, SHARETURNOVER, IFRS, SIZE | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | 300,208 | 4 | 75,052 | 532,943 | ,000b |  |
|  | Residual | 51,401 | 365 | ,141 |  |  |  |
|  | Total | 351,609 | 369 |  |  |  |  |
|  | a. Dependent Variable: BIDASK | | | | | | |  |
|  | b. Predictors: (Constant), LnReturnVariability, SHARETURNOVER, IFRS, SIZE | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | 3,335 | ,283 |  | 11,769 | ,000 |  |
|  | IFRS | -,288 | ,043 | -,138 | -6,703 | ,000 |  |
|  | SIZE | -,309 | ,015 | -,501 | -20,302 | ,000 |  |
|  | SHARETURNOVER | -,578 | ,031 | -,452 | -18,591 | ,000 |  |
|  | VAR | ,483 | ,046 | ,223 | 10,524 | ,000 |  |
|  | a. Dependent Variable: BIDASK | | | | | | |  |

**6.4.3 Removing all observations from the crisis years**

As an additional sensitivity analysis, I remove all observations in the period 2008-2010 to see whether or not the observed results on the IFRS dummy are different when a shorter time period is covered. This is not the case as is shown in table 6.16. This regression analysis shows the same reduction of 1,2%. This observed result supports the early evidence presented in Bevers (2009). Therefore it is possible to conclude that the short term cost of equity capital effects are sustained over the long run. If results in the short run would have been different this conclusion could not have been made. One drawback of removal of the observations in the year 2008-2010 is that the variable *SIZE* turns insignificant. For the other variables no large differences are observed. Results from this regression are presented in the table 6.16 below.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.16 Results short-term COEC regression** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,533a | ,284 | ,270 | ,0316023 |  |  |  |
|  | a. Predictors: (Constant), SIZE, BMR, IFRS, VAR, LEV | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | ,101 | 5 | ,020 | 20,145 | ,000b |  |
|  | Residual | ,254 | 254 | ,001 |  |  |  |
|  | Total | ,354 | 259 |  |  |  |  |
|  | a. Dependent Variable: COEC | | | | | | |  |
|  | b. Predictors: (Constant), SIZE, BMR, IFRS, VAR, LEV | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | ,083 | ,031 |  | 2,726 | ,007 |  |
|  | IFRS | -,012 | ,004 | -,161 | -2,935 | ,004 |  |
|  | VAR | ,434 | ,059 | ,421 | 7,305 | ,000 |  |
|  | LEV | ,027 | ,013 | ,124 | 2,137 | ,034 |  |
|  | BMR | ,014 | ,006 | ,117 | 2,153 | ,032 |  |
|  | SIZE | -,002 | ,001 | -,065 | -1,066 | ,287 |  |
|  | a. Dependent Variable: COEC | | | | | | |  |

When removing the observations in the period 2008-2010 for the bid-ask regression no large or confounding differences are observed. This suggests that the quality of the model is rather insensitive to changes in sample size.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TABLE 6.17 Results from short-term bid-ask regression** | | | | | | | | |
|  |  |  |  |  |  |  |  |  |
|  | **Model Summary** | | | | |  |  |  |
|  | Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |  |  |  |
|  | 1 | ,927a | ,859 | ,856 | ,3409632 |  |  |  |
|  | a. Predictors: (Constant), LnReturnVariability, SHARETURNOVER, IFRS, SIZE | | | | |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | **ANOVAa** | | | | | | |  |
|  | Model | | Sum of Squares | df | Mean Square | F | Sig. |  |
|  | 1 | Regression | 171,803 | 4 | 42,951 | 369,450 | ,000b |  |
|  | Residual | 28,250 | 243 | ,116 |  |  |  |
|  | Total | 200,053 | 247 |  |  |  |  |
|  | a. Dependent Variable: BIDASK | | | | | | |  |
|  | b. Predictors: (Constant), LnReturnVariability, SHARETURNOVER, IFRS, SIZE | | | | | | |  |
|  |  |  |  |  |  |  |  |  |
|  | **Coefficientsa** | | | | | | |  |
|  | Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |  |
|  | B | Std. Error | Beta |  |
|  | 1 | (Constant) | 2,829 | ,313 |  | 9,029 | ,000 |  |
|  | IFRS | -,244 | ,047 | -,136 | -5,216 | ,000 |  |
|  | SIZE | -,305 | ,018 | -,539 | -17,424 | ,000 |  |
|  | SHARETURNOVER | -,526 | ,040 | -,412 | -13,275 | ,000 |  |
|  | LnReturnVariability | ,348 | ,056 | ,163 | 6,253 | ,000 |  |
|  | a. Dependent Variable: BIDASK | | | | | | |  |

**6.5 Summary of results**

The analysis of the cost of equity capital has shown that a reduction in the cost of equity capital is observed for the sample of Dutch firms in the period ranging from 2002 to 2010. Therefore the alternative hypothesis *H1: Mandatory adoption of IFRS has a negative relationship with the cost of equity capital***,** is accepted. This reduction amounts to 1,2 percent. This percentage is higher compared to Bevers (2009), who conducted similar research on a Dutch sample of firms. Bevers (2009) found a reduction of 1,06 percent. This small difference of 14 basis points is due to the fact that Bevers (2009) used a different set of control variables, different time-lag of the independent (November/December), different sample size (62 firms) and shorter sample period (4 years). Comparing the results of the study in this thesis with the study performed by Bevers (2009) indicates that the reduction of the cost of equity capital is sustained over a longer period. This notion is also supported by the sensitivity analysis performed in section 6.4.3., in which the removal of the crisis years results in the same coefficient for mandatory adoption of IFRS. This may indicate that positive capital market effects are not only observed in the short run.

