Master's Thesis

Corporate governance and voluntary disclosure reliability

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Abstract

This academic research investigates the effect of corporate governance mechanisms on voluntary disclosure reliability. I use management forecast accuracy as a proxy for voluntary disclosure reliability. The sample consists of publicly traded US firms from the period 2011-2019. I document that voluntary disclosure reliability improves as the number of members on the board of directors increases. Also, I find evidence that the proportion of independent members on the board of directors is positively associated with voluntary disclosure reliability. Third, I find that as the average tenure of members on the board increases, voluntary disclosure reliability increases as well. Lastly, I find evidence that CEO duality improves voluntary disclosure reliability. Overall, the results of this paper are stronger in a setting where an overly optimist management team is in place. However, the results also count for conservative management teams. The results of this paper are relevant to policymakers, investors and firms' management. By implementing the results of this research firms can minimize the management forecast error and by that increase voluntary disclosure reliability. Having more reliable voluntary disclosures as a result of certain corporate governance structures could decrease the information gap which mitigates the agency problem.

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1. Introduction

Financial reporting quality is of great importance for all users of financial statements and other financial information. These documents support the decision-making process of for example investors, creditors, suppliers and customers. Part of financial information that can be distributed by management are voluntary disclosures. A commonly wide used voluntary disclosure is a management forecast. This forecast shows the financial expectations management has of the firm in different time periods. These expectations contain mostly assumptions around ratios like EPS, ROA, earnings, etc. most often on a yearly or quarterly basis. Corporate governance is of value when it comes to creating and distributing financial information. Also, some of the main jobs of the board of directors are to manage risks and supervise and advise firms' management. Since the supervision and advising activities directly impact the quality and quantity of financial information this is relevant and interesting to study in relation to voluntary disclosure reliability. Because utilizing corporate governance mechanisms in such a way that is most effective with regards to the reliability of voluntary disclosers could mitigate the agency problem by decreasing the information gap.

This paper examines whether corporate governance mechanisms influence management forecast accuracy and to what magnitude. This is different from most previous research. Most previous research focuses on more specific settings (IPO, M&A) and investigated voluntary discloses and not merely the accuracy of it. Also, most previous research on management forecast accuracy and corporate governance utilizes a sample of non-western observations.

The research question this paper will answer is:

Does corporate governance mechanisms influence the reliability of voluntary disclosure in US publicly traded firms and to what extent?

There are many underlying motives for why firms' management could issue a voluntary disclosure. First, a voluntary disclosure could be issued by management to decrease information asymmetry between investors and the management (Coller & Yohn, 1997). This information asymmetry is part of the agency problem. The theory entails the phenomenon of management not creating maximum value for investors. In this case, management's goal is to create value for themselves. This is often a consequence of the misalignment of goals between management and the owners of a firm. Information asymmetry in this context is that management has inside information that is beneficial for the decision-making process of investors. However, due to the misalignment of management incentives and the investors' goals, this information is not shared or not shared accurately. Thus, if management has the intention to decrease the information gap between them and the owners, a voluntary disclosure like a forecast could be in place.

Another reason why management could issue a forecast is to guide analysts' expectations. Analysts provide the financial market with earnings expectations. If a firm fails to meet the expectations of the analysts, the share price most often reacts negatively (Kasznik & Lev, 1995; Williams, 1996). Management is incentivized to prevent failing to meet the analysts'

expectations. To avoid a negative market reaction when earnings are released management can issue a forecast on earnings. This forecast could lead to analysts lowering their expectations. If that is the case, the chances of the firm meeting or beating the analysts' expectations increases. Also, providing additional voluntary forecasts lowers the cost to acquire information for the analysts (Healy and Palepu, 2001). Firms with a lower cost of acquiring information have more analyst followers which increases the liquidity of the stock. The liquidity is also higher since investors feel the value of the share occurs at a 'fair value' price due to higher transparency.

Lastly, a possible reason for management to engage in issuing a voluntary disclosure is to prevent litigation or reputation damage (Skinner, 1994). If the firm has experienced or is experiencing events that negatively affect the firm's future, they have the option to communicate this to their stakeholders in time. When failing to do this in time, the firm is at risk of being taken to court. For example, the shareholders could sue management when there is a large share price drop if that is the consequence of management failing to disclose earnings news. However, if management forecasts certain ratio numbers to be achieved in the future but fails to do this, the chance of litigation increases (Healy and Palepu, 2001). This is since the market could sue the firm for misleading them on future ratios to increase the firms' value.

When looking into these possible underlying motives that could lead to firms' management issuing voluntary disclosures like a management forecast, one aspect returns. That is, management utilizing voluntary disclosures as a tool to communicate information to stakeholders that they otherwise would not have had before the official release date of earnings. Among other things, this study is relevant since knowing what corporate governance mechanisms lead to accurate and reliable information is of interest for decreasing the information gap. The awareness and implementation of the results of this study could, as a result of this, mitigate the agency problem. That means stakeholders would benefit since a smaller information gap decreases the possession of management having more material knowledge that could harm the long term.

To what magnitude investors value the information content of a voluntary disclosure, like a forecast, depends on the accuracy of previous disclosures. If, for example, a firm has been able to be accurate in its past forecasts, then the users of this voluntary disclosure will trust and believe the information the firm provides to a larger extent. Accuracy in previous management forecasts could be measured as the relative difference between the predicted financial information and the actual financial information. This is the forecast error. The lower it is, the higher the forecast accuracy. A higher accuracy leads to the financial markets implementing the information as stated in the management forecasts to value the firm (Muramiya, 2005). Trueman (1986) argues that if management has shown its capabilities in assessing future economic events the result will be a higher firm value. So, the accuracy of the forecast is of great importance to both the firm and the users of the information.

Members of the board of directors are responsible for the supervision of various tasks. First of all, the board of directors' main job is to improve governance standards, supervise firms' management and manage risks (Abdullah and Nasir, 2004). The quality and strength of this

entity in supervising and advising has a direct influence on the reliability of disclosures. Since the board of directors can address certain issues early in the process to prevent them from affecting the output of the firm. This output could be information in voluntary disclosures.

The academic paper of Lin and Hwang (2010) provides a meta-analysis of 48 prior studies. In this paper, the focus lies on earnings management and the connection with corporate governance. The main findings and conclusions support the notion that corporate governance mechanisms like the board of directors' independence, size and experience are negatively related to earnings management. That means management is less incentivized to engage in cooking the books to achieve self-interest goals if those corporate governance mechanisms are larger/ higher. Providing stakeholders with a more accurate and thus reliable forecast is important for the stakeholders' interest. Thus, this research supports the notion that effective corporate governance mechanisms positively influence the alignment of goals between management and stakeholders which in the end influences the reliability and the decrease of the information gap.

