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Information Asymmetry and Discretionary Accounting in European Banks

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ABSTRACT

Recent theoretical research suggests that information risk is a non-diversifiable risk factor and should therefore affect the cost of capital of the individual firm. This study investigates this notion for listed European banks during the period 2005-2015. I use two measures based on the level and uncertainty of discretionary accounting choices to proxy information risk and investigate the effect on the information asymmetry component of banks' cost of capital. I study the effects on the equity market, proxied by bid-ask spreads and stock volatility, and the credit market, proxied by bond and CDS spreads. The results show that the level of discretionary accounting affects information asymmetry on the equity market, mainly through the effect on bid-ask spreads. Additional tests suggest that these effects are solely generated by the level of discretionary loan loss provisions. I find some evidence that the uncertainty in the level of discretionary accounting has a similar effect on the equity market, however these results are weak to alternative model specifications. I am unable to empirically support any effect on the credit market. My results should be of interest to standard-setters to ensure that financial accounts provide information that support investors' decisions. The results also suggest that banks are able to lower their cost of equity capital by providing high quality information.

Keywords: Information asymmetry, discretionary accounting, earnings management, capital markets, financial institutions.

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1 Introduction

Accounting choices that are used to manage earnings and hence alter the information content to capital providers is an area that has generated great interest of researchers. From the view of standard-setters, the purpose of accounting information is to assist investors or other capital providers in their decisions (IASB, 2010; FASB, 2010). However, principle based accounting standards might also create incentives for management to pursue personal objectives, which may distort the picture of the firms' underlying economics.

This paper is predicated on theoretical and empirical research that show that firm-specific information regarding information quality has an effect on the cost of capital for the individual firm (Diamond and Verrecchia, 1991; Amihud and Mendelson, 1986). In theoretical research, Easley and O'Hara (2004) and Lambert et al. (2012), amongst others, have shown that the information provided by the individual firm is a priced factor for investors. That is, it serves as a type of systematic risk. This notion has been investigated by empirical research in a general setting (e.g., Francis et al., 2005; Leuz and Verrecchia, 2000; Botosan, 1997) and for banks specifically (e.g., Bushman and Williams, 2015; Shen and Huang, 2013).

I measure information risk as the quality of earnings, whereas others have focused on the quality of disclosures. More specifically, I use measures based on discretionary choices in accounting for loan losses and gains and losses on sales of securities. In the area of accounting for loans losses, the regulation is largely based on expectations of future loan losses, hence it is to a great extent dependent on the professional judgement of management (Ahmed et al., 1999; Beatty et al., 2002; Cornett et al., 2009; Bouvatier et al., 2014; Cohen et al., 2014). In addition, the accounting treatment of realized gains and losses of securities provides alternative flexibility for managers (Cohen et al., 2014; Beatty and Liao, 2014). By timing the realization of securities, banks are able to alter reported earnings. The accounting discretion creates two possible implications of the accounting information. Firstly, managers are able to use their judgement in order to increase the quality of the financial information provided to capital investors. In terms of information asymmetry, the case where privately informed managers use discretionary policies to increase the information quality is expected to reduce the information asymmetry and thus generate a lower cost of capital. Secondly, from an alternative view, managers are able to use discretionary accounting choices to serve personal objectives at the expense of misleading outsiders. From this perspective, managerial discretion serves as a source of information risk that might affect pricing decisions of investors to demand a higher required return, thus implying a higher cost of capital for the firm.

The purpose of this study is to examine how managerial discretionary behavior in banks affects the perceived risk of capital providers. The underlying assumption is that bank management uses discretion to manage earnings. This notion has been vastly investigated by contemporary research studying the different incentives of income smoothing, capital management and signaling (see further Section 2). The latter incentive concerns the value relevance of discretionary accounting policies, in other words, the association with market value or future earnings. However, my question is whether earnings management increases or decreases perceived risk.

This question is important for several reasons. First, individual bank risk-taking behavior contributes to the systemic risk of the economy as a whole (Acharya et al., 2010; Bushman and Williams, 2015). Consequently, it is important to ensure the transparency and quality of the information provided by banks in particular. In a similar vein, evidence shows that earnings management is associated with crash risk of individual stocks (Jin and Myers, 2006; Cohen et al., 2014; Bushman and Williams, 2015). Considering the systemic importance of banks, it is of greater significance to ensure the soundness of the information provided by banks. Secondly, there is empirical evidence that the level of opacity is higher in the banking industry than in other industries (Morgan, 2002; Iannotta, 2006). From a market perspective, this means that an increase in information asymmetry would generate a higher uncertainty for banks than in other industries. Consequently, banks and regulators have greater incentive to increase the quality of information to enhance the transparency and thus lower uncertainty. Lastly, scholars have discussed if and how the existing accounting regulation regarding loan losses and securitization contributed to the most recent financial crisis (Barth and Landsman, 2010). Therefore, it is of interest to examine how the leeway given by accounting standards is assessed by market participants in terms of increased or decreased risk.

Contemporary research studying capital market pricing of accounting quality has mainly relied on deriving discretionary behavior using various modifications of the model introduced by Jones (1991) for estimating abnormal accruals (e.g., Dechow and Dichev, 2002; Francis et al., 2005; Core et al., 2008; Gray et al., 2009). In essence, the model estimates normal accruals and the estimated residuals are used as indicators of abnormal accruals. Business in the financial sector is characterized by other fundamentals than sales of goods and services, hence research within this area requires a different modelling approach. My objective to focus on a specific industry assists in deriving a more precise proxy of discretionary accounting choices.

Drawing on extant empirical research concerning the banking industry, there are mainly two approaches when investigating discretionary behavior. The first approach is to control for non-discretionary factors in a one-step regression model (see e.g., Ahmed et al., 1999; Lobo and Yang, 2001; Kanagaretnam et al., 2004). The other approach first separates loan loss provisions (LLP) and/or realized gains and losses into one discretionary and one non-discretionary part, as the residuals of a regression model, and in a second step study the effects of the component(s) (see e.g., Beatty et al., 2002; Kanagaretnam et al., 2011; Shen and Huang, 2013; Cohen et al., 2014). My approach stems from the latter. By separating the items into two discretionary components, I define the level of discretionary accounting as the absolute value of the difference between the discretionary components. With regard to studies that use the signed value of residuals, I focus on whether the presence of accounting discretion affects the perceived risk, hence the absolute value is more adequate compared to signed residuals that arguably are more related to value relevance. Moreover, I investigate the uncertainty of the discretionary accounting choices using a similar approach as Francis et al. (2005) to define the proxy of uncertainty as the standard deviation of residuals. To my knowledge, the capital market effects of this approach have not been examined in previous banking research.

I study the effects of these measures in relation to bid-ask spreads, stock volatility, bond spreads and credit default swap (CDS) spreads. These measures serve as proxies for the market's perception of the bank-specific risk and ultimately an indication for the firm's cost of capital.

Bid-ask spreads and stock volatility are proxies for equity risk, whereas bond spreads and CDS spreads are indicators for credit risk. As pointed out by Beatty and Liao (2014), the main body of existing literature does not make a distinction between information asymmetry and the signaling hypothesis. The methodological approach in this study is to investigate discretionary behavior in the light of information asymmetry. Moreover, Beatty and Liao also advocate that there is a need for research studying the effects of discretionary behavior in relation to the credit market.

My findings suggest that the level of discretionary accounting behavior is positively associated with information asymmetry on the equity market. It is mainly evident for the effect on bid-ask spreads, whereas the results for stock volatility is weak. I am unable to confirm a similar effect on the credit market. Additional tests show that it is exclusively the discretionary loan loss provisions that affect the equity related proxies. I also find some indications that the uncertainty of discretionary accounting affects the equity market's perceived risk. These results are however weak to alternative model specifications and could potentially be affected by the noisier proxy of discretionary gains and losses on sales of securities.

The main contribution is that I show that discretionary accounting in banks increase information asymmetry on the equity market. Taking the perspective of standard-setters, this finding is important as it shows that the effect of the given leeway in accounting standards rather increases the uncertainty in the eyes of investors, thus the effect is seemingly contrary to the main objective of financial accounting to provide information to assist decisions of investors. From the view of prepares, the results suggest that banks are able to reduce information asymmetry and ultimately the cost of equity capital by providing high quality information. I also add to the literature studying the effect of discretionary accounting choices on the cost of capital for European banks. Even though the existing body of literature has examined these two factors separately, there is less knowledge of the influence between discretionary accounting choices and the cost of capital in the banking industry. In addition, most capital market research regarding discretionary behavior in banks is concentrated to a US setting, while the evidence for Europe is more sparse. The empirical evidence in Europe mainly relates to research investigating the presence of the various incentives for discretionary accounting choices, whereas my approach rather attends to the potential impact on the cost of capital indicators of the discretionary choices. Moreover, drawing on the methodological approach in Francis et al. (2005), I introduce an industry-specific measurement of studying the pricing effects of the uncertainty of discretionary accounting choices. To my knowledge, this approach has not been investigated in the stream of literature studying discretionary behavior in banks.

The remainder of this paper is structured as follows. Section 2 provides an overview of relevant literature regarding capital market research and discusses incentives for discretionary accounting choices in banks more specifically. Section 3 draws on prior research to develop hypotheses for the empirical tests. Section 4 describes the methodological approach used to investigate the hypotheses presented in the former section. Section 5 presents the sample collection and characteristics. Sections 6 and 7 present and conclude the findings of this paper.

2 Literature Review

2.1 Information Risk and the Cost of Capital

Over time the notion whether information risk affects the pricing of capital has drawn great interest of researchers. According to Fama (1991) information risk is idiosyncratic (i.e. dependent on shocks or technology) and consequently diversifiable and not affecting expected return. This notion has later been challenged by several researchers. In the stream of theoretical research, Easley and O'Hara (2004) draw upon CAPM and investigate how private and public information affect the cost of capital. The findings in the study suggest that private information is priced higher implying higher cost of capital. As stated by the authors, this is explained by that private information increase the uncertainty for uninformed investors, consequently private information serves as a type of systematic risk that cannot be fully diversified. In contrast, Lambert et al. (2007) and Hughes et al. (2007) argue that when the number of traders increases in Easley and O'Hara's model, the pricing effects of private information vanish. Instead, Lambert et al. (2007) advocate that the quality of information affects the market's perception of future cash flow and thereby the cost of capital. Hughes et al. (2007), however, are unable to analytically support that information asymmetry affects the cost of capital for the individual firm. In contrast, the authors advocate that information asymmetry only affects market-wide risk. More recently, Lambert et al. (2012) show that the quality of information affects the cost of capital since it enhances the precision of investors' information. According to the authors, in a market with perfect competition, it is rather the precision of investors' information that affects the cost of capital, while information asymmetry is not a priced factor per se. However, the information asymmetry is still argued to affect prices in markets with imperfect competition.

Drawing on the aforementioned studies, the evidence how information risk affects the cost of capital remains somewhat unclear. The consistent arguments in theoretical literature are that information risk plays a part in determining the cost of capital to some extent, whether it is on individual firm-level (e.g., Easley and O'Hara, 2004; Lambert et al., 2012) or market-level (e.g., Hughes et al., 2007). Applying the perspective of the former, firms are able to lower their cost of capital by providing sound information to investors. The notion that financial information serves to support investors in their decision making process is also the main objective for standards setters such as IASB and FASB.

The main focus in empirical research studying the quality of information has been on disclosure quality and different earnings quality metrics (Kothari, 2001; Healy and Palepu, 2001). The objective of this paper is to investigate the latter, hence it is treated more thoroughly, whereas the empirical evidence for market effects of disclosure quality is only briefly discussed.

In the case of disclosures, Leuz and Verrecchia (2000) investigate German firms that changed accounting regulation from German GAAP to IAS or U.S GAAP. The change of accounting standard is interpreted as a commitment[1] to increased level of disclosure. By relating the commitment to increased disclosure to information asymmetry proxies such as bid-ask spread,

[1] Leuz and Verrecchia (2000) make a distinction between commitment and voluntary disclosure, where the former is a decision before and the latter is a decision made after knowing the content of the disclosed information.

trading volume and share price volatility, the study hypothesizes that firms that commit to increased disclosure face lower cost of capital. Accordingly, the findings support this notion for the two former proxies, however not for stock price volatility. In addition, the authors only find small differences in information asymmetry between those firms that switch to US GAAP contra IAS. However, it should be noted that Leuz and Verrecchia measure the increased level of disclosure and not disclosure quality per se. Another study with similar approach and findings is performed by Botosan (1997). She shows that firms with low-analyst following face lower cost of equity with increased disclosure for a US sample of 122 firms in the machinery industry.

For empirical evidence concerning the cost of debt, Sengupta (1998) study 532 US firms for the period 1987-1991. The findings suggest that disclosure quality is negatively associated with the cost of debt proxied by the yield to maturity of the first issued debt in the subsequent period and the total interest cost of the first debt issue. Sengupta (1998) does not estimate the quality of disclosures, instead the author relies on scores provided by analysts[2]. A potential issue with this approach is that the measure could generate bias that the researcher cannot control.

