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Understanding banking disclosure:

The effect of competition on management forecasts

A thesis for the master program Accounting, Audit & Control

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Executive summary

This study examines the association between banking competition measures and the number of management forecasts made by U.S. listed banks. A deeper understanding of banking disclosure behaviour is important both because of a lack of research and to help improve banking regulation. Utilizing a panel regression, statistically significant evidence is found to support that competition decreases the number of management forecasts made by banks. Furthermore, markets do not appear to react to bank manager forecasts as no significant abnormal stock returns are found in the periods surrounding management forecasts. The implications of this study's findings are twofold. Firstly, regulators should take the effects of competition on disclosure behaviour into account when formulating new banking regulation. Secondly, bank managers that provide management forecasts to create movement in their stock price, should revaluate their firm's disclosure strategy.

Key words:

Voluntary Disclosure, Management Forecasts, Banking, Competition, Proprietary Costs, Event Study, Abnormal Returns, Lerner Index, RS index, USA.

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Table of Contents

1. Introduction 1
2. Theoretical background 3
2.1 Voluntary disclosure 3
2.2 Disclosure motivation 4
2.3 Proprietary costs 5
2.4 Competition 6
2.5 Voluntary disclosure in banks 5
2.6 Management forecast usefulness 8
3. Research design 9
3.1 Variables 9
3.2 Sample selection 14
3.3 Statistical analysis 15
4. Empirical results and analysis 17
4.1 Descriptive statistics 17
4.2 Correlation analysis 17
4.3 Panel regression 18
4.4 Event study 19
5. Conclusion 20
6. References 21
7. Appendix 27
8. Figures and tables 30
8.1 Figure 1: Examples of competition metric calculation 30
8.2 Figure 2: Libby box 31
8.3 Competition measure correlation matrix 32
8.4 Variables description 33
8.5 Sample selection 34
8.6 Descriptive statistics 35
8.7 Forecast types 36
8.8 Correlation matrix 37
8.9 Relation bank disclosure and competition 38
8.10 Test for abnormal returns 39

1. Introduction

The financial crisis in 2008 triggered an increased focus on the disclosure behaviour of banks. It gave way to the implementation of the Sarbanes-Oxley Act which caused one of the most drastic changes in banking disclosure regulation (Ge & McVay, 2005). The recent scandal of Archegos Capital shows that bank disclosure regulation is still not perfect. By not having to disclose who the banks were lending to, Archegos capital was able to obtain swaps on the same set of stocks from multiple banks. Once the stock prices moved against them Archegos went under again leaving deposit-funded banks with large losses. The SEC also recognizes the need to further improve bank disclosure regulation to avoid such future scandals as Archegos. The agency has recently updated its disclosure framework for banking registrants (SEC, 2020). Both the proposed changes in regulation and the recent scandals shows that there is a hunger for a deeper understanding of bank disclosure behaviour. This thesis tries to satisfy this demand by examining the following research question:

Does higher competition decrease the amount of voluntary disclosure made by US banks?

Within the voluntary disclosure literature, multiple forces have been hypothesized to explain disclosure behaviour such as capital market forces (e.g. Healy & Palepu, 1995; Lang & Lundholm, 2000) or litigation forces (Skinner, 1994). This thesis hypothesizes that high propriety cost (e.g. Berger & Han, 2007; Lang & Sul, 2014) are an important determinant of US banks voluntary disclosure behaviour for two reasons. Firstly, competition in the banking industry has historically always been relatively high in the US (Schaeffer, 1989) and secondly, banks compete based on information (Hoffman, 2011).

Firm disclosure behaviour is not only driven by the costs of disclosure, but also by the potential benefits that managers hope to capture (Healy & Palepu, 2001). Examples of such benefits of disclosure have been widely discussed in the literature (e.g. Lang & Lundholm, 2000). A common example is that, as a result of reduced information asymmetry, increased voluntary disclosure leads to lower costs of capital (Francis, Nanda & Olsson, 2008). Coller and Yohn (1997) suggest that a lack of perceived benefits can also explain why certain managers don't make use of voluntary disclosure. Managers are rational and when the costs of additional disclosure outweigh the benefits they will limit the amount of voluntary disclosure they provide. A common way in which the usefulness of disclosure is evaluated, is by examining abnormal returns. By linking the abnormal movement in stock prices to disclosure dates researchers such as Ball and Brown (1968) have shown that the market reacts to earnings information provided by firms. From this they conclude that earnings are useful. This thesis, besides examining the effects of competition, also investigates if the market perceives voluntary disclosures made by banks to be useful. The following secondary research question is examined:

Do markets abnormally react to management forecasts made by US banks?

From both an academic and a practical viewpoint it is important to better understand the disclosure choices of banks. Previous research on the relation between competition and voluntary disclosure has found contrasting results with regard to the sign of the relation. Bamber and Cheon (1998) for example find, for their sample of NYSE firms, that the number of management forecasts made to have a negative association with industry concentration. Verrechia and Weber (2006) however, find that voluntary disclosure is higher in more concentrated industries. There is thus conflict in the literature which makes it interesting to research. Furthermore, within the existing academic literature, disclosure motives of financial institutions are relatively less covered compared to the disclosure motives of non-financial firms (Haely & Palepu, 2001; Beyer, Cohen & Walther, 2010).

There is also a demand from practice for further insights into the disclosure behaviour of banks. Recent changes surrounding the regulation of banks, for example the implementation of the Dodd-Frank act in 2010 (Balasubramnian & Cyree, 2014) and the more recent loosening of the Dodd-Frank act in 2018 (Granja, 2018), signal that US policy setters are still struggling with disclosure regulation for financial institutions. Kleymenova and Zhang (2019) show the danger of not understanding disclosure motivation by documenting that the loosening of disclosure regulation decreases both mandatory and voluntary disclosure by banks. This general decrease in the transparency of bank operations is unfavourable and has been identified as one of the factors contributing to the financial crisis in 2008 by Acharya and Richardson (2009). In order to prevent future financial bank meltdowns, it is therefore important for regulators to get a deeper understanding of what drives voluntary disclosure in banks.

This paper takes a cost and benefit approach to explaining the disclosure behaviour of banks. The paper can therefore be divided into two sections. In the first section, I examine how competition affects the voluntary disclosure behaviour of banks via the proprietary cost hypothesis. Voluntary disclosure is proxied with management forecasts as these have high potential proprietary costs (Karuna, 2010). Proprietary costs in turn are proxied with an aggregated measure of competition that measures three different dimensions of competition. These dimension capture the difference in competitive advantages that banks can have due to operation level, their base of operation and pricing power. This aggregated measure of competition is regressed, together with several bank characteristics as control variables, on the absolute number of management forecasts made per bank per fiscal year. A panel regression with fixed effects is used as regression model. U.S. listed banks are selected as a research sample and corresponding data about bank fundamentals is obtained from Compustat. Information about management forecasts is obtained from IBES Guidance, Bloomberg and via hand collection. As an institutional setting the U.S. is taken due to its relative homogeneity in banking disclosure regulation (Goddar, Molyneux, Wilson & Tavakoli, 2007).

The second part of the paper examines the potential benefits of voluntary disclosure. An event study surrounding the collected management forecasts is performed to examine if investors perceive management forecasts to be useful. This is determined by examining if there are abnormal returns. Two restrictions are set to the types of management forecasts that are evaluated. Firstly, they must be numerical and secondly, they must have a forecast period of a year. Following previous researchers that make use of event studies, (e.g. Waymire, 1984; Kim, Lacina & Park, 2008) statistically significant cumulative abnormal returns are interpreted as a sign that management forecasts convey new information to investors. Daily stock returns of the U.S. banks that make management forecasts are obtained from CRSP.

Controlling for bank characteristics I find evidence that there is a negative relation between voluntary bank disclosure and the amount of competition a bank faces. The results are statistically significant with a one point increase in competition being associated with an 18% decrease in the number of management forecasts being issued. This found result is somewhat robust and holds when using two alternative direct measures of banking competition.

Furthermore, I don't find statistically significant evidence to support the hypothesis that investors find management forecast made by banks to be useful. There appears to be no abnormal stock market reaction surrounding the announcement date of management forecasts. This finding is robust for different return estimation models and significance tests.

This study contributes to existing academic research in a few ways. The main contribution of this paper is that it expands the research on the impact of competition on disclosure behaviour in banking. While there are papers that examine such a relation for non-financial firms (e.g. Darrough, 1993; Burks, Cuny, Gerakos & Granja, 2018), there are no papers that I know of that do this for a banking setting. Another contribution of this paper is that the measure of competition that I use is new. By combining different dimensions of competition I circumvent problems that singular dimension measures have. This study therefore also adds to the literature on how to best measure banking competition (Haely & Palepu, 2011).

The results of this paper also provides new insights and implications. Firstly, the paper provides evidence that also within banking there is a negative relation between competition and voluntary disclosure. While the finding that there are no statistically significant abnormal returns surrounding bank management forecasts does not completely rule out that investors don't value bank voluntary disclosure, it does provide a signal for banks. Banks that provide voluntary management forecasts should reassess if the perceived gains of such voluntary disclosure actually materialize or that they only experience the costs associated with such disclosures. Finally, the finding that competition is associated with bank disclosure behaviour is also of interest for regulators such as the SEC. The institution should take that into account when shaping new regulation as influencing disclosure behaviour of banks can also be done via competition regulation.

The body of the paper is organized as follows. Section 2 discusses the theoretical background and develops the hypothesis. Section 3 discusses the research design and section 4 discusses the found empirical results. Finally, section 5 concludes the thesis.

2. Theoretical background

This section describes the literature that is used to support the hypothesis development. Firstly, in sections 2.1 and 2.2 voluntary disclosure and the motivations behind disclosure are discussed. Secondly, in sections 2.3 and 2.4 some different methods of measuring competition are highlighted. Finally, sections 2.5 and 2.6 present the links of existing theories with the hypotheses of this paper.

2.1 Voluntary disclosure

Investors and other stakeholders operate in a world with information asymmetry where firm-insiders generally have more information about the profitability of the firm than firm-outsiders (Beyer, Cohen, Lys & Walther, 2010). This uneven distribution of information creates two problems that help explain why there is demand for corporate disclosure.