This study uses a sample of 2.464 US publicly traded firm year observations to research the influence of corporate governance mechanisms on voluntary disclosure reliability. Those observations are derived from in total 200 firms. In section four I first perform a univariate analysis by creating a Pearson Correlation matrix. I also include a VIF test to test for multicollinearity affecting the results. After that, I perform an Ordinary Least Square regression as a multivariate analysis. To mitigate endogeneity concerns, I include 7 control variables and industry and year fixed effects. The sample period is 2011 until 2019 to prevent crises like the credit crisis and the COVID-19 crisis to influence the results.

The main findings of this paper are the following. First of all, the size of members on the board of directors is positively associated with management forecast accuracy. This indicates that more board members influence the reliability of voluntary disclosures positively. Second, as the proportion of independent board members grows, the reliability of voluntary disclosures positively develops as well. Also, I find evidence that the average experience of board members on the board of directors influences the accuracy of management forecasts positively. This also contributes to the reliability of voluntary disclosures. Lastly, although in the opposite direction than my hypothesis suggests, I find evidence that if a CEO is also the boards' Chairman forecast accuracy is higher. This indicates that firms with the Chairman of the board of directors also being their CEO results in more reliable voluntary disclosures. Thus, corporate governance mechanisms do positively affect the reliability of voluntary disclosures.

This paper contributes to the literature on corporate governance and voluntary disclosures. This research focuses not on a specific setting (IPO or M&A) like most previous research. The result of this is that the findings are more generalizable to ordinary business situations for publicly traded firms in western society. Besides that, this research focuses merely on the accuracy of the management forecast unlike most previous research that focused on the decision management has to provide it. So, this research contributes to that specific topic surrounding voluntary disclosures. The conclusion of academic research around the reliability of disclosures

is especially relevant because of the fraud scandals that occurred at the beginning of this millennium. As the consequence of corporate scandals such as Enron and WorldCom and the growing need for transparency by stakeholders (Driel, 2018). Especially since then, the Securities and Exchange Commission together with stock exchanges focuses on the role of corporate governance in the process of enhancing the quality of disclosures (Karamanou & Vafeas, 2005).

Healy and Palepu (2001) find evidence that voluntary disclosures lead to a decrease in information asymmetry which mitigates the agency problem most firms face. This study attributes to a decrease in the still existing problem of the information gap. Not only does decreasing the information gap increase value for shareholders, but it also lowers the cost of equity for the firm itself (Muramiya, 2005). The cost of equity is influenced by the risk-free rate and by the risk premium. If management is able to be seen as reliable because of accurate voluntary disclosures the risk premium part of the cost of equity equation will decrease. So, decreasing the information gap is also financially beneficial for the firm itself. To further extend the research Healy and Palepu (2001) performed I'll investigate what corporate governance mechanisms support the decrease of the information gap. The results could be beneficial for firms' management to implement because of the advantages of decreasing the information gap.

Besides the relevance of this study to the shareholders and the firm, others can benefit from it as well. For suppliers, solvability and liquidity are measures that are of value in the process of accepting and working with customers. Especially if the supplier is a creditor since they receive the payment a few months later (Wu & Barnes, 2012). If, after this study, suppliers know what specific corporate governance mechanisms influence the reliability of voluntary disclosures they could take this into account when evaluating a potential customer. Because, if for example management forecast accuracy tends to be high the customer could be seen as reliable when it comes to financial disclosures.

The results of this study are also relevant for standard setters. Since voluntary disclosures are supporting the decrease of information asymmetry between firms' owners and firms' management. For standard setters, this is important since that also leads to fewer illegal earnings management opportunities and in the end, fewer fraud cases (Persons, 2009). The results of this study could help standard setters in creating or changing regulations. Especially with the goal to stimulate businesses to set up corporate governance structures in such a way that leads to a decrease in information asymmetry because of more accurate and reliable voluntary disclosures.

This paper is organized in the following way. Section two provides a literature review regarding the topic of management forecasts and corporate governance. Section three discloses the hypotheses and their development. Section four focuses on the sample and the methodology of the research. Section five shows the results of the research. And lastly, section six summarizes the findings and contributions and shows the limitations of this paper.

2. Literature review

This section provides a literature review regarding relevant topics. First, I present academic literature and their findings regarding voluntary disclosures. Then, I summarize some academic papers that investigated corporate governance. Lastly, I provide a literature review regarding management forecast accuracy.

2.1. Voluntary disclosures

Dontoh (1989) stated that firms often voluntarily disclose information when it is expected to positively affect the share price. The paper explains this to be the result of the assumption that firms' management goal is to maximize the share price in the current period. The incentive to increase share price in the short term is the opposite of creating shareholder value for the long term. Because long term shareholder value is established by focusing on increasing future cash flows. The paper of Dontoh (1989) suggests that voluntary disclosures are utilized when firms' management wants to affect the share price positively. That incentive does not support the goal of providing stakeholders with as accurate and reliable information as possible.

In the academic research of Eng & Mak (2003) the results suggest that when a firm has a board with a larger portion of independent members, they reduce the number of voluntary disclosures. The theory behind this is that outside directors are able to acquire information about management by their monitoring activities. Also, the paper of Eng & Mak (2003) found empirical evidence that firm size has a positive relation with the number of disclosures. Lastly, this paper supports the theory of the cash flow problem by Jensen (1986). Eng & Mak (2003) show evidence that there is a negative relation between debt and the number of disclosures. This is in line with Jensen (1986) stating that firms with more debt in their capital structure have less free cash flow and thus decrease the need for voluntary disclosing. As creating and distributing voluntary disclosures is a costly process and acquires time.

In the review of Healy and Palepu (2001) several theories regarding the relevance of voluntary disclosures are discussed. First, they explain the information problem. This theory is also known as the "lemons" problem. Firms that look for capital to grow or start-up often rely on debt and equity issuance. The lemons problem entails the distinguishment between "good" and "bad" firms. If a firm raises money by the issuance of shares but the public cannot determine whether the firm is good or bad, then the valuation will be non-optimal. This means, that firms will be valued at an average and that is a disadvantage for "good" firms (Healy & Palepu, 2001). Firms could use voluntary disclosures to show the public their value. This transparency could decrease the information asymmetry gap and lead to a higher valuation for "good" firms (Trueman, 1986).

Another theory that is well discussed in the review of Healy and Palepu (2001) is the agency problem. This problem arises since investors often do not participate in the management team. The result is that firms' management has more information regarding the operations and financial health of the firm when compared to its owners. The incentives of firms' management lead to decisions that are made to increase short term cash flow and thus short-term share price

performance. On the other hand, the value of shareholders would be maximized when the long-term growth and cash flow are taken into account. To mitigate this problem optimal contracts between owners and management could be made (Healy & Palepu, 2001). However, the composition of an optimal contract is almost impossible (Hart, 2017). Another possible solution is using voluntary disclosures to inform stakeholders. These disclosures could distribute information that otherwise would not have reached the firms' stakeholders.

As discussed earlier, reliable voluntary disclosures lead to a lower cost of capital. Muramiya (2005) finds evidence that more accurate voluntary disclosures decrease the risk premium part of the cost of capital equation. This is in line with the capital markets transactions hypothesis of Healy and Palepu (2001). They argue that the distribution of voluntary disclosures towards equity issuance leads to a lower cost of capital. This is the result of a reduction in information asymmetry.

