



Board characteristics and earnings quality: evidence from the U.S.A.

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Abstract

The purpose of this thesis is to examine the relation between board characteristics, specifically board independence and directors' tenure and earnings quality. The objective is to see whether board characteristics have an influence on earnings quality and if so, how. The study is conducted with a sample between 2007 and 2015 with data from U.S.A. based firms. The earnings quality is measured via the McNichols (2002) model and the board independency as the fraction of independent directors in a board. Furthermore the directors' tenure of a board is measured via the average tenure of a board per firm year. The results show a negative relation between board independence and earnings quality and a positive relation between directors' tenure and earnings quality. This latter relation has shown an inverted U shape, meaning that at some point, the longer tenure will have a negative effect on earnings quality. The results underline the impact of board of directors on the performance of a firm and how board composition can influence earnings quality. Furthermore the results may help composing a board for a firm where earnings quality improvement is wanted.

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1. Introduction

The purpose of this study is to examine the relation between corporate governance and firm performance. Specifically, I investigate the relation between characteristics of the board of directors and the quality of the reported earnings of a firm. The research question is as follows:

“Are board of directors characteristics associated with earnings quality?”

This study investigates the relation between the board independence and the average directors' tenure of a board and the earnings quality of a firm. Providing an answer to this research question is important, because it contributes to the debate about the effectiveness of corporate governance on firm performance and specifically, the relation between board characteristics and earnings quality.

The board of directors is a group that monitors top management and is used to deal with the agency problem (Jensen & Meckling, 1976) and prevent that managers behave opportunistically. There are two types of directors, namely dependent and independent directors. Dependent directors are employees of the firm and independent directors do not have such a connection with the firm (Hermalin & Weisbach, 2001). Independent directors are directors that do not have material relation with the firm whatsoever. It is believed that independent directors act different than dependent directors since they have different incentives and connections to the firm they monitor. It is a common view that the independency of boards is necessary since it has its primary task to monitor the top management (Bhagat & Black, 2000). However, Sun et al. (2014) suggested that a too much independency will to an absence of inside information which may result in lower monitoring quality and therefore lower earnings quality.

Another characteristic of the board of directors that may influence the earnings quality is the directors' tenure on a board. It is believed that on the one hand, longer tenure will lead to more firm specific knowledge which would improve the monitoring quality (Kim et al., 2014) and on the other hand, connections with management may get too tight which will result in lower monitoring quality (Vafeas, 2005).

One of the responsibilities of top management is the reporting of the annual earnings. The quality of the earnings is a function of the firm's fundamental performance (Dechow et al., 2010). Earnings have a high quality if the information they provide is useful for a specific decision, made by a specific decision-maker (Dechow et al., 2010). Since the board of directors oversees the firms' performance and thus also the earnings quality, the question arises if the independency of the board of directors has an association with the quality of the annual earnings reported by a firm.

This study empirically supports the theory (Bhagat & Black, 2000) according to which independent directors have influence on the firm performance and to the theory of whether directors' tenure has either a positive (Kim et al. 2014) or negative (Vafeas, 2005) impact on firm performance.

This study attempts to answer the research question by conducting an empirical research based on U.S.A. based firms within the period of 2007 – 2015.

The first hypothesis investigates the board independency as follows: "Ceteris paribus, board independency has an association with earnings quality" while the second hypothesis investigates the relation between the average directors' tenure of a board and firms' earnings quality as follows: "Ceteris paribus, directors' tenure has an association with earnings quality." In extension to this I investigate if the relation between average directors' tenure and earnings quality has an inverted U shape.

The results show a negative and significant relation between board independence and earnings quality. This can be explained by the literature of Sun et al. (2014), who suggested that too much independent directors may lead to a lack of inside information and knowledge about firm specific operations and strategy. This may lower the monitoring quality of a board and therefore the earnings quality of a firm.

The second hypothesis did not only test whether there is an association between average directors' tenure and earnings quality, but also the shape of the relation. The results show that there is an inverted U shape relation between average directors' tenure and earnings quality. Meaning that the theory of Kim et al. (2014), who stated that longer tenure would have a positive influence and Vafeas (2005) who stated that tenure would have a negative influence both are right. The results underline the research of Livnat et al. (2016) who observed a relation in the shape of an inverted U between directors' tenure and firm performance.

This research adds value to the literature about board characteristics and firm performance. Where most literature is focused on firm performance measures such as return on assets, return on equity or Tobin's Q. This research focuses on earnings quality, which is also a part of firm performance according to Dechow et al. (2010). The most research done about earnings quality focusses on earnings management. When earnings management is present, earnings quality will be low. However, without earnings management, the quality of the reported earnings may still be low (Dechow & Dichev, 2002). Measuring earnings quality via the McNichols (2002) model makes it possible to capture earnings quality without only looking discretionary accruals, which is a measure for earnings management.

Lastly, most research regarding earnings quality conducted in the U.S.A. focusses on the earnings management and not the earnings quality. Research that focusses on earnings quality and board characteristics has only been conducted with non-U.S.A. sample and therefore, conducting this research inside the U.S.A. will provide new insights.

The results of this study are relevant for all users of the financial statement, provided by a firm which has a board of directors. It helps users when interpreting the firms' earnings and judging its quality.

Furthermore this study contributes to the ongoing debate of the effect of board of directors on firm performance and if the quality of earnings can be influenced by the board independency and directors' tenure. The results of this study may be interesting for shareholders since they elect the directors and demand high earnings quality.

The results also contribute to the debate of how a board of directors should be composed. For instance, firms with low earnings quality and a high proportion of independent directors on their board that want to higher their earnings quality, may consider a lower proportion of independent directors, since this will lead to more firm specific information such as information about specific operations and strategy. Since this decision is up to the shareholders of a firm, the results of this study are useful for shareholders. Furthermore, this research shows an inverted U shape relation between average directors' tenure and earnings quality, which means that the relation is not linear. It might be interesting for further research to investigate what the optimal average tenure is for the highest earnings quality. The results of this research are useful for composing a board of directors.

2. Theoretical background

2.1 Corporate governance

The board of directors is a mechanism that is part of the corporate governance structure of a firm. Corporate governance is the structure that “deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment” (Shleifer & Vishny, 1997, p.737) and is used to reduce the costs of the agency problem as described by Fama & Jensen (1983). The agency problem occurs when there is a contract in which a principal (shareholder) contracts an agent (manager) to perform services on their behalf and give decision making authority to the agent (Jensen & Meckling, 1976). This means that agency problems occur in a situation when there is a separation in ownership and control of a firm. A good corporate governance structure will lower the chance that the senior management of a firm will act in a way that is not in the best interest of the shareholder.

Agency theory is the analysis that focusses on the constant conflicts of interest between the manager and the shareholder. For instance, a situation may occur where shareholders demand the pay-out of cash, but this will reduce the resources of a firm and thus the power of the management (Jensen, 1986). The conflict of interest behind this is that management is seeking for power and shareholders demand optimal share-return. Agency theory describes that this divergence can be limited by incurring monitoring costs, such as the use board of directors, and create incentives for the management to keep their interests align with the shareholders, such as share-based compensation (Hill & Jones, 1992).

2.2 Sarbanes-Oxley act

Due to accounting scandals involving WorldCom, Enron and Arthur Andersen, public skepticism aroused towards the governance and audits of a firm. As a reaction to this, the government of the U.S.A. enacted the Sarbanes-Oxley Act (SOX) in 2002 to prevent such scandals. The objective of SOX is to improve the quality of the corporate governance structure, quality of the financial report and the audit quality of publicly listed firms (Jain & Rezaee, 2006). Aspects of SOX include rules about a higher degree of independent directors in the board (>50%), more auditor independence, which is created by audit partner rotation and restrictions for auditing firms who provide non-audit services. Furthermore, executives could get personal sentence for acting unethical.

Studies have examined the effect of the implementation of SOX on firms. For instance, since 2002, after of the enacting of SOX, there are more independent directors in the U.S.A. (Zhang et al., 2013; Dah et al., 2014).Cohen et al. (2008) observed higher earnings management activities before the enacting of SOX and a decrease after the implementation, which indicates that SOX is having a positive

effect on the corporate governance. Within in this line, researchers have observed a decrease of discretionary accruals (Lobo & Zhou, 2006). This may be the result of the new penalties that were installed by SOX. Penalties include punishment on personal level of management for overstating/ understating earnings. The decrease of discretionary accruals may be the result of the fact that there are greater penalties for overstating than understating earnings (Lobo & Zhou, 2006).