The agency problem arises because investors in firms often do not play an active role in the management of the firm (Jensen & Meckling, 1976). Instead, the day-to-day management is done by managers who thus act as agents for the investors or the principals. The goals of these agents are not always aligned with the goals of the principles (Jensen & Meckling, 1976). The second problem is the so-called "lemons problem" (Akerlof, 1970). There are both information differences and conflicting incentives between firm insiders and outsiders (Healy & Palepu, 2001). As investors don't exactly know the quality of the firm they are investing in, they can't distinguish between good and bad firms. As a result, they will value each firm to be average which leads to certain firms being undervalued and others overvalued, relative to the information available to investors.

Corporate disclosure is one of the main methods that firms apply to overcome the two above mentioned problems and it is critical for the correct functioning of capital markets (Healy & Palepu, 2001). Disclosing information about firm performance allows investors to check on their agents and it also enables firms to signal their relative quality to investors.

Firms provide disclosure through a large variety of ways such as management forecasts, financial statements and investor conferences (Healy & Palepu, 2011). The method in which firms disclose information, and the channels they use, are constantly changing over time (Miller & Skinner, 2015). The content of the disclosures can be divided into two groups. The first group encompasses all mandatory disclosures that are made by firms. Examples are regulated financial reports such as quarterly financial statements and annual reports. The extent and scope of mandatory disclosure differs per country and per industry group (Wallace & Naser, 1995). Mandatory disclosure is thus driven by law and accounting standards.

The second group encompasses all forms of voluntary disclosure. Voluntary disclosure encompasses all forms of disclosure by firms that is in excess of requirements set by financial regulation and laws (Meek, Roberts & Gray, 1995). Management has freedom in choosing to disclose these types of information and therefore voluntary disclosure is also called discretionary disclosure (Verrecchia, 1983). Management forecasts are one of the most popular forms of voluntary disclosure. The use of management forecasts has increased over time in the US following the passage of the Private Securities Litigation Reform act in 1995 (Kile, Pownall & Waymire, 1998). According to King, Pownall and Waymire (1990) issuing management forecasts follows a sequential approach by management. First, managers decide whether to disclose a forecast. Secondly, they decide on how often they want to provide a forecast. Subsequently, they need to decide on the properties of the forecast such as the bias of the forecast, the horizon and the forecast venue (King et al., 1990). Academic literature has examined each of these steps and the management forecast properties. Skinner (1994) for example examines the type of news presented in the forecasts based on how it compares to the current market expectations. Ajinkya et al. (2005) furthermore look at the timeliness of management forecasts based on how earlier on in the fiscal year they are made. In turn, Karamanou and Vafeas (2005) examine the precision of the made forecasts by comparing them with the realized earnings.

2.2 Disclosure motivation

The motivation behind voluntary disclosure has long been an area of interest for accounting research as is evident from the extensive literature. As summarized by Healy and Palepu (2001) there are six main forces, or hypotheses, that researchers often use to explain the disclosure behaviour of firms. While some hypotheses lack evidence, others are well documented. An example of a well-supported one is the capital markets transactions hypothesis. Healy and Palepu (1993, 1995) find that investors' perceptions influence the cost of capital of firms. By disclosing more information about the profitability and strategy of the firm the information asymmetry, that exists between firm insiders and outsiders, can be reduced (Myers & Majluf, 1984). When investors have more certainty about an investment, so when there is less information risk, the total required rate of return they demand will be lower as the risk premium is lower (Barry & Brown, 1986; Merton, 1987). The capital market transactions hypothesis thus suggests that firms voluntary disclosure behaviour can be explained by the desire to lower costs of capital.

The litigation cost hypothesis is another theory that is often used to explain differences in disclosure behaviour between firms and industries. The effect of litigation on firms disclosure is twofold. On the one hand, litigation increases firms voluntary disclosure. Skinner (1994) documents that in an attempt to reduce the cost of litigation managers pre-disclose bad earnings news. On the other hand, Francis et al. (1994) find that higher levels of litigation are associated with firms disclosing less forward-looking information such as management forecasts.

2.3 Proprietary costs

A third theory that is used to explain corporate disclosure behaviour with is the proprietary costs hypothesis. Proprietary costs can be described as the indirect costs of disclosing voluntary information. Within the existing literature proprietary cost are described in different ways by different researchers. Verrechia (1983) sees proprietary costs as costs that are associated with releasing information that is unfavourable to the disclosing firm. Disclosing the information could be unfavourable because it could be useful to competitors, shareholders or employees in a way that could harm the firm's prospects (Verrechia, 1983).

Verrecchia (1983) was one of the first to examine the relation between proprietary costs and corporate disclosure. He found that, in the presence of proprietary costs, partial disclosure may be optimal and that the level of disclosure decreases as proprietary costs increase. The underlying theory used to explain this found relation is that industries with a lower level of competition have higher profits. The proprietary costs associated with disclosure are thus higher for these firms (Lang & Sul, 2014). Bamber and Cheon (1998) focussed on management forecasts as a proxy for disclosure. They found a negative relation between industry concentration, meaning industries with lower competition, and the likelihood of issuing management earnings forecasts. In a more recent study, Ali, Klasa and Yeung (2014) examine the relation between U.S. Census industry concentration measures and the informativeness of corporate disclosures. They find that firms operating in competitive industries, measured as being more concentrated, disclose management forecasts less frequently.

An implicit assumption that underlies the proprietary costs theory is that competitors are able to infer proprietary information from the voluntary disclosure of firms (Botosan & Stanford, 2005). Botosan and Stanford (2005) give an example of this. They study a U.S. company that started to voluntarily disclose segment information. Competitors were then able to identify that certain segments were more profitable than expected and also entered these markets (Botosan & Stanford, 2005). While in the example above the proprietary costs are relatively obvious this may not be the case for all types of voluntary disclosure. For example, Robinson and Schmidt (2013) found that investors and competitors react both positively and negatively at the same time to voluntary tax disclosures. This shows that not all competitors are able to correctly identify proprietary information that can be used to their advantage.

Overall, the proprietary cost hypothesis is not suitable for all industries. I argue that it is appropriate to use in the banking industry. Ali et al. (2014) suggest that inferring proprietary costs is easier to do in industries that consist of large firms whose earnings are strongly correlated with industry-wide earnings. Bank earnings are largely driven by market interest rates (Flannery, 1981) that affect nearly all banks. This industry dependence on interest rates results in banking industry earnings being correlated (Flannery, 1981). Furthermore, Ali et al. (2014) also argue that inferring costs is easier to do in industries where there is a large systematic component to demand across firms. Taking deposit services as the main product of banks, Dick (2008) argues that this is the case for the U.S. banking sector.

2.4 Competition

The proprietary information costs of voluntary disclosure are generally proxied in the existing literature by a measure of market competition (e.g. Bamber & Cheon, 1998; Beyer, Cohen, Lys & Walther, 2010). Competition within a market can range from monopolistic to perfect competition. Competition in banking is an unobservable and abstract concept and so there is a large debate on what is the best method to capture it. Literature on the measurement of competition in banking can broadly be categorized into two streams (Leon, 2014). The first stream of literature is the structural stream. Under this stream of literature, researchers make use of measures of market concentration as a proxy to measure competition. The lower the concentration of the market the greater the competition in the market is perceived to be. The Herfindahl index (HHI) is the most known example of this structural measure and is widely applied in research (Hirschman, 1964).

In contrast to the structural stream, the non-structural stream of literature determines the competitiveness by looking directly at the conduct at banks. Two famous examples of this stream are the Lerner index (Lerner, 1934) and the Panzar-Rosse model (Rosse & Panzar, 1977). The Lerner index measures competition based on the marginal pricing ability of the bank. Greater marginal pricing ability is seen as greater bank competitive power. The Panzar-Rosse model measures competition by looking at the elasticity of revenues given a change in input prices (Rosse & Panzar, 1977). The less elastic the revenue change of the bank is, the more competitive the bank is deemed to be.

A shortcoming of many of the different existing measures of bank competition is that they measure competition differently. Therefore they often only capture certain dimensions of competition (Bolt & Humphrey, 2015). For example, the popular Herfindahl index focuses on market share and does not account for how a bank obtained that market share (Berger, 1995). A shortcoming of the Lerner index is that it only focuses on the pricing power of banks and ignores existing scale advantages (Bolt& Humphrey, 2015). A direct result is that the measures of competition are not correlated. This in turn leads to different conclusions being made about the influence of competition. Researchers can come to different conclusions for the same research question based on the measure used (Bolt & Humphrey, 2015).

2.5 Voluntary disclosure in banks

Within the existing literature that looks at the motivation behind management forecasts, the focus is predominantly on non-financial firms. In order to fill this gap, I hypothesize that the proprietary costs theory, proxied by competition, can help explain U.S. bank disclosure behaviour.

The proprietary costs theory is applicable to the U.S. banking market because of a few characteristics that the market has. First of all the average size of U.S. banks is large. Large banks make more use of information-based lending instead of relationship banking (Berger & Black, 2011) and so they greatly value information. The high costs of giving up valuable information, in the form of management forecasts, is therefore more likely to be a constraining factor on the amount of voluntary disclosure U.S. banks provide (Verrecchia, 1983). Furthermore, the U.S. banking market is also deemed to be one of the most competitive banking markets in the world (e.g. Claessens & Laeven, 2004) making concerns about proprietary costs greater. Thirdly, the U.S. financial system is arguably amongst the most mature and well-developed banking systems in the world. Both the NYSE and NASDAQ, on which the research subjects of this paper are listed, are among the most liquid and most followed stock markets in the world. The chance of management forecasts being incorporated is therefore higher in this market. Any effects of the choice in the trade-off between the positive and negative effects of disclosure (Darrough, 1993) will thus likely be high for U.S. banks.

In this thesis, I focus on management forecasts as a proxy for voluntary disclosure. Management forecasts are an appropriate proxy for voluntary disclosure to measure the effect of competition on disclosure behaviour with. Management forecasts are predominantly forward-looking in their nature (Berger, 2011) and talk about events that will occur in the following months. This often means that rivals have time to react to the announcements before the disclosed information will affect the market (Karuna, 2010). Therefore, proprietary cost concerns are greater with management forecasts (Karuna, 2010).