Another hypothesis of Healy and Palepu (2001) that is of value surrounding the voluntary disclosure literature is one regarding stock compensation. First of all, for management to execute certain trades on the equity market they need to meet certain restrictions set by trading rules. This also entails the distribution of inside information when available. Besides that, Shehata (2014), among others, found evidence that contracting costs are reduced as a result of the issuance of voluntary disclosures. That is the consequence of more stock liquidity and a lower bid-ask spread. Also, more analysts follow firms that provide accurate voluntary disclosures due to the lower costs of acquiring information (Healy & Palepu, 2001). This in itself leads to more liquidity since investors feel a firm trades closer to fair value if more analysts follow it.

2.2. Corporate governance

Within the corporate governance literature, the effects of corporate governance mechanisms on earnings management and information asymmetry if often investigated. Also, the effects of corporate governance mechanisms on voluntary disclosures are investigated. However, most often on a specific sample and setting like IPO and M&A settings or differences between countries. Ahmad-Zaluki and Wan-Hussin (2010) found evidence that effective governance has a positive effect on disclosing practices surrounding IPOs for Malaysian firms. However, they did not find evidence that an independent board of directors is positively related to disclosures in the IPO setting. Also, Sosnowski and Wawryszuk-Misztal (2019) find evidence in the IPO setting of Polish firms that certain corporate governance mechanisms influence the accuracy of management forecasts. Specifically, they find that a board with more diversification regarding age and with higher management ownership is more accurate.

Karamanou and Vafeas (2005) investigated the association between corporate boards, audit committees and management earnings forecasts. They find evidence that firms with effective governance mechanisms will make and update earnings forecasts more often. The evidence of these results is stronger when bad news is involved in the disclosure. The theory underlying this finding is that well governed firms want to protect and share information even if the news

is bad (Karamanou & Vafeas, 2005). The researchers of the article also found evidence that well governed firms have a higher forecast accuracy. This could be the result of management not wanting to mislead their shareholders. Or, management does not have the chance to mislead due to the effective governance mechanisms in place.

Singh and Davidson (2003) investigated agency costs, ownership structure and corporate governance mechanisms. In line with Ahmad-Zaluki and Wan-Hussin (2010) Singh and Davidson (2003) did not find evidence that the independent outsiders on the board protect against agency costs. Besides that, Singh and Davidson (2003) argue that smaller boards could be more effective in mitigating the agency problem. Earlier research supports this statement (Eisenber et al., 1998; Yermack, 1996).

2.3. Management forecast accuracy

Management forecast accuracy is a measure that is of great value to all stakeholders. Hirst et al. (2008) define management forecast accuracy as follows: "*Management earnings forecasts are voluntary disclosures that provide information about expected earnings for a particular firm. Such forecasts represent one of the key voluntary disclosure mechanisms by which managers establish or alter market earnings expectations, preempt litigation concerns, and influence their reputation for transparent and accurate reporting.*"

Management of a firm has the decision regarding how much time and resources they want to allocate estimating the forecast that will be disclosed. Williams (1996), Tan, Libby and Hunton (2002) and Karamanou and Vafeas (2005) found evidence that firms with a past of accurate earnings forecasts are seen as more reliable by the public and especially analysts. This is important for a firm since that enables management to use voluntary disclosures to guide analysts' forecasts. If a firm fails to meet or beat analysts' forecasts the result most often is a negative share price reaction (Williams, 1996). This could be prevented in the period before the earnings are announced by providing a management earnings forecast that results in a lower analysts' expectancy. If the firm is seen as reliable due to accurate prior forecasts analysts will value the information in the disclosures and implement it in the valuation process. This reputation shows the relevance of voluntary disclosure reliability and incentivizes management to be accurate in their voluntary disclosure.

Besides the accuracy of a voluntary disclosure, the influence of the sign a forecast has is investigated as well. Skinner (1994) finds evidence that firms tend to be conservative in their forecasting. This is the consequence of the litigation risk that accompanies forecasts. As Healy and Palepu (2001) state firms who voluntarily disclose forecasts face two different risks. First, the firm can be sued if the forecast error is large. Also, the firm risks being sued if the information is not timely disclosed. So, the decision to disclose information is difficult, especially in complex situations where uncertainty is involved. Skinner (1994) explains the negative direction of the forecast error as a result of management being more conservative to prevent litigation and a negative earnings surprise.

Another potential motive for a firm to disclose conservative or pessimistic information about forecasts is to prevent or discourage new businesses from entering the industry (Rogers & Stocken, 2002). Rogers and Stocken (2002) found evidence that this is especially the case in industries with few participants and with high profit margins. On the other hand, they found support for the hypothesis that stated that firms in financial distress issue optimistic forecasts to keep their position and prevent going bankrupt. Communication of a firm about being in financial distress could lower the urge of new competitors in entering the market as a result of bad potential profit margins that could be made.

This research differs from most previous research since it links voluntary disclosure reliability to corporate governance mechanisms in a general setting. Also, most corporate governance research is done to investigate the effect on for example agency costs, earnings management, etc. instead of voluntary disclosure reliability. When compared to most voluntary disclosure literature, this research differs since the focus lies on accuracy, thus reliability, instead of the decision to make a forecast or not.

3. Hypotheses development

This section presents the hypotheses that are tested. Also, theoretical background regarding all hypotheses is given. The hypotheses are developed in order to isolate the effects of different board characteristics on voluntary disclosure reliability.

3.1. Board size

The first hypothesis examines the association between board size and management forecast accuracy. Singh and Davidson (2003), among others, found evidence for a negative association between board size and agency costs. This means, more board members on the board of directors does not mitigate the information asymmetry that is a result of the agency problem. An explanation for that finding could be that a larger board is less efficient in supervision due to a lower feeling of commitment to the firm. However, among others, Aygun and Sayim (2014) found support for the statement that board size is negatively correlated with earnings management. That means a larger board leads to less earning management which mitigates the agency problem. In the context of this research that would suggest that a larger board is effective in supervising management and that management forecast accuracy will be positively influenced by board size. To conclude, the results are mixed regarding board size and its association with agency problems. I investigate whether a larger board is more effective when it comes to stimulating management to put enough time and resources into forecasts so that the accuracy and reliability of it is positively affected.

H1: More members on the board of directors has a positive effect on management forecast accuracy.

3.2. Board independence

The second hypothesis that I investigate concerns the proportion of independent board members on the board of directors. Chen Cheng and Wang (2015) found evidence that board independence is negatively related to earnings management. The results are stronger in an information rich environment. Their findings indicate that a higher proportion of independent board members results in less engagement in earnings management of the firm. Garcia-Meca and Sanchez-Ballesta (2010) provide a meta-analysis of 27 academic papers regarding the topic of board independence and voluntary disclosure in European firms. Their findings suggest a positive relation between board independence and voluntary disclosures. However, the findings only hold in countries where regulatory entities enforce high protection rights for the investors. However, Ahmad-Zaluki and Wan-Hussin (2010) and Singh and Davidson (2003) found different results. Their results showed no support for the notion that independent outsiders on the board of directors protect investors against agency costs. In the context of this paper that means that a higher proportion of independent board members does not lead to a higher management forecast accuracy. Still, I expect to find evidence that a higher proportion of independent board members lead to more accurate and reliable voluntary disclosures.