For the effect of information risk of earnings quality on the cost of capital, Francis et al. (2005) provide an example of pricing effects of current accruals quality as a proxy for information risk in the US. The authors use a regression model to estimate total current accruals. Based on the regression estimates, they define accruals quality as the standard deviation of firm-specific residuals over five years. The reason for using the standard error of residuals is argued to be that it captures the uncertainty of the accruals. Firms that consistently over- or understate accruals, leading to a small standard deviation of residuals, are examples of predictable behavior and should not impose a pricing premium based on higher uncertainty. The authors also decompose the accruals quality metric into discretionary and innate accruals quality using a similar method as in the first step[3]. For cost of capital proxies, the study uses betas derived from CAPM, P/E ratios for the cost of equity and interest rate scaled by interest-bearing debt and credit ratings for the cost of debt. The findings suggest that lower accruals quality is associated with higher cost of equity and debt and that innate accruals affect the cost of capital to a larger degree than discretionary accruals. The arguments are that the discretionary accruals are used both to improve the reporting, i.e. reducing information asymmetry which leads to lower uncertainty, and to decrease the quality information by managerial opportunistic behavior. This notion could be connected to the signaling and, to some extent, the earnings management hypothesis in the banking industry (discussed further in Section 2.2).

In a similar vein, Gray et al. (2009) study Australian firms in the period 1992-2005. In line with Francis et al., they find that accruals quality is a priced factor for both the cost of debt and equity and that innate accruals are the main source of the effects. In contrast, the authors are unable to find any significant influence of discretionary accrual quality on neither the cost of debt nor equity. According to Gray et al., this may be attributable to the unique disclosure requirements in Australia that might affect the discretionary component of abnormal accruals. Core et al. (2008) argue that Francis et al.'s findings of accruals quality in relation to beta are

[2] The scores are collected from Report of the Financial Analyst Federation Corporate Information Committee.

[3] Francis et al. (2005) define discretionary accruals as the portion of accruals quality that is dependent on managerial accounting choices and innate accruals as dependent on the inherent risk profile of the specific firm.

explained by modeling misspecifications. In their alternative model specification, they find no evidence for the effect of accruals quality and firm-specific beta. Moreover, Eckles et al. (2014) derive a industry-specific model based on Francis et al. to study the effect of information quality in insurance companies. The findings suggest that information risk is only a priced factor for the cost of debt, however not for the cost of equity. An alternate approach is provided by Cohen (2008). His study measures information quality from the unexplained variation in future operational cash flows. Similarly to Francis et al., the study defines accounting quality as the standard deviation of residuals and also adds the measure of unsigned residuals. The results show that information quality does not affect the cost of equity.

2.2 Earnings Management in Banks

The notion of earnings management via altering the level of loan loss provisions (LLP) has been extensively attended to in contemporary research. LLP is the most significant accrual for banks and it is subjected to extensive managerial judgment (Ahmed et al., 1999). The item consists of management's estimations of changes in expected future losses from credit risk in the loan portfolio (Ahmed et al., 1999; Cornett et al., 2009; Bouvatier et al., 2014). LLP decreases net income and increases the corresponding balance sheet item loan loss allowances (LLA), thus also reducing the net of outstanding loans. Because management has to rely on its professional judgement in estimating the future loan losses, it creates a leeway for managers to alter earnings and/or regulatory capital by over/understating LLP.

There are several reasons for using discretion in order to manage LLP. The most studied incentives in related research are income smoothing [4], capital management and signaling incentive (Kanagaretnam et al., 2004; Ahmed et al., 1999; Lobo and Yang, 2001). In addition, gains and losses on sales of securities is also an accounting area where management are able to alter earnings (Cohen et al., 2014; Beatty and Liao, 2014). The discretionary aspect of gains and losses on securities is related to the timing when to realize gains or losses on available-for-sales securities, since prior fluctuations in fair value are recognized in OCI. However, since the unrealized gains and losses are excluded from the regulatory capital it is not an incentive for capital management.

In general, studies in this area have mainly focused on US banks, however, in recent years there has been a growing body of literature investigating the incentives in an European or global setting. In these studies, researchers have both focused on testing for these incentives separately or testing for all of the incentives simultaneously. My review of earnings management literature in banks is structured in four parts. First, I attend to the empirical evidence for the income smoothing hypothesis. Secondly follows a review of literature regarding the signaling hypothesis. Thirdly, I discuss the findings of the capital management hypothesis. Lastly, I connect the implications of discretionary accounting choices to the empirical literature that

[4] Several studies instead use the term earnings management interchangeably to describe income smoothing and/or earnings-altering to reach targets. In this study, however, I use earnings management as the use of discretionary accounting policies to achieve some kind of objective that either increase or decrease information quality. Even though the capital management incentive also include altering the level of LLA, the main underlying objective for all incentives is to manage earnings with various motives.

explicitly studies risk effects.

2.2.1 Income Smoothing

Income smoothing has generated a great deal of interest for researchers throughout the history. In 1968, Copeland described income smoothing as “the repetitive selection of accounting measurement or reporting rules in a particular pattern, the effect of which is to report a stream of income with a smaller variation from trend than would otherwise appear” (pp. 102). For the income smoothing incentive in banks, managers are hypothesized to overstate (understate) LLP when earnings are expected to be high (low). There might be several reasons to engage in income smoothing. For instance, by showing a stable stream of income, banks are expected to appear less risky by investors and therefore face a lower cost of capital (Ahmed et al., 1999). From an agency perspective, managerial compensation might be related to the stabilization of earnings, thus discretionary behavior could also be generated by the agency problem where management maximizes its self-interest (Lambert, 1984; Greenawalt and Sinkey, 1988).

In a stream of empirical research of income smoothing in banks, Greenawalt and Sinkey (1988) study 106 large US bank holding companies over the years 1976 to 1984. Their findings suggest a positive association between earnings before LLP and provisions for loan losses, consequently confirming the income smoothing hypothesis. Lobo and Yang (2001) use a wide modelling approach to test for all three aforementioned incentives. According to their findings, the income smoothing is the strongest incentive for using discretion to manage LLP.

Similarly, Beatty et al. (2002) provide empirical evidence for earnings management in US banks over the years 1988-1998. By separating LLP and realized security gains and losses into discretionary parts defined as the residuals of predicted values, the authors show that banks use earnings management to transform small declines in earnings (before discretionary LLP) into small increases in earnings. In addition, this behavior appears to be more extensive in public compared to private banks. This finding is motivated by a larger pressure on public banks to report increasing earnings. Kanagaretnam et al. (2004) use a different modelling approach to study earnings management in the US during an extended time-frame than Beatty et al. (2002). Their results also support the hypothesis of income smoothing in US banks. Moreover, the authors find that the incentive to smooth income is dependent on the incentives to signal.

For examples outside the US, Bouvatier et al. (2014) investigate various ownership characteristics in the light of earnings management in European banks in 2004-2009. Contrary to the findings of Beatty et al. (2002), Bouvatier et al.’s findings suggest that the income smoothing behavior is less evident in listed banks. One possible explanation might be that only listed banks in Europe are forced to apply IFRS. The introduction of IFRS has been shown to mitigate earnings management behavior in banks (Leventis et al., 2011). In the case of the US, however, the accounting standards are more homogeneous for listed and unlisted banks during the investigated period of 1988-1998 in Beatty et al. The notion that income smoothing behavior in listed contra unlisted banks differs between countries are supported by the findings of Fonseca and González (2008). Curcio and Hasan (2015) find that income smoothing is an important factor for both the Euro area and non-Euro area banks. Furthermore, Pérez et al. (2008) provide evidence for smoothing behavior in Spanish banks, but this behavior is mitigated after year 2000 with the introduction of stricter policies (compared to IFRS) in accounting for loan losses in Spain. More recently, Skała (2015) confirms that banks in Central Europe use LLP to smooth income when earnings are high. However, the results indicate that banks also make larger provisions in periods of extremely low income, which would be in line with the notion of big bath accounting, but not with the income-smoothing hypothesis. For other regions, Anandarajan et al. (2007) provide evidence for income smoothing in Australian banks during 1991-2001.

While the prior studies are consistent in their findings of income smoothing behavior in banks, there are some studies with contrary findings. For instance, Ahmed et al. (1999) find no evidence of income smoothing in US banks between 1986-1995. These results are supported by Beatty et al. (1995) using a sample of 148 large US banks in 1985-1989. To address potential explanations to the contrary findings, the models used to test the income smoothing hypothesis differs between studies. Ahmed et al. (1999) and Beatty et al. (2002) have a similar time-frame for their studies, although different model specifications. Another difference is that Beatty et al. (2002) define earnings management as small changes in earnings, whereas Ahmed et al. (1999) investigate the association between LLP and earnings before tax and LLP.

2.2.2 Signaling

The rationale behind the signaling theory from a capital market perspective is that management use discretionary actions to mitigate the adverse selection problem where lack of information leads to higher cost of capital (Akerlof, 1970). Applied to the case of discretionary LLP, banks are hypothesized to increase LLP to signal managerial private information of future financial strength (Wahlen, 1994; Ahmed et al., 1999; Kanagaretnam et al., 2004). The most commonly used methods to test this hypothesis are to relate discretionary behavior to future earning or cash flow or to investigate the following market reaction of discretionary LLP.

The empirical evidence for the signaling incentives is somewhat conflicting. For instance, Wahlen (1994) show a positive relationship of unexpected components of LLP both in terms of signaling stock returns and future cash flows. In a similar fashion, the frequently cited study by Beaver and Engel (1996) investigate how different components of the LLA affect the market value of equity in two different time periods. The method used in their study separates LLA into one discretionary portion and one non-discretionary portion by using a regression model. Also, they make similar estimations of discretionary and non-discretionary LLP. The findings suggest that the two components are priced differently, where the discretionary LLA is positively associated with the market value of equity, whereas non-discretionary LLA has a negative association, thus confirming the signaling hypothesis. The results for discretionary LLP are similar but only for the second time period, 1985-1991. On the contrary, applying a different methodological approach, Ahmed et al.'s (1999) findings indicate that the signaling incentive is not significant in US banks. Instead of separating LLP into different components as in Beaver and Engel (1996), the authors control for non-discretionary LLP by including factors as independent variables. Regarding the findings of Wahlen (1994), the authors argue that the signaling incentive might be specific to the time period of his study. Lobo and Yang

(2001) later challenged this notion by using a different methodology when conducting bank-specific regressions compared to Ahmed et al.'s (1999) pooled time series cross-sectional (PTSCS) approach. The bank-specific regressions showed a significant positive association of LLP and future operating income, however these results were not consistent with the year-by-year cross-sectional, PTSCS or fixed effects regressions. According to the authors, this is explained by the fact that the signaling incentive is determined by bank-specific decision dependent on the unique situation. The study of Kanagaretnam et al. (2004) shows that undervalued banks are more likely to use discretionary LLP to signal financial strength. Further, the study finds a similar interdependency as for the income smoothing hypothesis, i.e that the incentive to signal is dependent on the incentive to smooth income.

More recently, Kanagaretnam et al. (2011) investigate the effect of audit quality using the same methodological approach as Beaver and Engel (1996). The results indicate that the signaling effect is greater with high quality audit firms (defined as Big 5). In addition, Kilic et al. (2012) study the implementation of SFAS 133, *Accounting for Derivative Instruments and Hedging Activities*. Their findings suggest that discretionary LLP used for signaling purposes exist, but the informativeness of the item appears to be lower after the implementation of SFAS 133.

For studies outside the US, following the methodological stream of Ahmed et al. (1999), Anandarajan et al. (2007) find no evidence of signaling in Australian Banks. Using a similar approach, Leventis et al. (2012) investigate 91 listed bank in the EU during the period 1999-2008. The authors fail to find supportive evidence for signaling in their baseline specification. However, when including a solvency risk dummy, the results indicate that financially distressed banks are more prone to signal. In addition, this behavior seems to be stronger after the introduction of IFRS in the EU. Curcio and Hasan (2015) also study signaling in Europe. Their results suggest that only banks outside the Euro area use LLP to signal future earnings.

2.2.3 Capital Management

The incentive to engage in capital management via discretionary LLP is motivated by reaching capital levels imposed by bank regulators. According to this view, banks use discretionary LLP to manage regulatory capital levels as the corresponding balance sheet item, loan loss allowances (LLA), is included in the regulatory capital (Lobo and Yang, 2001; Ahmed et al., 1999; Beatty et al., 1995). The violation of capital requirements could generate restrictions of paying out dividends, conducting acquisitions and might ultimately force the bank to shut down (Beatty et al., 1995; Wall and Koch, 2000). Consequently, LLP is predicted to be negatively associated with regulator capital as banks with lower capital levels have larger incentives to manipulate LLP. Compared with the income smoothing hypothesis, the empirical evidence of capital management is quite inconsistent during different time periods and regions. One possible explanation is the introduction of the Basel Accords in the 90's, which has lowered the influence of LLP on regulatory capital levels[5].