The analysis of the bid-ask regression has shown that the dummy variable for IFRS shows a negative sign in the bid-ask regression. Therefore the alternative hypothesis *H2: Mandatory adoption of IFRS has a negative relationship with the bid-ask spread.* This supports the conclusion that cost of equity capital has been reduced. Furthermore, the positive correlation between the cost of equity capital and the bid-ask spread shows that the used construct for the cost of equity capital has a relatively good construct validity.

By accepting both alternative hypotheses it is possible to conclude that mandatory adoption of IFRS has resulted in a reduction of cost of equity capital, not only in the short run (e.g. Lee et al. [2008], Bevers [2009], and Li [2010]), but also in the longer run. This thesis has contributed to prior research by showing this effect in the long run, not solely by including more adoptions years but also by controlling for the crisis years. Chapter 7 will give a short recap of the conclusions reached in this section, point out some limitations and give directions for further research.

**Chapter 7 Conclusion and recommendations for further research**

**7.1 Conclusion**

In this thesis I have found evidence for a negative relationship between mandatory adoption of IFRS and the cost of equity capital in the Netherlands. I find evidence for a significant reduction of 1,2% in the cost of equity capital attributable to mandatory adoption. The alternative hypothesis H1 is therefore accepted:

*H1: Mandatory adoption of IFRS has a negative relationship with the cost of equity capital.*

This conclusion implies that mandatory adoption of IFRS may have a positive effect for the long run. Prior research mainly provides ‘early’ evidence for the first one or two adoption years. This thesis includes more mandatory adoption years, including economically worse years. Controlling for the crisis years does not find contrary results to the presented ‘early’ evidence in prior research.

Also, I find significant supporting evidence for this conclusion of the cost of equity capital. I find a significant reduction in the bid-ask spread attributable to mandatory adoption of IFRS, which is a popular proxy for information-asymmetry and market liquidity.

*H2: Mandatory adoption of IFRS has a negative relationship with the bid-ask spread.*

According to disclosure theory, a reduction of information asymmetry is generally associated with a higher level of disclosure and consequently a lower cost of equity capital. Accepting this hypothesis implies that it is likely, according to theory, that the cost of equity capital is reduced as well.

**7.2 Caveats recommendations for further research**

It is important to note that these results *may* be an indication that the quality of disclosure in the Netherlands has increased due to mandatory adoption of IFRS. However, as prior research suggests, it also possible that the positive cost of equity capital effects are the result of increased comparability. Whether or not this is the case, or that the reduction is caused by both comparability and increased disclosure and to which extent is not covered by this thesis and is a recommendation for further research.

An important caveat to consider in this thesis is that cost of equity capital is estimated by one single method. Using alternative estimation models could result in different conclusions. Furthermore, the research design does not address possible bias issues in the cost of equity capital estimate. There are methods like the ones of Guay et al. (2011) and Hou et al. (2011) that attempt to deal with these biases, and could be beneficial for further research. These methods have not been used due to the limited sample size of Dutch listed firms.

Another limitation is that the research design does not control for industry type, although this has been a reoccurring control variable in prior research. Dividing 46 companies is multiple industries is not likely to show significant results in regression for this variable. However, for larger (international) samples, it may be an important variable to consider.

The included dummy-variable for the crisis is a somewhat artificial way to control for economic worse years. However it does show the expected relationships in the regression analyses. This crisis dummy covers three relatively similar years with respect to macro-economic developments. However, in the longer run this dummy variable may not be a good indicator for economically worse years. Future research that incorporates a much larger period could possible benefit from a more specific year-to-year macro-economic dummy.