H2: A higher proportion of independent members on the board of directors leads to more accurate management forecasts.

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3.3. Board experience

The third hypothesis will clarify whether management forecast accuracy is positively associated with the average tenure of board experience. This means, if the average years of experience directors on the board is higher, I expect forecast accuracy to be higher as well. Little academic literature is found regarding this specific board characteristic. Park and Shin (2004) conducted an empirical study in Canada that investigates the influence of board composition on earnings management. They do not find significant evidence that a longer average board tenure leads to less earnings management. Xie et al. (2003) even found evidence that average board tenure is negatively correlated with discretionary accruals. However, I do expect that more average board experience will lead to more accurate management forecasts. This is the result of the board gaining more experience and knowledge of the firm over time (Garven, 2009). I expect this knowledge about risks, operations and the industry to make the board more competent in recognizing earnings management at an earlier stage. This theory is also known as the expertise hypothesis created by Vafeas (2003). Thus, the following hypothesis suggests that when the board experience increases, the accuracy and reliability of voluntary disclosures increases as well.

H3: The average experience of members on the board of directors has a positive relation with management forecast accuracy.

3.4. CEO duality

The last and fourth hypothesis states that if the CEO is also the Chairman of a firm, management forecast accuracy will become more prone to errors. The theory behind this is that the objectivity and independence of a CEO in that position could be compromised (Jensen, 1993). The CEO is able to lead and monitor operations of the firm while he also leads the board of directors whose job it is to keep oversight. That results in the possibility of the CEO to distinguish between what information is beneficial to distribute to the board of directors and what not. This is part of the agency problem. The incentive of the CEO could be different from the goals of investors. If for example, the CEO wishes to reach certain financial goals to get a bonus, he could more easily mislead the board of directors since he is so involved and he has influence due to the Chairman position. Besides Jensen (1993) also Cornett et al. (2008) found evidence for a positive relation between CEO duality and earnings management. Samaha, Khlif and Hussainey (2015) have conducted a meta-analysis of 64 empirical studies. They find a negative effect of CEO duality on voluntary disclosures. Like Garcia-Meca and Sanchez-Ballesta (2010) the findings of Samaha, Khlif and Hussainey (2015) are stronger in countries where investors are more protected by regulations. Although the meta-analysis focused on voluntary disclosures in general, I also expect that the effect of CEO duality is negative on management forecast accuracy.

H4: Firms with a CEO that also holds the position of Chairman of the board of directors have less accurate management forecasts.

4. Methodology

This section will describe the methodology of this research. First, I describe from where the data is retrieved and what datasets have been merged. Then, the selection process of the sample is present and a table is provided. Lastly, the statistical analyses that are utilized during the research are shown.

4.1. Sample selection

The sample I use during the investigation on the effect of corporate governance mechanisms on voluntary disclosure reliability consists of data retrieved from several databases. Most data is retrieved from Warton Research Data Services (WRDS) which the university is subscribed to. The sample period is restricted from 2011 till 2019. Data is collected after the most uncertain part of the credit crisis that started in 2007 and ended in approximately 2011. Because of the uncertainty that came with the financial crisis, I decided not to include those years. Since, I expect forecasts to be biased as a result of uncertainty and financial distress for most firms during that time period. Due to the impact COVID-19 had on the corporate industry, the sample period ends when COVID-19 began. The period after the beginning of the COVID-19 crisis, around March 2020, was full of uncertainty and fear in the capital markets and in almost all businesses. Again, this uncertainty can lead to forecasts being biased differently then without this crisis. So, that is the reason that the sample period is between 2011 and 2019. To prevent this research from being influenced by the survivorship bias I also include firms that went bankrupt during the sample period.

First, I retrieve data from the WRDS IBES database. Specifically, I utilize the Guidance dataset. This dataset provides management forecasting data. From the initial data selection, I remove all forecasts that are measured with different ratios then EPS. I use the data from IBES Guidance partly to generate the dependent variable forecast error. Second, I collect the number of analysts following a firm from the database WRDS IBES corporate. I retrieve Institutional ownership data from the Thomson and Reuters database. Fourth, I merge data from WRDS BoardEx with the other data. With this data, I am able to generate the variables board size, board independence, board experience and CEO duality. Lastly, I merge the data with information gathered from the WRDS CRSP database. With this information, I am able to complete the dependent variable forecast error. Also, I use data from this database to generate firm size, leverage, return on assets, market-to-book ratio and industry fixed effects. I merge all different datasets by using the unique identifier CUSIP 9 and time combined. The CUSIP 9 identifiers are hand collected after selecting firms in the IBES Guidance dataset. Without this combination of identifier and time merging with the other datasets was not possible. In the end, 2464 firm year observations are useful for this research. These observations consist of in total 200 firms. During the research, I make a distinguishment between positive earnings surprises and negative earnings surprises. Since, I expect corporate governance mechanisms to be of influence on the direction of the surprise in EPS. The subsample positive surprise consists of 784 observations and the negative surprise sample consists of 1680 observations. Table 1 shows an overview of the steps I take that result in the final sample for this research.

Table 1
Sample Selection Process

Sample period 2011-2019		Firm year Observations (N)
WRDS IBES Guidence		236.559
- Excluding non-EPS measures	-143.363	
- Merging with WRDS Thomson Reuters	-45.656	
- Merging with WRDS BoardEx	-38.968	
- Merging with WRDS CRSP	-6.108	
Missing and duplicate observations		-234.095
Final observations		**2.464**

This table provides the sample selection process. It shows how many observations are lost due to the combining process of different datasets.

4.2. Research design

The regression equation used during the research I conduct is the following:

$$Error = \alpha_0 + \beta_1\, BRD\_Size + \beta_2\, BRD\_Indep + \beta_3\, BRD\_Exp + \beta_4\, CEO\_Dua$$
$$+ \beta_5\, Horizon + \beta_6\, Inst\_Own + \beta_7\, Size + \beta_8\, Lev + \beta_9\, ROA + \beta_{10}\, MTB + \beta_{11}\, Analyst$$
$$+ Industry\ fixed\ effects + Year\ fixed\ effects + \varepsilon$$

To create a clear visual overview, I constructed Libby boxes (Figure 1 – Appendix). I will perform an Ordinary Least Squares Regression on the created dataset. I perform three different regressions. One covers the dataset as a whole to see the effect of corporate governance mechanisms on voluntary disclosure reliability. Also, the same regression will be executed on data with a negative surprise and a positive surprise. The negative surprise sample consists of firms where the actual earnings are lower than the forecasted earnings. This since the negative surprise could be a result of different corporate governance mechanisms. For the same reason, the last and third regression I run is on all positive surprises with regards to the forecasted and actual earnings. This means all firm year observations with earnings higher than the forecasted earnings by management. The four hypotheses will be investigated in all three regressions.