2.3 Board characteristics

The board of directors is an important part of the governance structure of large firms and has the power to fire, hire and compensate the senior management of a firm (Baysinger & Butler, 1985). The board is a construct that is used to deal with the agency problem and to lower the divergence between management and shareholders. Their work field is to serve as a source of advice, counsel and act in a crisis situation. Furthermore they monitor the senior management and assure that their actions are in the best interest of the shareholders and avoid opportunistic behavior (Adams et al., 2008; Eisenhardt, 1989).

2.3.1 Board independence

There are several board characteristics discussed in literature that may have an effect on the board performance and thus on the senior management level of a firm. It is believed that the independency of the board has influence on how the board acts. Since the board is responsible to oversee the senior management, an independent board may not be able to monitor the senior management properly.

There are three types of directors, namely dependent, independent directors and affiliated (grey) directors. Dependent directors are employees of the firm and independent directors do not have such a connection with the firm or any material connection whatsoever (Hermalin & Weisbach, 2001). Affiliated directors are directors who are past employee of the firm, relatives to the CEO or other business relation to the CEO (Klein, 2002a). According to the U.S.A. law, independent directors are directors that have no material relation with the firm whatsoever.

It is believed that independent directors act different than dependent directors since they have different incentives and strings to the firm they monitor. It is a common view that the independency of boards is necessary since it has its primary task to monitor the top management (Bhagat & Black, 2000). However, it is also believed an independent directors knows less about the firm and is less able to have a critical view on details (Aishah Hashim & Devi, 2008), which will result in lower monitoring quality.

2.3.2 Directors' tenure

Another characteristic that might influence the monitoring quality of the board of directors is the directors' tenure. There are two views regarding the effect of directors' tenure which are conflicting with each other (Vafeas, 2005). It is believed that the tenure of a director has a positive influence on the directors' behavior, since they have attended to more meetings and therefore have more experience with the firms' strategies, policies, operations and the management itself. This will improve the monitoring performance of the board (Kim et al., 2014). Kim et al. (2014) argued that the tenure has a positive association with the monitoring performance since its performance relies on the information board members have about a firm. If directors' have a longer tenure on the board and thus more information of a firm, the performance will increase. Kim et al. (2014) tested this hypothesis and found robust and significant results that underlined this hypothesis. On the other hand, Vafeas (2005) argued that directors who served for a long time on the board are more likely to become friends with management which will lower the monitoring quality of the director since he will be less critical towards his friends.

2.4 Earnings quality

2.4.1 Why earnings

Since Ball & Brown (1968) earnings are one of the most used indicators for firm performance. The earnings of a firm in a given year are equal to the cash flows of that year, with adding/ subtracting the accruals. Ball & Brown (1968) investigated the relation of income numbers to stock return and found that indeed the income number has a relation with the stock return. In extent to this research, Dechow (1994) investigated the explanatory power of earnings and cash flow in respect to stock returns and found that earnings and thus accruals are more informative than cash flows, decreasing over time.

2.4.2 Accruals

As stated above, earnings are based on cash flows and accruals. Where cash flows are based on transactions of cash, accruals are the results of timing and revenue matching problems (Dechow, 1994). However, accruals are based on certain estimates and assumptions that could be wrong and if so, must be corrected in the future accruals and earnings (Dechow & Dichev, 2002). Furthermore, managers have some discretion over the recognition of accruals. Since accruals are informative (Dechow, 1994), managers can use accruals to send a signal to the public which can result in a decrease information asymmetry. On the other hand, managers can use accruals for opportunistic goals (Healy & Wahlen, 1999) and in this case, there will be an increase in information asymmetry. In other words:

the earnings number will be less representative to the firms' performance and therefore, the quality of the earnings will be lower.

Accruals can be distinguished into two types, namely discretionary accruals and non-discretionary accruals. Discretionary accruals, also known as abnormal accruals, are the accruals in which managers have the opportunity to manipulate earnings due its flexible nature (Dechow, 1994). A high level of discretionary accruals will lead to an increase in information asymmetry and in other words a decrease of earnings quality.

2.4.3 What is earnings quality

Earnings quality is linked to the usefulness of information provided by financial accounting. Higher earnings quality are reported earnings that "provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker" (Dechow et al., 2010, p.1). The quality of the reported earnings are relevant for all types of users of the reported earnings. It is not only relevant for its shareholders and debt holders, but also for the management itself since compensation contracts are based on earnings, which means that overstating earnings will result in overcompensation of managers (Schipper & Vincent, 2003). Earnings quality itself is a wide notion and can be referred to in three features (Dechow et al., 2010):

1. Earnings quality relates to the decision-relevance of the provided information.
2. Earnings quality relates to the informativeness of the earnings with respect to the firms' financial performance.
3. Earnings quality relates to the ability of the accounting system to measure performance.

2.4.4 Earnings quality and firm performance

It is argued that earnings quality is a part of firm performance. Chan et al. (2001) examined the relation between earnings quality and stock return and found that earnings quality, with discretionary accruals as proxy, has a predictive power for future returns. They argue that investors see higher accruals as a sign of earnings manipulation. In extension to this, Chan et al. (2001) find that a large increase in accruals is a sign of a turning point in the firm performance. It is argued that these large amount of accruals occur when the high growth of a firm has faded, but managers try to extent this growth with manipulating the accounting numbers.

Francis et al. (2005) investigated the market pricing of accrual quality and used the Dechow & Dichev (2002) model to capture accruals quality and found that lower accrual quality will result in higher costs of equity and debt. This is consistent with the above explanation that investors see low

accrual quality as a sign that managers try to manipulate earnings and thus earnings quality is low, which means there is information asymmetry, resulting in higher financing costs.

Furthermore, Dechow (1994) showed that earnings and thus accruals, have a higher explanatory power to stock return than cash flows. An explanation for this could be that accruals, have a predicative aspect since they tell something about future operations of a firm. Therefore future results may partly be derived from accruals, which explains the higher explanatory power.

Because there is a market reaction to accruals magnitude and quality, which is a part of earnings quality, I assume it is a part of firm performance and therefore a responsibility of the senior management. Senior management has the opportunity to manipulate those earnings, which is at cost of the earnings quality. This is why the markets react negatively to low accruals quality.

2.5 Positive Accounting Theory

There are several reasons why a manager would manipulate accounting numbers and lower the quality of earnings. These are described in the positive accounting theory. The positive accounting theory (PAT) was developed by Watts & Zimmerman (1978) and tries to explain why managers would choose for a certain accounting policy. It is based on three hypothesis that describe why managers would enhance certain accounting policies (Watts & Zimmerman, 1990). The bonus plan hypothesis describes the incentive of managers to make the accounting numbers look better than they are. Managers often do this since their compensation contract is based on these accounting numbers. The second hypothesis focusses on debt covenants. When making the accounting numbers more positive, the cost of debt might be lower, since these contracts are also based on accounting numbers. The last hypothesis is based on the political heat. Managers could choose to lower the accounting numbers to avoid political heat. Political heat may arise when, for example, a firm makes high profit but starts to cut on its employees.

Summarizing the positive accounting theory, I can conclude that managers have several incentives to manipulate earnings and thus lower the earnings quality. These manipulations can be unfavorable for the shareholders of a firm, which means an agency problem occurs, because the managements does not act in the best interest of the shareholders. In this way, the positive accounting theory is connected to the agency theory, since the agency problem occurs when management behaves in a way that is explained by the positive accounting theory. As described in the first section, the board of directors plays an important role in the corporate governance structure and in overcoming the agency problem, since it has a monitoring and counseling function towards the senior management and is able to fire and hire senior management. This means that I can assume that there

is a relation between several board characteristics, which have an influence on the effectiveness of a board and earnings quality.

3. Literature review

3.1 Board characteristics and firm performance

3.1.1 Board independence and firm performance

Knyazeva et al. (2013) examined the relation between board independence and firm performance and found a positive relation between board independency and firm value and performance. They measured firm performance with the variable Tobin's Q and the return on assets. The results are in line with the agency theory, which describes that board independence will have a positive influence on firm performance (Rosenstein & Wyatt, 1990). So how more independent a board is, how better the performance of the firm will be according to the findings of Knyazeva et al. (2013). These results are similar as the one of Terjesen et al. (2016) who conducted a similar study and also examined the relation between board independence and firm performance. Where Knyazeva et al. (2013) only investigated U.S.A. based firms, Terjesen et al. (2016) examined the relation with a sample of 47 different countries, meaning that the relation also holds outside the U.S.A.

Nevertheless, studies have also found no significant relation between board independence and firm performance. Bhagat & Black (2000) investigated the same relation and found no significant relation between board independence and firm performance. This research was done before the implementation of SOX and could be an explanation for the different results. Bhagat & Black (2000) also argue that a possible reason for no significant results could be that independent directors are not truly independent. With the implementation of SOX, stricter rules apply for the board of directors and its independency. This could influence the effectiveness of the board of directors.