**Appendix I: Overview of prior empirical research on mandatory adoption of IFRS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Author | Sample | Dependent variables | IFRS Variables | Control Variables | Results |
| Hail and Leuz (2007)  “Capital Market Effects of Mandatory IFRS Reporting in the EU:  Empirical Evidence” | 21,656 observations from 5,683 EU firms  Benchmark sample:  82,943 firm years from 21,710 firms of non-IFRS adoption countries  Period:  2001-2005 | Cost of equity capital  Claus and Thomas (2001)  Gebhardt, Lee, Swaminathan (2001)  Ohlson and Juettner-Nauroth (2005)  Easton (2004)  Market liquidity proxies  Bid-ask spread  Amihud’s illiquidity measure  Proportion of zero return days | Voluntary IFRS  Post-EFRAG IFRS  Mandatory IFRS  Interaction term | Risk-free rate  Firm size  Financial leverage  Return variability  Forecast bias  Firm size  Return variability  Forecast bias | Cost of equity capital:  Mixed results. Small increase observed for IFRS reporting firms and first-time adopters in 2005.  Market liquidity:  Strong improvements for independents zero return days, and illiq. Measure of Amihud. |
| Daske et al. (2008)  “Mandatory IFRS Reporting around the World: Early Evidence on the Economic Consequences” | 34,673 observations from 8,726 worldwide firms  Benchmark sample:  70,854 observations from 17,389 firms of non-IFRS adoption countries  Period:  2001-2005 | Cost of equity capital  Claus and Thomas (2001)  Gebhardt, Lee, Swaminathan (2001)  Ohlson and Juettner-Nauroth (2005)  Easton (2004)  Market liquidity proxies  Bid-ask spread  Proportion of zero return days  Amihud’s illiquidity measure  Total trading costs  Tobin’s Q | Early voluntary  Late voluntary  First Time Mandatory  Interaction term | Risk-free rate  Fims size  Financial leverage  Return variability  Forecast bias  Firm size  Share turnover  Return variability  Firm size  Financial leverage  Asset growth  Average Industry | Cost of equity capital: Decrease observed, but only when accounting for the possibility that effect can occur before mandatory adoption date. Otherwise no decrease observed.  Market liquidity:  On average, market liquidity has increased. |
| Lee et al. (2008)  “Mandating IFRS: its Impact on the Cost of Equity Capital in Europe” | 18,900 firm-year observations from 17 European countries  Period:  1995-2006 | Cost of equity capital  Easton (2004)  Ohlson and Juettner-Nauroth (2005) | Post (adoption)  Interaction term between Post and enforcement score | Market value  Book-to-market  Leverage  Sales growth  R&D expense  Percentage of closely held shares  Country Dummy  Industry Dummy | Cost of equity capital:  Limited and mixed evidence for countries with low enforcement.  A reduction of the cost of equity capital is observed for countries that show high enforcement. |
| Bevers (2009)  “The consequences of IFRS for the cost of equity capital”  (De gevolgen van IFRS voor de cost of equity capital) | 203 observations from 62 Dutch firms  Period:  2003-2006 | Cost of Equity capital  Easton (2004) | IFRS (adoption) | Return variability  Financial leverage  Book-to-market ratio  Return on Assets  US-listing  Firm Size  Consumer price index | Cost of equity capital:  Cost of equity capital has decreased due to adoption of IFRS.  *(continued)* |

**Appendix I: Overview of prior empirical research on mandatory adoption of IFRS *(continued)***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Author | Sample | Dependent variables | IFRS Variables | Control Variables | Results |
| Li (2010)  “Does Mandatory Adoption of International Financial Reporting Standards in the European Union Reduce the Cost of Equity Capital?” | 6,456 firm-year observations from 18 EU countries  Period:  1995 - 2006 | Cost of Equity capital  Claus and Thomas (2001)  Gebhardt, Lee and Swaminathan (2001)  Gode and Monanram (2003)  Easton (2004)  Market liqiduity  Bid-ask spread | Mandatory IFRS adopters  Post adoption period  Interaction term | US-cross listing indicator variables  Firm size  Inflation  Return variability  Financial leverage  Industry indicator variable  Country indicator variable  Market value  Return variability  Share turnover  Industry effects  Country fixed effects | Cost of equity capital  A decrease is observed only for countries that show higher than average enforcement scores. Low enforcement countries do not show a decrease in cost of equity capital.  Market liquidity  Same results apply to market liquidity with regard to enforcement. |
| Christensen et al. (2013)  “Mandatory IFRS Reporting and Changes in Enforcement” | 613,752 quarter-year observations from 23 EU treatment countries and 21 Non-EU Benchmark countries  Period: 2001 - 2009 | Cost of equity capital  N/A  Market liquidity  Bid-ask spread  Combined aggregate liquidity variable of the variables below*:*  *Bid-ask spread*  *Zero-return days*  *Price impact*  *Total trading cost* | IFRS (EU country, change in enforcement)  IFRS (EU country, no change in enforcement)  IFRS (Non-EU country) | Firm size  Share turnover  Return variability | Market liquidity  Positive market liquidity effects are only observed in countries that bundled a change in enforcement with mandatory adoption if IFRS. |

**Appendix II: Overview of other proxies used in prior research on capital market effects**

This appendix presents an overview of all other proxies for capital market effects used in the research presented in chapter 3.

**Bid-ask spread**

This dependent variable is widely used in prior research as proxy for information asymmetry (Daske et al. (2008). This measure is generally calculated as the difference between bid- and ask prices divided by their midpoint. It is expected that disclosure level is negatively related with the bid-ask spread.