Previous literature found conflicting evidence on the sign of the relation between competition and voluntary disclosure. Bamber and Cheon (1998) find for their sample of NYSE firm that the number of management forecasts released has a negative association with industry concentration. Both Botosan and Harris (2000) and Botosan and Stanford (2005) also find there to be a negative association. On the other hand, Verrechia (1983), Darrough and Stoughton (1990) and Weber (2006) all find that voluntary disclosure is higher in more concentrated industries.

Within the U.S. banking setting, this thesis expects there to be a negative association between competition and bank disclosure. This is expected because the costs of disclosure increase more than the benefits of disclosure when competition increases. Larger U.S. banks compete mainly based on information (Berger & Black, 2011). When markets become more concentrated the revelation of proprietary information in such markets becomes more costly (Botosan & Stanford, 2005). At the same time capital market benefits of additional disclosure, such as improved stock liquidity and lower costs of equity capital (Diamond & Verrechia, 1991; Clarckson, Guedes & Thompson, 1996), are arguably less important for U.S. banks than they are for non-financial firms. Banks mainly finance operations with savings and deposits given to the bank by its customers. With benefits of additional disclosure then lacking, additional disclosure could therefore only bring additional costs. An increase in competition will therefore likely not change the way U.S. banks finance themselves.

A potential argument against the proposed negative direction is found in the work of Gigler (1994). He argues that the relationship could be positive as proprietary costs actually increase the amount of voluntary disclosure by firms. Gigler (1994) suggest that high proprietary costs provide credibility to management forecasts. This higher credibility results in the market reacting more strongly to made management forecast which increases potential disclosure benefits. This in turn increases the incentive to voluntary disclose (Gigler, 1994). However, evidence suggests that Gigler's (1994) theory does not hold for the banking sector. Existing high litigation risk and litigation costs already lend high credibility to bank managers forecasts (Rogers & Stocken, 2005) which would limit additional credibility obtained from increasing competition.

Taken all together, I propose that competition can help explain banking disclosure behaviour in the U.S. This notion is examined via the following hypothesis:

Hypothesis 1: There is a negative association between bank competition and the number of management forecasts.

2.6 Management forecasts usefulness.

Complimentary to proprietary costs, another factor that could potentially explain why banks and other financial institutions make fewer management forecasts is that their management forecasts are not perceived to be informative by investors. Coller and Yohn (1997) suggest that as some firms don't experience the upside of additional disclosure, such as greater stock liquidity or greater analyst following (Healy & Palepu, 2001), but still experience the downsides, they choose to disclose less. Nichols & Tsjay (1979) explain that such a lack of movement in the stock could be a result of all information already being incorporated into the stock price. In other words, investors don't perceive the management forecast to be useful as it doesn't provide new information.

A popular way in which the usefulness of corporate disclosure is measured by academic literature is by linking it to movements in stock prices. With their paper Ball & Brown (1968) were one of the first to link corporate disclosure to movement in stock prices. By showing that there is a significant relation between the sign of the earnings announcement and the direction of the stock movement, they find evidence that markets react to disclosure. From this Ball & Brown (1968) conclude that earnings are useful.

While Ball & Brown (1986) looked at a form of mandatory disclosure, other researchers have also looked at the usefulness of voluntary disclosure such as management forecast. Patell (1976) was one of the first to examine the link between management forecasts and the reaction in stock price following a disclosure. Using a sample of NYSE listed firms he found that a significant relationship exists between the stock price reactions and the release of earnings forecasts by management. He explains this relation by suggesting that management forecasts contain certain information about firm performance that was not known to investors before the forecast. Upon deciphering the information investors revalue the company and adjust their stock holdings which results in changes in the stock price (Patell, 1976). Following Patell (1976) other researchers have expanded the forecasts research with Penman (1980) for example looking at the information content of earnings announcements and Anjinkya and Gift (1984) examining the strategic use of forecasts by managers. Overall, the majority of papers document a significant stock price reaction to the release of earnings forecasts by management.

While markets react to the earnings announcements of non-financial firms, there is evidence in the literature that suggest this does not have to be the case for financial firms. A lot of information about bank operations is already known to investors due to the relatively high mandatory disclosure rules for banks (Beatty & Liao, 2014). Furthermore, Ball & Brown (1968) found that investors only react to earnings news if it diverts from the earnings consensus. Partially due to their relatively large size, American banks have been found to have reduced return volatility (De Haan & Poghosyan, 2012). Lower return volatility makes it easier to predict future earnings resulting in lower earnings surprises.

If markets don't react to the management forecasts of banks, banks would likely only experience the downsides of disclosure. It could also mean that any proprietary costs would be greater than the gains of disclosure, as these are zero. I examine if markets react to earnings announcements made by managers of stock-listed banks. This is tested via the following hypothesis.

Hypothesis 2: There is an abnormal stock market reaction to management forecasts made by banks.

3. Research design

This section first discusses the measurement of the dependent and independent variables. Following that, the control variables and sample selection process are discussed. Finally, the applied statistical test used to test the hypotheses are motivated and explained.

3.1 Variables

3.1.1 Voluntary disclosure

In this thesis, I focus on management forecasts as a proxy for voluntary disclosure. Management forecasts are an appropriate proxy for voluntary disclosure to measure the effect of competition on disclosure behaviour with. Management forecasts are predominantly forward-looking in their nature (Berger, 2011) and talk about events that will occur in the following months. This often means that rivals have time to react to the announcements before the disclosed information will affect the market (Karuna, 2010). Therefore proprietary cost concerns are greater with management forecasts (Karuna, 2010).

The frequency of management forecast is measured as the total number of management forecast made by banks in the US during a fiscal year (Ali et al., 2014). Due to the nature of the forecast data available in IBES Guidance, I only focus on the numerical aspects of the forecasts. The management forecasts are gathered both from IBES guidance, Bloomberg and via manual collection.

3.1.2. Competition Measure

Proprietary costs are often proxied by a measure of competition (Haely & Palepu, 2011). Traditionally, competition in turn is then measured with the Herfindahl-Index (e.g. Berger & Hannan, 1989). However, the use of market concentration as a measure of competition has been scrutinized due to its weak relationship with measures of profitability when measures of market share are included in the regression (Berger, Demirguc-Kunt, Levine & Haubrich, 2003). Other researchers have also found that concentrated banking industries can still be competitive when the threat of entry and exit costs are both low (Baumol, 1982). Therefore, notwithstanding the dominant use of the Herfindalh-index in the literature, it is contestable if the Herfindahl-index is the best measure of banking competition.

Despite this discussion, a general consensus is that each method has its own advantages and disadvantage and that a good measure is one that captures multiple aspects of competition (Haely & Palepu, 2011). I therefore construct a new metric to measure the competition that banks face which is based on a combination of often-used metrics of banking competition. I measure bank competition along three dimensions that have each been hypothesized to capture an aspect of bank competition. These are operation level, operation base and firm efficiency. For each separate measure, all banks are ranked on their score. The top half of each group is then awarded 1 point. The sum of all points each bank gets is then used as a proxy for the amount of competition a bank faces. This measure is described as the COMP variable.

Operational level - The size of banks affects the competitive conditions that the bank faces (Berger et al., 2003). From a proprietary cost point of view, larger banks face more competition compared to smaller banks as they are scrutinized more (Webb, 2008) as they generally have larger analysts followings. Furthermore, larger banks have higher proprietary costs because they compete more on a quantitative information basis as compared to smaller banks who are more dependent on relationship banking (Stein, 2002).

I therefore make a distinction between banks that operate on mostly a (singular)state level or regional level and banks that operate on an (inter)national level. To categorize the banks in my sample I first make use of the classification system in the Bank Regulatory database in WRDS and the institution type code used by the FFIEC. For the banks of which there is no classification level data I manually examine their operations using both Bloomberg and the banks YahooFinance! profile. I then assign them to a category based on the spread of the bank's branches.

Operation base - Not only the geographic scale on which banks operates matters for what competition they face, but also where they operate. Within the U.S. there is a difference in the degree of banking competition between different states due to the presence of strong state governments (Rico & Strahan, 2010). While banks have to follow federal regulation, such as certain minimum capital requirements, states have relative freedom on deciding to what degree banks in their state should follow those federal regulations (Rice & Strahan, 2010).

Following Rice and Strahan (2010) and Cornaggia, Mao, Tian and Wolfe (2015) I make use of the Rice and Strahan index (Henceforth RS index) that the aforementioned created to factor in the difference in local competition that the U.S. banks face. The RS index classifies state banking competition based on the use of certain restrictions of the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) by U.S. states. Originally, the IBBEA was introduced to promote interstate banking competition (Kerr & Nanda, 2009). However, some states took the act as an opportunity to erect restrictions for out-of-states banks (Rico & Strahan, 2010). As some states did make use of certain restrictions, while others didn't, the IBBEA had the effect that differences in the degree of banking competition between states arose.

In short, the RS index model classifies competition according to four provisions. These provisions cover different themes such as minimum required institution age and deposit caps. If a state makes use of certain provisions it gets a point on the index with a maximum score of 4 points. States with a score of 4 are deemed to be less competitive for existing banks compared to states with a score of 0 (Rice & Strahan, 2010). In the U.S. many of the bank's operations concentrate in the state where the bank has its headquarters (Hirtle & Stiroh, 2007). The banks are given an RS index score based on the state in which their headquarters is located. The data on the headquarters of the banks is collected from the WRDS Banking Regulatory database. A high RS index score indicates that the state in which the bank operates has many restrictions to outside banks (Rice & Strahan, 2010). Banks in these states thus operate in an low competition environment. In order to align the RS index model with the other measures of competition, I reverse the RS-scores. A score of 4 on the index will be included as a score of 0. A more elaborate discussion of the RS-model and the state rankings can be found in appendix A.

Operation efficiency - As a third aspect to capture competition with, I look at the bank's operational efficiency which is captured by the banks pricing power. The Lerner index is a measure that is used to measure market power via the firms pricing power (Lerner, 1934). The Lerner index as a measure of market competition has as an advantage that it measures the firms individual level of competition. It is therefore useful to make comparisons of intra firm differences in competition.