4.3. Variable description

This section will explain all variables that are used in this research. Besides that, the way I measure all variables will be elucidated. Also, the decision process of why the variables are chosen in the way they are is present. I also provide a brief description of all variables in the Appendix Table 6. In this section, I first explain the dependent variable. Then, all independent variables will be explained. And lastly, I clarify the control variables.

4.3.1. Dependent variable

I measure the accuracy of the voluntary disclosure by looking into how close the management forecast is to the actual forecasted item. I do this by creating a variable that measures the forecast error. In measuring this dependent variable *Error*, I follow Gounopoulos (2011) and De Jong et al. (2010). They subtracted the forecasted EPS from the actual EPS and divided this by the actual EPS. A small change I make is changing the numerator to an absolute value. This is in order to prevent positive and negative values to diminish the actual relative difference in the forecast and actual earnings. To still be able to create two subsets with a positive and negative earnings surprise I create a dummy variable that equals 1 if the actual earnings are above the forecast and 0 if otherwise.

4.3.2. Independent variables

Like previous research such as Singh and Davidson (2003), Aygun and Sayim (2014) and Vafeas (2003) I use a measurement of board size (*BRD_Size*) as the absolute number of board of director members in a given year. I measure board independence (*BRD_Indep*) as the percentage of independent board members divided by the total amount of board members. By doing that I follow Chen Chang and Wang (2015) and Ahmad-Zaluki and Wan-Hussin (2010). I calculate the average tenure of experience of a board member (*BRD_Exp*) by dividing the sum of all years of experience by the total amount of board members. Among others, Xie et al. (2003) and Garven (2009) also calculated board tenure like this. The last independent variable that is included in the regression equation as shown in section 4.2 is CEO duality (*CEO_Dua*). This is a dummy variable that equals 1 if the CEO is also Chairman of the board and 0 otherwise. By measuring CEO duality this way, I follow Xie et al. (2003).

4.3.3. Control variables

In order to isolate the effect of the independent variables on the dependent variable, seven control variables are added. This mitigates the endogeneity concern that omitted variables influence the relation between the independent variables and the dependent variable. The control variables are included to control for observable confounding effects. The control variables are horizon, institutional ownership, firm size, leverage, return on assets, market to book ratio and analyst following. Besides that, I include industry and year fixed effects in the model to prevent events, specific industry regulations, etc. affecting the results of my research. By incorporating this many control variables as well as the fixed effects, I mitigate the threat of having observable and unobservable omitted variables and confounding effects affecting the potential causality of the results. This way, I minimize endogeneity concerns of this type.

I calculate *Horizon* by taking the number of days between the forecast and the actual earnings announcement. By doing this I follow previous research Baik et al. (2011), Sosnowski and Wawryszuk-Misztal (2019) and de Jong et al. (2010). This control variable is included since evidence is found that the length of the forecast horizon is of influence on the forecast accuracy (Ajinkya et al. 2005). Also, following Baik et al. (2011) and Sosnowski and Wawryszuk-Misztal (2019), I calculate institutional ownership (*Inst_Own*) as the percentage of total shares outstanding owned by institutional owners. To calculate the firm size (*Size*) I take a natural

logarithm from total assets. By utilizing this way of measuring firm size I follow Ahmad-Zaluki and Wan-Hussin (2010) and Baik et al. (2011). Leverage (*Lev*) is also included as control variable. I calculate leverage by taking the ratio of total debt to total assets. The reason for including this ratio is that I expect firms with higher debt ratios to be more cautious about initiating forecasts and their accuracy. Also, I added the return on assets ratio (*ROA*). This is since I expect that positive returns create more resources and time to put enough effort into the forecasting process. Besides that, Miller (2002) found evidence that ROA is positively related to the frequency of voluntary discloses. As Ertugul et al. (2017), I include market to book ratio (*MTB*) in the regression equation. This is in order to control for firm growth. Firms with a ratio below 1 are considered as firms with little growth opportunity. On the other hand, if the ratio is above 1, firms are considered to create excessive positive cash flow. This allows the firm to grow which could bias the forecast accuracy due to the unstable growth of the firm. Lastly, I incorporate the number of analysts following (*Analyst*) a firm as a control variable in the regression equation. Karamanou and Vafeas (2005) found significant evidence that the number of analysts following a firm influences the number of disclosures the firm makes. Besides that, I expect that because of the extra attention firms with more analyst following intend to allocate more resources to the forecasting process. By including those control variables besides the fixed effects, I mitigate the problem of endogeneity.

5. Results

In section five I will discuss and show the statistical results of this research. These results are used to determine whether sufficient evidence is present to reject or accept the hypotheses. First, this section will show a descriptive analysis. Then, I will show the results of the Pearson Correlation analysis. Third, I will discuss the results of the VIF test. Lastly, I will provide and discuss the results of the OLS regression analysis.

5.1. Descriptive analysis

Table 2 shows the summary statistics of the dependent and all the independent and control variables that are included in the regression equation. Only the year and industry fixed effects are left out. First, I will discuss the statistics of the dependent and independent variables. Lastly, I discuss the descriptive statistics of the control variables. Each variable in the sample is winsorized at a 1% and 99% level. This is in order to minimize the negative effect of outliers in the results of the research.

First of all, the descriptive results I find of the error are in line with the paper of De Jong et al. (2010), Baik et al. (2011) and Ahmad-Zaluki and Wan-Hussin (2010). The average error in this sample is 2.32%. On average board size (*BRD_Size*) is similar to the descriptive results of Garven (2009) and Sun et al. (2014). However, the average of 8.52 is lower than the average of Xie et al. (2003). This could be the result of their sample consisting of firm year observations ranging from 1992 to 1996. Which could indicate that board size decreased over the last decades. On average, in the full sample, the proportion of independent board members (*BRD_Indep*) is around 85%. This is in line with the results of Garven (2009) and Xie et al. (2003). These researchers both found an independent board ratio of around 80%. The tenure of average experience (*BRD_Exp*) of the board members in this sample is around 7.5 years. This is slightly lower than the 8 years of average experience found in the sample of Garven (2009), Xie et al. (2003), Anderson et al. (2004) and Sun et al. (2014). Also, the percentage of firms with CEO duality (*CEO_Dua*) is lower when compared to the results of Xie et al. (2003). The difference is almost 20% with a proportion of around 50% in this sample.

The average number of days between a forecast and the actual earnings (*Horizon*) is within my sample 222. This is in line with the 216- and 204-days horizon found in the papers of respectively De jong et al. (2010) and Sosnowski and Wawryszuk-Misztal (2019). The percentage of institutional ownership (*Inst_Own*) is around 0.25 percentage points higher than in the paper of Baik et al. (2011) and Sosnowski and Wawryszuk-Misztal (2019). The average size (*Size*) is around 7 with a standard deviation of 1.4 and the leverage ratio is around 0.5 with a standard deviation of 0.2. The return on assets ratio (*ROA*) that represents the average of the full sample is 0.038. This is in line with Miller (2002). The market to book (*MTB*) ratio has an average value of 3.422. This means, since most firms have a market-to-book ratio of above 1, that most firms in this sample are considered to be overvalued. Lastly, the average amount of analysts following a firm (*Analyst*) in this sample is 11.5. This is in line with Karamanou and Vafeas (2005).

