

Non-GAAP based compensation, corporate governance and firm characteristics

Early evidence on the relation

Master Thesis

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Abstract

The purpose of this thesis is to provide evidence on the usefulness of non-GAAP measures by using a novel dataset of hand-collected information on the usage of non-GAAP measures in the as of yet neglected executive compensation setting. By looking at the effect of governance quality and other firm characteristics on the use of non-GAAP based compensation, I provide early evidence consistent with the arguments of proponents, as my results show a positive effect of governance quality on the use of non-GAAP measure, indicating the measures are useful for compensation purposes and, by extension, useful in general. Further, the results show the use of non-GAAP based compensation is widespread. These results have important implications for investors and regulators alike. Investors can use whether the measures was used in compensation contracts and the governance quality as factors in their judgement on the trustworthiness and usefulness of non-GAAP measures, while regulators gain important information on the use in the compensation setting, which they can use in their review of their current regulation regarding this setting.

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Chapter 1: Introduction

The use of non-GAAP financial measures, performance measures defined by firms that exclude or include numbers that are included and excluded from the traditional results reported under accounting standards, continues to be a hot topic for academics, regulators and the financial press alike. For instance, the SEC released new interpretation guidance on their regulation surrounding non-GAAP measures last May and the chairman of the International Accounting Standards Board, Hans Hoogervorst, warned for misleading use of the measures the year before (Agnew, 2016; SEC, 2016). This attention is unsurprising given that use of these measures by firms is widespread and still on the rise, with 88% of S&P 500 firms using at least one non-GAAP measure during the third quarter of 2015 and this figure rising to 96% for the fourth quarter of 2016 (Audit Analytics, 2017). Further, there is a fierce (theoretical) debate surrounding the use between proponents who argue for the practice due to the perceived informativeness and therefore usefulness of the disclosures, and opponents who argue against the practice due to the potential for opportunism and ability to mislead investors.

However, the attention has insofar focused on the use by firms in their annual or quarterly financial statements and accompanying press releases, thereby focusing on the financial disclosure setting of firms informing their investors. This while use by firms in executive compensation contracts is also widespread and on the rise. A different study by audit analytics (2016) found that between 2009 and 2016, the use of non-GAAP language in proxy statements rose from just under 20% to nearly 60% of researched firms. Their research also found less strict regulation surrounding this use in executive compensation, the most significant difference being no mandated disclosure of a reconciliation between the non-GAAP measure and the corresponding GAAP measure.

This gap in the literature and regulation for the use in executive compensation is surprising, as the debate between usefulness and opportunism from the disclosure settings holds in the executive compensation setting as well. One of the goals of executive compensation is aligning incentives between management and shareholders in an effort to ensure management acts in the best interest of shareholders and curb management opportunism. For a performance measure to be useful for compensation purposes, it needs to meet these goals and should therefore be useful for shareholders as well (Murphy, 1999). Research on the use in the compensation setting can, therefore, provide valuable evidence in the debate surrounding usefulness and opportunism.

The purpose of this thesis is to help fill this gap in the literature and provide early evidence surrounding the usefulness of non-GAAP measures by providing evidence on the effect of

governance quality on the likelihood of firms using non-GAAP based compensation. This is done by answering the following research question:

Does governance quality influence the decision to compensate based on non-GAAP measures?

I hypothesise that high quality boards are better equipped to compensate based on truly useful measures while lower quality boards are more likely to succumb to management pressures and opportunism (Bebchuk & Fried, 2003; Klein, 2002a). A (lack of) difference in use between governance quality therefore shows evidence on the usefulness of non-GAAP measures in the compensation setting according to the board, and by extension, the usefulness in general. As such, the answer to the research question will provide evidence on the usefulness of non-GAAP measures in the compensation setting and, by extension, in general.

Further, I provide evidence on the effects of other firm characteristics in the compensation setting found by prior research by Lougee and Marquardt (2004) to influence the use, usefulness and opportunism of non-GAAP measures in the disclosure setting, showing early evidence of which effects transfer between settings.

The data on the compensation decision is hand-collected from a random sample of 611 DEF14A proxy statements issued between 2006 and 2015, consisting of 265 unique firms, with the final sample consisting of 127 observations across 60 firms between 2009 and 2015 due to data availability issues. This data is then combined with data on governance quality and other firm characteristics in a logistic regression model, using an index consisting of twelve characteristics of high quality governance adapted from prior literature such as Aggarwal, Erel, Stulz and Williamson (2009) and Isidro and Marques (2013) to capture governance quality.

Results show a significant portion of the researched firm use non-GAAP measures for executive compensation, with 64.6% of firms using at least one non-GAAP measure in their compensation contracts for the year. Further, results of the regression show a highly significant, positive relation between governance quality and the likelihood of a firm using non-GAAP measures for executive compensation, indicating governance quality is a major influence on the decision by the board to compensate based on non-GAAP measures. Given firms that are better equipped to compensate on useful measures given their higher governance quality are more likely to use non-GAAP measures, these results also indicate these measures are useful measures of firm performance. This result therefore provides evidence on the side of the proponents of non-GAAP measures. However, the effects of many other firm characteristics do not transfer between the two settings,

such as the effect of director experience and expertise or low GAAP earnings informativeness. The effect of loss reporting transfers only very mildly between settings. With an effect of loss reporting generally seen as evidence of opportunistic use, this is a positive difference. Lastly, robustness checks are performed for the effect of using an index approach to governance, differing methods of dealing with outliers and other audit quality measures, none of which alter the main results on the effect of governance quality.

This thesis contributes to the growing amount of research into non-GAAP measures. As mentioned, there is a striking gap in the literature surrounding the use of these measures in executive compensation contracts. Using the effect of governance quality and other firm characteristics, this thesis provides early evidence on the usefulness in the compensation setting, and by extension, usefulness in general, thereby adding to the existing literature on the usefulness in the disclosure setting such as Entwistle Feltham and Mbwagu (2010) and Lougee and Marquardt (2004). Further, by researching the effect of governance quality and other firm characteristics in the compensation setting, I provide early evidence on which found firm characteristics transfer between the different settings, adding to papers such as Isidro and Marques (2013) and Jennings and Marques (2011), who researched the effect of governance quality on the use of non-GAAP measures, and, again, Lougee and Marquardt (2004) who researched the effect of firm characteristics on the use of non-GAAP measures.

The results have important implications for investors and regulators. The usefulness of non-GAAP measures used for executive compensation by firms with high governance quality gives investors two factors to use in their judgement on the usefulness and trustworthiness of non-GAAP measures reported by firms. However, given this is early evidence on the usefulness, a healthy level of scepticism is still required. The usefulness and high use should be cause for regulators to evaluate their regulation surrounding the use of non-GAAP based compensation and closely monitor the use in compensation contracts.

The remainder of the thesis is organised as follows. First, chapter two describes the theoretical framework, explaining the theory underlying the use non-GAAP performance measures and agency theory, before discussing relevant empirical research on non-GAAP measures, corporate governance and executive compensation. Next, chapter three outlines the research design, including the hypothesis, the regression model used to test said hypothesis and the sample selection process. Chapter four then provides the results, including descriptive statistics, a difference of means test and the main regression model before discussing the results of several robustness checks. Lastly, chapter five concludes.

Chapter 2: Theoretical background

In this chapter I provide the theoretical background for my thesis by first explaining relevant theories and concepts, such as the intuition behind non-GAAP earnings, in a theoretical framework. Afterwards I give an overview of the relevant empirical research on non-GAAP measures, corporate governance and performance measurement in compensation contracts in a literature review.