3.1.2 Directors' tenure and firm performance

Livnat et al. (2016) investigated the impact of directors' tenure on firm performance. They not only investigated if there is any effect, but also what the optimal directors' tenure is. They found a positive relation between directors' tenure and stock returns which peaks at a tenure of 9 years. Meaning that this relation has the form of an inverted U-shaped relation, peaking at 9 years. This can be explained by the fact that the directors and the managers obtain more information about the firm as time passes by, but after a certain amount of time, the strings with management get tighter which results in a lower quality of monitoring, this is also explained by Hwang & Kim (2009).

Furthermore, Kim et al. (2014) found that the tenure of outside directors is positively associated with firm performance which underlines the theory that longer directors' tenure of independent directors will result in better firm performance due the decrease in information asymmetry. This is because the strategic decision making, which is a task of the board of directors, can only been done right if the information available for the directors is complete and precise. Since the

tenure of a director will increase the boards' firm-specific knowledge, the tenure of a director will have a positive relation with its monitoring performance.

Furthermore, Hwang & Kim (2009) found that the compensation of a CEO is higher and less influenced by firm performance when the CEO is socially connected with the board of directors. This can be either the result of less effective monitoring since the connections between board and CEO gets tighter. On the other hand, this can be the result of the decrease of information asymmetry and the CEO has provided the board with reasons for the bad performance.

From the above mentioned literature, I can conclude that board characteristics, have influence on the firm performance. In the next section I will focus on studies which have investigated on the board characteristics and specifically earnings quality.

3.2 Board characteristics and earnings quality

3.2.1 Board independence and earnings quality

Several studies have investigated the relation between board characteristics and earnings quality. Klein (2002a) investigated the relation between board independence and earnings management, which erodes earnings quality (Dechow et al., 2010) for U.S.A. firms and found that boards with a majority of independent directors have a negative relation with the total amount of discretionary accruals, a proxy for earnings management and thus earnings quality. The results suggest that independent boards are indeed more effective since maintaining a low level of abnormal accruals is an objective of the board.

These results are similar to a more recent study, executed by Chen et al. (2015) who also found a negative relation between board independence and the level of discretionary accruals. This means that the implementation of SOX did not had an effect on the relation between board independency and earnings quality. A reason for this could be that earlier researchers like Jensen (1976) already suggest an independent board for better performance, and that this view was already adopted by firms before the implementation of SOX.

Similar research has been done in other countries than the U.S.A. Aishah Hashim & Devi (2008) investigated the same relation for Malaysian firms, but the researchers did not find a significant relation between board of directors' independence and the quality of the earnings. The absence of SOX could be an explanation for the insignificance. On the other hand, researchers conducted a similar study in Italy (Marra et al. 2011) and did find a negative relation between board independence and abnormal accruals.

These studies only focused on the earnings management measured via discretionary accruals. However, it is possible to have low earnings quality even in the absence of earnings management

(Dechow & Dichev, 2002). Bhagat & Black (2000) argue that independent directors are less informed and could make wrong decisions because they have a lack of inside information. This means that too much independent directors could have a negative effect on earnings quality as there would be a lack of inside information to monitor properly. Especially in firms with a noisy information environment (Sun et al., 2014), the case of too much independent directors is realistic since the implementation of SOX required more independent boards.

3.2.2 Directors' tenure and earnings quality

Regarding the relation between directors' tenure and earnings quality, Firoozi et al. (2016) examined the relation between the tenure and accrual quality for Canadian firms. The researchers found a significant and negative relation between directors' tenure and the accrual estimation error, which means longer tenure leads to higher earnings quality, supporting the idea that directors' who are longer part of the board know more inside information which improves the monitoring quality and thus the earnings quality of a firm.

Furthermore, Kim & Yang (2014) investigated the relation between directors' tenure and discretionary accruals, another measure for earnings quality, in South-Korea. Similar to Firoozi et al. (2016), the researchers found that the absolute value of accruals decreases when directors' tenure increases, which indicates a positive relation between tenure and earnings management in South-Korea based firms. Same results have been found by Aishah Hashim & Devi (2008) who conducted a similar study for Malaysian firms.

However, Vafeas (2005) argued that when directors are too long on a board, strings with the management may get too tight which will result in lower monitoring quality. Beasley (1996) examined the relation between board composition and financial statement fraud, a proxy for measuring earnings quality, and found that the chance of fraud is positively related with the directors' tenure, underlying Vafeas' (2005) statement.

3.3 Contribution to literature

Overviewing the existing literature, there has been done a lot of research on board characteristics and several firm performance measures that they may influence. However, most literature focusses on market performance (Tobin's Q) or the net income performance (return on assets) and little research is done about the relation between board characteristics and earnings quality, which is also a part of firm performance.

A lot of research is done regarding board characteristics and earnings quality. However, most research focusses on the discretionary accruals of a firm. Which is used to measure its level of earnings

management. This relation is investigated because earnings management is something that the board of directors must prevent. But, as Dechow & Dichev (2002) argue, even when the amount of discretionary accruals is low, which means the amount of earnings management is low, accrual quality itself can still be low. So the discretionary accruals may not capture the quality of the reported earnings of a firm. This makes it interesting to investigate the relation between board characteristics and accrual quality, measured in a differently way than the discretionary accruals method.

However, this relation is barely investigated and if it is investigated, it is done outside the U.S.A. Conducting a research that investigates the relation between accrual quality, differently measured than the discretionary accruals approaches, and board characteristics, such and board independence and average directors tenure, for firms in the U.S.A. will add value to the existing literature since it has not been done yet. Furthermore, it may add value to the research about board characteristics and how certain characteristics may influence the quality of the reported earnings.

4. Hypothesis development

Agency theory describes the conflicts between management and the shareholders (Jensen, 1976). The board of directors is an important part of the governance structure since it has certain powers over the management (Baysinger & Butler, 1985). An objective of the board of directors is to monitor the management and make sure their actions are in line with the shareholders. Several studies observed a market reaction to earnings quality, which indicates earnings quality is a part of firm performance (Chan et al., 2001; Francis et al., 2005). Since it is a part of firm performance and senior management is responsible for it, it is also an objective of the board of directors to make sure the earnings quality is high. I therefore assume an association between board of directors characteristics and earnings quality.

Literatures has investigated on several board characteristics that may have influence of the effectiveness of a firm. Knyazeva et al. (2013) examined the relation between board independence and firm performance and found a positive relation, which indicates that the independency of a board has a positive association with its effectiveness. These results were similar as the ones of Terjesen et al. (2016). However, the results of other studies found no significant relation (Bhagat & Black, 2000). Looking at earnings quality specifically as firm performance, researchers have found a positive relation between board independence and accrual quality, measured via discretionary accruals (Klein, 2002a; Chen et al., 2015).

Furthermore, literature also suggests that too much independent directors will results in lower monitoring quality since the absence of inside information (Sun et al., 2014). I therefore assume an association between earnings quality and board independence, but since the mixed literature, my hypothesis will be neutral. This results in the following hypothesis:

H1: Ceteris paribus, board independency has an association with earnings quality.

This hypothesis is stated in the alternative form, the null hypothesis is: "Ceteris paribus, board independency has no association with earnings quality."

Another board characteristic that is investigated by the literature is the directors' tenure on a board. The theory behind the influence of directors' tenure on board effectiveness has two different views. Research argues that directors with a longer tenure have more information and will therefore provide better monitoring quality (Kim et al., 2014). Another view is that the strings with management get too tight which will result in less critical monitoring (Vafeas, 2005).

Looking at the literature that investigated the relation between directors' tenure and firm performance, Livnat et al. (2016) found evidence for the positive and negative relation between

directors' tenure and earnings quality, which underlines both the views on directors' tenure. The turning point from a positive to negative relation was observed at year 9 of the directors' tenure.

Focusing on earnings quality specific as firm performance, evidence has been found that underline a positive relation between directors' tenure and earnings quality (Firoozi et al., 2016; Kim & Yang, 2014; Aishah Hashim & Devi, 2008). However, Beasley (1996) found a negative relation between directors' tenure and earnings quality. Since the theory and literature is mixed about the type of relation between directors' tenure and earnings quality, my hypothesis will be neutral.

H2: Ceteris paribus, directors' tenure has an association with earnings quality.

This hypothesis is stated in the alternative form, the null hypothesis is: "Ceteris paribus, directors' tenure has no association with earnings quality."

To investigate if the relation between directors' tenure and earnings quality has an inverted U-shape form, I will also add the average tenure squared to my research. If the average tenure itself has a positive relation with earnings quality and the average tenure squared a negative, there is indeed an inverted U-shape relation between directors' tenure and earnings quality.