Coccorese (2009) argues that the Lerner index is a good reflection of the bank's degree of market power as it shows the bank's ability to charge a relative mark-up price over the marginal costs of the bank. Berger et al. (2009) also support this notion as they say that in order for a bank to be able to charge a markup-up it must have some competitive advantage in the form of either lower costs or superior product.

For calculating the Lerner index I follow the approach used in Berger et al. (2009) and in Demirguc-Kunt and Pereira (2010). Both of these papers follow the so-called production approach to calculate the Lerner index with. This approach assumes that total assets are the best measure for bank output. The formula of the Lerner index is presented below.

$$LI_{it} = P_{it} - MC_{it}$$

The price (P) is calculated as the ratio of total bank revenues, which consists of both interest income and non-interest income, to total bank assets. To calculate the marginal costs (MC) of the banks I again follow Berger et al. (2009) and Demirguc-Kunt and Pereira (2010) and make use of three costs inputs. These are labor, physical costs, and deposit costs. Labor costs resemble personnel costs that banks have to make and it is calculated as the ratio of personnel expenses to total assets. The physical cost resembles the costs that banks have to make to house and facilitate their operations so they mainly consist of property, plant and equipment expenses. The physical costs are calculated as the ratio of other non-interest expenses to fixed assets (Demirguc-Kunt & Pereira, 2010). Finally, the deposit costs resemble the financing costs that banks need to make. Banks borrow capital from depositors which the bank in turn uses to finance its operations and invest. In return, the bank must pay a certain interest rate on those deposits. Interest costs are calculated as the ratio of interest expenses to total funds.

$$\ln TC = \beta_o + \beta_1 \ln(Y_i) + \frac{1}{2}\beta_2(\ln(Y)^2) + \sum_{l=1}^{3} v_l(\ln(w_{li})) + \frac{1}{2}\sum_{l=1}^{3} v_3 +._l(\ln(w_{li}))^2 + \sum_{l=1}^{3}\beta_2 +_l [\ln(q_i)][\ln(w_{il})] + \sum_{l\neq l'} b_6 +_l [\ln(w_{li})]\left[\ln\left(w'_{l\,i}\right)\right] + \varepsilon_i$$

In the equation above, i denotes banks and t denotes years. TC is the total operating costs and Y stands for the total assets. W_{li} is the price of the input for a bank. After estimating the total costs, the marginal costs can be obtained by taking the first derivative and multiplying by the average costs. The marginal cost are calculated by taking the derivative of the equitation above. This can be shown with the following formula.

$$MC = [\beta_1 + \beta_2 \ln(Y_i) + \sum_{l=1}^{3} \beta_2 + l[lnw(w_{li})]] * \frac{Cost_i}{Y_i}$$

The average calculated Lerner index is 0.24 and has a standard deviation of 0.08. This average Lerner index is comparable to the one found in the research of Bolt and Humphrey (2015). The Lerner index is a measure of the firms pricing ability and should be interpreted as follows. Taken individually, the greater a firms ability is to demand a mark-up of price over marginal costs, the greater that firms market power is (Ariss, 2010). The link with competition is that greater market power implies less competition. A higher Lerner index thus means lower competition (Pruteanu-Podpiera,, Weill & Schobert, 2007).

A note of attention is that the constructed Lerner index does not account for the risk premia in the prices of a bank's product and services (Iveta, 2012). The method therefore does not take into regard the monopoly rents that allow larger banks to offer lower prices. Instead, I capture the supposed advantages that larger banks have over smaller banks, due to economies of scale, in the operational level risk dimension discussed earlier.

After having calculated each separate measure, the three different measures of competition are then combined to form a new single measure of competition. I build this metric simply by dividing the banks into a bottom group and a top group for the Lerner and the RS index. The top group consist of the banks that face the most competition given their respective competition measurement metric. If a bank belongs to the top group it receives 1 point. Banks also receive a point if they operate on an (inter)national level.

The maximum score of three points thus resembles that a bank is operating in a highly competitive environment and has high proprietary costs.

In order to provide more insight into how the three subcomponents of competition each measure different aspects of competition, a correlation matrix is created. Table 1 shows the correlation of the sub-components of the competition measure. Overall, the Lerner index is not correlated with the operation level of the firm but is slightly correlated with the RS index. It could be that banks with strong competitive pricing abilities are able to compete with other banks and so are located in states with high banking competition. The level at which a firm operates and the RS index are not correlated which can be explained by that international banks are not concentrated in states with low levels of competition. The fundamental accounting data that is used to calculate the competition metrics is collected from Compustat Bank Fundamentals and from the Bank Regulatory WRDS database.

3.1.3 Control variables

The literature on potential drivers of firm voluntary disclosure is extensive. Researchers have for example looked at how the differences in board structure (Cheng & Courteny, 2006) and other corporate governance factors (Eng & Mak, 2003) determine corporate disclosure. In order to isolate the effect of competition, it is therefore important to control for certain firm-specific factors that have been proven to influence disclosure. The focus of this thesis is to describe intra industry differences. Therefore control variables that explain disclosure behaviour between different industries, such as competition from potential entrants (Li, 2010) or the number of private firms in the industry (Bens, Berger & Monahan, 2011), are not included as control variables.

Firm size - Firm size is a control variable that has often been used in previous research on determinants of voluntary disclosure (e.g. Lang & Lundholm, 1993; Kasznik & Lev, 1995). In general, it is found that larger firms disclose more information compared to small firms. Meek, Roberts and Gray (1995) provide multiple explanations for why this can be in their centennial research on factors influencing voluntary disclosures by Western firms. A plausible one is that there are fixed costs associated with disclosure which is relatively smaller for larger firms. Furthermore, the agency theory suggests that larger firms have higher agency costs (Lefwich, Watts & Zimmerman, 1981). Following the discussion by Schilkbach (2017), I measure bank size with total assets instead of revenue as bank revenue can greatly fluctuate on a year-on-year basis.

Firm performance - Miller (2002) finds that firm voluntary disclosure increases as firm performance increases. Lang and Lundholm (1993) also find that that firms with the highest disclosure ratings are often the firms with the highest earnings performance. They suggest that this could be caused by a self-selection bias where firms increase their disclosure as their performance improves. As firm disclosure could be driven by performance I control for the factor. It is measured with ROE which is a measure of bank performance that is often used in academic literature (e.g. Fanta, Kemal & Waka, 2013).

Litigation risk - Previous research has shown that litigation risk faced by managers influences the amount of forward-looking information that firms provide (Skinner, 1994; Francis, Philbrick & Schipper, 1994). Cao and Naranyanamoorthy (2011) find that this is also the case for management earnings forecast. They find that litigation risk has a positive relation with bad news forecasts and a negative relation with good news forecasts. Arguably the directors and officers liability insurance (D&O) premium used by Cao and Narayanamoorthy (2011) is a good proxy for firm litigation risk. It incorporates information about both the expected change of litigation and the expected size of the litigation (Cao & Narayanamoorthy, 2011). However, litigation insurance information for banks is not widely publicly available. I therefore instead make use of a measure that is similar to the litigation risk

proxy as proposed by Johnson, Kasznik and Nelson (2001). In their paper, they estimate litigation risk based on a probit model that makes use of certain firm characteristics that have been proven to be related with the chance of getting sued. They for example find that litigation risk is statistically significantly associated with firm size, firm leverage use and with negative stock price returns. A probit model is used to estimate the litigation risk that banks face. The explanation of the calculation can be found in appendix B.

Firm leverage - Firm leverage also has an effect on firm disclosure. As the chance of wealth transfer from debtholders to shareholders increases with leverage, agency costs are higher for more leveraged firms (Smith & Warner, 1979). To offset these higher agency costs leveraged firms tend to provide more voluntary disclosure. Li (2010) also notes that leverage is associated with the intensity of competition in an industry. Overall the literature finds a positive relation between leverage and voluntary disclosure. Just as normal firms, banks are also considered to be a riskier investment if they hold more leverage (Dell'Ariccia, Laeven & Suarez, 2017) which suggest the same disclosure demands also counts for banks. Leverage is used as a control variable and it is measured as the Tier 1 leverage ratio of the banks. This ratio is calculated by dividing the bank's core capital by its total risk-weighted assets. While the Tier 1 leverage ratio is not exactly the same as the leverage ratio, investors do use it in a similar way namely to assess the firm's ability to absorb losses (Demirguc-Kunt, Detragiache & Merrouche, 2013). As opposed to the normal leverage ratio, the tier 1 leverage ratio is reversed meaning that a higher ratio is better.

Firm growth - Firm growth is negatively related to voluntary disclosures such as management forecasts (Li, 2010; Lo, 2012). As firms grow at a quicker pace, so have a higher growth rate, making forecasts about future performance becomes more difficult and less accurate. As there are negative aspects related to less accurate forecasts (Barefield & Comiskey, 1976), such as higher litigation costs and loss of credibility (Healy & Paleaupu, 2001), firms lower the amount of forward-looking disclosure in the face of higher forecasting difficulty (Lo, 2012). The growth of banks is measured in this thesis as the growth rate of earning assets.

Analysts coverage - Both Abarbanell, Lanen, and Verrechia (1995) and Karamanou and Vafeas (2005) find that the number of analysts following a firm has an influence on the number of management forecasts provided by the firm. As the number of analysts increases the pressure on management to provide more information increases resulting in more disclosure. Lang and Lundholm (1996) however argue that voluntary disclosure could also affect the number of analysts. Superior disclosure allows analysts to create more value through for example superior forecasts leading to more analysts following the firm. Whatever the direction of the relation, analyst coverage seems to influence the amount of voluntary disclosure made. Therefore, I include the number of analyst following a firm as a control variable. The number of analyst following the company is gathered from IBES summary statistics and Bloomberg.

Institutional ownership - Ajinkya, Bhojraj and Sengupta (2005) document a positive relation between institutional ownership and the likelihood of issuing a management forecast. Ajinkya et al. (2005) suggest that this relation can be explained from two sides. On the one hand, institutions prefer to invest in less risky stocks and so favour firms that have superior disclosure. On the other hand, institutions encourage additional disclosure in the firms they have to invest in. In line with previous research on institutional ownership in banks (Ajinkya et al., 2010) institutional ownership is measured as the total percentage of share held by institutional investors at the end of the fiscal year. The WRDS Thomas Reuters Institutional (13f) Holding's ownership database is used to collect data about institutional stock ownership.