Some early research contributions focused solely on the capital management hypothesis, whereas contemporary research mainly empirically examines the incentives altogether. Examples

[5]See Anandarajan et al. (2007) for a more thorough explanation of the effects of the Basel Accords.

of the former are Moyer (1990) and Kim and Kross (1998). Moyer (1990) studies the effect of discretionary behavior in accounting for LLP, security gains and losses and loan charge-offs[6] in US banks during 1981-1986. Their findings suggest that LLP and security gains and losses, but not charge-offs, are used to manage regulatory capital in banks that are close to violate capital requirements. Similarly, Kim and Kross (1998) focus on US banks and the implications of the aforementioned changes in regulation in 1989 (the regulatory changes in the US were largely the same as those imposed by the Basel Accords). In relation to the regulatory changes, banks decreased the level of LLP in the post-period, indicating that the new regime had a mitigating effect on capital management. In line with Moyer (1990), the results suggest that this behavior is most apparent in banks with low capital ratios.

In the other stream of literature studying all incentives, Ahmed et al. (1999) provide a consistent view that the regulatory changes in 1989 had a mitigating effect on the incentives for capital management. Although, the authors advocate that the incentive for capital management is the dominant incentive for using discretionary LLP even in the post-period of implementation. Earlier studies using a similar approach also find evidence for a negative association between LLP and capital levels in the US, thus confirming the capital management hypothesis (see e.g., Beatty et al., 1995; Beaver and Engel, 1996). The various modelling approach of Lobo and Yang (2001) show no indication of capital management in the US. In contrast to Ahmed et al. (1999), their findings show a positive relationship of LLP and capital ratios. In contrast, when relating to the minimum required ratio of capital, the capital management hypothesis is supported. This suggests that, instead of being determined by a bank-specific or cross-sectional mean, banks tend to manage their capital level by comparing with the capital adequacy ratios imposed by regulators. For more recent evidence from the US, Kilic et al. (2012) study the impact of SFAS 133 and find weak indications for capital management in small banks.

For studies outside the US, the evidence for capital management in Australia is only supported before the implementation of the Basel Accords (Anandarajan et al., 2007). Furthermore, Fonseca and González (2008) find no association between LLP and capital level in their study covering 41 countries from different regions. Considering that the Basel Accords has a large effect on LLP and its relation to regulatory capital, the year of implementation and potential adjustments on country level are expectedly important determinants, thus their approach might not be adequate to investigate capital management.

In the EU, the study by Leventis et al. (2011) finds no evidence for capital management before or after the implementation of IFRS. Similar conclusions in the EU can be drawn from the studies of Curcio and Hasan (2015) and Bouvatier et al. (2014). In addition, the previously discussed study of Pérez et al. (2008) focusing on Spanish banks find no evidence for using LLP to manage capital levels. In contrast, Bouvatier and Lepetit (2008) find that EU banks with lower regulatory capital are less prone to make provisions to loan losses.

[6]Charge-offs are loans that are considered uncollectible and adjust prior made LLP. Hence the item only affects non-performing loans and LLA, and thus only regulatory capital and not the income statement.

2.2.4 Market Assessment of Earnings Management in Banks

As discussed in the former section, the presence of incentives for discretionary behavior is covered extensively in contemporary research. However, the literature that explicitly studies the effects on the cost of capital is more sparse. Morgan (2002) argues that banks in general are more opaque than other firms. Based on this notion, potential asymmetric information in banks generates higher market uncertainty. By examining the disagreement of credit rating agencies in reacting to call reports, he shows that US banks, second to insurance firms, generated disagreement more often than other firms. Similar findings are presented by Iannotta (2006) in Europe. Moreover, Iannotta show that bank size and regulatory capital ratio is positively associated with uncertainty. To address the finding of capital ratio, the author argues that a higher level of capital might indicate lower quality of assets, which generates disagreement of credit rating agencies. In addition, Flannery et al. (2004) find that the structure of banks' assets affects market uncertainty proxies such as bid-ask spread, trading volume and stock volatility. The reason for the relative higher opaqueness of banks is that outsiders are unable to assess the true market value of the majority of banks' assets, since there are no active secondary market for loans. Thus managers that are able to better assess the creditworthiness of borrowers have a larger information advantage compared to other industries that are less opaque (Zhang et al., 2009). Drawing on the theoretical research in Section 2.1, as the empirical evidence proposes that the information provided by banks generates more market uncertainty, the natural implication would be that the market effect of information quality is greater than other firms.

A study performed by Cohen et al. (2014) investigate how earnings management affects extreme declines in stock prices in the US for the period 1997-2009. The study uses a measure of earnings management similar to Beatty et al. (2002), where earnings management is measured as absolute value of the combined residuals when regressing LLP and realized gains and losses on security sales. The findings fail to show any association before the economic crisis of 2007, however during the economic crisis earnings management was negatively associated with downside stock risk. In addition, the authors suggest that discretionary LLP has a larger impact on the market risk than discretionary gains and losses on securities. Similar findings are presented by Bushman and Williams (2015). They use a different measure of accounting discretion in delayed expected loan loss recognition by classifying banks into two subgroups. In addition to individual downside risk during recession, they also find empirical evidence that higher individual discretionary behavior has a greater effect on the risk of stock crashes on a market-wide level than banks with lower discretionary accounting. Furthermore, they find an association between discretion and stock illiquidity, thus indicating that banks that delay the recognition of loan losses face a higher cost of capital. Floreani et al. (2015) study the determinants of betas in 59 European banks. Their findings suggest that LLP is able to explain some variation in bank-specific beta. Further, the effects of LLP during the crisis and before crisis differs, where LLP showed a positive effect on beta in the crisis, while the overall effect is negative. Thus banks' systematic risk is seemingly affected by LLP.

For the cost of debt, Shen and Huang (2013) use a similar approach as Cohen et al. to investigate how discretionary policies affect credit ratings. Their sample consists of 3473 banks from

85 countries during 2002-2008. The study shows a negative association between discretionary LLP and credit rating, indicating a higher cost of debt. Compared to Cohen et al., Shen and Huang base their main results on measuring discretionary LLP as the signed value of residuals. The interpretation from this approach is that banks that overstate LLP face lower credit rating, whereas banks with negative discretionary LLP, that increase earnings, face upgraded ratings. Consequently, it can be argued that it is not the information quality per se that is valued by credit rating agencies, it is rather the behavior of over/understating LLP. However, the authors also perform additional tests for the absolute value of discretionary LLP that show similar results. The potential effects of discretionary policies regarding realized gains and losses on sales of securities are left unattended.

3 Hypotheses

This paper is predicated on the notion that managerial accounting decisions affect the perceived risk of capital providers. Elaborating on the review of literature in the previous section, there is conflicting evidence of how accounting discretion affects the cost of capital.

Literature studying banks' discretionary accounting behavior in the light of the various incentives for earnings management has found conflicting evidence. In addition, the implications of the various incentives may affect the cost of capital differently. The rationale of the income smoothing and capital management hypotheses is to appear less risky and thereby lower its cost of capital (Ahmed et al., 1999; Beatty et al., 1995). However, if capital providers are able detect the opportunistic behavior, it provides a distorted picture of the bank's underlying economics and would increase the information asymmetry with a negative effect on cost of capital. Conversely, the theoretical basis for the signaling incentive is to convey private information about future earnings or cash flows (Beaver and Engel, 1996; Beatty and Liao, 2014). If the discretionary accounting choices are based on this incentive it would indicate a negative association between discretion and the cost of capital proxies.

With this background, the first hypothesis tests the impact of discretionary accounting behavior on the cost of capital proxies. As the empirical evidence is conflicting, this hypothesis does not make any prediction of the sign of the association. For the second hypothesis, the uncertainty of discretionary accounting policies is expected to increase the information risk. Thus, for this hypothesis, I predict adequate signs for the information risk proxies. To address certain differences between the indicators of information risk and potential divergence of their impact on cost of capital, I discuss the proxies separately. However, as this study uses the different indicators to examine two phenomena without any prediction of potential differences between the proxies, I develop two general hypotheses including all information asymmetry indicators.

The first information asymmetry proxy is the stock bid-ask spread. The bid-ask spread is an information risk proxy that has been used extensively in contemporary research. Amihud and Mendelson (1986) provide both a theoretical basis and empirical evidence of the relation between bid-ask spreads and the cost of equity. He et al. (2013) decompose the bid-ask spreads into a adverse selection component and also confirm the association with various estimations of cost on equity. Richardson (2000) study the relationship between earnings management and bid-ask spreads. Drawing on the Jones (1991) model, the findings show that higher bid-ask spreads are related to higher levels of earnings management. Moreover, the study of Leuz and Verrecchia (2000) finds that information quality in terms of increased disclosure affects bid-ask spreads. Additional examples of the connection with information quality are Welker (1995) and Healy et al. (1999) that find an association between disclosure ratings and bid-ask spreads. Consequently, the existing body of research has established a link between the accounting information and the information risk captured by the bid-ask spread. By providing high quality information, firms can lower their information risk and thus face a lower cost of capital.

This study's second proxy for information risk is stock volatility. The rationale of using volatility of stock returns is that the volatility affects the perceived riskiness of the firm (Froot et al., 1992). The consequence of increased volatility is that investors demands a higher premium (French et al., 1987), which in turn increase the firm's cost of capital. In addition, stock volatility is associated with distress risk (Campbell et al., 2008).

The empirical evidence for the relation of stock volatility and accounting information is more unclear compared to bid-ask spreads. Leuz and Verrecchia (2000) only find weak evidence for increased disclosures and lower volatility. Conversely, Lang and Lundholm (1993) and Bushee and Noe (2000) find a positive association with disclosure quality and stock volatility. The latter attribute these findings to the notion that an increased disclosure quality leads to higher degree of transient institutional ownership with more aggressive trading, thus increasing stock volatility. Whereas this may be the case for disclosures, the conceptual connection with discretionary accounting choices that affect earnings and increased transient ownership is harder to motivate.

The connection between earnings and stock returns are well documented. However, considering the association with stock volatility explicitly, Rogers et al. (2009) document that earnings that convey bad news in relation to management's forecasts increase stock volatility. Furthermore, Jorgensen et al. (2012) find an association between earnings dispersion and unexpected stock volatility. In contrast, the study of Bushman et al. (2004) shows that stock volatility is unable to explain a significant variation in earnings timeliness.

While economic fundamentals are able to explain some stock volatility, the stock prices are also affected by non-fundamental factors of irrational behavior (Froot et al., 1992). This makes stock volatility a quite noisy indicator compared to other proxies of information asymmetry, albeit still of interest especially considering the conflicting empirical evidence of its relation with information quality.

The other source of capital to finance firms' assets is debt. One common way of debt financing is to issue bonds. While most banking literature focuses on equity capital, the most important source of capital for banks is bonds (Beatty and Liao, 2014; Ahmed et al., 2011). The yields of corporate bonds are generally higher than the comparable treasury bonds. The difference between these yields composes the credit spread. An explanatory factor to this spread is the higher credit risk of the different issuers. According to Huang and Huang (2012) the credit risk only accounts for around 20 % of the spread with some variation due to the quality of the bond and time-to-maturity. Thus, there are other factors that determine the credit spread. Two frequently documented determinants for the spread is bond liquidity and tax premiums (Elton et al., 2001) [7]. In contrast, Collin-Dufresne et al. (2001) argue that changes in credit spreads are more related to aggregate market factors rather than firm-specific factors or liquidity.

To address certain differences between the equity and bond markets, participants on the bond market is often large institutional investors that can be expected to be more advanced in the their risk assessment compared with the average equity investor (Bhojraj and Swaminathan, 2009). Furthermore, the bond market is less liquid than the stock market (Collin-Dufresne et al., 2001; Huang and Huang, 2012). Thus, the premium due to illiquidity may be more important on the bond market.

In relation to accounting information quality, Duffie and Lando (2001) analytically examines the implications of accounting information on credit spreads. According to their findings, the fact that investors are unable to assess firms' asset quality directly and instead have to rely on historical accounting information generates an increased credit spread. This effect is also proven to be greater for firms with less reliable accounting information. In the empirical literature, Yu (2005) finds that firms with higher disclosure quality ratings have lower bond spreads. Similar findings are presented by Sengupta (1998) when studying various proxies of the cost of debt, including bond yields. Furthermore, Bhojraj and Swaminathan (2009) find that firm's with a higher level of operating accruals has on average a lower bond yield. Consequently, there is fairly well-documented evidence that accounting information is a risk factor for the bond market. For banks in particular, the findings of Ahmed et al. (2011) show that the relative level of non-performing loans has a positive association with bond spreads.