2.1 Theoretical framework

This paragraph will explain several important theories and concepts for my thesis. Paragraph 2.1.1 explains the theory behind the use and misuse of non-GAAP measures. Paragraph 2.1.2 explains Agency theory and how it relates to corporate governance and executive compensation.

2.1.1 Non-GAAP financial measures

Nowadays, firms often supplement their traditional accounting numbers in their annual reports or other announcements with so called non-GAAP, street or pro forma measures¹. As the name non-GAAP implies, these are financial measures that do not follow rules set out in accounting standards but are instead created by the firm itself. Firms take their traditional GAAP result and either exclude items that are or should be included in the traditional result or add items that are or should not be included in the traditional GAAP result, thereby creating their own performance measure (Marseille & Vergoossen, 2005).

The use of non-GAAP measures by companies is widespread and still on the rise. Recent research by Audit Analytics shows that 88% of S&P 500 firms used at least one non-GAAP measure in their third quarter 2015 8-K filings, with the figure rising to 96% for the fourth quarter 2016 filings (Audit Analytics, 2017). Their 2015 results also show that 95% of the firms that use non-GAAP measures use more than one, with the highest found usage being a staggering 33 non-GAAP measures (Audit Analytics, 2015).

In order to understand this widespread use of non-GAAP measures it is necessary to understand the use and usefulness of accounting information in general. The usefulness of accounting information stems from its ability to provide interested parties with relevant information for their decision making. For instance, investors decide based on the accounting information whether to keep, sell or buy certain stocks. The main purpose of accounting standards is to help ensure accounting information is useful for the stakeholders of the firm in many different ways (Deloitte, 2016a).

¹ the names are used interchangeably for the same concept.

The use of non-GAAP measures can be explained through this usefulness perspective of accounting information. Proponents of the measures, such as managers, argue that the usefulness, generally measured as the value relevance of the measures, is higher than of traditional GAAP numbers (Bhattacharya, Black, Christensen, & Larson, 2003; Entwistle, Feltham, & Mbagwu, 2010). There are several reasons for this:

The first of these is the non-recurring nature of certain items that have to be included in the GAAP result. Traditional GAAP net income includes special or transitory items such as restructuring charges or gains and losses from assets sales, which will not be part of the result in the future (Bhattacharya, Black, Christensen, & Mergenthaler, 2004). Due to their non-recurring nature, these items add noise to the earnings measure. This noise could cause predictions of future performance to be based on wrong assumptions about future performance. By excluding such non-recurring items from the non-GAAP measure, the measure shows the level of income that can be seen as sustainable, making it a better measure to predict future performance. This in turn means it is a more useful measure for the valuation and monitoring functions of accounting information than the traditional net income (Bhattacharya, Black, Christensen, & Larson, 2003; Entwistle, Feltham, & Mbagwu, 2010, 2012; Phillips, Luehlfing, & Vallario, 2002; PWC, 2010).

Management itself has been found in research to consider the ability of earnings to predict future earnings by being sustainable and properly reflecting underlying operations to be the most important factor for earnings quality, giving more power to this usefulness perspective (Dichev, Graham, Harvey, & Rajgopal, 2013).

A second reason is the lower usefulness of traditional GAAP earnings for some industries. Research has shown that traditional GAAP earnings may not be as useful to investors in intangible heavy industries such as high-tech or pharmaceutical companies. These firms have a high amount of costs related to intangibles, such as research and development (R&D) or advertising, which are likely to lead to future earnings, but generally have to be expensed under current GAAP standards unless strict criteria are met. This then distorts traditional GAAP earnings, lowering their ability to help predict future earnings, in turn lowering their usefulness. Management can use its discretion in defining the non-GAAP measures to provide a measure that can better predict future performance and is therefore more useful for investors (Lougee & Marquardt, 2004).

A final way in which non-GAAP measures can provide (more) useful information is by allowing management to provide insider information, thereby lowering information asymmetry. They allow management to show performance measures they feel properly reflect the performance of the firm or are otherwise used internally by the firm. This can best be seen in the segment reporting

section, where showing the internally used measures is mandatory under IFRS 8 (Brouwer & Knoops, 2015).

However, the practice has received significant criticism as well. Non-GAAP disclosures are inherently a voluntary act by management, giving them a large amount of discretion, such as naming conventions or the formulas used to calculate them. This discretion combined with the fact the measures are generally unaudited and not subject to strict regulation causes opponents to argue management has opportunistic motives for their use of non-GAAP measures, such as misleading investors or influencing investor perceptions, rather than a desire to provide useful information (Doyle, Jennings, & Soliman, 2013; Frankel, McVay, & Soliman, 2011).

Management has several incentives to opportunistically use non-GAAP measures to mislead or influence investors and other stakeholders. Most of these are related to the stock market. Management has several strong incentives to influence stock market participants and keep share prices stable.

Management has strong incentives to meet or beat benchmarks such as analyst consensus forecasts. Failure to do so results in a strong negative reactions in stock price due to doubts about potential future performance, with successful firms being rewarded instead (Graham, Harvey, & Rajgopal, 2005). When the GAAP result disappoints, management can use non-GAAP measures to influence the reaction of the stock market by showing a non-GAAP measure that does beat the benchmark, improving the perception of firm value by investors and analysts. This can be done by opportunistically defining the items to include and exclude from the measure, a practice generally named “earnings before the bad stuff” after a similar comment made by then SEC chief accountant Lynn Turner (SEC, 2000).

Next to opportunistically defining the non-GAAP measure, management can also show the non-GAAP measure more prominently in their annual report and earnings announcement in an attempt to influence the perception of the two measures. The non-GAAP measure can be the primary performance measure shown, being in the headline with the GAAP result following pages later, or even the only shown result in an earnings announcement (Bowen, Davis, & Matsumoto, 2005; Doyle, Lundholm, & Soliman, 2003; Entwistle, Feltham, & Mbagwu, 2010).

Management also has incentives to manage expectations when the traditional GAAP result does not disappoint, instead having to manage the expectations given the overall investor sentiment in the stock market. This because, while a positive sentiment is good for a firm as it lowers disclosure costs and overall scrutiny of the market because optimistic investors are less rigorous in their

information processing than pessimistic investors, markets that are too optimistic create expectations for the future that are similarly too optimistic, creating benchmarks that firms are unlikely to be able to meet. Therefore, firms stand to gain from managing the market sentiment, boosting it when it is too low, lowering it when it is too high and maintaining it when it is at an appropriate level. Non-GAAP measures can play an important part in this, with management therefore having incentives to opportunistically define and release the measures (Brown, Christensen, Elliot, & Mergenthaler, 2012).

A second reason to opportunistically define and calculate non-GAAP measures is to show a pattern in the non-GAAP results, such as smoothing (Cormier, Lapointe-antunes, & Magnan, 2011). This is done as stock markets hate uncertainty, at least according to managers, which patterns certainly are not. With stock markets being seen by management as their most important user of financial information and one of the most important stakeholder in general, management has incentives to please them with a pattern even if the regular results cannot (Graham, Harvey, & Rajgopal, 2005).

A final incentive for opportunistic use of non-GAAP measures to influence the stock market perceptions and expectations is executive compensation contracts. The bonus of management can depend on the stock market valuation of the firm in various ways. Management can have outstanding stock options, causing incentives to lower stock price near the grant date, and raise stock price near the sell date. Management can also receive a bonus dependent on the stock market performance of the firm, giving incentive to raise the stock price in order to maximise the awarded bonus (Frankel, McVay, & Soliman, 2011; Isidro & Marques, 2013).