3.2. Sample selection

Country research setting - Table 3 provides an overview of the sample selection process. The sample includes U.S. listed banks that were active from 2010 up to and until the end of 2020. The U.S. is chosen as a research field for two reasons. The first reason is that compared to European banking regulation, banking regulation in the U.S. is relatively uniform (Barth, Caprio & Levine, 2013). While there are differences in regulation in terms of for example capital requirements, taxation and risk disclosure between different U.S. states (Garrett, Wagner & Wheelock, 2005), intra EU regulation differences are found to be significant (Goddard, Molyneux, Wilson & Tavakoli, 2007; Barth et al., 2013). By choosing a U.S. based setting I limit the influence of different disclosure regulation, a problem that is arguably larger in an EU setting.

A second reason for using a U.S. setting is of practical nature namely that the amount of available data is much greater. Berger (2011) discusses the problem of having few observations in disclosure research and Lang and Sul (2014) expand on this problem stressing the importance of sample size to overcome difficulties of linking industry concentration to proprietary costs.

Time frame - As noted by Beyer, Cohen, Lys and Walther (2010) in their review of disclosure literature, endogeneity concerns remain a problem as it is often not clear what exactly drives disclosure behaviour. Berger (2011) elaborates on this concern and he suggests that change in regulation is often actually the underlying driver of changes in the disclosure behaviour of firms, instead of the examined firm characteristics. In order to circumvent this potential problem, this thesis makes use of a time frame where there have been no major changes in disclosure regulation for banks. The last identified major change in banking disclosure regulation was the Dodd-Frank act that became effective on July 21, 2010[1]. Only observations after this point in time are thus used.

Sample selection process - As an initial sample, all U.S. national banks that are trading on the NASDAQ and on the NYSE are taken. Banks trading on the smaller U.S. stock market, the NYSE American, are not included as this is a market maker stock market that has different regulation compared to the two larger U.S. stock markets. Trading on the NYSE American is also more infrequent, compared to trading on the NYSE and NASDAQ, as the market maker is sometimes not open for trading. This infrequent trading severely biases the beta estimates (Dimson, 1979) which is used by the market model to estimate expected returns.

Furthermore, banks that stop to exist, either because of delisting or because of bankruptcy are also removed from the sample. Leftwich, Watts and Zimmerman (1981) mention that firms that delisted their stocks changed their disclosure behaviour in run-up to the delisting announcement. Likewise, banks that became publicly listed during the research period, of which West End Indiana Bancshares is an example, are also excluded from the sample. Firms that are planning an IPO make use of management forecasts and the IPO also affects the disclosure behaviour of the firm in the post-IPO period (Jog & McConomy, 2003). If these types of firms would be included it could be possible that the observed management forecasts are actually driven by firm listing behaviour instead of competition.

A graphical overview of the theoretical constructs that are tested is presented in a Libby box. The Libby box is labeled as figure 2 and can be found at the end of the thesis in section 8.

[1] In 2018 there were changes in the Dodd-Frank (Granja, 2018). However, these changes only had influence on the mandatory disclosure for very large banks. I check if there are significant changes in the voluntary disclosure behaviour of these large banks surrounding the 2018 period. I'd don't find evidence that suggest that the change in regulation affected disclosure behaviour.

3.3 Statistical analysis

3.3.1 Correlation analysis

As first statistical tests, both a Pearson and a Spearman correlation analysis is used to get an overview of the relationships between all the variables used in this research. The Pearson correlation analysis tests for linear correlation between the variables while the Spearman analysis tests for monotonic correlation. This step makes it possible to check if the same relationships between the variables are present as they have been found in previous researches. The correlation analysis also helps signal possible multicollinearity issues. As the COMP variable is an ordinal variable, and not continuous, it is excluded from the Pearson correlation analysis.

3.3.2. Regression model

The dataset used for hypothesis 1 is a balanced panel data set as it consists of the same set of banks that are observed repeatedly over 10 years. Using panel data regression is appropriate in this research as unobserved heterogeneity is a potential problem. As is evident from the vast academic literature on disclosure behaviour there are many potential forces that can drive firm disclosure. While I try to account for this by including control variables it is possible that some unobserved independent variables are not included and so are captured by the error term. If they are correlated with an independent variable this could bias the results potentially resulting in the overestimation of the effect that competition has on management forecasts. Using panel data is therefore appropriate as it can be used to control heterogeneity in the regressions.

In order to determine whether a pooled OLS or a model with fixed effects/random effects is more appropriate, I make use of the Hausman-Test. The Hausman-Test in short tests for endogeneity. It has as a null hypothesis that the covariance between the independent variables, and the individual effects of omitted variables on forecasts frequency, is equal to zero. The $\chi 2$ value for the Hausman test is 6.12 with a corresponding *p*-value of 0.029 and so H0 is rejected and fixed-effects are preferred (Brooks, 2019). Hypothesis 1 is tested using the following regression model.

$$(1)\ FREQ_{it} = \alpha + \beta_1 COMP_{it} + \beta_2 SIZE_{it} + \beta_3 PERF_{it} + \beta_4 LIT_{it} + \beta_5 DEBT_{it} + \beta_6 FGROW_{it} + \beta_7 FOLW_{it} + \beta_8 INST_{it} + \theta_t + \varepsilon_{it}$$

All the variables have the same meaning and measurement as is described in table 2. The subscript i stands for the firm and t stands for the year. θ_t stands for the time fixed effects that capture the effect of unobserved variables that affect voluntary disclosure over time but have the same impact on all banks. Finally, ε is the error term. Hypothesis 1 implies that there is a negative relation between the number of management forecasts and the amount of competition banks face. The predicted sign of the COMP coefficient is therefore negative.

3.3.3 Event study

Following previous literature that examines how useful management forecasts are for investors (e.g. Waymire, 1984; Kim, Lacina & Park, 2008), I examine the information content of the forecast with an event study. The information content is measured with abnormal stock returns surrounding the announcement dates of the forecasts. The abnormal stock returns are calculated as the difference between realized and expected stock returns. As both the management forecasts and some analysts forecasts used in the dataset consist of both point and range estimates, it is not feasible to calculate expected stock returns based on the consensus analysts forecast such as Waymire (1984) does. Instead, I calculate expected stock returns based on the market model. The market model is an appropriate model

to use as there is slight clustering of the announcements dates around certain calendar dates (Peterson, 1989). The market model calculates the expected return based on the banks individual beta factor and an estimation period of stock returns. The cumulative abnormal returns are estimated using the following equation.

$$CAR_{it} = \sum_{t=1}^{T} (R_{it} - E(R_{it}))$$

Here R is the actual return of the bank stock and E(R) is the expected return of the bank stock. The cumulative abnormal return is then the abnormal returns of all events summed up together. The subscript i stands for the firms and the subscript t stands for years. The daily stock returns data is collected from CRSP in the WRDS database.

Parameters of the event study - As an event window to conduct the event study with I use a seven day window as the code that I use is based on weeks. A seven day event window is also close to the five day event window which is the most common choice of event window length according to Oler, Harrisson and Allen (2007). The chosen event window is also smaller compared to some earlier studies that conduct event studies in a banking setting (e.g. Becher, 2000) to capture the effects of markets having become quicker at capturing information. Furthermore, I set all announcement dates that are not made on trading days to be captured on the next trading day. For example, if a bank manager makes a forecast on a Saturday, I measure the effect of this disclosure on Monday. In order to limit contamination of the estimation period, I remove management forecasts made by the same company that are within two trading weeks of each other. Finally, I use an estimation period with a rolling window of 100 days which is in line with some more recent events studies in the field of banking (e.g. Kleinow, Nell, Rogler Horsch, 2014).

To determine if investors find management forecast made by banks to be useful I examine if the cumulative abnormal returns differ statistically from zero. I make use of a cross-sectional T-test to test the significance. The regression to measure hypothesis 2 is thus as follows.

$$(2)\ t_{cs} = \frac{\frac{1}{M}\sum_{i=1}^{M} CAR_{it}}{\sqrt{\frac{1}{M(M-1)}\sum_{i=1}^{M}[CAR_i - \frac{1}{M}\sum_{i=1}^{M} CAR_i]^2}}$$

Here t_{cs} stands for the t statistic of the cross-sectional T-test. M stands for the number of days in the event window. Hypothesis 2 does not imply a certain direction in the movement of the stocks surrounding a management forecasts announcement. Instead, it implies that the movement is abnormal. The null hypothesis is that that the mean of cumulative abnormal returns is not significantly statistically different from zero. If it is statistically significantly different, then this can be seen as evidence that investors find management forecasts to be useful as they contain new information.

4. Empirical results and analysis

This section discusses the empirical results. First, the descriptive statistics and the correlation between the variables are discussed. Following that the results of the panel regression used to test hypothesis 1 are discussed. Furthermore, the results of the event study for hypothesis 2 are presented and finally robustness test are discussed.

4.1 Descriptive statistics

Table 4 shows the descriptive statistics. The dataset contains some outliers for certain variables that are dealt with as follows. Banks with institutional ownership variable higher than 1 are removed as are banks that have negative assets values. Furthermore, banks that had an abnormally high growth rate are also removed from the sample as they are banks that are undergoing mergers. These bank's disclosure behaviour is likely driven by capital market motivations (Merton, 1987) and is thus not part of the research population. Finally, as the sample consists of both larger and relatively smaller banks, the natural logarithm is taken of the SIZE variable.

Table 5 provides an overview of the management forecast type distribution. A total of 832 quantitative management forecast are obtained, which are made by 68 unique banks. Of the 315 banks in the sample, more than 78% don't seem to make use of management forecasts. The vast majority of the management forecasts are about the expected earnings per share (EPS). This found distribution is not unexpected as EPS has been found by literature to be a metric that is highly valued by investors (e.g. Foster, 1973) as it provides the investor valuable information about the firm's ability to pay dividends. Dividend per share (DPS) is the second most observed management forecast subject. It is comparable to EPS as it also is an indication of what returns investors can expect. In joint third place, after EPS and DPS, the most observed management forecasts are about the earnings before tax (EBT) and the return on assets (ROA). Both metrics again convey information about the overall performance of the bank.