**Amihud’s (2002) illiquidity metric (price impact of trades)**

This is a measure of illiquidity suggested by Amihud (2002). This proxy for market liquidity is created to capture the price impact of trades. In other words, it describes the ability of an investor to trade in shares without influencing the price of the share. The illiquidity measure is calculated by dividing the average daily stock return by the market value of traded shares. Higher values of this ratio indicate more illiquid shares. A negative relationship between level of disclosure and this measure of illiquidity is therefore expected.

**Zero return days**

The variable zero return days is a market liquidity proxy that is calculated as the ratio of days with zero stock returns and the number of all trading days. Zero return days reflect periods in which transaction costs of trading outweigh the value of information signals not yet contained in prices. This variable has been validated in prior research as a suitable measure for market liquidity (Hail and Leuz, 2007). The level of disclosure is expected to relate negatively with this variable.

**Total trading costs**

Total trading costs is a market liquidity variable that is calculated by adding all transaction costs associated with trades. This includes bid-ask spreads, commissions, implicit costs from short selling constraints and taxes (Christensen et al., 2013). This measure is based at the logic that investors do not want to trade if costs exceed the value of new information, similar to the rationale behind the variable zero return days. Total trading cost is expected to have a negative relationship with disclosure.

**Tobin’s Q**

Tobin’s Q is computed as (Total assets – book value of equity + market value of equity) / total assets. This is a frequently used metric in corporate finance literature (Daske et al., 2008). Higher values of Tobin’s Q reflect differences in discount rates and differences in expected future cash flows and growth expectations. According to Daske et al. (2008) this measure serves as more comprehensive measure than the cost of equity capital. Tobin’s Q is expected to have a positive relationship with the cost of equity capital.**Appendix III: Enforcement change in the Netherlands**

The text below is taken directly from Christensen et al. (2013), and illustrates why they think that mandatory adoption of IFRS was bundled with an improvement of enforcement in 2005 in the Netherlands.

*“Although the Authority for Financial Markets (AFM) was not formally set up until 2006, a proactive comment and review process began in the last quarter of 2005. The Supervisory Financial Reporting Act (Wet Toezicht Financiele Verslaggeving; Wtfv), which gives the AFM the statutory task of reviewing financial statements, was originally scheduled to enter in to force on November 1st, 2005, but was later postponed until December 31st, 2006. Despite the lack of statutory support the AFM began to proactively review financial reports (on a voluntary basis) upon IFRS adoption in 2005. In each of the first two years of its existence, the AFM reviewed around 30 firms (about 10% of publicly listed firms). The first sanctions were imposed in 2007, and include: (i) public disclosure of violations, (ii) restatements of financial statements, and (iii) changes to financial statements going forward.”* (Christensen et al. 2013, p. 37.)

**Appendix IV: Overview of variables and data**

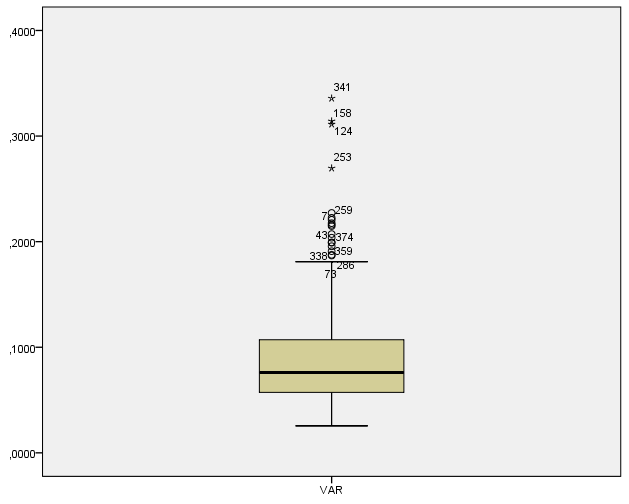
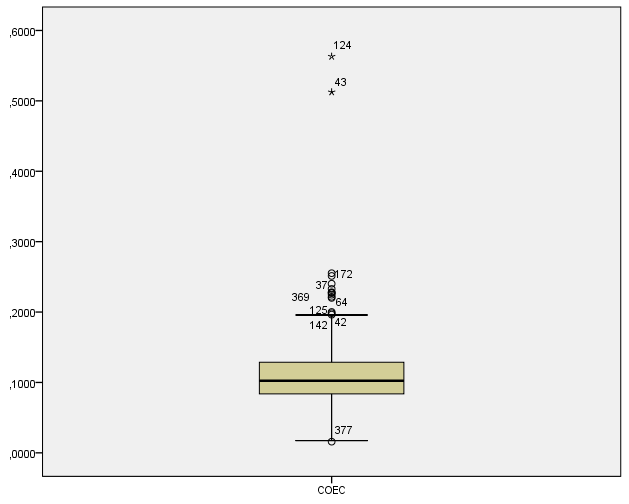
|  |  |  |  |
| --- | --- | --- | --- |
| Overview of variables and data | | | |
| Variable | **Necessary data** | **Database** | **Variable name in database** |
| *Dependents:* |  |  |  |
| *COEC\** | Stock price  Expected earnings per share | Datastream  I/B/E/S | Closing price (P)  Mean estimate |
| *BIDASK\** | Weekly Bid-price  Weekly Ask-price | Datastream  Datasream | Price – bid (PB)  Price – ask (PA) |
|  |  |  |  |
| *Independents:* |  |  |  |
| *IFRS* | Followed accounting standards | Worldscope | WS.AcctgStandardsFollowed |
| *CRISIS* | Observations in period 2008-2010 | N/A | N/A |
| *ROA* | Return on assets | Worldscope | WS.ReturnOnAssets |
| *SIZE* | Total assets | Worldscope | WS.TotalAssets |
| *BMR\** | Monthly Book-to-market ratio | Datastream | Market-to-book value (MTBV) |
| *LEVERAGE* | Total liabilities  Total assets | Worldscope  Worldscope | WS.TotalLiabilities  WS.TotalAssets |
| *VAR\** | Monthly Stock Return Index | Datastream | Stock return index (RI) |
| *ANALYSTFOLLOWING\** | Number of analysts per eps1-estimate | I/B/E/S | Number of estimates |
| *RISKFREE\** | Yield on 10 year Dutch government bonds | Datastream | Average yield (RY) |
| *SHARETURNOVER\** | Monthly  market value of traded shares  Monthly market value of shares outstanding | Datastream  Datastream | Turnover by value (VA)  Market value (MV) |