It is interesting to note the opportunistic motives have strong parallels with traditional earnings management. Earnings management is defined as management using “judgement in financial reporting and in structuring transactions to alter financial reports” (Healy & Wahlen, 1999), such as reaching a specific amount in order to reach a certain goal. There are several incentives for management to manage earnings that are the same as those for opportunistic disclosure and defining of non-GAAP measures, such as pleasing capital markets by meeting expectations like benchmarks or smoothing earnings; or maximising executive compensation (Healy & Wahlen, 1999). The common incentives have given rise to the argument that opportunistic use of non-GAAP measures is strongly related to traditional earnings management, with research showing that it is a substitute for more traditional earnings management actions when the costs of these are high (Doyle, Jennings, & Soliman, 2013; Isidro & Marques, 2015).

The potential for opportunistic use is not the only problem opponents argue against the use of non-GAAP measures. Firms are free in their choice of name and items to include or exclude from the measures, which causes problems with the comparability when disclosure of these choices is also limited (Allee, Bhattacharya, Black, & Christensen, 2007). Firms can use measures with similar or the same names while using drastically different formulas to calculate them, causing the comparability between firms to suffer. Firms are also not bound to using the same formula to determine the measures over time, causing limited comparability between firms years as well (Bhattacharya, Black, Christensen, & Mergenthaler, 2004; Grant & Parker, 2002).

Given the potential for providing useful and misleading information, regulators have also taken an interest in the practice. If the measures provide more useful information than GAAP earnings this could be a sign the accounting standards themselves need to be changed, while if they are primarily opportunistic in nature, it is up to them to improve their regulation to prevent this. The current viewpoint by regulators is that non-GAAP measures can provide useful information combined with the regular GAAP result, but need careful regulation to prevent opportunistic use (Deloitte, 2016b). In order to do this, the SEC issued regulation G in 2003. This regulation requires management to provide a reconciliation to the nearest GAAP measure for any non-GAAP measure provided, thereby increasing the transparency in the choices made by management in the calculation of the measures, and prohibits them from putting more emphasis on the non-GAAP measures (Deloitte, 2016b; SEC, 2003). Regulators in the EU have not yet issued similar rules, but intend to combat opportunistic use in the near future (De Horde & Piersma, 2016).

2.1.2 Agency theory

Agency theory is one of the most commonly used theories about social interaction and contracts in economics due to the theory's applicability (Eisenhardt, 1989; Fong & Tosi, 2007). Pretty much any contract, social or otherwise, is subject to a principal-agent relationship and can therefore be subjected to the theory (Jensen & Meckling, 1976). The theory's main prediction is that any agency relationship is subject to conflicts of interest between the two parties that cannot be resolved at zero costs and, as such, give rise to agency costs for the parties involved. In their work on theory of the firm, Jensen and Meckling define an agency relationship as follows:

"We define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent." (Jensen & Meckling, 1976) (p. 308)

They then continue to argue that any such relationship in which an agent is expected to act in the best interest of the principal will give rise to actions by the agent that are not in the principal's best interest. This is because people ultimately want to maximise their own utility and agents will choose to do so at the expense of the utility of the principal in situations with diverging interests (Jensen & Meckling, 1976). This choice is possible as the principal cannot perfectly observe the actions of the agent, giving rise to information asymmetry: the agent has better information about his characteristics and actions than the principal. These two are more formally known as adverse selection and moral hazard respectively (Zajac & Westphal, 1994).

A common example is the employee-employer relationship where the employer (principal) hires the employee (agent) to do work for him or her. The agent knows whether he is a hard worker while the principal does not before he or she is hired and the agent also has better information about his or her own exerted effort on the job. As this information asymmetry cannot fully be resolved by the principal, the agent has an incentive to misrepresent his or her abilities during the interview (adverse selection) or not exert as much as effort as would be optimal for the principal, therefore shirking (moral hazard) (Alchian & Demsetz, 1972; Eisenhardt, 1989; Fong & Tosi, 2007).

In order to prevent this negative effect on his or her utility, the principal can either remove/minimise the information asymmetry or remove/minimise the diverging interests. This can be done through monitoring the performance of the agent or making the agent's compensation contingent on outcomes that are desired by the principal.

The principal can monitor the agent, either personally or through another agent, to become aware of the actions taken and effort exerted by the agent being monitored (Alchian & Demsetz, 1972). The input and output performance of the agent can be checked, but monitoring in agency literature also includes actions that limit the possibility to act on diverging interests such as budget restriction, operating rules or giving instructions (Alchian & Demsetz, 1972; Jensen & Meckling, 1976). Since monitoring informs the principal of the actions of the agent, lowering information asymmetry, the agent is likely to realise he cannot act opportunistically without the principal knowing, curbing opportunistic behaviour (Eisenhardt, 1989).

The principal can also use outcome based contracts with the agent to limit agent opportunism. Outcome based contracts align the interests of the agent with those of the principal by making the agent's compensation dependent on outcomes that are in the best interest of the principal. In doing so, the agent now maximises his own utility by taking actions that are in the best interest of the principal. The agent's incentives to maximise his own utility are therefore no longer

diverging from the interests of the principal, removing the conflicts of interest (Eisenhardt, 1989; Fong & Tosi, 2007).

However, both lowering information asymmetry and aligning incentives are costly. The principal will therefore only take these actions insofar their costs are lower than the costs from the opportunistic actions taken by the agent. There will therefore always be some opportunistic actions by the agent, causing a residual loss from the relationship. Total agency costs of the contract will be equal to the sum of the monitoring costs, incentive aligning costs and residual loss (Fama & Jensen, 1983; Jensen & Meckling, 1976).

Modern firms are subject to many different principal-agent relationships with accompanying agency costs (Fong & Tosi, 2007; Jensen & Meckling, 1976). The arguably most important one of these, seeing as one of the two streams of agency theory is almost entirely devoted to it, is that between a firm's shareholders and its upper management/CEO (Eisenhardt, 1989).

Most large firms are publicly traded on stock markets around the world. In doing so, corporations move from being owned by one or a handful of people, being limited in size by the available capital to these few, to being owned by many individuals together with access to much more capital and therefore being able to grow much larger in size (Berle & Means, 1933). Beyond this easier access to capital, it also allows firm to use better risk sharing and adds survival value (Fama & Jensen, 1983). However, the high dispersion in and ease of transferability of ownership makes controlling the organisation's day to day operations by the owners difficult, becoming a bureaucratic, slow and costly system (Alchian & Demsetz, 1972; Fama & Jensen, 1983). Many of the shareholders are so small that their rights to control are insignificant enough or lack the required expertise, deciding not to get involved in the control of the organisation, instead becoming passive investors investing capital for a return through dividends or a rise in share price (Berle & Means, 1933; Fama & Jensen, 1983). Instead, ownership and control are separated between the shareholders and upper management/the CEO.

While this adds another benefit in the form of management expertise running the company, the separation gives rise to a pure agency problem and the accompanying agency costs (Fama & Jensen, 1983; Jensen & Meckling, 1976). Management has insider information about how the firm is performing and being managed that the shareholders do not, causing information asymmetry between the parties. This can explain, in part, several practices in current firms such as the existence of boards of directors and stock based executive compensation.

Boards of directors are a way for shareholders to monitor the firm's management and reduce information asymmetry. Boards are appointed by shareholders and are tasked with evaluating top management/CEO on their behalf and resolving conflicts. Boards therefore have the power to hire, fire and determine the compensation of said management/CEO. They are also involved in important decisions, approving and monitoring them (Fama & Jensen, 1983). Boards generally consist of both inside and outside directors, with inside directors being experts on the firm activities and decisions while outside directors are generally experts in other fields that outnumber internal directors to help keep management and inside directors in check (Fama & Jensen, 1983).