4.2 Correlation analysis

Table 6 shows the output of the Spearman and Pearson correlation analysis. Apart from one exception, the majority of the signs of the correlations are in line with expectations. SIZE and INST have a negative relation which is surprising. The assumption normally is that larger firms are seen as a safer investments compared to smaller firms. Institutional investors, especially insurance companies and pension funds, are relatively more risk-averse and so a positive relation was expected (Bebchuk, Cohen & Hirst, 2017).

Of all variables, INST and FOLW have the strongest correlation (0.292). The work of Bhushan (1998) and O'Brien and Bhushan (1990) provides a potential explanation for this suggesting that firms that provide a lot of information are attractive to both institutional investors and analysts to follow. O'Brien and Bhushan (1990) also find that analyst following and institutional investments positively affect each other. All control variables are statistically significantly correlated with the dependent variable FREQ except for FGROW. A monotonic relation thus exists between the number of management forecasts and the majority of the research variables. Despite a general lack of strong correlation, the statistical significance of most control variables does support the choice for including those variables in the research.

Although there appears to be no high correlation between any of the explanatory variables Myers (1990) argues that multicollinearity can still be present even in the case of low correlation. Therefore, this thesis also formally checks for the possible multicollinearity problem. The variance inflation factor (VIF) is calculated and the largest VIF value found is 1.43 for the variable FOLW. This is below 5 and hence there is no severe multicollinearity problem in the sample (Studenmund, 1997).

4.3 Panel regression

Using a panel regression with year fixed effects, and controlling for a battery of control variables, this thesis finds a statistically significant relation between the amount of competition a bank faces and the number of management forecasts that bank makes. Column 2 of table 7 shows the results of regression 1. The sign of the coefficient suggests that there is a negative association between the amount of competition a bank faces and the total number of numerical management forecasts that the bank makes per fiscal year. The relation is found to be significant at a 10% statistical significance level. The null hypothesis that there is no relation between bank competition and the number of management forecasts is thus rejected.

The economic significance of the results of regression 1 is also quite large. Given that, for the banks in the research sample, the average number of forecasts made by a bank is 0.16, a decrease of 0.029 per point increase in competition is equivalent to an 18% change. The found negative relation between competition and the number of management forecasts is in line with findings of literature that finds such relations to exist for non-financial firms. The results for example align with the findings of Bamber and Cheon (1998) who find there to be a negative association between proprietary costs and the number of management forecasts made by firms. Following their paper, the negative relation between competition and management forecasts can be explained by banks facing higher proprietary costs as competition increases (Bamber & Cheon, 1998). Banks facing more competition then decide to limit these costs by making fewer management forecasts (Li, 2010).

The found results oppose papers that find there to be positive, or no relation, between competition and management forecasts such as Verrecchia and Weber (2006). Berger (2011) provides an initial explanation for this difference in found effect by suggesting that both the sample and the measure of competition has great influence. With regard to the control variables, the number of management forecasts is also found to be statistically significantly related to bank size, the litigation risk a bank faces and the number of analysts that follow the bank. All of these control variables have a coefficient sign that is in line with what was expected.

To add robustness to the found results some alternative measures of competition are used. The components of the competition measure are each separately used as a competition variable. The results of these robustness test are reported in table 7 in columns 3-6. When using both the Lerner index and the RS index as separate measures of competition, again a statistically significant negative relation between competition and the number of management forecasts is found.

In this thesis I take multiple measures to limit endogeneity concerns and improve the robustness of the results. Both the use of panel regression and fixed effects in the methodology are supposed to combat endogeneity concerns (Roberts & Whited, 2013). Furthermore, I follow the methodology used in earlier works on disclosure to limit endogeneity concerns by making extensive use of control variables (e.g. Baik, Farber & Lee, 2011). In order to further improve robustness, I have also attempted to use instrumental variables regressions as proposed by Roberts & Whited (2013). Unfortunately, I have not been able to find strong instruments. Each of the proposed instruments violated at least one of the three criteria points that Roberts & Whited (2013) suggest the instrumental variable should meet in order to be considered strong. For example, gender was proposed as instrumental variable to stand in for personality, which is unobservable. While gender does meet the exogeneity assumption and the relevance condition (e.g. Niederle, Muriel & Vesterlund, 2011), it violates the exclusion restriction as gender does have an influence on voluntary disclosure (e.g. Liao, Luo & Tang, 2015). Following Roberts & Whited (2013) advice that using weak instruments can lead to problematic biased inferences, I decide not to use instrumental variables to deal with endogeneity.

4.4 Event study

The results of regression 2 are shown in table 8 in the final column under CAAR. The cumulative average abnormal return is -0.526%. The corresponding cross-sectional t-statistic is -1.026. The null hypothesis that there is are no cumulative abnormal returns is therefore not rejected. I do not find significant evidence that supports that investors perceive management forecasts of banks to be useful as captured by abnormal returns surrounding the dissemination date of the management forecasts.

While the cumulative average abnormal returns are not statistically significant, one day in the event window is found to have statistically significant abnormal returns. Right before the management forecasts becomes public, I observe a significant negative average abnormal return of around half a percent.

Overall, the found results that there appear to be no abnormal returns are not in line with what was expected. The majority of previous research that examines the information content of management forecast do find abnormal stock returns surrounding the announcements dates of management forecasts (e.g Waymire, 1984). One possible explanation for a lack of statistically significant abnormal returns is that the made management forecasts concern performance metrics that investors don't care about. While some performance metrics have been linked with movement in stock prices, such as earnings (e.g. Beaver, 1968), the existence of a link between other metrics and stock price movement is more debated.

Another possible explanation is that the information that is disclosed in the management forecast is not new in the sense that it is different from expectation. Ball & Brown (1968) found that investors only react to earnings news if it diverts from the earnings consensus. Partially due to their relatively large size, American banks have been found to have reduced return volatility (De Haan & Poghosyan, 2012). Lower return volatility makes it easier to predict future earnings resulting in lower earnings surprises.

To add robustness to the event study, it is repeated under different conditions. Firstly the event study is repeated using the market adjusted model as an alternative model to estimate expected returns with. The market adjusted model uses the actual return of the market (MacKinlay, 1997; Oler et al., 2007). Furthermore, it is possible that no significant abnormal returns are found because some of the management forecasts are about financial metrics that investors traditionally care less about.

As roughly only half the sample consists of EPS related forecasts it could be that abnormal returns are hidden by noise from non-important metrics. To test this I also examine if there are abnormal returns for the EPS only management forecasts sample. The result are reported in table 8 in rows 4 and 5. While I do find a higher significance for the EPS only sample, I again find no statistical significant cumulative average abnormal returns. The earlier found results thus seem robust and no evidence is found to support the notion that investors react to management forecasts of banks.

Also, an alternative measure of significance is used. The Patell Test (1976) standardizes every abnormal return by the forecast-error-corrected standard deviation before calculating the test statistics. The Patell – Z score for the event study, when using the full sample of management forecasts, is -0.784. The Patell score when using only the EPS Forecasts is 0.945. The threshold for statistical significance is thus not reached in either samples and the alternative significance measure does not lead to a different conclusion about the event study.

5. Conclusion

This thesis examines whether competition affects the number of management forecasts made by U.S. listed banks. Furthermore, it examines if investors perceive management forecasts of banks to be useful by examining if there are abnormal stock returns surrounding management forecasts. I find evidence that supports that there is a negative relation between the number of issued management forecasts and the degree of competition banks face. Furthermore, no significant cumulative abnormal returns surrounding the management forecasts dates are found.

This paper adds to existing academic research in multiple ways. The main contribution is to expand the knowledge on bank disclosure behaviour which is an area of research that is still underexposed. Furthermore, the thesis adds to the discussion on what measure of competition should be used by showing that it is important to use multiple dimensions of competition. The implication of the found results is twofold. Firstly, banking regulators should be aware of the unwanted effects that competition regulation has on bank disclosure behaviour. At the same time, regulators can promote voluntary bank disclosure by increasing competition restriction regulation. Secondly, bank managers that provide management forecasts with the hope of creating movement in the stock price of their banks should revaluate their voluntary disclosure policy.

A potential alternative explanation for the found negative relation between voluntary disclosure and competition can be found in the work of Libby and Rennekamp (2012). In the end, the decision to issue a management forecast is made by the manager. Libby and Rennekamp (2012) argue that managerial traits contribute to the decision to provide a forecast or not. Using an abstract experiment they find that manager overconfidence is associated with issuing more management forecasts. In the context of this paper, the difference in the number of management forecasts between different banks could potentially also be explained by differences in manager characteristics.

The lack of abnormal returns can potentially be explained by that the forecasts are not found to be credible. Past researchers have found that the credibility of managers has an impact on how their forecasts are perceived by the market (e.g. Pownall & Waymire, 1989; Ng, Tuna & Verdi, 2013; Hutton & Stocken, 2021). Managers that have strong track records of making accurate predictions realize greater abnormal returns compared to managers that have lower credibility.

The main limitation of this thesis is that it only focuses on publicly available data (public companies). As is discussed by Berger (2011) a limitation of research on proprietary costs is that proprietary costs are likely to be different for private firms. Furthermore, the research sample is not perfect. While great care has been taken to include as many management forecasts as possible, it could still be that certain banks make use of disclosure channels that are not captured by either the IBES, Bloomberg or Yahoofinance databases.

Given the open debate on what is the most appropriate metric to measure competition with, future research could re-examine the disclosure-competition relation using different measures of competition. If the researcher has access to serious computing power, an interesting idea includes applying the 10-K fillings based measure of competition as created by Li, Lundholm and Minnis (2013) to the banking industry. Further research ideas include examining different characteristics of the bank's management forecasts such as for example the tone of the forecasts and the strategic timing of when they are. Furthermore, abnormal stock returns were expected but were not found. Future research should dive deeper into why this result was found by for example looking at only larger or smaller banks. Finally, the research could also be expanded to Europe perhaps using a sample of the largest European banks.

6. References

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7. Appendix:

Appendix A. RS index

The Rice and Strahan (2010) index, also called the RS index, is an index of banking competition that is used to determine differences in interstate (U.S) banking competition. In order to stimulate banking competition the Interstate Banking and Branching Efficiency Act (IBBEA) was implemented in 1994. The act forced states to allow banks from other states to start operating within their state. However, states were allowed to opt in for (Rice & Strahan, 2010) four restriction for out-of-state banks.