The second indicator for the banks' credit risk is credit default swap (CDS) spreads. In essence, a credit default swap is a protection that ensures the buyer a payment in case of default of the reference entity (Annaert et al., 2013; Ashcraft and Santos, 2009). In turn, the CDS spread is the annual rate that the buyer pays the seller of the instrument until maturity or credit event. Consequently, a larger spread indicates a higher default risk of the reference entity. While bond spreads are to a larger extent influenced by other risk factors such as liquidity risk and interest rate, the CDS spreads are considered a more direct credit risk indicator of the reference entity (Düllmann and Sosinska, 2007; Arora et al., 2014). However, since both bond prices and CDS spreads are affected by the underlying credit risk of the bank (in the role as the issuer or reference entity, respectively), they can be expected to be closely correlated.

In related literature, Hull et al. (2004) provide empirical evidence for the connection between CDS spreads and bond spreads. In addition, they show that changes in CDS spread is able to predict future downgrades of credit rating. Moreover, Zhu (2006) shows that bond and CDS prices are equal on average, but may differ in the short run. According to Zhu, the market reacts differently on changes in credit conditions. Consequently, among other explanatory factors, there might be different implications of the financial information on bonds and CDS. Düllmann and Sosinska (2007) provide another example of interdependency with the other risk factors. By studying three German banks, they show a connection with changes in CDS spreads and changes in systematic risk indicators such as abnormal stock returns and bid-ask spread.

Compared to bonds, there is evidence that the CDS market reacts faster to changes in credit

[7] Corporate bonds in the US are subjected to both state and local taxes, whereas government bonds are not (Elton et al., 2001).

quality (Hull et al., 2004; Zhu, 2006). Therefore, it is possible that the CDS market derives its risk assessment predominantly from sources other than the information in the annual accounts, which in nature is historical. In this case, accounting quality might not be a priced factor for CDSs. However, Arora et al. (2014) provide evidence for an association between accounting information and CDS spreads. By using an assets reliability measure defined as the level of financial assets measured at fair value on level 2 or 3, the authors show that the accounting information is able to determine CDS spreads. Similarly to the other indicators, it is expected that informativeness of the financial accounts is negatively associated with CDS spreads. Conversely to Arora et al.'s measure of accounting quality, it is unclear how the discretionary accounting choices in banks affects the CDS spreads[8].

Drawing upon the empirical findings in prior studies, I develop two general hypotheses to investigate the market implications of accounting discretion in banks on the four different information asymmetry proxies. The hypotheses are presented in their alternative form. As noted in the previous section, the evidence of the implications of discretionary policies in banks is conflicting. Therefore, the first general hypothesis investigates the potential difference in information asymmetry in relation to the level of discretionary behavior. For the second hypothesis, it is expected that the uncertainty of discretionary choices generates higher information risk and thus a higher level of information asymmetry. Or more formally presented;

Hypothesis 1 *The level of discretionary accounting policies of loan loss provisions and realized gains and losses on sales of securities is associated with the perceived risk of market participants.*

Hypothesis 2 *The uncertainty of discretionary accounting policies of loan loss provisions and realized gains and losses on sales of securities is positively associated with the perceived risk of market participants.*

4 Research Design

4.1 Measuring Discretionary Behavior

This study hypothesizes that discretionary behavior or earnings management affects the risk assessment of the market. As outlined in the literature review, the accounting regulation of LLP relies on extensive managerial judgement for estimating future loan losses. Consequently, accounting discretion can be used both opportunistically and to increase information quality. With this background, LLP consists of two components. One non-discretionary portion that reflects those provisions that are made for actual future losses on bad loans. The other portion is influenced by management's discretion when estimating future loan losses or deciding when to realize gains or losses of securities. Since these components are unobservable for outsiders, the challenge for this study is to construct a measure that is able to isolate the discretionary part of the item.

[8] Arora et al.'s measure of relative amount of financial assets valued at level 2 or 3 indicates higher uncertainty with quite straight forward predictions. For accounting discretion (as defined in this study), it can be used to both increase and decrease information asymmetry with different implications on market uncertainty.

Studies focusing on US banks, such as Beatty et al. (2002) and Cohen et al. (2014), regress LLP on typically non-discretionary items and controlled for various loan types. However, the lack of data for non-US banks regarding different loan types imposes a sharp decrease in sample size if applying similar model specifications[9]. Therefore, I base my measure of discretionary LLP on the model specifications used in Kanagaretnam et al. (2004) and Shen and Huang (2013). The rationale behind the model is to estimate an adequate level of LLP based on non-discretionary items. The unexplained variation of LLP is assumed to consist of discretionary accounting choices[10]. Compared to the model advocated by Kanagaretnam et al. (2004), I exclude net charge-offs due to restrictions of sample size[11]. Furthermore, pre-tests on the given data set show significantly higher yearly standard deviations of the discretionary component during the time period 2011-2014. Therefore, I base the estimations on the years 2005-2010 and assume "normal banking activity" during these years[12]. Even though the pre-tests suggest a larger variance in the later time period, I recognize that defining normal banking activity including the time period of the most recent financial crisis is not unproblematic. I use a two-way fixed effects model with individual and time fixed effects to control for potential heterogeneity between banks and over time[13]. While it is conventional that the unobserved heterogeneity of firms is constant over time, I confirm this by performing Hausman's (1978) specification test against the notion that the unobserved heterogeneity is randomly distributed across the banks. As provisions for loan losses are affected by the state of the economy, there might be large time variation. Under the assumption that the countries in EU share similar fluctuations in the economy, this variation is captured by the time fixed effects. This assumption may not hold since the recent financial crisis affected the European countries differently. With this in mind, certain differences in the mean magnitude of fluctuations between countries over time are partly captured by the individual fixed effect estimator. Moreover, the individual fixed effects estimator captures the variation of omitted time-invariant factors. All variables are scaled with total assets. The estimated regression is:

$$LLP_{i,t} = \alpha_{i,t} + \alpha_1 \Delta LOANS_{i,t} + \alpha_2 NPL_{i,t} + \alpha_3 \Delta NPL_{i,t-1} + \alpha_4 LLA_{i,t} + \alpha_5 lnTA_{i,t} + \epsilon_{i,t} \quad (1)$$

[9] This is based on the data availability in the databases Bankscope and Datastream.

[10] In essence this is the same approach applied in popular industry-wide models such as the Modified Jones Model and the Dechow Dichev Model (see Dechow et al., 1995; Dechow and Dichev, 2002, respectively).

[11] Untabulated regressions results show no significant difference in the estimates for the remaining variables when including net charge-offs. In addition, the coefficient for net charge-offs is insignificant in explaining the variation in LLP. The sample size when excluding net charge-offs increases from 453 to 658.

[12] The implications of this approach is that I carry forward the coefficient for 2010 and assume it is constant for the period 2011-2014.

[13] Shen and Huang (2013) use country by country regressions for their global sample of banks. However, since I solely focus on listed EU banks that have similar regulation, I assume that potential heterogeneity is mainly driven by bank-specific factors rather than cross-country factors.

Where,

$$\Delta LOANS_{i,t} = \text{change in total loans for bank } i \text{ at time } t \text{ scaled by total assets}$$
$$NPL_{i,t} = \text{non-performing loans for bank } i \text{ at time } t \text{ scaled by total assets}$$
$$\Delta NPL_{i,t-1} = \text{lagged change in non-performing loans for bank } i-1 \text{ at time } t \text{ scaled by total assets}$$
$$LLA_{i,t} = \text{loan loss allowances for bank } i \text{ at time } t \text{ scaled by total assets}$$
$$lnTA_{i,t} = \text{natural logarithm of total assets for bank } i \text{ at time } t$$

The predicted values derived from the model are assumed to be the non-discretionary component of LLP for bank i at time t. In the next step, I use the residuals generated by Model (1) to proxy the discretionary component of LLP. More specifically, the discretionary accounting choices of LLP ($DLLP$) are measured as:

$$DLLP_{i,t} = \hat{\epsilon}_{i,t}$$

One should note that the residuals include all noise generated by the regression model and are consequently influenced by factors other than discretionary accounting behavior. For instance, situations where potential lack of expertise generates misstatements of LLP is captured by the residuals, however lack of expertise does not connote discretionary behavior. Moreover, the potential time-invariant component of accounting discretion is captured by the FE estimator. Therefore, the measure is at best an indication of discretionary accounting choices.

The second component of the earnings management measure is realized gains and losses on sales of securities. As noted earlier, management is able to control when to realize gains and losses on securities and thus alter earnings. Prior studies focusing on US banks estimate the coefficients for realized gains and losses by simple OLS with the rationale that banks' investments mainly consists of government bonds, which should not vary in value across regions/banks (e.g., Beatty et al., 2002; Cornett et al., 2009; Cohen et al., 2014). However, since I focus on banks from several countries, there might be cross-sectional heterogeneity between the market values of securities across countries. Therefore, I perform the regression with country and time fixed-effects[14]. Again, I scale the variables with total assets. The model specification to derive non-discretionary realized gains and losses on securities is:

$$GAINS_{i,t} = \alpha_{j,t} + \alpha_1 lnTA_{i,t} + \alpha_2 UGAINS_{i,t} + \epsilon_{i,t} \tag{2}$$

Where,

$$j = \text{country code}$$
$$GAINS_{i,t} = \text{realized security gains and losses for bank } i \text{ at time } t \text{ scaled by total assets}$$
$$lnTA_{i,t} = \text{natural logarithm of total assets for bank } i \text{ at time } t$$
$$UGAINS_{i,t} = \text{unrealized security gains and losses for bank } i \text{ at time } t \text{ scaled by total assets}$$

[14]I experimented by using both simple OLS in line with Beatty et al. (2002) and an OLS model that allowed for individual fixed effects. The model specifications provide similar estimates but the applied model with country fixed effects increases the explanatory power significantly.

Similarly to the method for discretionary loan loss provisions, the discretionary component of realized gains and losses ($DGAINS$) is measured by the residuals from Model (2).

$$DGAINS_{i,t} = \hat{\epsilon}_{i,t}$$

Descriptive statistics of the variables used to estimate Model (1) and (2) are displayed in Table 6 in Appendix B. The results of the estimations are shown in Table 7 in Appendix B and are generally consistent with those reported from Cohen et al. (2014) whom use a similar approach in a comparable period of time.

To derive a combined measure of discretionary accounting behavior, I follow Cornett et al. (2009) and use the difference between $DGAINS$ and $DLLP$. This is motivated by the fact that the two measures affect earnings in opposite directions. More specifically, higher (lower) levels of discretionary loan loss provisions and lower (higher) levels of discretionary realized gains and losses on securities decrease (increase) income. Thus, the difference is the combined effect on earnings, where higher (lower) levels of discretionary accounting, $DISC1$, increase (decrease) earnings. In contrast to Cornett et al. (2009), I use the absolute value of the difference between $DGAINS$ and $DLLP$. Following the purpose of this study, it aims to investigate how discretionary behavior affects information asymmetry. In that sense, it is not the signed effect on earnings that is of interest. Therefore, I regard the absolute value of accounting discretion as a better measure for this study. This approach is similar to the one applied in Cohen et al. (2014)[15].

$$DISC1_{i,t} = |DGAINS_{i,t} - DLLP_{i,t}| \tag{3}$$

Furthermore, I use an additional measure to study the uncertainty generated by discretionary behavior. Taking the perspective of Francis et al. (2005), it is the uncertainty generated by accounting information (in their case, abnormal accruals) that is a priced factor for market participants. From this view, the market is able to predict discretionary behavior that continuously over/understate earnings. To measure the uncertainty generated by discretionary behavior in banks, I use a similar approach as Francis et al. (2005) and calculate the three-year moving standard deviation of the signed values of the difference in Equation (3). Arguably, a time period of $t-2$ to t is short for computing the standard deviation. However, considering the relatively short time period of homogeneous regulation in EU and the limited data availability of listed banks, it still serves as an indicator for the uncertainty generated by discretionary accounting. The uncertainty proxy, $DISC2$, is defined as:

$$DISC2_{i,t} = \sigma(DGAINS_i - DLLP_i)_t \tag{4}$$

4.2 Measuring Information Asymmetry

This study uses four different proxies for information asymmetry. As discussed during the hypothesis development, the various proxies aim to capture potential differences in assessing discretionary policies. Bid-ask spreads and stock volatility are information asymmetry proxies

[15] Cohen et al. (2014) use a three-year moving sum of absolute residuals to measure earnings management.