Boards can be seen as part of a greater monitoring practice known as corporate governance. According to Larcker, Richardson and Tuna, corporate governance is *"the set of mechanisms that influence the decisions made by managers when there is a separation of ownership and control."* (Larcker, Richardson, & Tuna, 2007) P 964 It collectively catches the controls, policies, procedures and guidelines that ensure a firm reaches the organisation's objectives. These include monitoring by the board of directors, auditors, institutional shareholders, debt holders and other stakeholders deterring and finding opportunistic behaviour, coupled with rules and regulations limiting opportunistic behaviour by accounting standard setters, stock market regulators, etc. that are enforced through this monitoring (Aggarwal, Erel, Stulz, & Williamson, 2009; Fama & Jensen, 1983).

As mentioned, boards are tasked with determining the executive compensation of top management/the CEO. To do so, they determine the mix of compensation that best motivates management/the CEO to make decisions in the best interest of the shareholders. According to Murphy (1999), executive compensation is based on four basic components: base salary, annual bonus dependent on accounting measures, stock options and long-term incentive plans such as restricted stock rewards. These stock based rewards and bonuses, often called incentive based pay, are used to align the interests of management/the CEO and shareholders by making their compensation dependent on the performance of the company's stock, either directly for the stock options and indirectly in accounting based bonuses², which is the same base of rewards for the shareholders. The right mix thereby removing/minimising agency conflicts and opportunistic behaviour.

The use of incentive based pay has seen a significant increase in the past few decades (Harvey & Shrieves, 2001). Harvey and Shrieves (2001) found incentive based pay to make up 44.9%³ of total pay in their random sample of both small and large Compustat firms while Byrd, Parrino and

² Indirectly as accounting based performance such as net profit is a primary source for the stock market to price stocks. See for example Nichols and Wahlen Figure 1 p 266 (2004).

³ Median value

Pritsch (1998) found a median of 72% for the Larger Fortune 500 companies they researched, indicating the practice is more common in larger companies.

However, the practice of incentive based compensation has also received significant criticism. It is thought to not just remove incentives for opportunistic behaviour by management/the CEO, but also simultaneously add and expand incentives to do so, such as the incentives to manage earnings and stock prices (Healy & Wahlen, 1999). Plenty of research has been done on the effect of performance based or stock based compensation on firm performance and the quality of the firm's accounting. The results of this research have been inconclusive. While some studies find an increase in earnings management surrounding accounting based targets to maximise bonuses, such as Healy (1985) and Holthausen, Larcker and Sloan (1995), more recent research finds no such relation between equity incentives and earnings management (Armstrong, Jagolinzer, & Larcker, 2009). The same goes for research on the effect of incentive based pay on firm performance (Tosi, Werner, Katz, & Gomes-Meijia, 2000).

Going one step further are the advocates for managerialism, which has been extended into managerial power theory by Bebchuk and Fried (2003; 2004). Their main argument is that boards cannot bargain at arm's length of the CEO, causing managerial influence over their own executive compensation. This is the case as management has bargaining power over the board due to their power over the director's pay and influence on the director nomination process. This combined with lack of board independence due to loyalty and collegiality causes executive compensation to be set at excessively high amounts that are not related to actual firm performance or incentive aligning.

The authors argue managerial influence can be seen in four common practices: power-pay relationships, use of compensation consultants, stealth compensation and gratuitous payments and benefits for leaving CEOs. The power-pay relationship means that the more bargaining power management has, the higher compensation will be and the lower that compensation's relation to firm performance. Compensation consultants generally want to appease the CEO in order to be hired for other, both compensation and non-compensation, consultancy jobs again in the future, allowing the CEO to mask the excessive pay. Stealth compensation is another way to hide the excessive compensation by disclosing rather than recognizing it when this was allowed by the accounting standards, such as executive loans at below market interest rates before these were made illegal by SOX in 2002. Finally, big retirement or severance packages for leaving CEOs beyond those specified in the contracts are a final sign of managerial power over the board.

2.2 Literature review

In this paragraph I will summarize relevant empirical research on the usefulness and opportunism in non-GAAP reporting, the effect of corporate governance on management opportunism and on performance measurement for compensation purposes.

2.2.1 Non-GAAP measure usefulness

2.2.1.1 Informativeness and value relevance

As explained in the theoretical framework, proponents argue that non-GAAP measures provide investors with more useful information than GAAP measures by showing insider information, being closer to the underlying result or correcting for issues in GAAP. A large body of literature has formed over the years to empirically test this argument, with mixed results. The most often used way to test this is to use the prediction that, if the non-GAAP measures are more useful they should be highly value relevant and decision useful to investors and other stakeholders.

To test this, Entwistle, Feltham and Mbagwu (2010) ran a horserace between three different earnings measures used and available for S&P 500 firms to determine which one had the highest value relevance. They compared the traditional GAAP earnings, the non-GAAP earnings issued by the firm in their press releases and the analyst adjusted Institutional Brokers' Estimate System (I/B/E/S) non-GAAP earnings. All three earnings measures were found to be value relevant, but the manager adjusted non-GAAP earnings were consistently the most value relevant of the three, beating the I/B/E/S adjusted earnings which in turn beat the traditional GAAP measure. This is likely due to fact the manager adjusted earnings are the best of the three measures at predicting sustainable earnings.

Their results are consistent with the results of prior research using press releases by Bhattacharya et al. (2003). In their research on the informativeness and persistence of non-GAAP earnings, Bhattacharya et al. find that non-GAAP earnings are more informative to investors than the traditional GAAP result, and that the I/B/E/S earnings are also more informative than the GAAP earnings⁴. Besides this higher informativeness, their results indicate the non-GAAP earnings are also perceived by investors as more persistent than GAAP earnings.

Some other papers have evaluated the value relevance of non-GAAP earnings and found a higher value relevance for them than for the traditional GAAP result as well. For instance Bradshaw and Sloan (2002) and Brown and Sivakumar (2003). However, these papers used the I/B/E/S non-GAAP earnings measure as a proxy for the manager adjusted non-GAAP earnings, which in many

⁴ Do note they do not compare the manager adjusted non-GAAP to I/B/E/S earnings, unlike Entwistle et al. (2010)

cases is not a good proxy. This as many of the firms that had an I/B/E/S earnings measure did not disclose manager adjusted earnings and for the firms that do their manager adjusted numbers can differ greatly from those adjusted by analysts (Bhattacharya, Black, Christensen, & Larson, 2003; Lougee & Marquardt, 2004).

A more limited in scope and generalisability but interesting result is given by the Canadian *income trusts*. Cormier et al. (2011) found a high value relevance for the *distributable cash* non-GAAP performance measure used by almost all flow-through entities, such as the income trusts. The distributable cash is the amount of cash a firm can deliver to its investors as dividends without negatively impacting the continued operation of the firm. This is a measure of sustainable dividends. The high value relevance is likely due to the type of investors attracted by flow-through entities. Flow-through entities pride themselves on their high dividend payouts and lack of excess cash, attracting investors that are interested in receiving large dividends. The amount of sustainable dividends is therefore of great interest to their investors, being seen as the best performance metric by investors and analysts.

However, research has also found important caveats for the usefulness of non-GAAP earnings. For instance, Lougee and Marquardt (2004) found that the higher value relevance of non-GAAP earnings compared to GAAP earnings is only the case for firms where the GAAP earnings have low informative power. These firms are also found to be more likely to report non-GAAP earnings, consistent with the informing view of proponents. Besides the low informativeness of GAAP earnings, for the higher informativeness of non-GAAP earnings to hold they also need to be free from strategic considerations, that is, the earnings surprise of GAAP should not be negative.