\*Variables are lagged at 7 months after fiscal year end.

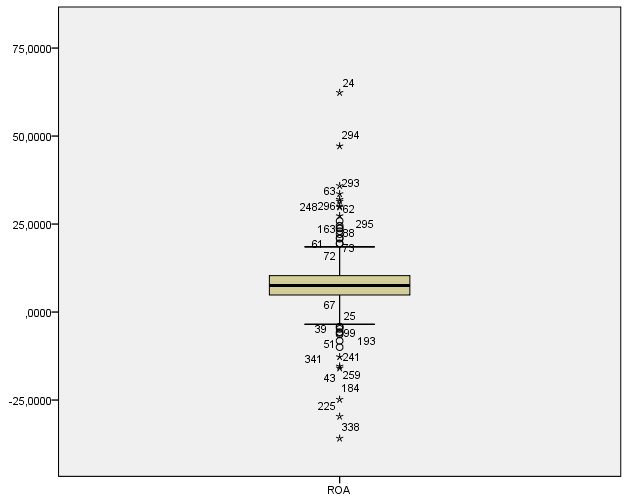
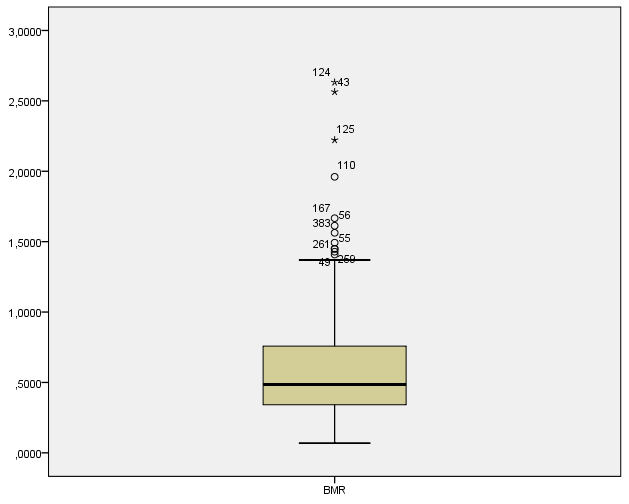
**Appendix V: Overview of Outliers**

Outliers marked with an asterisk have been eliminated.

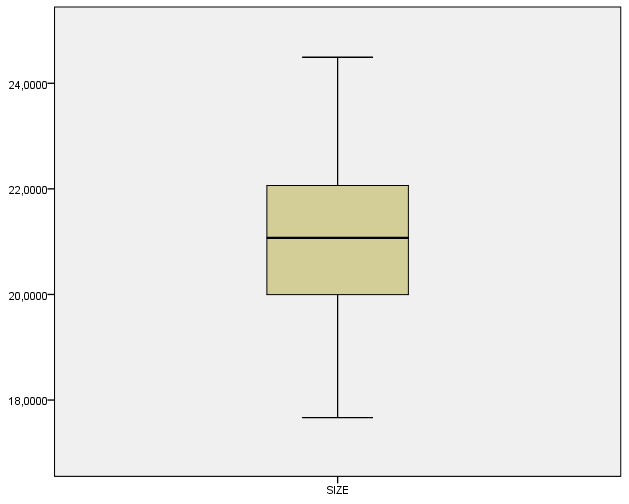
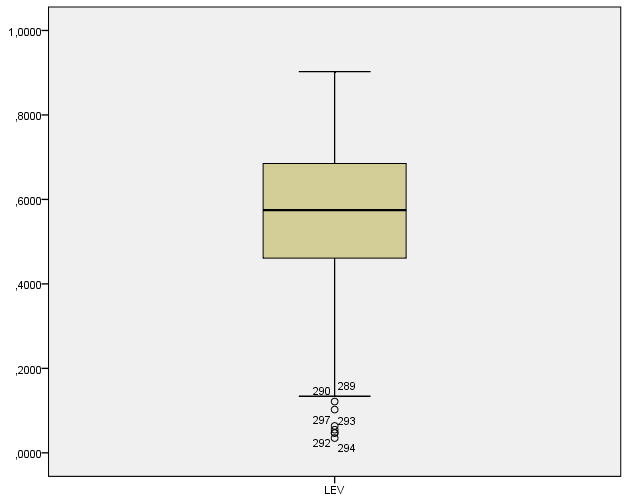
**COEC VAR**