used to capture potential effects on the equity market, thus indicating equity risk. Bond spreads and CDS spreads are credit risk proxies and investigate the information assessment on the credit market. The information asymmetry proxies are defined as follows:

$$\begin{aligned}
Bid - Ask_{i,t} = &\text{annual average of daily stock } \frac{\text{(ask price - bid price)}}{\text{(bid price + ask price)}\, 0.5} \\
&\text{for bank } i \text{ at time } t \\
VOLATILITY_{i,t} = &\text{annual standard deviation of daily stock returns for bank } i \text{ in time } t \\
BONDspread_{i,t} = &\text{annual value-weighted average of weekly bond spreads for} \\
&\text{all outstanding bonds for bank } i \text{ in time } t \\
CDSspread_{i,t} = &\text{annual average of weekly CDS spreads for bank } i \text{ in time } t
\end{aligned}$$

I use the natural logarithm transformed values to mitigate the effect non-normality and expect this to provide sounder estimates. Each of the proxies (see below for bond spread) has a natural limit above zero, which makes logarithm transformation advantageous for this study. To elaborate further on each proxy variable, for $Bid - Ask$, I follow the approach applied in Leuz and Verrecchia (2000), where the bid-ask spread is calculated as the difference between bid and ask price in relation to the average of the bid and ask price. Consequently, the bid-ask spread is expressed as a ratio to limit the effect of differences in observed prices. When defining $VOLATILITY$, I again rely on the same definition as Leuz and Verrecchia (2000) and use the standard deviation of daily stock returns. To calculate the daily stock returns, I use the daily difference in the reported closing prices of bank i's stock between consecutive trading days scaled with closing price the day before. This approach mitigates the effect of differences in quoted prices, where higher quoted prices naturally have a larger standard deviation. The $BONDspread$ is provided by Datastream and is calculated as the difference between the observed yield and a yield of a equivalent government bond with the same maturity in the same currency. Since the maturities do not match exactly, the benchmark yield is interpolated[16] to fit the observed bond yield. The bond data is collected on a weekly basis to facilitate the processing of the data. As bank i might have several outstanding bonds in time t, I define $BONDspread$ as the value-weighted average bond spread of the portfolio of outstanding bonds. The value weight is the outstanding amount of a particular bond. Therefore, bonds with a larger outstanding amount have a larger influence on the information asymmetry proxy. I exclude bond observations with shorter than one year in maturity because of higher illiquidity that increase the risk for pricing errors (Yu, 2005). Another implication of the bond spread is that the assumption of a natural limit above zero is weaker for bond spreads, since it is practically possible to have a negative spread. Therefore, I run additional robustness tests when using the value-weighted yield mean of outstanding bonds. $CDSspread$ is calculated as the average of weekly spreads during time t. I use weekly data of CDS spreads since weekly data is known to be more reliable than daily data (Annaert et al., 2013).

[16]Datastream applies linear interpolation between data points.

4.3 Discretionary Accounting and Information Asymmetry

To test the hypotheses in Section 3, I regress the information asymmetry proxies on the two measures of accounting discretion and adequate control variables that are known to affect each information asymmetry proxy. Again, I use two way fixed-effects models that controls for individual and time-specific variation for the same reasons as for previous models. For some of the models, I again test the consistence of the FE estimator against the RE estimator using Hausman's (1978) specification test. These tests suggest that the RE estimator is inconsistent. Furthermore, I winsorize the accounting discretion variables to the 1st and 99th percentiles. Other variables are winsorized if needed. I use standard errors clustered by bank to ensure estimates robust to heteroscedacity and autocorrelation in the residuals. More specifically, this approach relaxes the assumption of independent and identically distributed error terms and allows for heteroscedacity and autocorrelation of errors within the panels. The general models used are:

$$Bid - Ask_{i,t} = \alpha_{i,t} + \mathbf{D}_{i,t-1}\beta + \mathbf{X}_{i,t-z}\delta + \epsilon_{i,t} \tag{5a}$$

$$VOLATILITY_{i,t} = \alpha_{i,t} + \mathbf{D}_{i,t-1}\beta + \mathbf{X}_{i,t-z}\delta + \epsilon_{i,t} \tag{5b}$$

$$BONDspread_{i,t} = \alpha_{i,t} + \mathbf{D}_{i,t-1}\beta + \mathbf{X}_{i,t-z}\delta + \epsilon_{i,t} \tag{5c}$$

$$CDSspread_{i,t} = \alpha_{i,t} + \mathbf{D}_{i,t-1}\beta + \mathbf{X}_{i,t-z}\delta + \epsilon_{i,t} \tag{5d}$$

Where,

$\mathbf{D}_{i,t-1}$ is a variable taking the value corresponding to DISC1 or DISC2

$\mathbf{X}_{i,t-z}$ is a vector of control variables

z is 0 or 1

The parameters of interest are denoted β and show the effect of the discretionary accounting proxies on each respective information asymmetry proxy. For the first hypothesis, I do not make any prediction of the association, hence there is no expected sign of $DISC1$. For the second hypothesis, I expect a positive effect of the uncertainty proxy, $DISC2$.

For investigating the effect of accounting discretion on $Bid - Ask$ and $VOLATILITY$, I follow Leuz and Verrecchia (2000) and control for $SIZE$ measured by the natural logarithm of the daily average market value of equity for bank i in time t. In addition, $VOLUME$ is the daily average of traded shares divided by outstanding share for bank i in time t and controls for stock illiquidity, which is a known price-factor for equity (Amihud, 2002). In line with Leuz and Verrecchia (2000), I include controls for $FREEFLOAT$, which is the natural logarithm of the percent of widely held shares and hence a proxy for ownership dispersion. For risk factors specifically related to the banking industry, I control for revenue mix, MIX, measured as the ratio of non-interest income to total revenue for bank i in time $t-1$ due to findings of prior research showing that the level of non-interest income affect individual bank-risk (e.g., Brunnermeier et al., 2012; De Jonghe, 2010). Overall bank risk is controlled for by using CAP, which is the regulatory capital ratio for bank i in time $t-1$. In the same vein as previous research, I also control for $LEVERAGE$, which is the *book value of debt/(book value of debt+market value of equity)* for bank i in time $t-1$ (e.g., Fama and French, 1992; Leuz and Verrecchia, 2000; Francis et al., 2005; Gray et al., 2009). As equity-related risk proxies only tend to one of the sources of capital, the markets are expected to emphasize the accounting discretion differently depending on the leverage ratio. Lastly, I control for profitability, ROA, measured by the ratio of net income to total assets of bank i in time $t-1$.

For testing the bond and CDS spreads, I use the same banking industry-specific controls, i.e. MIX and CAP. Following Yu (2005), I also control for $MATURITY$, which is the value-weighted average of time to maturity for the bonds of bank i in time t. Prior research has showed that longer time to maturity is associated with bond yields (Sengupta, 1998). Prior studies have controlled for the outstanding amount of issued bonds, where larger amount is expected to be negatively associated with bond spread (see e.g, Sengupta, 1998; Yu, 2005). However, as the main part of the bond sample consists of bonds stretching over the whole time-frame of this study, I assume that the potential effect of outstanding amount is captured by the time-invariant factor. I also add the variables $SIZE$, ROA and $LEVERAGE$ since they are also expected to affect both bond and CDS spreads (Collin-Dufresne et al., 2001; Arora et al., 2014).

5 Data and Descriptive Statistics

5.1 Sample Selection

My data are collected from Thomson Reuters Datastream that provides both the adequate accounting data and capital market data for this study. The sample consists of listed banks in the EU with the addition of Norway and Switzerland to ensure homogeneous accounting regulation. I exclude Swiss banks that comply with local or US GAAP. For the same reason, the time-frame of the study is 2005-2015 since all listed entities within the EU have to apply IFRS after 2005. This generates a gross sample of 232 banks. In early stages, I aimed to study the effects of quarterly accounting data, however pre-tests showed a questionably low yearly standard deviation of quarterly accounting data. Therefore, I use annual accounting data, which in turn limit the sample size to 658 bank-year observations with data for all accounting items used to estimate discretionary behavior[17].

I include data for bonds issued from financial institutions after 1976. The time-frame of 1976 is used since bonds with 30-year maturity are potentially active during 2006, which is first year of the studied period. I limit my sample to straight bonds with fixed rates and annual coupons. The whole population consists of 22,354 bonds. As each bank is able to issue several bonds, I

[17]Comparable studies using a similar approach as this study estimate discretionary behavior on significantly larger samples (e.g., Beatty et al., 2002; Cohen et al., 2014). As these studies focus on US banks, the standardized performance report of the Federal Reserve (FR Y-9) allows for greater data availability. However, my sample is comparable to Cornett et al. (2009) that estimate discretionary accounting behavior on 563 observations.

manually connect each bank included accounting sample to its bonds. This limits the sample of bonds to 3,529 bonds.

CDS spread data are collected for 5-year CDS contracts since these are the most liquid (Arora et al., 2014; Hull et al., 2004; Longstaff et al., 2005). In the same vein, I use senior debt issues since these contracts are most popular and consequently the most liquid (Meng and Gwilym, 2008; Annaert et al., 2013). Moreover, I use data for Modified Modified restructuring (MM) CDS contracts[18]. This generates a population of 72 CDS contracts in Europe. After manually connecting each CDS contract to the reference entity included in the accounting sample, the sample consists of 41 CDS contracts. The historical CDS data from Datastream only stretches back to 2007, thus limiting the time-frame under which the hypothesized effect on CDS spreads is studied.

5.2 Descriptive Statistics

Table 1 reports descriptive statistics for the variables used to test the hypotheses. The variables of interest are denoted $DISC1$ and $DISC2$. Because $DISC2$ is calculated as the standard deviation over three years, the number of observations is smaller for $DISC2$. Therefore, each test of the second hypothesis is based on a subsample of the variables displayed in the panels of Table 1. The composition of the subsamples is not displayed for the sake of brevity. The mean for $DISC1$ ranges from 0.00285 to 0.00340 in the different panels, which means that the average estimated level of discretionary accounting is around 0.3 percent of total assets. This level is in line with other studies using a similar approach (see e.g., Cohen et al., 2014). For $DISC2$, the means are between 0.00178 and 0.00233, meaning that the average deviation from the three-year mean of the signed values of $DISC1$ is approximately 0.2 percent of total assets.

For the information asymmetry proxies, I present bid-ask spreads, bond spreads and CDS spreads transformed into percentages. The volatility proxy is the calculated annual standard deviation. The descriptive statistics of the information asymmetry proxies is in essence the same as those reported from prior research (see e.g., Leuz and Verrecchia, 2000; Ashcraft and Santos, 2009; Arora et al., 2014, for equity, bonds and CDSs, respectively). For the other variables, there is no pronounced difference between the samples, except for the largest value of revenue mix (89.88) in the equity samples. The descriptive statistics also reveal that the CDS sample consists of slightly larger banks. Considering the limited sample of CDS contracts, it is expected that the data availability is greater for larger banks.

[18]According to Datastream's FAQ this the preferred restructuring type for Europe.

Table 1: Descriptive statistics

VARIABLES	N	mean	sd	min	max
Panel A: Descriptive statistics for Model (5a)					
Bid-ask(%)	393	0.993	2.036	0.0476	15.28
Bid-ask(ln)	393	-0.989	1.450	-4.371	2.727
DISC1	393	0.00310	0.00566	3.34e-05	0.0435
DISC2	246	0.00215	0.00338	7.90e-05	0.0250
FREEFLOAT(ln)	393	4.050	0.692	-1.553	4.605
VOLUME(ln)	393	0.202	1.917	-10.04	5.649
MIX(%)	393	32.89	15.70	1.640	89.88
LEVERAGE	393	0.0164	0.00830	0.000214	0.0625
CAP(%)	393	11.54	4.250	4	26.10
ROA(%)	393	0.778	0.988	-5.770	4.990
SIZE(ln)	393	22.38	2.166	13.80	28.02
Panel B: Descriptive statistics for Model (5b)					
VOLATILITY	428	0.0254	0.0148	0.00115	0.138
VOLATILITY(ln)	428	-3.830	0.594	-6.764	-2.445
DISC1	428	0.00326	0.00600	3.34e-05	0.0435
DISC2	269	0.00233	0.00364	7.90e-05	0.0250
FREEFLOAT(ln)	428	4.054	0.672	-1.553	4.605
VOLUME(ln)	428	0.0178	2.097	-10.04	5.649
MIX(%)	428	32.45	15.93	1.640	89.88
LEVERAGE	428	0.0175	0.00867	0.000214	0.0625
CAP(%)	428	11.40	4.204	4	26.10
ROA(%)	428	0.740	1.150	-5.770	4.990
SIZE(ln)	428	22.28	2.168	13.80	28.08
Panel C: Descriptive statistics for Model (5c)					
BONDspread(%)	178	2.485	1.746	0.0454	10.00
BONDspread(ln)	178	0.642	0.841	-3.092	2.303
DISC1	178	0.00285	0.00414	3.34e-05	0.0287
DISC2	120	0.00178	0.00223	0.000178	0.0138
MIX(%)	178	33.00	12.73	6.610	72
LEVERAGE	178	0.0105	0.00885	0.000929	0.0566
CAP(%)	178	11.25	3.145	5.800	22.40
ROA(%)	178	0.763	0.734	-3.300	2.490
SIZE(ln)	178	22.51	1.860	16.94	26.13
MATURITY(ln)	178	1.806	0.558	0.693	3.219
Panel D: Descriptive statistics for Model (5d)					
CDSspread(%)	191	2.623	3.093	0.274	19.50
CDSspread	191	0.581	0.806	-1.294	2.971
DISC1	191	0.00340	0.00682	3.34e-05	0.0435
DISC2	127	0.00207	0.00266	7.90e-05	0.0138
MIX(%)	191	31.35	13.26	1.640	72
LEVERAGE	191	0.0101	0.00848	0.000501	0.0566
CAP(%)	191	10.69	2.963	4	22.40
ROA(%)	191	0.639	1.077	-5.770	4.990
SIZE(ln)	191	23.36	1.553	19.28	26.75

Note: For variable specifications see Table 5 in Appendix A.