The first restrictions is to demand a certain minimum age of existence before out-of-state banks are allowed to acquire in-state banks. The second restriction is to limit the opening of interstate branches entirely. If such a restriction ins in place, entry into that that state is only viable via mergers for out-of-state banks. The third restriction is to only allow the acquisition of branches instead of whole banks. The final restriction that states could use to limit out-of-state competition is to demand a minimum deposit cap. The deposit cap entails that out-of-state banks can't enter into a merger with in-state that holds more than 15% of the total deposits in the state.

Overall, the more restrictions a state opt in for, the harder it is for out-of-state banks to enter the state. The harder it is for out-of-state banks to enter the state, the less competition banks within the state experience. Rice and Strahan (2010) made use of the difference in which restrictions were applied by states to measure the competitiveness of banking between different states.

A state receives a point if it makes use of a certain restriction. In total state scores thus range from 0-4. A score of 4 means that the state has many restrictions that limit the ability of out-of-state banks to enter their market. Banks that operate in this state thus experience less competition than banks in states with a low RS index score (Rice & Strahan, 2010). On the other hand, states with a low RS index score have little restrictions to limit the entry of out of state banks. Banks operating in such states thus face a higher degree of competition.

In the table on the next page the RS index scores per state are shown as they are calculated by Rice and Strahan (2010). In the paper the RS index scores are reversed in order to align with the other measures of competition. A score of 4 thus means there is a lot of competition.

RS index scores per U.S. state		
State Name	**Abbreviation**	**RS index score**
Alabama	AL	3
Alaska	AK	2
Arizona	AZ	2
Arkansas	AR	4
California	CA	3
Colorado	CO	4
Connecticut	CT	1
Delaware	DE	3
Florida	FL	3
Georgia	GA	3
Hawaii	HI	0
Idaho	ID	3
Illinois	IL	0
Indiana	IN	1
Iowa	IA	4
Kansas	KS	4
Kentucky	KY	3
Louisiana	LA	3
Maine	ME	0
Maryland	MD	0
Massachusetts	MA	1
Michigan	MI	0
Minnesota	MN	3
Mississippi	MS	4
Missouri	MO	4
Montana	MT	4
Nebraska	NE	4
Nevada	NV	3
New Hampshire	NH	0
New Jersey	NJ	1
New Mexico	NM	3

RS index scores continued.		
New York	NY	2
North Carolina	NC	0
North Dakota	ND	1
Ohio	OH	0
Oklahoma	OK	1
Oregon	OR	3
Pennsylvania	PA	0
Rhode Island	RI	0
South Carolina	SC	3
South Dakota	SD	3
Tennessee	TN	1
Texas	TX	2
Utah	UT	1
Vermont	VT	0
Virginia	VA	0
Washington	WA	1
West Virginia	WV	1
Wisconsin	WI	3
Wyoming	WY	3

Appendix B: Litigation risk.

Following the method applied by Johnson et al. (2001), I estimate the litigation risk of banks using a probit model. Due to data limitations not all variables that are utilized by Johnson et al. (2001) are used. For example, detailed information about the CEO is not readily available for every bank in my sample due to the holding structure that most banks have. However, all variables that have statistically significantly been found to affect litigation risk by Johnson et al. (2001) are included. The following probit model is used to estimate litigation risk.

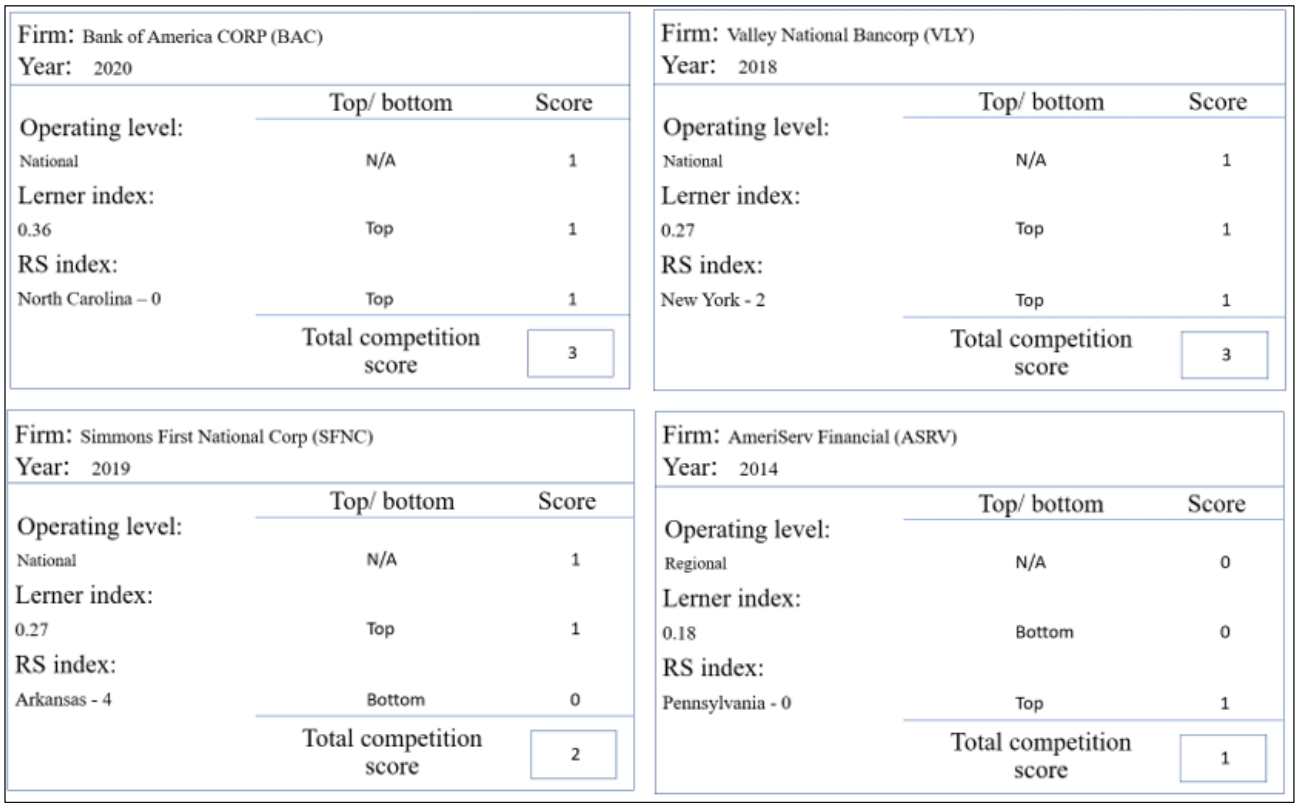
$$Prob(Litigation_i = 1) = (\alpha_0 + \beta_1 \text{Volatily}_\text{i} + \beta_2 \text{Performance} + \beta_3 \text{Financing}_\text{i} + \beta_4 \text{Leverage}_\text{i} + + \beta_5 \text{Montioring}_\text{i})$$

Litigation is equal to one if the bank was a defendant in a civil case in a certain year as mentioned in the FJC database. Volatility measures the equity beta of the bank stock and the share turnover which is calculated by dividing the total number of shares traded in a fiscal year by the average number of shares outstanding in the same period. Performance measures the prior cumulative returns and the return skewness (Johnson et al., 2001). Financing is a dummy factor that equals one if the bank issued debt (bonds) or equity (stocks) in a certain fiscal year. Leverage is a proxy for how close the banks are to violating debt covenants. It is measured with the debt to equity ratio. Finally, monitoring is a proxy for the corporate governance of the bank. It measures whether the bank was audited by a big 4 auditor or not.

The estimated litigation risk probabilities range from 0.12 to 0.92. The mean estimated litigation risk probability is 0.35. This average is slightly higher than the average found by Johnson et al. (2001). Different databases are used to compose the needed information. Information about which auditors the banks use is collected from Audit analytics. Information about the litigation cases that the banks have been involved in is collected from FJC database on WRDS. Daily stock returns of the banks are collected from CRSP. Equity betas and share turnover are obtained from Bloomberg and market return information is obtained from the Fama-French database. Information about the issuance of debt and equity is also obtained from Bloomberg. Finally, bank fundamental accounting information is collected from Compustat Bank Fundamentals and from the Bank Regulatory WRDS database.

8. Figures and tables

Figure 1: Examples of competition metric calculation



Firm: Bank of America CORP (BAC)
Year: 2020

	Top/ bottom	Score
Operating level:		
National	N/A	1
Lerner index:		
0.36	Top	1
RS index:		
North Carolina – 0	Top	1
Total competition score		3

Firm: Valley National Bancorp (VLY)
Year: 2018

	Top/ bottom	Score
Operating level:		
National	N/A	1
Lerner index:		
0.27	Top	1
RS index:		
New York - 2	Top	1
Total competition score		3

Firm: Simmons First National Corp (SFNC)
Year: 2019

	Top/ bottom	Score
Operating level:		
National	N/A	1
Lerner index:		
0.27	Top	1
RS index:		
Arkansas - 4	Bottom	0
Total competition score		2

Firm: AmeriServ Financial (ASRV)
Year: 2014

	Top/ bottom	Score
Operating level:		
Regional	N/A	0
Lerner index:		
0.18	Bottom	0
RS index:		
Pennsylvania - 0	Top	1
Total competition score		1

Figure 2: Libby box

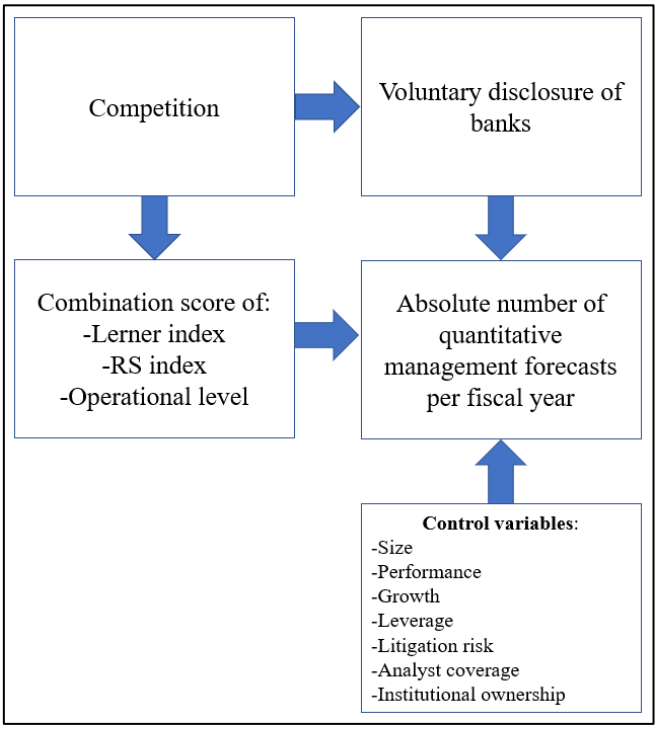


Table 1: Competition measures correlation matrix

Variable/ concept	Lerner index	RS index	Operation level
Lerner index	1.000		
RS index	0.405	1.000	
Operation level	0.287	0.125	1.000

Notes: Table 1 shows the strength of the relation between the different dimensions that are used to measure competition with. As the variables are all on an ordinal scale, Spearman rank-correlation is used. All correlations are statistically significant at a 5% level.