****

**BMR ROA**

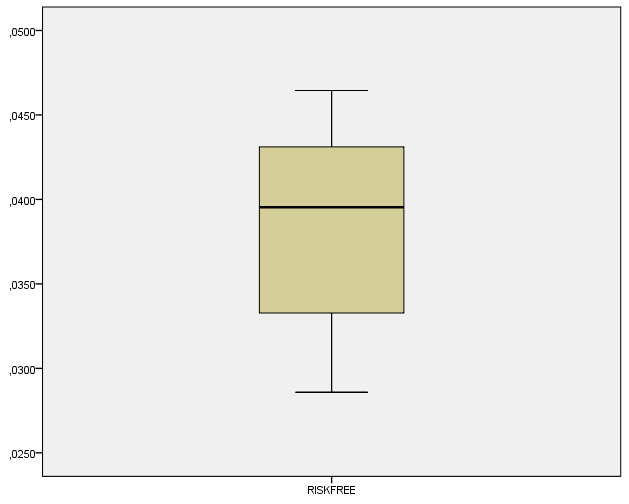
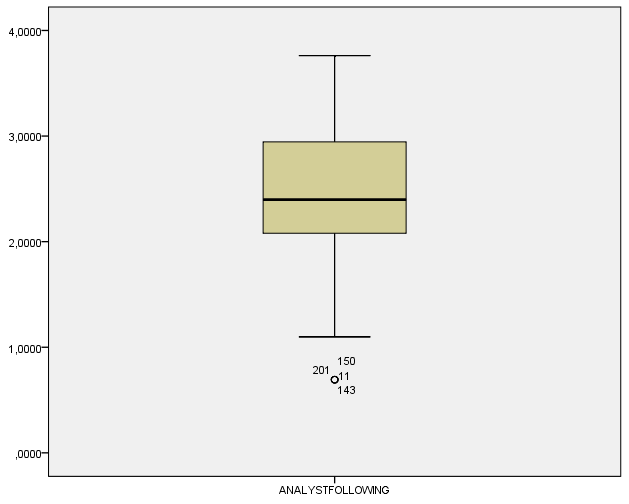
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**LEV SIZE**

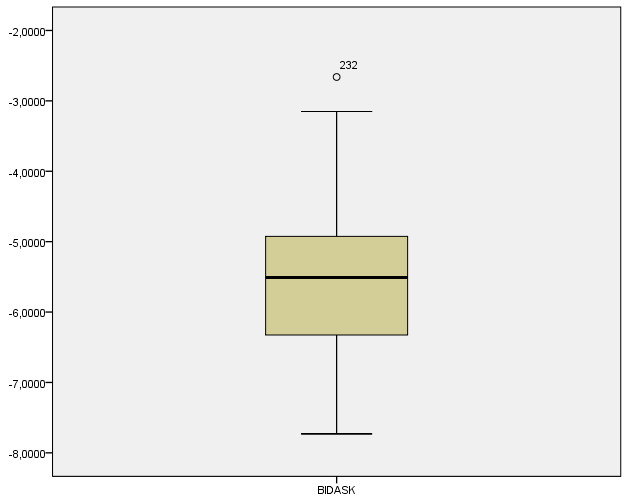
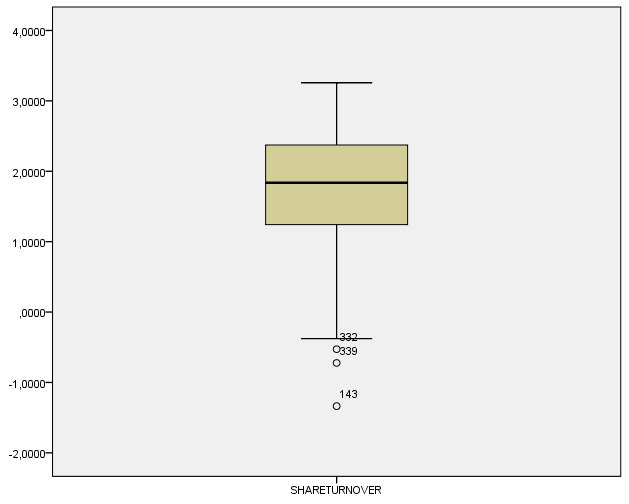
***(continued)***

**Appendix V: Overview of Outliers *(continued)***

**ANALYSTFOLLOWING RISKFREE**

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**BIDASK SHARETURNOVER**

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**Appendix VI: Overview of sample firms**