This effect of opportunism on the usefulness is also found by Entwistle et al. (2010), finding a lower value relevance when the non-GAAP number excluded recurring expenses or converted a GAAP loss into a non-GAAP profit, but not when non-GAAP measures meet or beat the analyst forecast when GAAP earnings do not. These results and the result by Cormier et al. above indicate the usefulness of non-GAAP earnings is context dependent.

2.2.1.2 Other evidence of usefulness

Besides this direct evidence on the usefulness and use of non-GAAP earnings, there is some indirect evidence for the informative approach of proponents. The first of which can be found in a survey by Dichev, Graham, Harvey and Rajgopal (2013). In this survey, managers were asked about their opinion on what constitute high quality earnings, with the ability of earnings to predict future earnings by being sustainable and properly reflecting underlying operations to be the most important

factor. This can be seen as indirect evidence for the usefulness and desire to inform investors view of non-GAAP earnings.

This can be seen in the reconciliations provided by US companies under regulation G. In research by both PwC and Afterman the most often excluded items from the non-GAAP earnings are unique, unusual or otherwise one-time items. For adjusted EBITDA, the most often found items in the reconciliations were: stock compensation, asset impairment charges and write-offs, merger and acquisition related costs, restructuring charges, losses on debt extinguishments, changes in fair values of assets and liabilities and gains or losses on the sales of assets (Afterman, 2015; PWC, 2014). These items are generally non-recurring in nature and their exclusion creates a better measure of sustainable core earnings.

2.2.1.3 Opportunistic use

While the lower usefulness of non-GAAP measures due to opportunism is to be expected, it is problematic seeing as a large body of research has found many incentives and widespread opportunistic use, lowering the overall usefulness of non-GAAP measures.

Firms have incentives to distract from a failing GAAP result, and plenty of papers indeed show that firms strategically put more emphasis on their non-GAAP measures when their GAAP results failed to meet benchmarks, even after the SEC cracked down on this practice in 2003 with their regulation G. Results by Marques indicate firms put more emphasis on their non-GAAP earnings than their GAAP earnings when they are higher than the GAAP earnings, show a profit while the GAAP earnings do not, they meet or beat analyst forecasts while GAAP earnings do not and when they meet or beat same period earnings last year while regular earnings do not. For all of these benchmarks except the last one, the results are significant for 2003, showing the opportunistic use continued even after regulation G was introduced (Marques, 2010).

Similar results came from the research by Lougee and Marquardt (2004). They found firms that fail to meet analyst consensus forecasts are more likely to report a non-GAAP measure, although this does, as mentioned earlier, lower the weight investors give to the non-GAAP measure. This indicates investors are able to see through this opportunistic use, at least partly. Similarly, research by Bowen, Davis and Matsumoto (2005) indicates firms emphasise the measure that is most favourable, which is generally the non-GAAP result. However, their results also indicate this higher emphasis results in a greater market reaction to the measure. Combined, this shows managers place

greater emphasis on non-GAAP measures and there is no conclusive evidence whether investors are misled by this⁵.

Other research shows that firms are managing their non-GAAP measures through strategic exclusions. There are two main types of exclusions: special items and other items. Special items are, as the name implies, special items that are non-recurring or otherwise highly unusual such as restructuring charges or merger and acquisition related costs. The other items are the exclusions that do not fit the special items definition and are therefore also a lot more vague. Doyle Lundholm and Soliman (2003) show in their paper that special items, as proponents argue, are not related to future performance and excluding them leaves a value relevant measure that can help better predict future performance than the GAAP result can. Other exclusions on the other hand are systematically related to future performance and excluding them removes relevant information about future performance from the measure. The found strategic use of the other exclusions creates non-GAAP measures that can be used to mislead investors. The opportunistic use of other items is widespread.

Management uses the other items to meet or beat analyst forecasts. After finding the difference in value relevance of the special and other items, Doyle, Jennings and Soliman (2013) did further research to determine if they were used to increase GAAP income and if there is a difference in the use of special and other items to meet and beat analyst forecasts. Their research shows that both types of items are generally income increasing in order to meet or beat forecasts, but that this result is fully attributable by the opportunistic use of other items, with special items having no significant effect. Even further research, this time for a European setting, by Isidro and Marques (2015) showed similar opportunistic exclusions of recurring items in the calculation of the non-GAAP result in order to meet benchmarks.

The two ways of opportunistic disclosure, higher prominence and strategic calculation, are not mutually exclusive, as can be seen from the examples above all researching meeting or beating benchmarks. Generally, incentives are found to increase both the emphasis on the non-GAAP number and the amount of income increasing exclusions (both other items and special items) used in the calculation of the measure.

This can be seen in research about the effect of investor sentiment. The higher the investor sentiment, the more likely firms are to disclose a non-GAAP measure in the press release; the more likely this non-GAAP measure exceeds the GAAP measure; the more prominence the non-GAAP measure gets and the more income increasing exclusions are made. Giving even more evidence of

⁵ The SEC has recently issued new interpretation guidelines clarifying the rules surrounding emphasis on non-GAAP measures, so whether this practice will continue is unknown.

the combined nature of opportunistic prominence and calculation, the amount of low quality exclusions such as recurring items was found to increase with investor sentiment and prominence given to the non-GAAP measure (Brown, Christensen, Elliot, & Mergenthaler, 2012).

Another avenue where this can be seen is in research about the effect of compensation on non-GAAP measures. Isidro and Marques (2013) found, for the European setting, that firms are more likely to release a non-GAAP measure, give the non-GAAP measure more prominence in the earnings announcement and are once again also more strategic in their calculation by excluding recurring items for firms where the compensation of directors is based on the market performance. They also found that these firms are less likely to report a reconciliation. Similarly, Brown et al. (2012) found a significant increase in the use of low quality exclusions to meet analyst benchmarks when management intends to sell their shares after the announcement, showing that the incentives also overlap.

Both Isidro and Marques (2013), and Frankel, McVay and Soliman (2011) show that opportunistic behaviour can be curbed by good corporate governance, most notably the board. Good corporate governance lowers the likelihood of disclosing a non-GAAP measure, curbs the added prominence and raises the likelihood of including a reconciliation, but does not change the opportunistic use of recurring item exclusions in Isidro and Marques. Frankel et al. meanwhile found lower board independence to be associated with more opportunistic exclusions of recurring items and, like Brown et al., more opportunistic use to meet or beat analyst forecasts around insider trading.

2.2.1.4 Effect of regulation

Next to the direct evidence of opportunism in the use of non-GAAP measures by some firms, the effect of regulation provides indirect evidence. The influence of regulation G has been researched in a few papers, with most showing, at least partly, the desired effect of the regulation, being less opportunistic use of non-GAAP measures.

Entwistle et al. (2006) find a decrease in the use of non-GAAP measures after regulation G was introduced in 2003, combined with a lower amount of reporting firms having non-GAAP earnings that are higher than their GAAP earnings. They also find a decrease in prominence and confusing language surrounding the non-GAAP earnings in the press releases of S&P 500 firms. Meanwhile, Jennings and Marques (2011), Marques (2006) and Heflin and Hsu (2008) all find a decrease in the amount of income increasing exclusions used to mislead investors and meet or beat analyst benchmarks. Combined, these results indicate a decline in the opportunistic use following the introduction of regulation and therefore provide evidence of opportunistic use before regulation G.