Table 2 shows the pair-wise correlations between each of the independent variables used to test the hypotheses. The reported correlations are based on the whole sample reported in Panel A-D in Table 1. The pair-wise correlations indicate whether there is a risk for collinearity between the predictors. In Table 2, the highest observed correlation is 0.799 between $DISC1$ and $DISC2$. This is expected since they are closely related. In terms of multicollinearity issues, this does not impose a problem since these variables are tested in separate models. For other variables, the highest correlation is 0.595 (between $VOLUME$ and $SIZE$), which is quite large. With this in mind, the issue of collinearity could affect the estimated impact of the individual predictors, and since both $VOLUME$ and $SIZE$ are control variables, this does not affect the hypothesis tests. Moreover, the pair-wise correlations do not detect collinearity with multiple regressors simultaneously. Therefore, I also compute variance inflation factors[19] (VIF) for each regressor. These are displayed in Table 14 in Appendix B and show that $VOLUME$ has the highest VIF[20] with 2.42, which is within an acceptable level.

Table 2: Pairwise correlations

Variables	DISC1	DISC2	FREEFLOAT	MIX	LEVERAGE	VOLUME	CAP	ROA	SIZE	MATURITY
DISC1	1.000									
DISC2	0.799	1.000								
	(0.000)									
FREEFLOAT	-0.248	-0.084	1.000							
	(0.000)	(0.185)								
MIX	-0.251	-0.252	-0.021	1.000						
	(0.000)	(0.000)	(0.667)							
LEVERAGE	-0.017	0.069	0.145	-0.098	1.000					
	(0.722)	(0.278)	(0.002)	(0.039)						
VOLUME	-0.116	-0.052	0.276	0.217	-0.448	1.000				
	(0.014)	(0.415)	(0.000)	(0.000)	(0.000)					
CAP	0.108	0.068	-0.101	0.217	-0.085	0.044	1.000			
	(0.035)	(0.311)	(0.054)	(0.000)	(0.099)	(0.399)				
ROA	-0.363	-0.308	-0.069	0.120	-0.046	-0.045	0.049	1.000		
	(0.000)	(0.000)	(0.165)	(0.015)	(0.349)	(0.359)	(0.364)			
SIZE	-0.096	-0.262	-0.055	0.263	-0.460	0.595	0.159	0.219	1.000	
	(0.044)	(0.000)	(0.252)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)		
MATURITY	-0.248	-0.084	0.058	-0.160	-0.083	0.056	-0.397	0.309	0.039	1.000
	(0.000)	(0.327)	(0.388)	(0.016)	(0.212)	(0.403)	(0.000)	(0.000)	(0.558)	

Note: P-values in parentheses. For variable specifications see Table 5 in Appendix A.

6 Empirical Results

6.1 Hypothesis 1

The first hypothesis investigates if the level of discretionary accounting in banks affects the market perception of information uncertainty. Due to the inconsistency of prior research in determining the underlying incentives for using discretion policies, the information quality could either increase or decrease. Therefore, I make no prediction for the relation with the observed information risk proxies. The interpretation of a positive (negative) significant estimated coefficient is that a higher level increases (decreases) the information asymmetry, and in a wider sense the cost of capital.

Table 3 presents the regression results for all models used to test the first hypothesis. All estimated coefficients are based on two-way fixed effects. The results show no significant impact of discretionary accounting choices on the bond spreads or CDS spreads. Stock return volatility, however, is weakly significant with a positive coefficient of 5.550. Furthermore, the relative bid-ask spread show a significantly positive relationship with an estimated coefficient of 22.93.

[19] VIF is based on regressing each predictor on the other predictors

[20] $DISC1$ and $DISC2$ have slightly higher VIFs (2.64 and 2.42) due to their interdependence. However, I exclude them for the same reasons as in the text. Nevertheless, those VIFs are also significantly below the conventional threshold of 5-10

Due to the log-level relationship between the dependent variable and the variable of interest, the coefficient is interpreted as percentage change in the dependent variable due to a change in the discretionary accounting proxy. The magnitude of the discretionary accounting proxy is expressed by e^{β}. For instance, a 0.001 unit increase in level of discretionary accounting proxy generates, on average, a 2.32 percent increase in relative bid ask spread[21].

To briefly comment on the outcome of the controls and the models' adjusted R-squared, the relative bid-ask spread is mainly determined by bank size and traded volume with an adjusted R-squared of 27.0 percent. The regression results of stock price volatility indicate a significant negative relationship with bank size and an adjusted R-squared of 51.7 percent. For bond spread, the only significant determinant is return on assets and the model itself explains 39.6 percent of the variation in bond spread. Lastly, CDS spread show a significant negative relationship with both revenue mix and bank size and the adjusted R-squared is 72.3 percent. The estimated coefficients of the controls show overall expected signs. The unexpected result is the negative impact of revenue mix on CDS spreads, which is opposed to the findings in relation to the equity market of Brunnermeier et al. (2012) and De Jonghe (2010).

The positive and significant coefficient confirms the first hypothesis for the effect on information asymmetry in relation to the bid-ask spread. Consequently, the level of discretion seems to generate some increase in equity related uncertainty. As the bond and CDS spreads show insignificant association, the predicted relation to the credit market does not hold. Given the high adjusted (within) R-squared, especially for CDS spreads, and few significant parameter estimates, the variation in bond and CDS spreads are mainly explained by the highly significant year-dummy coefficients. These are not displayed for the sake of brevity, but indicate that the CDS spreads varies over time and motivate the use of time fixed effects. Moreover, the respective pairwise correlation of revenue mix and size with the dependent variable within the CDS sample is high (-0.41 and -0.55, respectively), which adds to the high adjusted R-squared. Even though the pairwise correlation does not take into account other factors affecting the relationship, it is an indication of the significant predictive power of the independent variables. In addition, the smaller sample sizes in the regressions of bond and CDS spreads require a stronger observed association (or smaller standard error) to confirm a significant relationship.

To relate the results to the body empirical research, the positive association with bid-ask spread is in line with the industry-wide study of Richardson (2000). Furthermore, accounting discretion seems to have a similar effect as disclosures as shown by Leuz and Verrecchia (2000). Thus, in line with Flannery et al. (2004), the equity market seems to react similarly to accounting discretion in the banking industry compared to other industries. Even though studies such as Cohen et al. (2014) and Bushman and Williams (2015) tend to systemic risk, my results show a similar connection with the equity market. Given that the discretionary accounting proxy is indeed an indication of information quality, these findings are also in line with the evidence in theoretical that suggests that the quality of information affects investors' risk perception (e.g., Easley and O'Hara, 2004; Lambert et al., 2012).

With regard to the weak significance in the test of stock volatility, these results are the same

[21]because $e^{(22.93*0.001)} - 1 = 0.0232$

as Leuz and Verrecchia's (2000) findings for the effect of increased disclosure. According to the authors, stock volatility is influenced by a wide set of determinants and could thereby be affected by other factors. In a similar fashion, Froot et al. (1992) argue that stock volatility is a noisy indicator due to the effect of non-fundamental factors of irrational behavior. The results on volatility in Table 3 suggest a similar conclusion. In regard to studies showing a connection with earnings and stock volatility (e.g., Rogers et al., 2009; Jorgensen et al., 2012), the results are unable to provide a similar connection for the discretionary part of earnings.

The insignificant results of the credit proxies suggest that the information quality, in terms of accounting discretion, is not a priced factor on the credit markets. Similarly to Collin-Dufresne et al. (2001)[22], the results suggest that the credit spreads is not related to the firm-specific factor of accounting discretion. Another plausible explanation could be that the nature of actors on the credit market differs from the equity market. A larger degree of institutional actors on the credit market might entail other sources of information (Bhojraj and Swaminathan, 2009). From this view, credit market participants are able to see through discretionary accounting policies and base the risk assessment on alternative risk indicators. As suggested by Yu (2005) and Sengupta (1998), one such alternate source of information might be disclosure quality. Similarly, in terms of information quality, the proxy of accounting discretion is closely related to the performance of the bank. Consequently, the measure could mainly capture the the quality of information in regard to performance in the previous period. While cross-sectional short-term performance indicators might be of greater interest to equity investors, credit market participants may assess information quality of other key factors. Following this, prior research has shown significant effects in relation to the level of different key items such as operating accruals, non-performing loans and portion of level 2 and 3 fair value measured assets (see e.g., Bhojraj and Swaminathan, 2009; Ahmed et al., 2011; Arora et al., 2014). Conversely to these findings, accounting discretion in banks does not seem to be such a key factor. However, the previously discussed study of Shen and Huang (2013) finds a negative relationship between discretionary LLP in banks and credit ratings. A similar connection with bond and CDS spreads is not supported by the findings of this study in a European setting.

Even though the underlying incentive for discretionary accounting behavior is beyond this study, the positive association between $DISC1$ and the bid-ask spread suggests that the accounting discretion rather than mitigate the adverse selection problem, as proposed by the signaling hypothesis, instead increase it. From the view of equity market participants, this suggest that accounting discretion in banks is considered as an increased risk. Note that the results do not provide direct evidence that this is the effect of observed opportunistic behavior. Although, an extended interpretation of the results is that the equity market views accounting discretion as opportunistic activities in line with the capital and earnings management hypotheses.

[22]Note that Collin-Dufresne et al. (2001) investigate changes in credit spreads, whereas I study the level of credit spreads.

Table 3: Models to test Hypothesis 1

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
$DISC1_{t-1}$	22.93**	5.550*	21.57	1.892
	(10.65)	(2.809)	(13.66)	(5.711)
$FREEFLOAT_t$	0.0512	-0.0291		
	(0.127)	(0.0860)		
$VOLUME_t$	-0.264***	-0.0461		
	(0.0577)	(0.0490)		
MIX_{t-1}	-0.00150	-0.00244	0.00266	-0.00903*
	(0.00477)	(0.00217)	(0.00889)	(0.00479)
$LEVERAGE_{t-1}$	4.816	3.937	9.291	1.580
	(4.981)	(3.386)	(12.99)	(9.748)
CAP_{t-1}	-0.00336	-0.00776	0.0624*	0.0294
	(0.0130)	(0.00746)	(0.0327)	(0.0226)
ROA_{t-1}	-0.0114	-0.00972	-0.222***	-0.0317
	(0.0679)	(0.0194)	(0.0665)	(0.0522)
$SIZE_t$	-0.571***	-0.402***	-0.433	-0.457***
	(0.133)	(0.0766)	(0.359)	(0.153)
$MATURITY_t$			-0.0515	
			(0.132)	
Observations	393	428	178	191
Number of id	86	89	40	33
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.270	0.517	0.396	0.723

Note: Parameter estimates are based on two-way fixed effects. For variable specifications see Table 5 in Appendix A. HAC robust std. errors in parentheses. ***, ** and * indicate statistical significance at 1 %, 5 % and 10 %, respectively.

6.2 Hypothesis 2

The second hypothesis states that the uncertainty of discretionary accounting choices affects the market perception by increasing information asymmetry. The proxy for the uncertainty of discretionary accounting choices is denoted $DISC2$ and is defined as the standard deviation of the signed values of $DISC1$ over three years ($t-2$ to t). As the second hypothesis predicts an increase in information asymmetry, I expect a positive significant relationship between $DISC2$ and the various information asymmetry proxies.

The results for the hypothesis test are displayed in Table 4 and show similar results as for the first hypothesis. The uncertainty of discretionary accounting policies is unable to predict any effect on bond spreads and CDS spreads. Similarly to the first hypothesis, $DISC2$ show significantly positive association with the relative bid-ask spread and stock return volatility. The estimated coefficients for bid-ask spread and stock return volatility are significant on the 5 and 1 percent levels, respectively. The magnitude of the significant parameter estimates is 44.08 for bid-ask spread and 17.30 for stock return volatility, which is larger than for hypothesis 1. These estimated coefficients roughly correspond to a 4.5 and 1.7 percent increase, respectively, given a 0.001 unit increase in $DISC2$. The controls show overall expected coefficients. However, MIX

show an unexpected negative association with CDS spread. In addition, regulatory capital ratio is positively related to bid-ask and CDS spreads. According to Iannotta (2006), the positive association between regulatory capital and bid-ask spread and CDS spreads could be explained by the notion that a higher level of capital ratio might indicate lower asset quality, thus increasing the uncertainty. The models' adjusted R-squared is overall slightly lower compared to the models used for hypothesis 1. In the model regressing CDS spread the R-squared is higher compared to the model in Table 3.