Firms marked with an asterisk are removed from the sample for the alternative regression on the bid-ask spread.

|  |  |  |  |
| --- | --- | --- | --- |
| **Overview of observations** | | | |
| **Company name** | **# observations** | **Company name** | **# observations** |
| Aalberts Industries NV | 9 | Koninklijke Philips Electronics Na | 8 |
| Accell Group NV | 9 | Koninklijke Ten Cate NV | 8 |
| Akzo Nobel NV | 9 | Koninklijke Vopak NV | 9 |
| Arcadis NV | 9 | Koninklijke Wessanen NV | 9 |
| ASM International NV | 6 | Macintosh Retail Group NV | 8 |
| Ballast Nedam NV | 7 | Mediq NV | 9 |
| BE Semiconductor Industries | 7 | Nutreco NV\* | 9 |
| Beter Bed Holding NV | 9 | Ordina NV | 8 |
| Brunel International NV | 9 | Postnl NV | 9 |
| Corio NV | 9 | Qiagen NV\* | 9 |
| CSM NV | 9 | Randstad Holding NV | 9 |
| Eurocommercial NV | 7 | Reed Elsevier NV | 9 |
| Exact Holding NV | 9 | Royal Boskalis Westminster NV | 8 |
| Grontmij NV | 8 | Royal Imtech | 8 |
| Heijmans NV | 7 | SBM Offshore NV | 9 |
| Heineken NV | 9 | Sligro Food Group NV | 9 |
| Hunter Douglas NV | 8 | Telegraaf Media Groep | 9 |
| ICT Automatisering NV | 7 | TKH Group NV | 8 |
| Kendrion NV | 7 | Unilever NV | 9 |
| Koninklijke Ahold NV | 8 | Unit 4 NV | 9 |
| Koninklijke BAM Groep NV | 8 | USG People NV | 9 |
| Koninklijke DSM | 9 | Vastned Retail NV | 9 |
| Koninklijke KPN NV | 9 | Wolters Kluwer NV | 9 |
| *Subtotals* | *188* |  | *200* |
| **Total observations** | **388** | | |