However, the decrease in income increasing exclusions holds for both recurring and non-recurring items, showing firms also show less of the useful kind of non-GAAP earnings (Heflin & Hsu, 2008; Jennings & Marques, 2011).

2.2.1.5 Other trend in non-GAAP reporting

Overall, there is overwhelming evidence of both the usefulness and opportunism, which in turn lowers this usefulness, of non-GAAP measures. However, research has so far focused on the use of non-GAAP measures in the annual report and earnings announcement press release. Even the research on the effect of compensation on non-GAAP measures only focused on the use in the earnings press release. Recent research however shows that the use of non-GAAP measures in compensation contracts is on the rise, with nearly 60% of proxy statements in 2016 including non-GAAP language compared to less than 20% in 2009, most of the language concentrating in the executive compensation sections (Audit Analytics, 2016).

2.2.2 Effect of corporate governance on opportunism

Corporate governance mechanisms such as the board of directors, auditing or debt covenants exist to help firms reach their organisational goals. The most common way of doing so is by helping alleviate the impact of agency conflicts between stakeholders and management. By monitoring or otherwise deterring opportunism by management, corporate governance ensures that management does not receive gains at the expense of shareholders and other stakeholders. It helps limit behaviour such as earnings management, tax evasion or excessive risk taking (Larcker, Richardson, & Tuna, 2007; Schleifer & Vishny, 1997). Empirical research has so far produced mixed results about the effectiveness of corporate governance.

A good illustrative example of this mixed evidence can be found in the research on the effect of corporate governance on financial reporting quality. This topic has received a lot of attention over the years. This as stakeholders require high quality financial reporting for their analysis and decision making with regards to investment risk and future firm prospects to be correct, making reporting quality an important topic for research. As shown earlier, management has many incentives to produce low quality financial reports in order to mislead investors for their own gain, with regulators and others strongly believing corporate governance to be the best counter to this opportunism and thereby ensure high quality financial reporting (Larcker, Richardson, & Tuna, 2007).

Klein (2002a) researched the relation between board, and specifically audit committee, independence and earnings management. Earnings management is commonly used as a proxy for low financial reporting quality. She finds that high independence of either group has a negative relation with earnings management, indicating that good corporate governance is a deterrent to low

financial reporting quality. Similarly, Xie, Davidson and DaDalt (2003) find that the financial expertise and activity level in the form of amount of meetings of the board of directors and audit committee has the same negative relation with earnings management. These results indicate that a high quality board is a good deterrent for earnings management, raising financial reporting quality.

These results, however, do not match those found by Larcker, Richardson and Tuna (2007) in their thorough research into the effect of corporate governance on financial reporting quality. They looked at 39 often used governance quality characteristics and divided these into 14 subgroups through the use of principal component analysis, each subgroup capturing a certain element of corporate governance. Their results directly contradict the results on board and audit committee characteristics and financial reporting quality found by Klein and Xie et al.. This as they find no significant relation between the independence or the amount of meetings of the board and earnings management, nor on the likelihood of having to restate their financial reports (another common way of measuring financial reporting quality)⁶.

Similar mixed results to those on the effect of director independence can be seen on the effect of shareholder participation in governance of the firm. Active shareholder participation through shareholder proposals or takeovers are shareholders using their power over the firm in order to help ensure their rights are protected and their demands are heard (Hadani, Goranova, & Khan, 2011; Schleifer & Vishny, 1997). This use of power is often at the detriment of management. Takeovers often involve management turnover, and shareholder proposals can attract the attention of the greater public, threatening management's status and integrity even if the proposal is unsuccessful (Hadani, Goranova, & Khan, 2011). Empirical research shows mixed evidence on the effect of shareholder activism on financial reporting quality. Hadani, Goranova and Khan (2011) show a positive association between shareholder activism in the form of the amount of shareholder proposals and subsequent earnings management, indicating lower financial reporting quality through shareholder participation. Meanwhile, Baber, Kang, Liang and Zhu (2015) researched the effect of anti-takeover provisions, a deterrent to shareholder activism⁷, and find that few restrictions on active shareholder participation is associated with a lower probability of issuing a restatement, indicating shareholder activism raises financial reporting quality.

⁶ With amount of meetings not being considered for restatements as it is likely influenced by the imminent restatement

⁷ Anti-takeover provisions such as a staggered board of directors, make it more difficult for shareholders to partake in the governance of the firm, deterring them from doing so. Management can use these deterrents to entrench themselves in their position and protect themselves from the negative consequences of opportunism. Theoretically, therefore, anti-takeover provisions should raise opportunism

A second form of shareholder participation in governance is the existence of large, often institutional, investors such as pension funds, bank trusts or insurance companies. These large investors are expected to take an active interest in the firm, including the governance, due to the large amount of wealth invested and therefore at risk, while simultaneously having the required power to pressure management (Schleifer & Vishny, 1997; Velury & Jenkins, 2006). Empirical research on this factor of corporate governance is less mixed. Hadani, Goranova and Khan (2011) also looked at the effect of monitoring by the largest institutional investor on earnings management and, contrary to their findings on shareholder activism, found a negative relation, indicative of higher financial reporting quality through monitoring by a large institutional shareholder. The same conclusion comes from research by Velury and Jenkins (2006). Using elements of reporting quality from the FASB conceptual framework, they find that monitoring by institutional shareholders has a positive effect on financial reporting quality for three of four proxies. These being the relation between earnings and cash flow, the reporting lag and the earnings response coefficient, representing predictive value, timeliness and representational faithfulness of the financial reports respectively. Interestingly, the one proxy that did not show a significant relationship was that for neutrality, being the occurrence of earnings management, therefore contradicting the findings of Hadani et al. while delivering the same general conclusion.

Besides mixed evidence, a paper by Bowen, Rajgopal and Venkatachalam (2008) calls the effect of corporate governance on financial reporting quality into question in a different way. While they find a relation between weak governance and low financial reporting quality in the form of abused accounting discretion (earnings management, earnings smoothing and a tendency to avoid negative earnings surprises), they show that this higher manager opportunism in response to low governance quality is not at the expense of shareholders as this opportunism does not lead to poor future performance. Whether the opportunism is not at the expense of other stakeholders, however, is not considered.

All results combined provide no consistent evidence of the expected rise in financial reporting quality due to good corporate governance. As mentioned, financial reporting quality isn't the only effect with mixed empirical results. This mixed evidence can possibly be explained by the sheer size and complexity of both the subject of corporate governance itself and the subjects it is expected to affect. Several papers show a large amount of interplay between concepts, such as the found subgroups by Larcker et al. (2007) through principal component analysis; the requirement of both independence and expertise simultaneously for an internal audit department to have an effect on reporting quality in Abbott, Daugherty, Parker and Peters (2015) and the importance of both legal/regulatory enforcement factors and firm level governance factors according to Bonetti, Magnan

and Parbonetti (2016). This large size and complex nature gives rise to large endogeneity issues such as correlated omitted variable bias and other issues for research like construct validity (Dey, 2008; Larcker, Richardson, & Tuna, 2007). These are therefore issues I too need to be aware of and control for.

2.2.3 Performance measures in incentive compensation contracts

Incentive compensation contracts are used by firms to align the compensation of the firm's executives with the firm's performance, thereby aligning top management's incentives with those of the shareholders and deterring the opportunistic and myopic behaviour caused by agency conflicts. However, as the compensation and used performance measures are incentives for behaviour in and of themselves as well, boards must take this effect into account to avoid incentivising unintended behaviour.