Table 2
Descriptive Statistics – Full Sample

Variable	Obs	Mean	Std. Dev.	Min	Max
Error	2464	2.316	8.756	0.000	95.385
BRD size	2464	8.520	1.567	5.000	13.000
BRD indep	2464	0.854	0.0438	0.634	1.000
BRD Exp	2464	7.365	3.783	0.000	19.652
CEO Dua	2464	0.494	0.376	0.000	1.000
Horizon	2464	222.361	110.315	14.000	457.000
Inst Own	2464	0.722	0.214	0.000	1.173
Size	2464	6.954	1.365	3.980	9.748
Lev	2464	0.534	0.197	0.108	1.103
ROA	2464	0.038	0.059	-0.326	0.309
MTB	2464	3.422	2.484	-4.711	11.738
Analyst	2464	11.503	6.681	1.000	37.000

This table presents the descriptive statistics of all the dependent and all independent variables that are used in this research. *Error* is the absolute relative difference between the forecast error and the actual earnings. *BRD_Size* is the number of board members on the board of directors. *BRD_Indep* is the proportion of independent board members on the board of directors. *BRD_Exp* is the average years of experience the board of directors has. *CEO_Dua* is a binary variable which equals one if the CEO is also the Chairman of the board and 0 otherwise. *Horizon* is the number of days between the management forecast and the actual earnings announcement. *Inst_Own* is the proportion of shares held by institutional owners. *Size* is a logarithm of the total assets. *Lev* is the ratio of total debt to total assets. *ROA* is the net income divided by total assets. *MTB* is calculated as the total market value divided by the net assets of a firm. And lastly, *Analyst* is the number of analysts following a firm in a specific year.

This part of section five will present a pairwise Pearson Correlation analysis (Table 3) to enable the assessment of the relations between the dependent, independent and control variables. In this table, the linear correlations are shown with the significance levels. Besides the included VIF test, in the next part of this section, this Pearson Correlation Matrix is also of help in assessing whether multicollinearity is present. Multicollinearity concerns often lead to less reliable results of the research. This is the result of multicollinearity undermining the statistical significance. None of the correlations between the dependent, independent and control variables is higher than 0.472. As a rule of thumb, I can say that if the coefficient is above 0.5 a strong association is found. So, the results are positive in the light of preventing this research to be negatively affected by multicollinearity.

Although this is a univariate analysis, I can find some evidence in Table 3 regarding the hypothesis. No conclusions will be drawn. However, with the information in this table I can already indicate the direction regarding the relation between the independent and the dependent variables.

First, I observe a negative and significant correlation coefficient between the size of the board (*BRD_Size*) and the forecast error (*Error*). The coefficient has a value of -0.048 and is significant on a 5% confidence level. This indicates that when the board size grows, the error decreases. So, accuracy will increase with an increase in the number of board members. That does support H1.

Second, Table 3 shows a negative and significant correlation between the independent variable board independence (*BRD_Indep*) on the dependent variable forecast error. The level of significance is 10% and the coefficient has a value of -0.036. This indicates that the higher the proportion of independent board members on the board, the lower the forecast error. That is in line with H2 which states that more independent board members lead to higher forecast accuracy.

The third independent variable is the average experience of the board (*BRD_Exp*). The coefficient of this variable in relation to error is negative and significant (-0.039, $p < 0.1$). This is in line with the statement in H3. That states that more board experience leads to more accurate forecasts and thus lower errors.

Lastly, I observe that CEO duality (*CEO_Dua*) has a negative and significant correlation coefficient in relation to the dependent variable error (-0.043, $p < 0.05$). That means if CEO duality is present the error of the management forecast decreases and thus becomes more accurate. This contradicts H4 which states that CEO duality leads to less accurate forecasts.

Table 3
Pearson Correlations Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Error	1.000							
(2) BRD_size	-0.048**	1.000						
(3) BRD_indep	-0.036*	0.289***	1.000					
(4) BRD_Exp	-0.039*	0.212***	-0.025	1.000				
(5) CEO_Dua	-0.043**	0.030	-0.010	0.179***	1.000			
(6) Horizon	-0.005	0.115***	0.097***	0.065***	0.049***	1.000		
(7) Inst_Own	-0.007	0.223***	0.251***	0.320***	0.210***	0.046**	1.000	
(8) Size	-0.053**	0.472***	0.328***	0.191***	0.162***	0.121***	0.310***	1.000
(9) Lev	-0.051**	0.182***	0.192***	-0.121**	0.043*	0.027	0.079***	0.386***
(10) ROA	-0.036	0.202**	0.117*	0.126**	-0.007	0.043***	0.135**	0.226**
(11) MTB	-0.040 **	-0.050***	-0.025**	-0.041**	-0.011**	-0.116*	-0.141***	-0.151**
(12) Analyst	-0.037*	0.273***	0.077***	0.132***	0.224***	0.119***	0.249***	0.539***

Variables	(9)	(10)	(11)	(12)
(9) Lev	1.000			
(10) ROA	-0.081**	1.000		
(11) MTB	-0.083*	-0.076**	1.000	
(12) Analyst	*0.084***	*0.108***	*-0.019*	1.000

*** p<0.01, ** p<0.05, * p<0.1
Table 3 shows the Pearson correlations between the dependent, independent and control variables. This correlation provides a value of interaction between two variables. This is a univariate analysis.

Table 4
Ordinary Least Squares Regression

Error	(1) FULL	(2) NEG	(3) POS
BRD_size	-1.052***	-1.184***	-0.015
	(0.264)	(0.294)	(0.003)
BRD_indep	-7.107*	-9.547*	-1.754*
	(4.163)	(5.873)	(0.165)
BRD_Exp	-0.356***	-0.526***	-0.006**
	(0.076)	(0.145)	(0.002)
CEO_Dua	-1.205***	-2.124***	-0.059***
	(0.479)	(0.798)	(0.020)
Horizon	0.000	-0.001	0.000***
	(0.003)	(0.001)	(0.000)
Inst_Own	5.432***	5.523**	0.156**
	(1.652)	(2.328)	(0.073)
Size	1.854***	2.590***	-0.006
	(0.421)	(0.526)	(0.017)
Lev	-0.494	-0.689	-0.136**
	(1.354)	(1.675)	(0.062)
ROA	-0.248	-.506	0.076
	(4.326)	(6.425)	(2.849)
MTB	-0.445	-0.763	-0.096
	(0.109)	(0.240)	(0.054)
Analyst	-0.149***	-0.248***	-0.085**
	(0.056)	(0.086)	(0.023)
_cons	-0.476	-3.178	0.275
	(5.435)	(6.650)	(0.230)
Observations	2464	1680	784
R-squared	0.193	0.256	0.514
Industry fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES

*** $p<.01$, ** $p<.05$, * $p<.1$

Table 4 presents the OLS regression results with Error being the independent variable. The values given are coefficients and are provided for three different samples. One is the sample with all observations. The second regression runs on the observations with a negative earnings surprise. The third regression runs on the observations with a positive earnings surprise. The values in parentheses are standard errors.