**References**

1. The theory behind capital market effects of disclosure is discussed in further detail in chapter 2. [↑](#footnote-ref-1)
2. Note that market liquidity reflects the degree to which an asset or security can be bought or sold in the market without affecting the asset's price. And not the term which is used in accounting; the degree to which a firm is able to pay its short-term debt. [↑](#footnote-ref-2)
3. The amount by which the ask price exceeds the bid. In other words; the difference in price between the highest price that a buyer is willing to pay for an asset and the lowest price for which a seller is willing to sell it. [↑](#footnote-ref-3)
4. In this thesis the term ‘increased’ disclosure is equal to either an increase in information quality or information quantity. [↑](#footnote-ref-4)
5. E.g. Income smoothing, aggressive reporting of accruals, decrease of timeliness of loss recognition, meeting earnings targets. [↑](#footnote-ref-5)
6. E.g. many countries did not require a primary statement of changes in equity (IAS No. 17) did not require the disclosure of the fair value of financial assets and liabilities (IAS No. 32) or did not require the consolidation of special purpose entities. For the complete list of common recurring differences I refer to Bae et al. (2008), p 601. [↑](#footnote-ref-6)
7. The outcomes of this survey are based on differences between domestic GAAP and IFRS for fiscal years ending in 2001. The extent to which domestic standards differ could have changed at the time of mandatory adoption (e.g. due to convergence with IFRS). However, the categories at the time of adoption are likely to be the same. [↑](#footnote-ref-7)
8. Important to note is that these observations are based on the implementation of IFRS in 2005, which apply to the contents of IFRS at that time. IFRS has been subject to change ever since. However insights gained by this study are helpful in forming expectations on the possible effects of the transition from Dutch GAAP to IFRS. [↑](#footnote-ref-8)
9. E.g. proportional consolidation versus equity method (IAS 31), expensing vs. capitalization of borrowing costs (IAS 23), cost model vs revaluation model for property, plant and equipment, intangible assets and investment properties (IAS 16, 38 and IAS 40), recognition of actuarial gains and losses in respect of post-employment benefits (IAS 19) and possible exemption from IFRS 1 standards as a result of first time adoption (Ernst & Young (2006). [↑](#footnote-ref-9)
10. Especially valuations based on fair value; share based payment, business combinations, financial instruments and impairment. [↑](#footnote-ref-10)
11. An overview of the studies mentioned in section 3.3 is presented in Appendix I. [↑](#footnote-ref-11)
12. I have included an overview of all other proxies for capital market effects (i.e. besides cost ofequity capital) used in prior research in Appendix II. [↑](#footnote-ref-12)
13. Common recurring control variables in prior research and their association with the cost of equity capital will be explained in section 3.4. [↑](#footnote-ref-13)
14. Tobin’s *q* is a metric that is frequently used in corporate finance literature. A decrease in the cost of equity capital should, ceteris paribus, result in an increase in Tobin’s *q (*Daske et al., 2008). Tobin’s *q* also captures costs associated with implementation of IFRS (e.g audit fees). [↑](#footnote-ref-14)
15. The announcement date that adoption of IFRS would become mandatory for the consolidated statements of EU member states 2005 was 06/04/2002 (Daske et al, 2008). [↑](#footnote-ref-15)
16. This sample contains 326 pre-mandatory adoption firm-year observations, and 94 post mandatory-adoption firm-year observations from the Netherlands. However, no conclusion was made on changes of the cost of equity capital in the Netherlands. [↑](#footnote-ref-16)
17. This aggregate variable consists of a combination of the bid-ask spread, total trading costs, zero returns and the illiquidity measure of Amihud (2002). [↑](#footnote-ref-17)
18. I refer to appendix II for the reason why Christensen et al. (2013) perceive the Netherlands as a country which bundled an enforcement change with introduction of IFRS. [↑](#footnote-ref-18)
19. Measured by the regulatory index of Kaufmann et al. (2009). [↑](#footnote-ref-19)
20. Measure of accounting differences of Bae et al. (2008). [↑](#footnote-ref-20)
21. See als paragraph 4.2 for further explanation. [↑](#footnote-ref-21)
22. See e.g. Ball et al. (2003), Burgstahler et al. (2006), Li (2010), Christensen et al. (2013). [↑](#footnote-ref-22)
23. Capital asset pricing models such as the ones of Sharpe (1964) and Lintner (1965) were the most common models used in prior research, as well as the asset pricing theory of Fama and French (1993). For a more in-depth understanding of these models I refer to Fama and French (1997) for further reading. [↑](#footnote-ref-23)
24. The review of these estimates is limited to the estimates that are used in prior mandatory adoption research as discussed in chapter 3. Therefore the number of estimates addressed in this section is not exhaustive. [↑](#footnote-ref-24)
25. The cost of equity capital was consistently higher for firms in industries such as: sports and leisure, tobacco, commercial lending, electronic technology and automotive. Conversely, the cost of equity capital was significant lower in industries such as real estate, precious metals, financial services and medical equipment. [↑](#footnote-ref-25)
26. Proxies used in this study were based on the PEG ratio model and the modified PEG ratio model by Easton (2004), Gode and Mohanram’s (2003) implementation of the Ohlson and Juettner-Nauroth (2005) model, the model of Claus and Thomas (2001) and the model of Gehardt, Lee and Swaminathan (2001). [↑](#footnote-ref-26)
27. A priori, a reliable expected return proxy should positively predict future realized returns (Hou et al. (2011). [↑](#footnote-ref-27)
28. Guay et al. calculate the forecast error (FERR) as follows: . [↑](#footnote-ref-28)
29. The models used to estimate the cost of equity capital were the ones of Claus and Thomas (2001), Gebhardt et al. (2001) and Easton (2004). [↑](#footnote-ref-29)
30. These independent variables are: total assets, dividend payment, accruals, a dummy variable for whether or not the firm paid dividend and a dummy variable for whether or not the firm had negative earnings (Hou et al., 2011). [↑](#footnote-ref-30)
31. The earnings response coefficient is the estimated relationship between equity returns and the unexpected portion of companies ‘earnings announcements. This coefficient captures the reaction of stock prices to unexpected earnings, which should be higher for better proxies for the market’s earnings expectations (Hou et al., 2011) [↑](#footnote-ref-31)
32. This is in accordance with prior research. See e.g. Hail and Leuz (2007) and Li (2010). [↑](#footnote-ref-32)
33. Datastream only delivers the variable market-to-book. To obtain the book-to-market value, I divide the number 1 by these market-to-book values to calculate the book-to-market ratio. [↑](#footnote-ref-33)
34. Appendix V shows boxplots for both dependent and independent variables. [↑](#footnote-ref-34)
35. Appendix VI contains an overview of the firms in the sample. [↑](#footnote-ref-35)
36. After elimination of these firm-year observations I have checked whether or not the final sample contains firms with few observations. For instance, a firm in the sample that has only one observation left, or only observations in one cross-sectional period, would not contribute to the model and should be left out entirely, which implies additional eliminations. The final sample however does not need these additional eliminations because no such firms are observed in the final sample. [↑](#footnote-ref-36)
37. Removing the 13 ROA outliers identified in section 6.3, did not contribute to the significance of the variable, or the model as a whole. [↑](#footnote-ref-37)
38. Possible effects of multicollinearity include: inflated variance in regression coefficients; different signs and magnitudes of independents, adding or removing variables or data points result in large changes to the model, other variables may become insignificant (Aczel,2002). [↑](#footnote-ref-38)
39. To illustrate the differences between VIF levels: An of 1 results in infinite VIF. An of 0,99 results in a VIF of 100. An of 0,9 results in a VIF of 10. An of 0,8 results in a VIF of 5. And so on. [↑](#footnote-ref-39)
40. Tolerance is the inverse of the VIF. [↑](#footnote-ref-40)
41. See chapter 4. [↑](#footnote-ref-41)