There are several decisions to be made and factors to be considered by the board in choosing the performance measures to be used in incentive compensation contracts. With the amount of performance measures that are possible having risen substantially due to advances in IT and accounting methods, this large amount of options has also made it more difficult to make the 'right' choice (Raith, 2008).

The first decision to make is the choice of mix of input and output related performance measures. Input measures are related to the actions of management itself while output based measures depend on the firm's (overall) performance. In an agency setting with insider information, only output based pay will properly incentivise executives to use their insider information efficiently as they maximise congruity between the compensation of the agent and principal. However, output based measures expose management to higher income risk than input based measures because firm output is partly dependent on random influences outside of the executive's control, for which the manager will want to be compensated. This higher income risk may be too high given the risk attitude of management. In order to best incentivise management and reach the best firm performance, a mix of both input and output measures is needed that minimises the risk premiums paid (by minimising income risk to an acceptable level given the level of risk aversion of management), while maximising the efficient use of insider information through compensation congruity (Datar, Kulp, & Lambert, 2001; Raith, 2008). Finding the right mix for management, however, is home to some practical issues. First, the input by management is not directly observable, making input based measures impossible. Second, the actions by management sometimes do not reach their full payoff in output until either after the measurement period or the tenure of the

manager is over, leading to the risk for the manager of not being fully rewarded for his actions (Feltham & Xie, 1994).

A second choice is about the use of subjectivity in the compensation system. Subjectivity can be used in several ways in the rewards system. The first is through subjective performance measures. Performance measures can be both objective, such as quantitative financial measures like earnings or sales, and subjective. As stated by O'Connor, Deng and Fei:

Subjective performance measurement occurs when people use their discretion to cognitively measure an object ... that creates less verifiable information (O'Connor, Deng, & Fei, 2015) (p208-209)

Subjective performance measures capture qualitative performance, such as product quality, customer satisfaction or innovation. Second, the weight on performance measures can be determined subjectively by the board. Finally, the performance threshold can be set subjectively (Gibbs, Merchant, Van der Stede, & Vargus, 2004).

Subjectivity in performance measurement has several advantages that allow it to mitigate problems with and complement quantitative performance measurement. First, it allows additional information that arises during the measurement period to be considered, such as unforeseen market changes or noise added by other outside influences. This benefits the firm and manager by lowering the risk associated with the compensation, lowering the risk premium payable by the firm. Second, subjective performance measures can be used in cases where performance cannot be measured quantitatively but is still important. This can be seen with many strategic goals, which will be discussed later. Finally, it can reduce the noise in and possibility of management distortion of quantitative financial performance measures. As subjective performance measures help solve problems associated with purely financial performance metrics, the right mix is required to properly incentivise management (Gibbs, Merchant, Van der Stede, & Vargus, 2004).

Empirical research in several markets (the US, The Netherlands and China) on the design of management compensation systems for car dealerships found differences in the amount of subjectivity in compensation across the three settings, with China having a substantially more subjective compensation system than both the US and The Netherlands. However, in all three settings subjectivity was indeed used to mitigate the weaknesses in quantitative performance measurement systems (Gibbs, Merchant, Van der Stede, & Vargus, 2004; Jansen, Merchant, & Van der Stede, 2009; Merchant, Van der Stede, Lin, & Yu, 2011).

In making these choices, several factors must be considered. One of these factors is the strategy of the firm, both short and long-term. Firms formulate their strategy in order to obtain a competitive advantage. This competitive advantage is accompanied by current and future profitability, creating value for their shareholders (Balsam, Fernando, & Tripathy, 2011). Therefore, aligning management compensation with the firm's strategy aligns management's compensation with creating shareholder value, thereby aligning the incentives between management and said shareholders.

Without proper consideration for the strategy, however, the compensation system will not incentivise management to act in the best interest of the strategy or in the interest of the strategy at all. Stonich (1984) mentions as an example of this a large, diversified manufacturing firm that failed to bring their compensation system in line with the strategy. By still using the short term net profit as the driver for rewards, managers were discouraged from making long-term investments in line with the strategy as it would lower their compensation in the present, causing the firm to not realise their strategic goals and competitive advantage.

Empirical research shows some evidence that firms indeed take strategy into account in their choice of performance measures. Balsam, Fernando and Tripathy (2011) researched differences in performance measures in compensation contracts between the two strategies identified by Porter: cost leadership and diversification. Firms using a cost leadership strategy attempt to sell in high volume at low margins by keeping prices low. As these firms generate their profit from volume, market share and sales figures are performance measures that match their strategy. On the other hand, diversification firms attempt to capture their profits through high margins on products that can demand this premium through factors such as customer loyalty and brand image while having a lower turnover. Pure accounting numbers are not suitable for these firms. Diversification firms are therefore expected to focus on subjective performance measures related to the qualitative performance on topics such as innovation which better match their strategy. Their empirical results match these expectations, with cost leadership firms placing a higher weight on sales factors while diversification firms focus more on subjective non-financial performance measures. The same higher weight on non-financial performance measures was found by Ittner, Larcker and Rajan (1997) and Balkin, Markman and Gomez-Mejia (2000) for innovation strategies and high technology firms respectively, both being firms with a diversification type strategy.

Two other ways to incentivise management to act in accordance with the long-term strategy, especially in the form of long-term strategic investments, is using multi-year measurement periods and the strategic funds approach. By linking compensation to performance over multiple periods and deferring compensation, the negative effect on current compensation of strategic investments is

limited and the rewards for management are explicitly tied with the rewards for long-term shareholder. This is especially the case when the long-term incentive awards are in the form of stock compensation. The strategic funds approach splits expenses for compensation purposes into those originating from current operations and those from future oriented strategic investments. This then allows management to be evaluated separately on both their current managing of the firm and their work on creating future profitability through executing the strategy (Stonich, 1984).

When matching performance measures with strategy it is important to note the problem of surrogation, especially when using subjective performance measures. Surrogation is the tendency for management to focus solely on the performance measures, losing sight of the strategic goals and actions they attempt to capture. This can lead to situations that, while the strategic performance measurement system is set up correctly to facilitate managers' decision making in line with the firm's strategy, it still does not incentivise management to act in the best interest of the strategy. Surrogation is possible as the performance measures used in the compensation system are merely constructs of the strategy. To the extent that the constructs properly capture the strategy, surrogation isn't a major issue. For more difficult concepts that are more abstract and subjective, however, such as customer centricity as used by Choi, Hecht and Tayler (2013) where the construct validity is more likely to be low, surrogation is a bigger issue and can substantially shift management away from actions in the best interest of the strategy. Choi, Hecht and Tayler (2013) performed an experiment to find whether involving management in aspects of strategy determination helps prevent surrogation. Involving management in strategy determination should increase the accessibility and understanding of the strategic goals, lowering attribute substitutions such as surrogation. The results of the experiment show that incentive compensation does induce a surrogation effect; and that involving management in strategy selection helps prevent surrogation, but involving them in strategy deliberation does not, showing that involvement in determination of the strategy can have positive effects on incentive alignment.

A second factor to consider is, as shown in the trade-off between input versus output and objective versus subjective based performance measures, the risk associated with the performance measures. Besides the choice of performance measures, management can also be shielded from risk by altering the calculation of the performance measure. Dutta and Reichelstein (1999) discuss a model for the optimal performance measure given firm receivables and payables. These items only change the cash flow distribution between periods, not the actual performance of the firm, and can be seen as a financing activity by the firm. Using a cash flow measure based on the actual received cash flow fails to take these financing activities into account, causing income risk for management due to the variability of the financing activities. An optimal performance measure would take this risk

into account and correct the measure by adding accruals based on the fair value of the receivables or payables.