5. Research design

In this section I will discuss my research design and sample selection. In the first section I discuss the dependent variable, earnings quality. In the second section the independent variables and the control variables followed by the equations per hypothesis and lastly, in the fourth section I will discuss my sample selection.

5.1. Earnings quality measures

Looking at the features of earnings quality discussed in the theoretical background, it can be hard to measure the quality of earnings. In literature there are three categories in how earnings quality is measured (Dechow et al., 2010):

1. These models will be discussed in the next section. This category focusses on the determinants that cause an earnings outcome (Dechow et al., 2010). And investigate the properties of earnings. This includes the use of (discretionary) accruals, earnings persistence and the timely loss recognition. Research in this category is mostly based on accrual models such as the Jones Model (Jones, 1990), Modified Jones Model (Dechow et al., 1995) and the Accrual Estimation Error Model (Dechow & Dichev, 2002).
2. Research that investigates the response of investors of earnings. These studies investigate the Earnings Response Coefficient (ERC) (Ball & Brown, 1968) or the R^2 of a regression that examines the relation between earnings and stock return (Dechow, 1994) to capture the informativeness of earnings. This category focusses on the consequences and the impact of the earnings quality outcome (Dechow et al., 2010).
3. Research that investigates external factors that tell something about the quality of earnings. These factors include financial restatements, Accounting and Auditing Enforcement Releases (AAERs) and other factors that indicate an error in the reported earnings (Dechow et al., 2010).

5.1.1 Accrual quality measures

The focus of this research is on the properties of earnings quality and thus accrual quality and how they are influenced by the board of directors. Therefore in this research an accrual based model to measure earnings quality will be used, since it focusses on the determinants that causes the quality and not the economic consequences of its outcome. There are several accrual based models that try to capture the quality of earnings. What these have in common is that they try to estimate the supposed level of accruals. The residual from these models, the difference between the supposed

accruals and the actual accruals, are assumed to be a measure for earnings quality. Below is an overview of the most used discretionary accrual models.

5.1.2. The Jones Model (1991)

The Jones model was introduced by Jones (1991) and was not the first model that tries to distinguish accruals between discretionary and non-discretionary accruals. However, models prior to Jones' publication¹ assumed that the difference between last period and current period accruals were solely caused by discretionary accruals and are therefore naïve because they do not capture the changes in the economic circumstances of a firm (Jones, 1991). Jones (1991) tried to overcome this problem by adding gross property, plant and equipment (PPE) and change in revenues in the estimation of total accruals. These aspects of a firms' balance sheet have influence on accruals but are assumed to be non-discretionary. Revenues are added to the equation to control for economic environment and PPE is included since it will control for the part of accruals that is related to depreciation expenses (Jones, 1991). The aim of the model is to estimate the total accruals, with revenue and PPE, via an OLS-regression. The error term of this regression are the discretionary accruals. Below are the equation made by Jones to estimate the total accruals and the non-discretionary accruals. The discretionary accruals are calculated by subtracting (1) from (2).

$$TA_t = \beta_1 \left(\frac{1}{A_{t-1}} \right) + \beta_2 (\Delta REV)_t + \beta_3 (PPE_t) + e_t \quad (1)$$

$$NDA_t = \beta_1 \left(\frac{1}{A_{t-1}} \right) + \beta_2 (\Delta REV)_t + \beta_3 (PPE_t) \quad (2)$$

Where

A_{t-1} = Total assets of t-1

ΔREV_t = Change in revenue in t with respect to t-1

PPE_t = Gross PPE in period t

5.1.3 The Modified Jones Model (1995)

The Modified Jones Model is constructed by Dechow et al. (1995). The difference of this model with respect to the Jones Model (1991) is that the Jones Model assumes that discretion is not applied on revenues and that therefore the change in revenue is solely based on non-discretionary accruals (Dechow et al., 1995). However, it is possible to exercise discretion over revenues by recognizing

¹ Healy (1985) model & De Angelo (1986) model.

revenue for which cash has not be received and it is highly questionable that it will ever be received. To address this problem Dechow et al. (1995) adjust the change in revenue over a period with the change in account receivables, to capture only the non-discretionary part of revenue. The Modified Jones Model is shown in equation (3) and (4). Similar to the Jones Model, the discretionary accruals are calculated by subtracting (1), which calculates the total accruals, from (2), which calculates the non-discretionary accruals.

$$TA_t = \beta_1 \left(\frac{1}{A_{t-1}} \right) + \beta_2 (\Delta REV - \Delta REC)_t + \beta_3 (PPE_t) + e_t \quad (3)$$

$$NDA = \beta_1 \left(\frac{1}{A_{t-1}} \right) + \beta_2 (\Delta REV - \Delta REC)_t + \beta_3 (PPE_t) \quad (4)$$

Where

A_{t-1} = Total assets of t-1

ΔREV_t = Change in revenue in t with respect to t-1

PPE_t = Gross PPE in period t

ΔREC_t = Change in net receivables in t with respect to t-1

5.1.4. The Dechow & Dichev Model (2002)

The difference between the (modified) Jones model and the model developed by Dechow & Dichev (2002) is that Dechow & Dichev argue that “even in the absence intentional earnings management, accrual quality will be systematically related to firm and industry characteristics (Dechow & Dichev, 2002, p.2). In other words: earnings quality can be low even without the intention of the management. This is why the researchers do not distinguish the intentional and unintentional accrual estimation errors, since they both result in low earnings quality. Dechow & Dichev (2002) look at the estimation error, which occurs when the accruals do not match the future realized cash flow.

The researchers argue that the estimation errors and its corrections that must be made to enhance the error, are noise that reduce the beneficial role of accruals. This means that the quality of accruals and thus earnings, can be measured by the magnitude of the accrual estimation error. The standard deviation of the estimation error implies the earnings quality of a firm.

The model tries to capture the change in working capital via an OLS-regression, including the cash flows of t-1, t and t+1. Since current accruals should be matched with cash flows within one year, the residual is the part where accruals and cash flows are not matched and indicates bad earnings quality. Dechow & Dichev (2002) measures the estimation error via the following equation:

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \varepsilon_t \quad (5)$$

Where

ΔWC_t = Change in working capital in period t, calculated as the income before extraordinary items, minus the cash flow of operations plus the total depreciation

CFO_{t-1} = Cash flow from operations for period t-1

CFO_t = Cash flow from operations for period t

CFO_{t+1} = Cash flow from operations for period t+1

Note that the dependent variable and the CFO variables in the model are scaled to average total assets per period t.

This equation tries to measure the change in working capital by the change in cash flows from last year, current year and next year. The error term is for the not matched accruals with cash flows and is the accrual estimation error.

The downside of this measure is that it only captures the current accruals and not the long-term accruals, for example depreciation, which have a significant part in the accruals (McNichols, 2002).

5.1.5. McNichols Model (2002)

The main problem with the Dechow & Dichev (2002) Model is that it only focusses on the cash flows prior, of and after t and does not take economic changes of a firm into account. McNichols (2002) tries to overcome this problem by adding the economic factors from the Jones Model (1991) into the Dechow & Dichev model. McNichols tries to capture the change working capital not only with the cash flows from t-1, t and t+1, but also takes the change in sales and PPE into account. The McNichols model is shown in equation (6) and is a combination of the Dechow & Dichev (2002) and Jones (1991) Model. Note that the dependent and all the independent variables in the model are scaled to averaged total assets per period t.

$$\Delta WC_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta Rev_t + \beta_5 PPE_t + \varepsilon_t \quad (6)$$

Where

ΔWC_t = Change in working capital in period t, calculated as the income before extraordinary items, minus the cash flow of operations plus the total depreciation

CFO_{t-1} = Cash flow from operations for period t-1

CFO_t = Cash flow from operations for period t
 CFO_{t+1} = Cash flow from operations for period t+1
 ΔREV_t = Change in revenue in t with respect to t-1
 PPE_t = Gross PPE in period t

The earnings quality itself is measured by the standard deviation of the measurement error for a period from 3 to 5 years, depending on data availability. A higher standard deviation means more variation in the estimation error, meaning there is lower earnings quality. Therefore, how higher the standard deviation of the estimation error, the lower the earnings quality.

McNichols tests the Jones Model, Dechow & Dichev Model and the McNichols Model to see which one has the highest explanatory power in an OLS-regression with the change in working capital as dependent variable. The results show that the McNichols Model has the highest explanatory power and is therefore the best model to measure the earnings quality of a firm. Furthermore it is used in more recent studies (Barua et al., 2010; Francis et al., 2005; Jones et al., 2008). Therefore, in this research I will use the McNichols Model to measure the earnings quality of a firm.