Even though the results are quite mixed, the findings support that the uncertainty of discretionary accounting policies affects the information asymmetry on the equity market. In contrast, the results are unable to provide evidence for the same effect on the credit market. Note that the sample size is smaller than in tests for the first hypothesis. This is expected because $DISC2$ is calculated over three years, hence there are no computed values for 2006-2007. In a similar fashion as for $DISC1$, it is possible to attribute the lack of significant findings in relation to the credit proxies to the relatively small sample. Taking the results for the first hypothesis into account, a more plausible explanation is that there is no effect of accounting discretion on information asymmetry in the credit market. Another implication of the small sample size of bond spreads and CDS spreads is that it increases the risk for an overfitted model, which is an additional explanation for the high R-squared to reasoning given for the first tests. This potential problem is addressed further in Section 6.3.

As noted throughout this paper, the empirical evidence for the uncertainty of discretionary accounting in the banking industry is spares. Again, the results suggest that information risk mainly affects the perceived risk on equity market. In relation to studies focusing on a wide spectra of industries, the findings in relation to the equity market are in line with the findings of Francis et al. (2005) and Gray et al. (2009); however, not for the credit related proxies. A plausible explanation is that those studies explicitly investigate the effects on cost of capital proxies, whereas I focus on information asymmetry proxies. Moreover, as argued in Section 6.1, credit market participants might use other assess other sources of information than discretionary accounting. This might be especially true for banks since they are larger than the average non-banking firm included in the cross-industry studies. Therefore, credit market participants may rely on more advanced risk-assessment methods to determine information quality for banks (or larger firms in general) in relation to smaller firms, making the comparison with industry-wide studies [23] problematic. With this in mind, Eckles et al. (2014) show that a similarly defined measure of information quality is a priced factor for the cost of debt, but not for equity, in insurance companies. While these two sectors of financial intermediaries share similar features in terms of operations and opaqueness (Morgan, 2002), my findings suggest contrary conclusions for banks, where information quality affects the information asymmetry on the equity market, but not the credit market.

[23] Industry-wide studies often exclude financial institutions due to their vastly dissimilar nature of operations and financial composition.

Table 4: Models to test Hypothesis 2

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
$DISC2_{t-1}$	44.08**	17.30***	4.840	5.344
	(21.83)	(5.965)	(23.20)	(6.929)
$FREEFLOAT_t$	0.0137	-0.103		
	(0.143)	(0.0854)		
$VOLUME_t$	-0.265***	-0.0230		
	(0.0917)	(0.0604)		
MIX_{t-1}	-0.00531	-0.00409	0.00364	-0.00710**
	(0.00717)	(0.00252)	(0.00670)	(0.00315)
$LEVERAGE_{t-1}$	-8.704	3.961	17.61	14.64**
	(9.122)	(2.616)	(18.99)	(5.287)
CAP_{t-1}	0.0502**	0.00972	0.0102	0.0342**
	(0.0246)	(0.00987)	(0.0359)	(0.0143)
ROA_{t-1}	-0.0821	-0.0321	-0.0832	-0.1009
	(0.0809)	(0.0205)	(0.0712)	(.0598)
$SIZE_t$	-0.429**	-0.229***	-0.377	-0.846***
	(0.203)	(0.0594)	(0.225)	(0.0922)
$MATURITY_t$			-0.0719	
			(0.177)	
Observations	246	269	120	127
Number of id	64	67	32	28
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.202	0.454	0.195	0.837

Note: Parameter estimates are based on two-way fixed effects. For variable specifications see Table 5 in Appendix A. HAC robust std. errors in parentheses. ***, ** and * indicate statistical significance at 1 %, 5 % and 10 %, respectively.

6.3 Sensitivity Analysis and Additional Considerations

As noted in Section 4.2, some influential data points might be omitted when using log transformed values of bond spreads. To test this, I run untabulated regressions with value-weighted bond yields instead of bond spreads. This specification does not generate any difference for the variables of interest compared to the results presented in Table 3 and 4.

I also consider the possibility that the information asymmetry proxies are able to predict future information regarding discretionary policies. For instance, Hull et al. (2004) show that CDS spreads are able to predict future changes in credit ratings. Moreover, I rely on annual accounting information from Q4, thus firms have already disclosed information about provisions for loan losses and gains and losses in prior quarterly reports. Therefore, I run the regressions without the one period lag of the discretionary accounting proxies. The only material difference of these (untabulated) results is that CDS spread shows a positive coefficient in relation to $DGAINS2$ on a 10 percent level and an overall weaker significance for the equity related proxies.

To test the robustness of the estimation of discretionary LLP, I strictly follow the model specification used in Shen and Huang (2013) and include the variable net charge offs. The second stage (untabulated) tests on the information asymmetry proxies show no material difference, except both $DISC1$ and $DISC2$ are significant on the 1 percent level in relation to the equity related proxies, thus confirming the results in the main tests. Note that the reason for excluding net charge offs was due to limitation to the sample size. Consequently, these regressions are performed on an even smaller sample size than the main tests. While acknowledging this weakness, the fact that these estimations do not alter the conclusions from the main tests improves the robustness of the results. I also consider an analogue approach to Cohen et al. (2014) and Cornett et al. (2009) and estimate discretionary LLP with country fixed effects[24]. This model alteration generates the same results for stock volatility and slightly weaker significance for relative bid-ask spread. The variables of interest still show insignificant coefficients in relation to the credit market proxies.

In addition, I examine the effect of signed residuals in line with Shen and Huang (2013). The results are tabulated in Table 8 in Appendix B. Contrary to Shen et al., these test are unable to provide any evidence of an effect on neither of the information asymmetry proxies. This means that it is the presence of accounting discretion that increase information asymmetry as predicted by prior research based on the approach in the modified Jones (1991) model[25], while the signed effects on earnings have less importance.

To address the risk of overfitting the models for bond and CDS spreads, I exclude the variables CAP, $MATURITY$ and ROA. The only effect compared to the main tests is that $SIZE$ is significant in the bond spread regression. I also experiment by performing the tests without time fixed-effects. Obviously, this generates biased estimates and changes the outcome of the some of the controls, but the result for the variables of interest is the same. The R-squared for CDS spreads is naturally slightly lower, but still over 50 percent. This does not answer the question if the exact model specification overfitting the data for bond and CDS spreads in Table 4, however the results are robust to other model specifications less inclined to be overfitted.

Furthermore, I investigate the effect of discretionary policies of LLP and gains and losses separately. Hence, I run the regressions with separate proxies of discretionary LLP and gains and losses (i.e. separating $DISC1$ into two components). The results for the first hypothesis are displayed in Table 9 Appendix B. Interestingly, the results show that the level discretionary LLP ($DLLP1$) is significant in explaining bid-ask spread and weakly significant in relation to stock volatility. In contrast, the discretionary gains and losses ($DGAINS1$) is insignificant in all models. Consequently, the equity market seems to value the discretionary part of LLP, but not accounting discretion concerning gains and losses on sales of securities. These findings are consistent with Cohen et al. (2014) that find a significant association between discretionary LLP and large decreases in stock returns, while discretionary gains and losses were unable to predict these decreases. The implications for the baseline model might be that the potential effects of the level of discretionary behavior are offset when including an insignificant factor (i.e. $DGAINS1$). Moreover, the estimations of Model (1) and (2) displayed in Table 7 in Appendix B show that the adjusted R-squared when estimating the non-discretionary part of LLP is

[24] Cohen et al. (2014) and Cornett et al. (2009) control for different regions within the US. In a European setting, I consider this equivalent to different countries.

[25] These studies tend to use terms as abnormal accruals or earnings management, but due to the similar estimation approach this is in essence the same as the term accounting discretion in this study.

significantly larger than for realized gains and losses. Thus, it is expected that the measure of $DGAINS$ is noisier, which might further neutralize the effect of discretionary LLP. Since market participants seemingly only assess the level of discretionary loan loss provisions, I run the tests excluding $DGAINS1$ to increase the sample size. These results are displayed in Table 10 in Appendix B. In addition to the effect on bid-ask spread and volatility, the estimations of $DLLP1$ show a significant effect on CDS spread, however not for bond spread. Notably, the magnitude of $DLLP1$ is materially larger in relation to the CDS spreads in this estimation, suggesting that the coefficient might be affected by outliers. Therefore, I further winsorize $DLLP1$ at the 2.5 percent level. As expected, these untabulated results show an insignificant effect of $DLLP1$ in relation to the CDS spreads, whereas the results for the equity proxies are consistent. I also run separate tests regressing only $DGAINS$. In line with prior results, these estimations (tabulated in Table 11 in Appendix B) show no significant association of $DGAINS$ with any of the information asymmetry proxies. Regarding the uncertainty of both discretion proxies, I find no significant effect on the either of the information asymmetry proxies, except for a weak effect on CDS spreads. These results are tabulated in Table 12 in Appendix B. Consequently, the results for the second hypothesis are weak to alternate specifications and the observed effect of $DISC2$ could possibly be driven by the noisier proxy of discretionary gains.

Lastly, due to the lack of significant results for bond spreads and partly CDS spreads, I check for potential model specifications errors by regressing the information asymmetry proxies on both the level of loan loss provisions and realized gains and losses on securities both scaled with total assets[26]. Since loan loss provisions are closely related to the asset quality it is natural to assume a close relation with bond spreads. These results are tabulated in Table 13 Appendix B and show expected results for LLP, however not for $GAINS$, thus confirming the prior results of insignificant effects of discretionary realized gains and losses on securities with the extension that even the level of the item gains or losses on sales of securities seems unrelated to bond and CDS spreads.

7 Conclusion

This paper hypothesizes that discretionary accounting behavior in banks affect the information asymmetry on the equity and credit markets. By studying listed European banks during the period 2005-2015, I develop two measures of information quality based on discretion in accounting for loan loss provisions and gains and losses on sales of securities. The two measures aim to capture the level and the uncertainty (variation) of accounting discretion. I study the effect on information asymmetry on the equity market proxied by relative bid-ask spreads and stock return volatility and on the credit market proxied by bond spreads and CDS spreads. When interpreted in a wider context, an effect on information asymmetry is an indicator for the effect on the individual bank's cost of capital.

The findings of this paper suggest that the level of discretionary accounting increase information asymmetry on the equity market, mainly in relation to bid-ask spreads. I am unable

[26]I remove the one-year lag of return on assets due to collinearity with LLP.

to confirm the same effect on the credit market. Regarding the uncertainty of discretionary accounting, I find some indications of a similar effect on the equity market as for the level of discretion. However, these findings are weak to alternate model specifications and could potentially be affected by the noisy measure of discretionary gains and losses on sales of securities. These results should therefore be interpreted carefully. Additional tests show that it is only the level of discretionary loan loss provisions that affects the equity related proxies, whereas discretionary gains and losses have seemingly no effect at all. Consequently, the quality of information provided by banks has some implications on the risk perception of the equity market, even though the associated risk is mainly related to information quality of loan losses.

In the light of theoretical research, the findings on the equity market are in line with Easley and O'Hara (2004) and Lambert et al. (2012), that show that information quality is a priced factor for investors. This study also adds evidence to the literature studying the risk effects of discretionary loan loss provisions. Furthermore, the study provides complementary industry-specific evidence to the stream of empirical research studying the effects of information quality. The findings are important for standard-setters and other regulators in their objective of ensuring high quality accounting information to assist investors. In addition, the effect on accounting discretion on information asymmetry suggests that banks are able to affect their cost of equity capital by providing sound information. In turn, this serves as a reason to strive against mitigating opportunistic managerial behavior.

An obvious extension of this study is to apply a similar approach in a different setting. The reporting form required by the Federal Reserve in the US allows for extensive data collection, which further facilitates using a larger sample size than in this paper and to possibly study the effects on a quarterly basis. Another positive feature of the US market is the longer time-frame of consistent accounting regulation. In line with Cohen et al. (2014), an interesting approach is to study how the most recent financial crisis has affected the markets' perception of discretionary accounting. Due to the limited time-frame of consistent accounting regulation within the EU, the approach in this paper is unable to provide a sufficient number of observations in the pre-crisis period. An additional extension is to investigate the different incentives for accounting discretion to derive what underlying incentive drives the increased market risk observed in this study. Moreover, this study hypothesizes that accounting discretion affects the yearly average of the information asymmetry proxies. However, as argued in the hypothesis development, CDS spreads, for instance, are known to react faster than bond spreads to changes in risk (Hull et al., 2004; Zhu, 2006). Therefore, it is possible, and perhaps more adequate, to study the effects around the publishing of the financial statements. Another potential weakness of this study is the effect of reversed causality. Taking the perspective of Richardson (2000), it might be the presence of information asymmetry that drives the use of discretionary behavior in banks. Therefore, another approach could be to view information asymmetry as exogenous and study if the level of information asymmetry affects the observed level of discretionary behavior. More specifically, higher observed information asymmetry might increase the incentives to engage in earnings management.