5.3. Regression analysis

In the last part of this section, the results of the OLS regression will be discussed. The information is shown in Table 4. To prevent our results of this research to be unreliable as the result of multicollinearity I not only conduct a Pearson Correlation analysis but also perform a VIF test. The results of this VIF test are shown in Table 5. The value of the VIF is not above 10 for any of the variables. If that was the case the regression assumption of not having multicollinearity is violated. Besides addressing multicollinearity issues, endogeneity issues are also addressed. I do this to improve the reliability and robustness of the findings. The measures to prevent endogeneity are the inclusion of an excessive amount of control variables. Alongside the seven control variables, two fixed effects are added. Industry and year fixed effects. The year fixed effect controls for underlying unobservable differences because of time influence. On the other hand, industry fixed effects prevent events specific to an industry from influencing the results of the research. These events could be regulation changes, economic crisis's, etc.

Table 5
VIF Test

Variable	VIF	1/VIF
BRD_size	3.860	0.259
BRD_indep	2.160	0.463
BRD_Exp	3.260	0.307
CEO_Dua	2.020	0.496
Horizon	1.460	0.684
Inst_Own	4.010	0.249
Size	6.530	0.153
Lev	2.320	0.431
ROA	1.710	0.586
MTB	1.860	0.538
Analyst	3.600	0.277
Mean VIF	2.981	

Table 5 presents the VIF test. This test provides the values which are used to check whether multicollinearity is an issue. If the value of VIF is above 10 that could imply multicollinearity concern. As this table shows, that is not the case.

The results of the regression performed on three different samples are shown in Table 4. First, I run a regression on the whole sample. Then, I separate the firms where the actual earnings are lower than the forecasted earnings and analyze these in the second sample. These firms are thus overly optimistic in their forecast. Several reasons could drive this optimism. Being overly optimistic as management could be the consequence of wanting to ensure stakeholders that the financial performance is stable or improving. Also, management could overestimate their ability with the result of too optimistic forecasting. Lastly, besides other possible reasons, management could be ignorant to foresee certain economic events from happening or affecting their firm (Rezazadeh et al., 2020). To isolate the potential effect of different corporate governance mechanisms in this regard I create a negative sample. For the same reason, the last regression I run is on all positive surprises with regards to the forecasted and actual earnings.

This means all firm year observations with earnings higher than the forecasted earnings by management. Among other reasons, this could be the consequence of management being conservative in their forecasting process. Conservatism entails smoothing earnings and needing less evidence in recognizing costs and losses than when compared to income and profits (Ruch et al., 2015). The result of this way of pessimistically managing earnings is that the risk for investors declines due to more stability (Rezazadeh et al., 2020). That could lead to a lower cost of capital and a less volatile share price.

The first hypothesis states that a larger number of members on the board of directors leads to higher accuracy of management forecasts. Table 4 shows that the coefficient of board size (*BRD_Size*) is significant on a 99% confidence level for the first and second regression. The third regression, which is performed on a sample with positive surprises, is not significant. This means that the size of board of directors is not of significant influence in firms with a conservative management team. The coefficient of the full sample and negative surprise sample is respectively -1.052 and -1.184. This indicates that a larger board size leads to a lower forecast error. So, I find evidence that supports H1 on a 1% significance level. It states that larger boards are more efficient in monitoring activities which leads to a higher management forecast accuracy. Although the results of previous research on the topic of corporate governance and management reliability are still mixed Aygun and Sayim (2014) found the same results. That could be explained since previous research focused more on agency costs and earnings management (Singh & Davidson, 2003; Anderson et al., 2004) whereas I focus specifically on management forecasts.

Hypothesis two states that the higher the proportion of independent number of members on the board of directors the higher the forecast accuracy. As Table 4 shows, the coefficients of all three regressions on board independence (*BRD_Indep*) are negative. Respectively for the full, negative and positive sample the coefficients are -7.107, -9.547 and -1.754. All these coefficients are significant on a 90% confidence level. This is in line with H2 and thus the hypothesis that the independence of the board negatively influences error and thus positively influences forecast accuracy is supported. Chen Cheng and Wang (2015) and Garcia-Meca and Sanchez-Ballesta (2010) found significant results that support the notion that a higher proportion of independent board members leads to a more reliable management team. However, they only found significant results in a specific sample where there was a rich information environment and where regulatory entities enforce high protection rights for the investors.

Third I will discuss the results of the variable that captures the average experience the board members have on the board of directors (*BRD_Exp*). The results are significant over all three models with a confidence level of 99% for the full and negative sample and 95% level for the positive sample. Respectively, the coefficients of the full, negative and positive samples are -0.356, -0.526 and -0.006. Since the value of the coefficient from the positive surprise sample is small, the economic significance of this variable in the positive sample could be questioned. However, results support H3. That means the board of directors with more experience in the board are more efficient and effective in the supervision of the management team. That results in lower management forecast error when the tenure of experience increases. Thus, the

experience on the board of directors, the more accurate and reliable voluntary disclosures are. Park and Shin (2004) could not find significant evidence for such a hypothesis. Xie et al. (2003) even found evidence that contradicts this hypothesis. However, Vafeas (2003) and Garven (2009) did find evidence that is in line with the significant results I find in this paper.

Hypothesis four states that when the CEO of a firm is also the Chairman of the board of directors (*CEO_Dua*), forecast accuracy and thus voluntary disclosure reliability is lower. This is the result of personal incentives not being aligned with owners and the power to act on these incentives. However, the results of Table 4 suggest otherwise and rejects H4. The coefficient is negative and significant on a 1% level in all three regressions. The coefficients are respectively -1.205, -2.124 and -0.059 for the full, negative and positive sample. These results suggest that if a CEO is also the Chairman of the board, forecast accuracy is higher and voluntary disclosure reliability with it. The underlying theory could be that a CEO is more efficient and effective in communicating the actual status of the firm to the board of directors. The result could be that more informative and high-quality advice and monitoring activities are provided by the board as a result of this. This could lead to more accurate management forecasts. The results differ from the papers of Jensen (1993), Cornett et al. (2008) and Samaha, Khlif and Hussainey (2015). This could be the result of this paper focusing on management forecast accuracy while the other papers focus on earnings management and agency costs. This difference could have led to a different sample selection process and different proxies used for the dependent variable.