5.2 Board characteristics measures

5.2.1 Board independence

Several studies have investigated the board of directors' independency with respect to other firm factors. There are several ways to measure the board independency. Klein (2002a) used two variables to measure the independency. One was the percentage of outside directors, calculated as number of outside directors divided by the total number of directors on the board. The other one was a proxy which took a value of 1 if the board had more than 51% outside directors. However, this proxy is not usable anymore since all boards of firms listed at the NYSE and NASDAQ must have a majority of independent directors, as a reaction on the enacting of SOX in 2002 (Gupta & Fields, 2009). The percentage of outside directors is however still a widely used proxy in several studies which investigates board independency (Chen et al., 2015; Knyazeva et al., 2013; Marra et al., 2013). For the purpose of my research, I use the percentage of outside directors, calculated by number of outside directors divided by total directors, as the variable to capture the independency of a board, taken from the ISS Directors database.

5.2.2 Directors' tenure

To measure the directors' tenure I will subtract the year of service end minus the year of service begun, taken from the ISS Directors database. For directors who are in 2015 still at service, the

year 2015 will be used as year of service end to measure the directors' tenure. Otherwise it is not possible to capture the tenure of directors' who are still at service, since directors still at service do not have a year of service end date. I will take the average directors' tenure per firm year observation to capture the directors' tenure per board. This approach is similar to studies such as Kim & Yang (2014). Livnat et al. (2016) found an inverted U-shape relation between directors' tenure and firm performance. To investigate if this relation also holds stand for earnings quality, I also test if the average tenure squared has a relation with earnings quality. If the average tenure itself is positively related with earnings quality, and the average tenure squared negatively, it means that directors' tenure has an inverted U-shape relation with earnings quality.

5.2.3. Control variables

I will use several control variables in my research. The first control variable I will use is firm size. Since I measure the earnings quality with the accrual estimation error of McNichols (2002), it is expected that larger firms have better corporate governance mechanisms and have better earnings quality, therefore I will use the logarithm of total assets (Aishah Hashim & Devi, 2008). I also include return on assets (ROA) as control variable to control for firm performance. It is argued that managers of firms with bad performance will enhance earnings management to make their performance look better (Chen et al., 2015). As said earlier, earnings management erodes in earnings quality and is linked to the positive accounting theory. In extent to this, I will use a dummy control variable which takes the value of 1 if firms made a loss last year, similar as the study conducted by Klein (2002b).

Furthermore, I will use the market to book ratio to capture the growth opportunities of a firm. AlNajjar & Raihi-Belkaoui (2001) found that firms with higher growth opportunities will have a lower quality of accruals due a higher part of discretionary accruals. I will also use the leverage of a firm as a control variable, which will be calculated with the debt ratio. This is to capture the risk profile of a firm and if a larger part of shareholders in a firm has an effect on the earnings quality. Lastly, I will control for year fixed effects and industry fixed effects.

5.3 Econometrical model

In the previous section I discussed the variables I will use in my research. Below are the regression equations per hypothesis.

Hypothesis 1:

$$EQ_t = \beta_0 + \beta_1 BIND_t + \beta_2 Size_t + \beta_3 ROA_t + \beta_4 Pastloss_t + \beta_5 MTB_t + \beta_6 LEV_t + \beta_7 YearFE + \beta_8 Industry FE + \varepsilon_t \quad (6)$$

Hypothesis 2:

$$EQ_t = \beta_0 + \beta_1 Tenure_t + \beta_2 TenureSQ_t + \beta_3 Size_t + \beta_4 ROA_t + \beta_5 Pastloss_t + \beta_6 MTB_t + \beta_7 LEV_t + \beta_8 YearFE + \beta_9 IndustryFE + \varepsilon_t \quad (7)$$

Where

EQ	= Earnings quality (standard deviation of estimation error of McNichols model)
BIND	= Percentage of independent directors
Tenure	= Average directors' tenure
TenureSQ	= Average directors' tenure squared
Size	= Size, measured as the logarithm of total assets
ROA	= Return on assets (net income/ total assets)
Pastloss	= Dummy which takes a value of 1 if net income last year < 0
MTB	= Market to book ratio (market value/ total assets)
LEV	= Leverage (debt/ assets t-1)
YearFE	= Year fixed effect dummies
IndustryFE	= Industry fixed effect dummies, based on first two digits of SIC-code

5.4 Sample selection

To conduct my research, I will use a sample of U.S.A based firm. The main reason for this is that corporate governance is a widely debated topic in the U.S.A. This topic became even more widely discussed after the implementation of SOX. As discussed earlier, SOX focusses on corporate governance mechanisms such as the board of directors. Conducting this research for U.S.A. based firms will add value to the discussion about the board of directors' characteristics and its influence on firm performance. Furthermore, similar studies have been conducted in Italy (Ianniello, 2015) and Malaysia (Aishah Hashim & Devi, 2008). Another reason for the U.S.A. is that it has the required data available in the several needed databases. I will exclude financial firms from my sample, this will be done by excluding all firms with a SIC code between 6000 and 6799.

I will get my data from the Wharton Research Data Services (WRDS) system. The data which is needed to calculate the dependent variable and control variables will be subtracted from COMPUSTAT Fundamentals annual database. All the variables used to calculate the estimation error will be Winsorized by the extreme 1%. The data which will be used to capture the board characteristics will be obtained from the ISS Directors database. Furthermore, the independent variable average tenure was Winsorised by the extreme highest 1%. As for the control variables, all continues control variables are also Winsorised by the extreme 1% and incomplete observations were deleted from the sample.

The sample period used in this research is from 2007 to 2015 this period will give me the most recent data and I expect this sample period will give me enough observations. However, to generate certain variables it was needed to use data from before the sample period, so a larger dataset was obtained to create these variables.

The databases will be merged with the CUSIP code and fiscal year per firm. Table 1 provides the summary of the sample size used for the hypothesis test. The total sample exists of 8,333 firm year observations for 1,356 firms.

Table 1
Summary of sample size used for hypotheses tests

Compustat raw observation count		159,472
Less (Compustat)		
Firms with incomplete estimation error data	105,530	
Firms with less than 3 firm year observations	16,694	
Firms with incomplete control variables data	6,031	128,255
		31,217
Less (ISSDirectors merge)		
Firms without board of directors data		22,774
		8,443
Less (Industry)		
Financial industry firms		110
Sample for hypothesis 1 & 2		8,333

The sample for hypothesis 1 & 2 has firms of 53 different industries according to the 2-digit SIC code of the firms. Table 2 represents an overview of the firm observations per industry and firm. The largest industry in my sample is the industry 'Business Services' has a total of 985 observations and therefore is almost 12% of the total firm year observations. Furthermore the 'electronic industry' has a lot of observations and is in total responsible for 9% of the total observations.

When looking at table 2 it is also noticeable that the 2 SIC-codes that starts with the number 6 are missing. These are the financial industry firms that have been cut of off the sample. Furthermore there are almost none 9-digit SIC industries. This industries are governmental organizations and have no board of directors which makes them not suitable for my research.