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Appendices

A Variables

Table 5: Variables

Variable	Definition	Datastream Mnemonic
Dependent variables		
Bid-Ask	The annual average of daily relative difference between bid and ask price.	PB & PA
VOLATILITY	Annual standard deviation of daily stock returns of consecutive trading days.	P
BONDspread	Annual value-weighted average of weekly bond spreads of all outstanding bonds.	SP & AOS
CDSspread	Annual average of weekly CDS spreads.	SM
Independent variables		
DISC1	Absolute difference between signed values of DGAINS and DLLP.	Author's own caluclation
DISC2	Standard deviation of signed values of DISC1 over 3 years.	Author's own calculation
DLLP	Value of residuals estimated in Model (1).	Author's own calculation
DGAINS	Value of residuals estimated in Model (2).	Author's own calculation
DLLP2	Standard deviation of residuals over 3 years estimated in Model (1).	Author's own calculation
Control variables		
VOLUME	Annual average of daily traded volume scaled by number of outstanding shares.	VO & WC05301

Continued on next page

Variable	Definition	Datastream Mnemonic
LEVERAGE	Book value of debt scaled by market value of equity and bookvalue of debt.	MV & WC03255
CAP	Tier 1 capital to risk-weighted assets.	WC18157
MIX	Non-interest income scaled by net sales.	WC15593
FREEFLOAT	Ratio of total shares available to ordinary investors.	NOSHFF
SIZE	Market value of equity.	MV
ROA	Banking industry-specific measure of return on assets provided by Datastream.	WC08326
MATURITY	Value-weigthed average of time-to-maturity of all outstanding bonds.	AOS & RD
LLP	Provision for future loan losses. The bank's losses of loans that is considered uncollectible or difficult to collect.	WC01271
TA	Total assets.	WC02999
NPL	Non-performing loans. Loans that the bank expects difficult to collect	WC02285
LLA	Loan loss allowances. Allowance to cover potential loan losses.	WC02275
LOANS	Total outstanding loans.	WC02271
GAINS	Gains/losses on sales of securities. Calculated as the difference between realized amount and carrying value.	WC01270
UGAINS	Unrealized gains/losses on securities. The item represents gains and losses on securities held by the bank.	WC03498
NCO	Net charge-offs. Total amount of loans deemed uncollectible, net recoveries.	WC01273
YIELD	Value-weighted average yield of all outstainding bonds.	IY & AOS

B Tables

Table 6: Descriptive statistics for Models (1) and (2)

VARIABLES	N	mean	sd	min	max
DLLP1(abs)	913	0.00334	0.00615	3.85e-06	0.0388
DGAINS(abs)	1,191	0.00116	0.00144	9.53e-06	0.00885
LLP	466	0.00493	0.00743	-0.00328	0.0974
LLA	466	0.0160	0.0166	0	0.195
ΔNPL	466	0.00525	0.0132	-0.0460	0.0905
ΔLOANS	466	0.0507	0.108	-0.496	0.590
NPL	466	0.0229	0.0310	0	0.287
lnTA	466	17.31	2.202	11.69	21.91
GAINS	576	0.000651	0.00244	-0.0196	0.0295
UGAINS	576	0.00282	0.0111	-0.0378	0.0862
lnTA	576	17.29	1.985	12.01	21.58

Note: All variables scaled with total assets. For variable specification see Table 5 in Appendix A.

Table 7: Regressions for the period 2005-2010

VARIABLES	LLP	GAINS
$UGAINS_t$		0.0411
		(0.0314)
$lnTA_t$	-0.000278	0.000128**
	(0.00148)	(5.80e-05)
LLA_t	0.512***	
	(0.0867)	
NPL_t	-0.0328	
	(0.0411)	
ΔNPL_{t-1}	0.0904**	
	(0.0406)	
$\Delta LOANS_t$	-0.00811**	
	(0.00322)	
Observations	466	576
Time FE	YES	YES
Individual FE	YES	NO
Country FE	NO	YES
Adjusted R-squared	0.741	0.111

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Models testing Hypothesis 1 with signed values of DISC1

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
DISC1(signed)$_{t-1}$	13.61	3.118	10.24	-2.350
	(10.91)	(3.175)	(9.460)	(5.316)
FREEFLOAT$_t$	0.0371	-0.0378		
	(0.136)	(0.0900)		
MIX$_{t-1}$	-0.00249	-0.00272	0.00264	-0.00907*
	(0.00479)	(0.00221)	(0.00897)	(0.00487)
LEVERAGE$_{t-1}$	5.088	3.665	9.915	1.145
	(4.950)	(3.172)	(14.06)	(9.902)
VOLUME$_t$	-0.285***	-0.0488		
	(0.0538)	(0.0486)		
CAP$_{t-1}$	-0.00598	-0.00831	0.0571*	0.0283
	(0.0120)	(0.00717)	(0.0324)	(0.0221)
ROA$_{t-1}$	-0.00549	-0.0150	-0.205***	-0.0297
	(0.0674)	(0.0198)	(0.0659)	(0.0520)
SIZE$_t$	-0.583***	-0.406***	-0.415	-0.457***
	(0.136)	(0.0773)	(0.373)	(0.154)
MATURITY$_t$			-0.0336	
			(0.137)	
Observations	393	428	178	191
Number of id	86	89	40	33
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.263	0.514	0.388	0.724

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Models testing Hypothesis 1 with DLLP and DGAINS

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
$DLLP1_{t-1}$	28.69**	5.642*	28.07	5.229
	(11.24)	(3.243)	(17.52)	(6.577)
$DGAINS_{t-1}$	-48.53	10.57	21.04	-17.09
	(37.47)	(12.00)	(40.33)	(18.86)
$FREEFLOAT_t$	0.0300	-0.0271		
	(0.121)	(0.0849)		
MIX_{t-1}	-0.00114	-0.00241	0.00353	-0.00945**
	(0.00500)	(0.00214)	(0.00897)	(0.00462)
$LEVERAGE_{t-1}$	5.664	3.694	10.55	2.570
	(5.153)	(3.240)	(13.01)	(9.995)
CAP_{t-1}	-0.00194	-0.00729	0.0677*	0.0304
	(0.0133)	(0.00760)	(0.0353)	(0.0224)
ROA_{t-1}	-0.0352	-0.00839	-0.223***	-0.0322
	(0.0720)	(0.0199)	(0.0716)	(0.0515)
$VOLUME_t$	-0.265***	-0.0434		
	(0.0584)	(0.0501)		
$SIZE_t$	-0.572***	-0.404***	-0.426	-0.462***
	(0.129)	(0.0761)	(0.362)	(0.150)
$MATURITY_t$			-0.0580	
			(0.135)	
Observations	393	428	178	191
Number of id	86	89	40	33
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.276	0.515	0.398	0.724

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Models to test Hypothesis 1 with discretionary loan loss provisions

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
$DLLP1_{t-1}$	25.46**	5.709*	24.95	17.25**
	(10.09)	(3.348)	(17.77)	(6.060)
$FREEFLOAT_t$	-0.0708	-0.117*		
	(0.109)	(0.0644)		
MIX_{t-1}	-0.00354	-0.000977	0.00167	-0.00990**
	(0.00442)	(0.00207)	(0.00797)	(0.00483)
$LEVERAGE_{t-1}$	2.549	3.051**	5.180	1.553
	(1.764)	(1.373)	(3.925)	(1.168)
CAP_{t-1}	-0.00781	-0.00363	0.0556**	0.0290
	(0.0108)	(0.00561)	(0.0209)	(0.0186)
ROA_{t-1}	-0.0382	-0.0357**	-0.128	-0.0992
	(0.0446)	(0.0165)	(0.0787)	(0.0606)
$VOLUME_t$	-0.206***	0.00282		
	(0.0506)	(0.0442)		
$SIZE_t$	-0.494***	-0.329***	-0.524**	-0.239*
	(0.112)	(0.0652)	(0.259)	(0.133)
$MATURITY_t$			-0.0203	
			(0.116)	
Observations	597	644	243	248
Number of id	107	110	45	34
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.301	0.498	0.447	0.721

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Models to test Hypothesis 1 with discretionary realized gains and losses

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
$DGAINS_{t-1}$	-28.27	-4.411	53.21	-9.036
	(29.84)	(9.897)	(42.80)	(14.69)
$FREEFLOAT_t$	-0.00653	-0.0743		
	(0.118)	(0.0756)		
VOLUME	-0.282***	-0.0219		
	(0.0348)	(0.0388)		
MIX_{t-1}	0.00216	-0.00212	0.00658	-0.00745*
	(0.00403)	(0.00201)	(0.0103)	(0.00403)
$LEVERAGE_{t-1}$	-1.106	1.368	2.386	-1.796
	(3.403)	(2.353)	(4.456)	(7.243)
CAP_{t-1},	-0.00464	-0.00548	0.0148	0.0190
	(0.0152)	(0.00608)	(0.0303)	(0.0189)
ROA_{t-1}	-0.0624	-0.0323	-0.133*	-0.0306
	(0.0582)	(0.0196)	(0.0675)	(0.0482)
$SIZE_t$	-0.646***	-0.445***	-0.294	-0.484***
	(0.0902)	(0.0643)	(0.310)	(0.128)
$MATURITY_t$			-0.0445	
			(0.119)	
Observations	595	655	250	223
Number of id	133	139	60	36
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.316	0.594	0.393	0.767

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Models to test Hypothesis 2 with discretionary LLP

VARIABLES	Bid-Ask	VOL	BONDspread	CDSspread
$DLLP2_{t-1}$	30.01	7.371	36.31	32.32*
	(21.87)	(6.596)	(30.62)	(17.36)
$FREEFLOAT_t$	-0.184	-0.188***		
	(0.128)	(0.0614)		
VOLUME	-0.177**	0.0346		
	(0.0733)	(0.0497)		
MIX_{t-1}	-0.00353	-0.00234	-0.000208	-0.0116**
	(0.00618)	(0.00214)	(0.00695)	(0.00536)
$LEVERAGE_{t-1}$	5.287**	3.403**	3.146	1.183
	(2.204)	(1.450)	(2.824)	(0.779)
CAP_{t-1}	0.00831	-0.00433	0.0238	0.0273**
	(0.0164)	(0.00595)	(0.0279)	(0.0133)
ROA_{t-1}	-0.00256	-0.0333***	-0.153***	-0.0696*
	(0.0466)	(0.0117)	(0.0546)	(0.0388)
$SIZE_t$	-0.382***	-0.205***	-0.361**	-0.204
	(0.122)	(0.0406)	(0.177)	(0.131)
$MATURITY_t$			-0.0725	
			(0.115)	
Observations	430	461	198	192
Number of id	104	107	44	34
Time FE	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Adjusted R-squared	0.252	0.482	0.284	0.698

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13: Regressions on credit risk proxies with the level of LLP and GAINS

VARIABLES	BONDspread	CDSspread
LLP_{t-1}	35.64***	20.53***
	(9.584)	(3.851)
$GAINS_{t-1}$	55.56	-14.23
	(33.60)	(14.54)
MIX_{t-1}	0.00894	-0.0107**
	(0.00936)	(0.00444)
$LEVERAGE_{t-1}$	1.228	-0.630
	(4.399)	(0.805)
CAP_{t-1}	-0.00862	-0.0148
	(0.0239)	(0.0151)
ROA_{t-1}	-0.0907	-0.0644***
	(0.112)	(0.0208)
$MATURITY_t$	-0.0845	
	(0.0941)	
$SIZE_t$	-0.336	-0.0668
	(0.274)	(0.121)
Observations	306	254
Number of id	66	37
Time FE	YES	YES
Individual FE	YES	YES
Adjusted R-squared	0.453	0.791

HAC robust std. errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: VIFs

VARIABLES	VIF	SQRT VIF	Tolerance
DISC1	2.63	1.62	0.3809
DISC2	2.42	1.55	0.4138
VOL	2.42	1.56	0.4125
FREEFLOAT	1.47	1.21	0.6803
MIX	1.47	1.21	0.6788
LEVERAGE	1.44	1.20	0.6950
CAP	1.17	1.08	0.8578
ROA	1.29	1.14	0.7752
SIZE	2.06	1.44	0.4854
MATURITY	1.46	1.21	0.6867
Mean VIF	1.80		