The difference in magnitude of the coefficients between the full, negative and positive regression models is an interesting remark. The coefficients in the negative model, when compared to the full model, are for all variables stronger. Thus, the coefficient in the full model in comparison to the negative model is in all cases closer to 0. On the other hand, when compared to the full model, the coefficients of the positive model are weaker. This means coefficients are closer to 0 in the positive model when compared to the full model. At the beginning of this section optimism and conservatism are discussed briefly. Model two had overly optimistic forecasts which led to the negative earnings surprise. Instead, model three had conservative forecasts and that resulted in a positive earnings surprise. Since the coefficients of the second model are shown to be stronger in all cases, I argue that in presence of an overly optimistic management team, corporate governance mechanisms influence voluntary disclosure reliability more. Rezazadeh et al. (2020) supports this statement as their research found that overly optimistic management teams are more incentivized to engage in earnings management and hide bad news from their stakeholders. Also, Karamanou and Vafeas (2005) found stronger results for firms with negative earnings surprises. On the other hand, the results of this research imply that if a firm follows a conservative approach the effects of corporate governance mechanisms are still relevant and significant. However, the economic significance is less strong when compared to the second model. This finding implies that especially in overly optimistic firms' resources need to be allocated to the improvement of corporate governance mechanisms and processes to increase voluntary disclosure reliably and decrease the information gap.

6. Conclusion

In this last section, the results of the research will be summarized. Also, the contribution to the literature will be discussed as well as the implications of this research. Lastly, I will share some limitations that might be dealt with in future research to enhance the academic literature surrounding the topic of corporate governance structure and voluntary disclosure reliability.

The results of this research support hypothesis 1. That means, larger boards are more effective and efficient in monitoring the management team. That leads to a higher forecasting accuracy which means that the voluntary disclosures communicated to the stakeholders are more trustworthy. The second hypothesis argues that board independence positively influences management forecast accuracy. The results of this research support hypothesis 2. This research also supports hypothesis 3. So, the average experience of board members being part of the board of directors results in more reliable voluntary disclosures. The results reject the last hypothesis but show significance in the opposite direction. That means, if a CEO is also the Chairman of the board, voluntary disclosures are more reliable. Besides the significant results of the hypothesis, I find another important implication. The results suggest that in the second regression the coefficients are stronger when compared to the third regression. This means the influence of corporate governance mechanisms within firms with overly optimistic management (regression two) is stronger than when compared to more conservative firms (regression three). So, the relevance of applying the results of this research is even more important for overly optimistic firms. To answer the research question, corporate governance disclosures do influence voluntary disclosure reliability. The extent of influence differs between the mechanisms and is extensively discussed in the result section per hypothesis.

The contribution of this research is to the voluntary disclosure and corporate governance literature. The contribution to the voluntary disclosure literature is that this paper provides tests that are performed in a more general setting than other research in this area. Other research most often focuses on specific settings like IPO, M&A or the distinction between information rich environments or not. The results of this paper within the voluntary disclosure literature are thus more generalizable. Thus, what board characteristics positively influence voluntary disclosure reliability can be applied in a more general setting. For the corporate governance literature, the results of this paper could contradict some main notions like for H4 on CEO duality. A possible reason is that in my research I focused specifically on management forecast accuracy. Whereas in corporate governance literature, earnings management and agency costs are most often utilized. Future research could investigate this more deeply to get to the underlying reason why that is. The specificity of management forecast accuracy and thus voluntary disclosure reliability in this research is for the corporate governance literature a contribution. Since, most often earrings management or agency costs are used as dependent variables.

The implication of this research is relevant for policymakers, firms' management and other stakeholders. First, policymakers could shape regulations in such a way that it motivates management to create a corporate governance structure that is efficient in incentivizing the firm

to be reliable. This results, when looking at the evidence provided in this paper, in more accurate and reliable voluntary discloses. As stated in the literature review, this contributes to the decrease of information asymmetry and thus a decrease in agency costs. That is one of the goals to achieve of regulating entities. Creating trust.

If firms' management would like to show their stakeholders, that they value the reliability of their communication via voluntary disclosures they could act upon the results of this research. That could be done by implementing some of the results of this paper in their corporate governance structures. Not only will that lead to a lower cost of capital due to the lower information asymmetry, but also stakeholders' trust will grow and the share price will be less volatile and positively affected.

Lastly, other stakeholders can benefit from the results as well. For example, suppliers could evaluate the suitability of a firm as their potential client better if they know the probability of their voluntary disclosure being accurate is high. To determine the probability of an accurate voluntary disclosure they could look at the corporate governance mechanisms. If they align with the results of this research the client could be seen as more trustworthy. Also, for investors this research is valuable. Voluntary disclosures are only of value if you can trust the information shared. Investors could take into account during their decision-making process the structure of corporate governance to assess the reliability of corporate disclosures.

This research is subject to some limitations. A criticism that addresses all research on this subject is that the difference in actual and forecasted earnings cannot as a whole be seen as the consequence of management intentions. Also, external factors (omitted variables) influence the forecast error. I mitigate this type of endogeneity by including seven control variables and industry and year fixed effects. However, chances are that the inclusion of these control variables and fixed effects does not control for all confounding variables. The adaptation of the two stage least squares analyses that utilize instrumental variables could mitigate the effect of other unobservable confounding variables. This could be interesting for future research to implement since that also addresses the type of endogeneity concerning reverse causality. Besides that, unfortunately, due to the merging of several datasets and the fact that the number of management forecasts is not that high, some data is lost. This could lead to a selection bias. Future research could try to create a dataset for the regression with more firm year observations. This could be done by looking into more and different data sources which data is derived from. It would be interesting to see whether the results still hold or would be different. Besides that, future research could also investigate the relation between corporate governance structures and the decision of what forecast management is used (qualitative or quantitative and annually or quarterly). The last limitation of this research is that the results of this research could not be generalized outside the US due to the sample consisting of publicity traded US firms only.

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Appendix

Table 6
Variable description

Items	Description
Dependent variable:	
Error	Error is the absolute relative difference between the forecast error and the actual earnings. This is calculated by subtracting the forecast from the actual earnings and dividing it by the actual earnings. The absolute value is used in the research.
Independent variables:	
BRD_Size	BRD_Size is the number of board members on the board of directors.
BRD_Indep	BRD_Indep is the relative proportion of independent board members on the board of directors.
BRD_Exp	BRD_Exp is the average years of experience the board of directors has.
CEO_Dua	CEO_Dua is a binary variable which equals one if the CEO is also the Chairman of the board and 0 otherwise.
Horizon	Horizon is the number of days between the management forecast and the actual earnings announcement.
Inst_Own	Inst_Own is the relative proportion of shares held by institutional owners.
Size	Size is a natural logarithm of the total assets.
Lev	Lev is the ratio of total debt to total assets.
MTB	MTB is calculated as the total market value divided by the net assets of a firm.
ROA	ROA is the net income divided by total assets.

Figure 1
Libby boxes for hypothesis 1 to 4

Independent variable   Dependent variable

Conceptual

| Corporate governance mechanisms | → 1 | Voluntary disclosure reliability by management |

Operational

2 ↓   3 ↓

1. Board size
2. Board Independence
3. Board experience
4. CEO duality

→ 4 → Management forecast accuracy

5 ↓

Control

Forecast horizon, institutional ownership, size, leverage, market to book ratio, return on assets and industry and year fixed effects