Table 2

Observations per year and industry

2 digit SIC code	SIC description	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	Percentage
01	Agricultural - Crops	1	1	1	1	1	1	1	1	0	8	0,10%
10	Metal Mining	2	3	3	3	3	4	4	4	4	30	0,36%
12	Coal Mining	3	3	4	3	4	5	4	3	3	32	0,38%
13	Oil and Gas Extraction	20	33	31	33	42	45	50	49	49	352	4,22%
14	Mining and Quarrying	2	2	3	5	5	4	4	5	4	34	0,41%
15	Building Construction	8	8	9	9	9	9	9	9	9	79	0,95%
16	Heavy Construction	4	4	5	6	7	7	7	8	9	57	0,68%
17	Construction - Special	3	1	3	3	4	4	4	0	0	22	0,26%
20	Food and Kindred	25	31	30	34	36	36	39	39	31	301	3,61%
22	Textile Mill	2	4	4	4	4	4	4	0	0	26	0,31%
23	Apparel	9	13	13	13	14	12	13	14	10	111	1,33%
24	Lumber and Wood	7	7	7	7	6	8	8	8	6	64	0,77%
25	Furniture and Fixtures	7	7	7	7	9	9	9	9	7	71	0,85%
26	Paper and Allied	12	15	16	16	17	18	17	16	16	143	1,72%
27	Printing and Publishing	11	11	10	10	9	7	6	8	7	79	0,95%
28	Chemicals	71	78	75	72	78	75	79	86	88	702	8,42%
29	Petroleum Refining	9	13	13	11	10	10	9	10	10	95	1,14%
30	Rubber and Plastic	12	11	9	9	8	9	9	10	8	85	1,02%
31	Leather and Leather	6	6	6	6	6	5	5	6	0	46	0,55%
32	Stone, Clay, Glass, and Concrete	5	5	5	6	6	5	5	5	3	45	0,54%
33	Primary Metal	12	17	17	17	21	23	22	20	17	166	1,99%
34	Fabricated Metal	17	17	17	18	16	17	17	17	19	155	1,86%
35	Industrial and Commercial Machinery	65	68	69	67	69	66	73	71	64	612	7,34%
36	Electronic	75	89	93	94	95	94	89	82	62	773	9,28%
37	Transportation	23	33	29	30	29	30	32	31	29	266	3,19%
38	Measuring instruments	59	65	67	66	70	71	72	74	67	611	7,33%
39	Miscellaneous Manufacturing	7	9	11	10	11	11	10	7	5	81	0,97%
40	Railroad Transportation	3	3	4	4	4	5	5	5	0	33	0,40%
42	Motor Freight Transportation	6	9	8	8	8	8	10	10	11	78	0,94%
44	Water Transportation	4	5	5	5	6	6	6	8	6	51	0,61%
45	Transportation by Air	7	8	9	8	8	8	10	11	12	81	0,97%
47	Transportation Services	4	8	7	6	7	7	7	7	7	60	0,72%
48	Communications	9	16	20	21	21	25	24	26	25	187	2,24%
49	Electric, Gas and Sanitary Services	6	9	9	9	9	9	9	10	9	79	0,95%
50	Wholesale Trade - Durable Goods	30	30	30	30	29	29	26	27	24	255	3,06%
51	Wholesale Trade - Nondurable Goods	7	11	12	14	16	14	17	18	15	124	1,49%
53	General Merchandise	11	13	12	13	13	13	12	11	11	109	1,31%
54	Food Stores	4	5	5	4	6	7	5	5	0	41	0,49%
55	Automotive Dealers	7	10	10	9	11	10	10	11	11	89	1,07%
56	Apparel and Accessory Stores	19	21	19	19	22	20	21	21	20	182	2,18%
57	Home Furniture and Equipment	4	5	5	5	5	5	5	5	0	39	0,47%
58	Eating and Drinking Places	20	22	23	23	21	20	20	20	19	188	2,26%
59	Miscellaneous Retail	18	19	20	20	21	21	20	20	17	176	2,11%
70	Hotels and Lodging Places	1	2	2	2	2	2	3	3	2	19	0,23%
72	Personal Services	4	4	4	4	3	0	0	0	0	19	0,23%
73	Business Services	88	103	107	111	119	117	125	116	99	985	11,82%
75	Automotive Repair, Services	0	0	0	0	2	0	2	2	0	6	0,07%
78	Motion Pictures	2	2	2	2	3	3	3	2	0	19	0,23%
79	Amusement and Recreation Services	4	6	5	6	6	6	6	4	4	47	0,56%
80	Health Services	18	26	24	24	22	19	17	14	16	180	2,16%
82	Educational Services	6	7	8	8	9	9	9	8	7	71	0,85%
87	Management & Related Services	13	17	18	18	20	18	16	18	15	153	1,84%
99	Nonclassifiable Establishments	1	3	3	3	2	1	1	1	1	16	0,19%
Total		773	918	928	936	984	971	990	975	858	8333	100%

6. Empirical results and analysis

6.1 Descriptive statistics

Table 3 represents the descriptive statistics of the dependent, independent and control variables used in the regressions. On average, a board consists for 78.8% of independent directors which is above the required amount. Furthermore, directors are on average 10.5 years member of a board and the longest tenure of a directors is 22 years in this sample. Looking at the control variables, there are firms in the sample with no leverage whatsoever and firms which are almost completely leveraged (92.6%). Furthermore there are firms in my sample with a market to book ratio of 5.9, which means that these firms have high growth potential. Lastly, when looking at the past year loss dummy, we see that in a total of 8,333 firm year observations, only 12.4% made a loss.

Table 3
Summary statistics of main variables

Variable	Obs	Mean	Median	SD	Min	Max
<i>EQ</i>	8,333	0.070	0.056	0.053	0.000	0.601
<i>BIND</i>	8,333	0.788	0.800	0.110	0.000	1.000
<i>Tenure</i>	8,333	10.531	10.000	3.771	3.000	22.091
<i>Size</i>	8,333	7.768	7.619	1.532	4.861	11.870
<i>ROA</i>	8,333	0.052	0.058	0.087	-0.362	0.266
<i>Pastloss</i>	8,333	0.124	0.000	0.330	0.000	1.000
<i>MTB</i>	8,333	1.384	1.076	1.082	0.138	5.892
<i>LEV</i>	8,333	0.211	0.186	0.193	0.000	0.926

EQ is the standard deviation of the residual of de McNichols (2002) model; *BIND* is the percentage of independent directors in a board; *Tenure* is the average tenure of the directors in a board; *Size* is the LN of total assets; *ROA* is return on assets; *Pastloss* is a dummy that takes the value of 1 if last year net income was < 0; *MTB* is market to book ratio; *LEV* is the total debt divided by lagged total assets. Continued variables are Winsorized by the extreme 1%.

To investigate the correlation between the variables, table 4 shows the Pearson correlation matrix including the significance of the relation. This table shows that the average tenure is negatively and significant correlated with the standard deviation of the estimation error. However, the correlation between the independency of the board and the standard deviation of the estimation error is not significant. Furthermore, there are significant correlations between all the control variables and the standard deviation of the estimation error, the dependent variable.

Table 3
Pearson Correlation
matrix

	1	2	3	4	5	6	7	8
<i>EQ (1)</i>	1							
<i>BIND (2)</i>	-0.009 (0.406)	1						
<i>Tenure (3)</i>	-0.092 (0.000)	-0.361 (0.000)	1					
<i>Size (4)</i>	-0.171 (0.000)	0.231 (0.000)	-0.148 (0.000)	1				
<i>ROA (5)</i>	-0.133 (0.000)	-0.015 (0.179)	0.055 (0.000)	0.056 (0.000)	1			
<i>Pastloss (6)</i>	0.135 (0.000)	-0.008 (0.481)	-0.023 (0.035)	-0.115 (0.000)	-0.359 (0.000)	1		
<i>MTB (7)</i>	0.055 (0.000)	-0.099 (0.000)	0.064 (0.000)	-0.289 (0.000)	0.463 (0.000)	-0.164 (0.000)	1	
<i>LEV (8)</i>	-0.050 (0.000)	0.110 (0.000)	-0.111 (0.000)	0.290 (0.000)	-0.118 (0.000)	0.033 (0.002)	-0.270 (0.000)	1

EQ is the standard deviation of the residual of de McNichols (2002) model; BIND is the percentage of independent directors in a board; Tenure is the average tenure of the directors in a board; Size is the LN of total assets; ROA is return on assets; Pastloss is a dummy that takes the value of 1 if last year net income was < 0; MTB is market to book ratio; LEV is the total debt divided by lagged total assets. The numbers between brackets are the exact significance levels of the correlations.

6.2 Regression results

Table 5 presents the results of models 1 and 2 together. The regressions have an adjusted R² around 20% meaning that this regression with its independent variables explains the fluctuation in the standard error of the estimation error for round 20%.

The first hypothesis is “Ceteris paribus, board independency has an association with earnings quality.” Several studies found a positive relation between board independence and firm performance (Knyazeva et al., 2013) and some did not found a significant relation (Bhagat & Black, 2000). However, there is also literature that states that too much independent board will have a negative impact on the firm since it has a lack of inside information. Therefore I expect a relation but I am not confident about the sign.

As shown, there is a positive relation between board independency and the standard deviation of the estimation error, meaning that the more independent a board is, the lower the earnings quality is. However, the relation is only significant at the 0.1 level. The results can be explained by the theory of Bhagat & Black (2000) that too much independent directors may lead to a lack of inside information and are therefore not able to monitor the senior management properly. Especially with respect to earnings quality, since understanding the reported earnings is hard to monitor without inside detailed inside information. This means that a firm with a high percentage of independent directors can better their earnings quality by lowering the amount of independent directors in their board.

Dechow et al. (2010) and Chen et al. (2015) found that board independency leads to a lower amount of discretionary accruals, but as Dechow & Dichev (2002) argued: even in the absence of discretionary accruals, earnings quality may be low. These results underline the difference between earnings management and earnings quality and the difference in the measuring methods. Meaning it may be the reason these results are different as the one of Dechow et al. (2010) and Chen et al. (2015). I can conclude that hypothesis 1 is true at the significance level of 0.1 and that there is a negative association between board independence and earnings quality.

The second hypothesis tests the potential influence of directors' tenure and earnings quality. Since there are different views whether the effect of tenure on earnings quality has a positive or a negative effect on earnings quality, namely it can have a positive effect since directors' know more about the company the longer they are on the board (Kim et al., 2014), or it can have a negative effect since the strings with the management can get too tight which will result in less efficient monitoring (Vafeas, 2005). Therefore I assume a relation, but am not able to predict if the relation will be positive or negative. The results of the regression analysis are in table 5.