Table 2: Variables description

Variable/Concepts	Type	Calculation	Code
Management forecasts	Dependent	Absolute number of numerical management forecast made during a fiscal year, with respect to annual forecast periods.	FREQ
Bank competition	Independent	Sum of the score for each competition dimension measure. Max score of 3 and min score of 0.	COMP
Lerner index	Other	Pricing power of the firm with marginal costs based on three inputs. See section 3.1 for full explanation.	LERI
RS index	Other	RS index score indicating the level of banking competition of the state in which the bank has its headquarters. See appendix B for full explanation.	RSI
Operational level	Other	Dummy variable indicating whether bank operates at an (inter)national level or on a local level.	OPL
Firm size	Control	The natural logarithm of total assets.	SIZE
Firm performance	Control	Measured as the return on equity (ROE).	PERF
Firm growth	Control	(total earning assets t – total earning assets t-1) / total earning assets t-1	FGROW
Leverage	Control	Tier 1 leverage ratio. (Bank core capital) / (total risk-weighted assets)	DEBT
Litigation Risk	Control	The litigation risk that a bank faces in a certain FY. It is measured with a probit model and is based on certain firm characteristics. See appendix B for full explanation.	LIT
Analyst coverage	Control	Absolute number of analyst following a bank. Measured as the total number of unique bank EPS forecasts made by analysts per fiscal year.	FOLW
Institutional ownership	Control	Total common shares held by institutional investors/ total common shares outstanding.	INST

Notes: table 2 provides an overview of how the variables/concepts are calculated and labeled in this thesis. Column 1 provides the full name of the variable. Column 2 shows what role the variable has in regression 1. The calculation column provides more information on how the variable is constructed and calculated. The final column shows what abbreviation is used for the variable in the rest of the thesis.

Table 3: Sample selection

Description	Number of firms
Initial sample of stock listed U.S. banks.	379
Active over whole research period	375
Competition measure	
RS index data	375
Lerner index data	362
Operation level data	362
Control variables data	
Size- Firms with asset data	362
Performance - Firms with ROE data	360
Litigation- Firms with all litigation data	343
Leverage- Firms with Tier 1 information	322
Analyst following – Firms with at least 1 analyst following	315
Institutional- Firms with institutional ownership data	315
Total number of banks	**315**

Notes: Table 3 summarizes the sample selection process. It begins with the initial sample and it shows how many banks are excluded from the final research sample as a result of the banks not having all the required data.

Table 4: Descriptive statistics

Variable/ concept	Mean	Standard deviation	25th Perc.	75th Perc.
Dependent variable				
FREQ	0.161	0.821	0.000	0.000
Independent variables				
COMP	1.384	0.798	2.000	3.000
Control variables				
SIZE (before log)*	81031	343153	750	8269
PERF	8.73%	3.04%	5.55%	10.41%
LIT	0.352	0.227	0.153	0.784
DEBT	13.34%	3.637%	11.26%	14.70%
FGROW	9.28%	14.75%	1.46%	13.03%
FOLW	2.238	1.702	1.000	2.000
INST	22.47%	16.92%	0.00%	44.39%

Notes: Table 4 presents some descriptive statistics for the final dataset of 315 U.S. listed banks that is used to test hypothesis 1 and 2. The abbreviations have the following meaning: FREQ, frequency of management forecasts made per fiscal year; COMP, Measure of bank competition; SIZE, Banks size; PERF, Bank performance; LIT, Litigation risk faced by bank; DEBT, Bank capital level, FGROW, Bank growth; FOLW, Analysts following the bank; INST, Percentage institutional share ownership, *In order to improve the interpretability of the SIZE variable, the actual bank size before the log transformation is shown. The variable is in million $US.

Table 5: Forecast types

Forecasts type	Number of forecasts	% of total
EPS	402	48%
DPS	93	11%
EBT	84	10%
ROA	84	10%
Other	169	21%
Total	*832*	*100%*

Notes: This table shows the distribution of the different management forecasts types. EPS, earnings per share; DPS, dividends per share; EBT, earnings before tax; ROA, return on assets.

Table 6: Correlation matrix

Variable/ concept	FREQ	COMP	SIZE	PERF	LIT	DEBT	FGROW	FOLW	INST
FREQ	**1.000**	-	0.238**	0.043**	-0.032**	-0.023*	0.014	0.263**	0.132**
COMP	-0.037**	**1.000**	-	-	-	-	-	-	-
SIZE	0.170**	0.336**	**1.000**	0.129**	0.032**	0.021*	0.092*	0.289**	-0.112**
PERF	0.040**	-0.001	0.155**	**1.000**	-0.063**	-0.012	0.154**	0.018*	0.103**
LIT	-0.118**	-0.023*	0.067**	-0.068**	**1.000**	-0.032*	0.010	0.034*	-0.043*
DEBT	-0.013*	-0.064**	0.058*	-0.024	-0.059**	**1.000**	-0.168**	-0.129**	-0.105**
FGROW	0.002	-0.044**	-0.087**	0.146**	0.010	-0.165**	**1.000**	0.108**	0.100**
FOLW	0.148**	0.017	0.219**	0.023*	0.028*	-0.050**	0.098**	**1.000**	0.275**
INST	0.115**	0.027*	-0.221**	0.101**	-0.035*	-0.119**	0.100**	0.292**	**1.000**

Notes: Table 6 shows the results of the Pearson and the Spearman's rank-order correlation tests. The Pearson correlation statistics are reported to the right of the diagonal in the top half triangle. The Spearman correlation statistics are reported in the bottom half triangle left of the diagonal. The reported statistics show how strongly variables are correlated. The variables are defined as follows; COMP, Measure of bank competition; LERI, Lerner index; RSI, RS index ; OPL, Operational level bank; SIZE, Banks size; PERF, Bank performance; LIT, Litigation risk faced by bank; DEBT, Bank capital level, FGROW, Bank growth; FOLW, Analysts following the bank; INST, Percentage institutional share ownership. The asterisks next to the correlation strength statistics show the statistical significance of the spearman rank order test; **Significant at 1% *Significant at 5%.

Table 7: Relation bank disclosure and competition

Competition measure	COMP	LERI	RSI	OPL
Variable/concept				
COMP	-0.028*			
	(-1.852)			
LERI		-0.272*		
		(-1.932)		
RSI			-0.046*	
			(-1.885)	
OPL				-0.046
				(-1.138)
SIZE	0.032***	0.024***	0.249***	0.302***
	(5.178)	(4.119)	(4.966)	(3.941)
PERF	0.012	0.012	0.012	0.013
	(0.539)	(0.556)	(0.539)	(0.581)
LIT	-0.150**	-0.132**	-0.128**	-0.129**
	(-2.275)	(-2.957)	(-2.872)	(-2.812)
DEBT	-0.295	-0.282	-0.289	-0.251
	(-0.953)	(-0.908)	(-0.935)	(-0.821)
FGROW	-0.031	-0.016	-0.045	-0.043
	(-0.413)	(-0.222)	(-0.592)	(-0.631)
FOLW	0.071***	0.071***	0.070***	0.071***
	(11.953)	(16.402)	(15.420)	(13.221)
INST	0.007	0.035	-0.005	-0.005
	(0.179)	(0.785)	(-0.121)	(-0.082)
R^2	0.076	0.082	0.076	0.075
N	5082	5082	5082	5082

Notes: This table shows the coefficients and the significant levels that are calculated with regression 1. In regression 1 the number of management forecast is regressed on a measure of competition and a set of control variables. The variables have the following meaning: COMP, Measure of bank competition; LERI, Lerner index; RSI, RS index ; OPL, Operational level bank; SIZE, Banks size; PERF, Bank performance; LIT, Litigation risk faced by bank; DEBT, Bank capital level, FGROW, Bank growth; FOLW, Analysts following the bank; INST, Percentage institutional share ownership; R^2, r-squared value;
T-statistics in the parentheses; ***Significant at 1% **Significant at 5%; *Significant at 10%

Table 8: Test for abnormal returns

Type of forecasts	Number of events	AAR (-3)	AAR (-2)	AAR (-1)	AAR (0)	AAR (+1)	AAR (+2)	AAR (+3)	CAAR
All	472	0.233%	-0.068%	-0.458%*	-0.055%	-0.001%	-0.003%	-0.174%	-0.526%
		(1.360)	(-0.468)	(-1.987)	(-0.359)	(-0.007)	(-0.016)	(-0.632)	(-1.026)
EPS only	249	0.299%	-0.352%*	-0.234%	0.104%	-0.224%	-0.009%	0.254%	-0.162%
		(1.306)	(-1.830)	(-0.661)	(0.434)	(-0.744)	(-0.029)	(1.372)	(-1.5293)

Notes: Table 8 shows the results of the event study that is used to test if there are abnormal stock returns surrounding management forecasts by banks. The abbreviations have the following meaning AAR, average abnormal return per event day; CAAR, Cumulative abnormal returns over the whole 7 day event window; Cross-sectional t-statistic in parentheses; All, complete sample of management forecasts; EPS only, only the management forecasts about earnings per share sample.