As reported in table 5, there is a negative relation between the average tenure of a board and the earnings quality proxy. That said, there is a positive relation between the average tenure of a board and the earnings quality. These results corroborate the theory of Kim et al. (2014) that when directors are longer a part of the board and have attended to more meetings will result in better firm performance and thus earnings quality, since they are more experienced with the firms' strategies policies and operations.

In addition to the research of Livnat et al. (2016) I added the variable average tenure square, to investigate if the relation between average tenure and earnings quality has an inverted U shape relation. The results in table 5 show a positive and highly significant relation between the average tenure squared and the earnings quality of a firm, meaning that the average tenure of a board indeed has an inverted U shape relation.

Table 5
Regression estimates of earnings quality variables

Variable	Predicted sign	Board independency (H1)		Directors' tenure (H2)	
		Coefficient		Coefficient	
<i>Constant</i>		0.105 *** (0.000)		0.142 *** (0.000)	
<i>BIND</i>	?	0.009 * (0.068)			
<i>Tenure</i>	?			-0.004 *** (0.000)	
<i>Tenure sq</i>	?			0.000 *** (0.001)	
<i>Size</i>	-	-0.006 *** (0.000)		-0.007 *** (0.000)	
<i>ROA</i>	-	-0.072 *** (0.000)		-0.068 *** (0.000)	
<i>Pastloss</i>	+	0.014 *** (0.000)		0.013 *** (0.000)	
<i>MTB</i>	+	0.005 *** (0.000)		0.005 *** (0.000)	
<i>LEV</i>	?	-0.000 (0.923)		-0.002 (0.542)	
<i>Year fixed effect</i>		Yes		Yes	
<i>Industry fixed effects</i>		Yes		Yes	
<i>Adjusted R²</i>		0.203		0.217	
<i>N</i>		8,333		8,333	

*** denotes the significance at the 0.01 level, * denotes the significance at the 0.1 level; Earnings quality is the standard deviation of the residual of de McNichols (2002) model; BIND is the percentage of independent directors in a board; Tenure is the average tenure of the directors in a board; Tenure sq is the average tenure of a board squared; Size is the LN of total assets; ROA is return on assets; Pastloss is a dummy that takes the value of 1 if last year net income was < 0; MTB is market to book ratio; LEV is the total debt divided by lagged total assets. The numbers between brackets are the exact significance levels of the coefficients. The models include industry and year fixed effects.

Livnat et al. (2016) found this relation for average board tenure and firm performance and these results give evidence for the same relation with earnings quality. An explanation for these results may be that when time passes, directors get more familiar with the firm and acquire more knowledge, which will improve their monitoring. However, when time passes, strings with the management could get too tight which would lower their objectivity and monitoring.

Furthermore, the results are contradicting with the results of Beasley (1996), who found a negative relation between earnings quality and directors' tenure. An explanation for the different results may be that reporting fraud means there is low earnings quality, but not the other way around. And even in the absence of reporting fraud, earnings quality may be low.

From the results I can conclude that hypothesis 2 is true at the significance level of 0.01 and that there is an inverted U shape relation between directors' tenure and earnings quality.

In addition to investigating the results, I can conclude that most of the control variables are highly significant. These results may help investors when evaluating a firm and the quality of its reported earnings. For instance, there is a negative relation between the past year loss dummy and the earnings quality, which means that when a firm made a loss last year, the earnings quality will be lower the next year. Furthermore it is noticeable that firms with a higher market to book ratio, an indication for growth options have lower earnings quality. This could be explained by the fact that growth options come along with a high amount of uncertainty which is reflected in the earnings quality.

Lastly, the results show that the profitability of a firm is positively related with the earnings quality of a firm. The other way around it means that firms that are not that profitable have lower earnings quality. This can be explained by the positive accounting theory, which describes that managers have incentives to make the earnings look nicer than they are, because they are pressured by their bonus plans or debt covenants.

6.3 Sensitivity tests

6.3.1 Discretionary accruals

To test the sensitivity of my results I will conduct several robustness tests. First I will conduct the same research but instead of using the McNichols (2002) model, I will use the Modified Jones (1995) model as proxy to capture the earnings quality. This model is used to capture the amount of discretionary accruals and is used to measure the amount of earnings management in a firm. In this research is specifically choose for the McNichols (2002) model because even in the absence of earnings management, earnings quality may be low (Dechow & Dichev, 2002). However, the other way around, earnings management erodes in low earnings quality and therefore, earnings quality will always be

low if earnings management is present. This makes the amount of discretionary accruals an appropriate proxy to conduct a robustness test with. In table 6 are the results.

Table 6
Regression estimates of discretionary accruals variables

Variable	Predicted sign	Board independency (H1)	Directors' tenure (H2)
		Coefficient	Coefficient
<i>Constant</i>		0.045 *** (0.000)	0.033 *** (0.000)
<i>BIND</i>	?	-0.010 * (0.076)	
<i>Tenure</i>	?		0.000 ** (0.015)
<i>Tenure sq</i>	?		0.000 (0.556)
<i>Size</i>	-	-0.003 *** (0.000)	-0.003 *** (0.000)
<i>ROA</i>	-	0.370 *** (0.000)	0.369 *** (0.000)
<i>Pastloss</i>	+	0.008 *** (0.000)	0.008 *** (0.000)
<i>MTB</i>	+	-0.016 *** (0.000)	-0.016 *** (0.000)
<i>LEV</i>	?	-0.010 ** (0.003)	-0.010 *** (0.004)
<i>Year fixed effect</i>		Yes	Yes
<i>Industry fixed effects</i>		Yes	Yes
<i>Adjusted R²</i>		0.246	0.276
<i>N</i>		7,051	7,051

*** denotes the significance at the 0.01 level, ** denotes the significance at the 0.05 level; Earnings quality is the standard deviation of the residual of de McNichols (2002) model; BIND is the percentage of independent directors in a board; Tenure is the average tenure of the directors in a board; Tenure sq is the average tenure of a board squared; Size is the LN of total assets; ROA is return on assets; Pastloss is a dummy that takes the value of 1 if last year net income was < 0; MTB is market to book ratio; LEV is the total debt divided by lagged total assets. The numbers between brackets are the exact significance levels of the coefficients. The models include industry and year fixed effects.

A higher amount of discretionary accruals means higher earnings management and therefore lower earnings quality. Therefore, in this model a positive coefficient means it has a negative effect on earnings quality. Table 6 shows a negative relation between board independence and the amount of discretionary accruals. Meaning that board independence has a positive relation with earnings quality. This relation is significant at the 10% level.

Furthermore, the coefficient of the average board tenure and average board tenure squared, have a positive relation with the amount of discretionary accruals. In this model, the tenure squared has however no significant relation with the amount of discretionary accruals. The results of this analysis underline the positive relation between board independence and earnings quality, however, they do not underline the inverted U shape relation between directors' tenure and earnings quality, since the tenure squared is not significant. A reason for a positive relation between the directors' tenure and the amount of discretionary accruals could be that the strings between the directors' and the management get too tight and therefore lowers the monitoring quality of the board of directors (Vafeas, 2005).

6.3.2 Firm fixed effects

In the main regression I controlled for industry and year fixed effects. However, I did not control on firm fixed effects. Controlling for firm fixed effects creates a model where the explanatory power of the earnings quality is solely based on firms specifically and not on industry or year. In table 7 are the results of the regression with firm and year fixed effects.

Table 7 shows the results when controlling for firm fixed effects. When looking at the results of hypothesis 1, it is noticeable that the relation between board independence and earnings quality is not significant anymore and the control variables when from significant at the 0.01 level to the 0.1 level.

Furthermore, the inverted U shape relation between directors' tenure and earnings quality holds stand when controlling for firm fixed effects, which means the results are robust. What is also interesting is the increased explanatory power of the regressions, which were around 21 % in the main regression and are 62% when controlling for firm fixed effects.

This means that the fluctuation in the standard error of the estimation residual is largely explained by firm specific fixed effects. This is not strange, since the variables used to calculate the standard error of the estimation residual are all firm specific variables.

Table 7
Regression estimates of earnings quality variables

Variable	Predicted sign	Board independency (H1)		Directors' tenure (H2)	
		Coefficient		Coefficient	
<i>Constant</i>		0.236 *** (0.000)		0.243 *** (0.000)	
<i>BIND</i>	?	-0.006 (0.364)			
<i>Tenure</i>	?			-0.004 *** (0.000)	
<i>Tenure sq</i>	?			0.000 *** (0.001)	
<i>Size</i>	-	-0.021 *** (0.000)		-0.020 *** (0.000)	
<i>ROA</i>	-	-0.038 *** (0.000)		-0.038 *** (0.000)	
<i>Pastloss</i>	+	0.002 * (0.086)		0.002 * (0.083)	
<i>MTB</i>	+	0.001 * (0.077)		0.002 * (0.059)	
<i>LEV</i>	?	0.008 * (0.060)		0.007 * (0.070)	
<i>Year fixed effect</i>		Yes		Yes	
<i>Firm fixed effect</i>		Yes		Yes	
<i>Adjusted R²</i>		0.620		0.621	
<i>N</i>		8,333		8,333	

*** denotes the significance at the 0.01 level, * denotes the significance at the 0.1 level; Earnings quality is the standard deviation of the residual of de McNichols (2002) model; BIND is the percentage of independent directors in a board; Tenure is the average tenure of the directors in a board; Tenure sq is the average tenure of a board squared; Size is the LN of total assets; ROA is return on assets; Pastloss is a dummy that takes the value of 1 if last year net income was < 0; MTB is market to book ratio; LEV is the total debt divided by lagged total assets. The numbers between brackets are the exact significance levels of the coefficients. The models include year and firm fixed effects.

6.3.3 Industry robustness

The last robustness test is focused on a specific industry. Looking at table 2, it can be concluded that the industry 'Business services' (11.82%) is overrepresented compared to other firms. It is therefore interesting to investigate if the results are robust when the research is conducting without n a single sensitive industry. I therefore rerun the analysis without the industry 'Business services' because it is the largest industry in my sample. In table 8 are the results.

Table 8 shows that the relation between board independence and earnings quality is also negative, similar as the main results. However, with the removing of the industry 'Business services' this the relation is not significant anymore. Furthermore, the relation between average board tenure and earnings quality is positive and significant as well as the relation between average tenure squared and earnings quality. However, this coefficient is positive which underlines the inverted U-shape relation between directors' tenure and earnings quality. This means that regarding the directors' tenure, the results are robust when removing the industry 'business services' from the total sample, but the relation between board independence and earnings quality is not.

Table 8

Regression estimates of earnings quality variables without SIC 73

Variable	Predicted sign	Board independency (H1)		Directors' tenure (H2)	
		Coefficient		Coefficient	
<i>Constant</i>		0.108 ***		0.145 ***	
		(0.000)		(0.000)	
<i>BIND</i>	?	0.005			
		(0.267)			
<i>Tenure</i>	?			-0.004 ***	
				(0.000)	
<i>Tenure sq</i>	?			0.000 ***	
				(0.000)	
<i>Size</i>	-	-0.006 ***		-0.006 ***	
		(0.000)		(0.000)	
<i>ROA</i>	-	-0.066 ***		-0.063 ***	
		(0.000)		(0.000)	
<i>Pastloss</i>	+	0.013 **		0.013 **	
		(0.000)		(0.000)	
<i>MTB</i>	+	0.006 ***		0.006 ***	
		(0.002)		(0.000)	
<i>LEV</i>	?	-0.003		-0.005	
		(0.318)		(0.142)	
<i>Year fixed effect</i>		Yes		Yes	
<i>Industry fixed effects</i>		Yes		Yes	
<i>Adjusted R²</i>		0.218		0.208	
<i>N</i>		7,348		7,348	

*** denotes the significance at the 0.01 level, ** denotes the significance at the 0.05 level; Earnings quality is the standard deviation of the residual of de McNichols (2002) model; BIND is the percentage of independent directors in a board; Tenure is the average tenure of the directors in a board; Tenure sq is the average tenure of a board squared; Size is the LN of total assets; ROA is return on assets; Pastloss is a dummy that takes the value of 1 if last year net income was < 0; MTB is market to book ratio; LEV is the total debt divided by lagged total assets. The numbers between brackets are the exact significance levels of the coefficients. The models include industry and year fixed effects.

7. Conclusion and discussion

7.1 Conclusion

The board of directors is an important governance mechanism that monitors the senior management and must ensure that management does not act opportunistic. Due scandals as WorldCom, the debate about corporate governance mechanisms that should monitor senior management has risen and in 2002, SOX was enacted to improve the quality of the corporate governance structure and the quality of the financial report. This included rules about board characteristics such as a minimum percentage of independent directors. With the enacting of SOX, it is assumed that board characteristics have influence on the performance of a firm and in specific the quality of the reported earnings. It is therefore interesting to investigate if certain board characteristics have influence of earnings quality. This led to the research question: "Are board characteristics associated with earnings quality?"

This research examines the association between board independence and earnings quality and the directors' tenure and earnings quality. Board independency was measured as the proportion of outside directors on a board and the directors' tenure was measured as the average directors' tenure per board per firm year. The earnings quality itself was measured via the McNichols (2002) model which tries to estimate change in working capital by estimators. The standard deviation of the estimation error captures the earnings quality of a firm. A higher standard deviation means lower earnings quality.

The first hypothesis examines the relation between board independence and earnings quality and found a negative relation between board independence and earnings quality. Given the fact that due SOX the board independence must be above 50%, the results can be interpreted that too much board independency leads to a lack of inside information which lowers the monitoring quality of a board. This means that firms with a high proportion of independent directors and low earnings quality, may choose for more dependent directors to improve their quality.

The second hypothesis examines the relation between average directors' tenure and earnings quality. Where the relation between board independence and earnings quality was investigated linearly, the relation between average directors' tenure and earnings quality was investigated exponentially, since previous research showed an inverted U shape between average directors' tenure and firm performance. This made it interesting to investigate if this relation also applies for earnings quality. The results of hypothesis two show a positive relation between earnings quality and average tenure, but a negative when the tenure is squared, meaning that there is an inverted U shape relation. Which means that when time passes, directors' get more familiar with the firm and acquire more knowledge about operations and industry. This will improve the monitoring quality. But when a certain

amount of time passes, the strings with the management may get too tight which will lower the monitoring quality of the board of directors.

The research question of this research was: “Are board of directors characteristics associated with earnings quality?” The answer to this question is yes and specifically, board independence has a negative influence on earnings quality and average directors’ tenure has an inverted U shape relation with earnings quality.

7.2 Contribution

Most literature focused on board characteristics examined the relation between the board and firm performance (Knyazeva et al., 2013; Terjesen et al., 2016; Livnat et al., 2016). Furthermore, a lot of research has also been done about the relation between board characteristics and earnings management (Klein 2002a; Chen et al., 2015). But as said earlier, the quality of the reported earnings may be low, even in the absence of earnings management (Dechow et al., 2010).

However, less research has been done about the association between board characteristics and earnings quality and the researches that has study this relation were all done outside the U.S.A. With the enacting of SOX and the ongoing debate about the effectiveness of corporate governance mechanisms, it is interesting to investigate the relation between board characteristics and earnings quality with an U.S.A. sample.

The results of this research contribute to the debate on how board of directors should be composed. For instance, firms with a board that has a high proportion of independent directors that want to improve their earnings quality may consider settling more dependent directors. The control variables in the result also give interesting knowledge about earnings quality. For instance, there is a negative relation between the profitability of a firm and the earning quality. This can be interesting for investors who question the quality of the reported earnings.

7.3 Limitations

Despite the contribution of this research, there are also some limitation with this research. I have examined the relation between board independence and earnings quality, but have not investigated the optimal setting. This would contribute more to the ongoing debate since it will give clearer direction in how a board should be composed.

In extend to this, with this research I only investigate the type of relation between average directors’ tenure and earnings quality, which is an inverted U shape relation. This means that there must be a peak which is the optimal average tenure of directors’ in relation with earnings quality. In this research I did not investigate the optimal average tenure. I also did distinguish independent and

dependent directors when measuring the average directors' tenure. The influence of directors' tenure on earnings quality may be different for independent directors than dependent directors.

Furthermore, I tried to capture earnings quality with using the McNichols (2002) model. However, this only captures one aspect of earnings quality and focusses on the determinants of earnings. There are other ways to capture earnings quality, such as capturing the consequences and investors reaction to the outcome of earnings quality. Another way to measure earnings quality could be via capturing the financial restatements.

7.4 Further research

In extend to the limitations of my research, it is interesting to investigate the optimal board independence and average directors' tenure with respect to earnings quality. When conducting such a research for board independence, the research should be conducted outside the U.S.A., since the U.S.A. has specific rules about board independence which would influence the results of this research.

The results of the second hypothesis showed that when the average directors' tenure is too high, the earnings quality will lower, which could be the result of tighter strings with the senior management. However, this may be different for independent directors than dependent directors, since dependent already had strings with the management before entering the board. It is interesting to investigate the relation between directors' tenure and earnings quality, but distinguishing the average directors' tenure in average independent directors' tenure and dependent directors' tenure.

8. References

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