A special case of this shielding of management comes from special items in the determination of CEO cash compensation. Initial research found evidence of shielding from negative special items such as specific strategic investments or items deemed non-recurring such as restructuring charges (but only for managers with no recent history of restructuring charges). This in order to not discourage actions to ensure the future existence and profitability of the firm. This evidence is consistent with management being shielded from negative effects of special items, but not from the positive effects. More recent research by Potepa (2014) has found a shift towards significantly less shielding of management from negative special items with them also receiving less benefits from positive ones. His research further found a higher rate of exclusion of special items when they are non-recurring, the firm is close to bankruptcy and when there is a general slump in the economy, all factors associated with higher income risk, indicating management is being shielded from income risk (Potepa, 2014).

Overall, there are many different decisions to make and factors to consider by the board in choosing the optimal performance measurement system in incentive compensation contracts.

Chapter 3: Research design and sample

3.1 Research design

In this chapter the research design used to answer the research question is explained. The hypothesis for the thesis is developed in paragraph 3.1.1 based on the theories and papers discussed in chapter 2. Following that, the regression model used to test this hypothesis is explained in paragraph 3.1.2. Paragraph 3.2 discusses the sample selection and data collection process, including data preparation.

3.1.1 hypotheses development

As explained in the theoretical framework, the split between ownership and control of firms has, besides numerous advantages, also created an agency conflict in modern firms where management may not always act in the best interest of the firm's shareholders. Shareholders cannot perfectly monitor management's day-to-day running of the firm due a lack of knowledge, interest, power or otherwise and as such, management has insider information on both their own actions and the true performance of the firm. As management will ultimately want to maximise its own utility, this will lead to management acting in their own self-interest in cases of diverging interests between it and the shareholders, ultimately hurting said shareholders (Jensen & Meckling, 1976). In order to combat this agency conflict, firms and shareholders create boards of directors to monitor management, hold them accountable for their actions and reward or punish management appropriately.

One of the ways to do so is through the executive compensation. Boards have the power to determine the executive compensation by choosing, among other things, the type of reward; the specific performance measures to be used; their weighting towards total compensation and the payout that corresponds to the achieved performance level. The main goal behind the executive compensation is therefore aligning the interests between management and shareholders in cases of diverging interests by rewarding management action in the shareholders' best interests and, in doing so, combat management opportunism. In order to properly incentivise management and align incentives, the used performance measures need to be based on shareholder needs and be able to be influenced by management (Merchant & Van der Stede, 2007).

All this being true, the board's decision to use a non-GAAP or traditional GAAP performance measure reveals their opinion on non-GAAP measures. If these measures are indeed, as is argued by proponents, used by management because they are more useful measures of firm performance due to better reflecting potential future performance by removing effects that are out of managements' control or otherwise better reflecting the result of management action, all in all making them more useful to investors looking to value the firm, they would also be better suited as performance

measures for compensation purposes by the board. As such, if non-GAAP measures are primarily more useful performance measures, firms are more likely to use them as a base for compensation.

If they are instead primarily used by management in order to mislead investors or an equally opportunistic motive as is argued by opponents, or are otherwise not more useful measures of firm performance, they would also not be as useful for performance evaluation by the board for compensation purposes and this would mean firms are not more likely to use them as compensation base.

However, in order for this relationship to hold, the board must be able to truly independently set compensation and monitor management. If the board has little power over management due to low governance quality, management has high negotiation power. In those cases, the board cannot properly set compensation to align incentives and will therefore not be able to make optimal decisions to this effect. With high negotiation power, management will be able to influence the board's decision about weights, targets, the used measures and even the decision to exclude certain items in the determination of the adjusted, non-GAAP measure for the year, either directly in the actual salary/contract negotiations or indirectly by lowering the scrutiny of the directors management has power over.

In the case of low governance quality and the accompanying high managerial power, management will push for his or her compensation to be based on non-GAAP whether it is a more useful or opportunistic measure, as in either case it has a positive effect on his or her compensation. Either it is a better performance measure, making it more desirable due to the stronger connection between management action and compensation, or management can opportunistically influence their compensation due to their influence over the non-GAAP measures. Either way, it is more desirable for management due to a stronger influence over their rewards.

In short, while management will always want to be compensated based on non-GAAP measures, boards will only want to use them when they are more useful. Meanwhile, high quality boards are better able to withstand management's desires in the event they are not more useful than are low quality boards. Combined, this leads to the following hypothesis to test, stated in null form:

There is no difference in use of non-GAAP measures for compensation purposes between firms with high and low quality boards.

If the null hypothesis cannot be rejected, which would be the case if both types of boards compensate based on non-GAAP equally likely, then high quality boards do not reject their use and

non-GAAP measures can be seen as (more) useful. If, however, the null hypothesis has to be rejected, the result depends on the effect of board quality. If high quality boards are more likely to use non-GAAP measures, they can be seen as (more) useful, while if they are less likely to use them, then they can be seen as less useful or even opportunistic.

3.1.2 Research design

In order to test the effect of governance quality on the use of non-GAAP measures for compensation purposes, a logistic regression will be used. More specifically, the following logistic regression model will be used:

$$\Pr(\text{useNonGaap}=1) = \Lambda [\beta_0 + \beta_1 \text{ governance quality} + \beta_2 \text{ financial expertise} + \beta_3 \text{ age} + \beta_4 \text{ tenure} + \beta_5 \text{ percent of shares held} + \beta_6 \text{ intangibles intensity} + \beta_7 \text{ growth potential} + \beta_8 \text{ leverage ratio} + \beta_9 \text{ earnings volatility} + \beta_{10} \text{ loss this year} + \beta_{11} \text{ loss last year} + \beta_{12} \text{ loss previous years} + \beta_{13} \text{ audit quality} + \beta_{14} \text{ size} + \beta_{15} \text{ industry fixed effects} + \beta_{16} \text{ year fixed effects} + \varepsilon]$$

The following paragraphs will explain the reason for inclusion, operationalisation of constructs and the variable definitions used.

3.1.2.1 Dependent variable

The dependent variable in the model is the choice by the board to use a non-GAAP measure in their executive compensation. This is a dummy variable with firms coded 1 when they do, and 0 when they do not use a non-GAAP measure in their executive compensation. In this thesis, I only consider non-GAAP measures with a direct GAAP equivalent. For the purpose of this thesis these are: adjusted net income, adjusted earnings per share and adjusted operating income. These measures all have a version in the audited part of the financial statement to compare the firm's performance with. This is needed in order to properly compare and benchmark the non-GAAP performance in this and future research, such as for the value relevance of the non-GAAP measure when it is used for executive compensation purposes. A secondary reason for this decision is in order to focus and structure the manual data collection. Seeing as firms can use a lot of different non-GAAP measures, this is needed.

3.1.2.2 Independent variable

The variable of interest for this thesis is the governance quality. In order to measure governance quality, I follow and adapt the approach by Isidro and Marques (2013) and Aggarwal, Erel, Stulz and Williamson (2009) by creating an index variable based on several governance characteristics identified as high quality by prior research or entities such as the Institutional Shareholder Services (ISS), such as board independence. This boardScore variable is created by summation of several

dummy variables denoting the compliance with these characteristics of high quality boards (Isidro & Marques, 2013).

This index approach to governance aspects is commonplace in the corporate governance literature due to the complex nature of corporate governance. This as the index approach has numerous advantages over simply regressing on all variables separately in the case of corporate governance, as states by Isidro and Marques:

“This approach has two main advantages. One, it considers the complex and interactive nature of corporate governance, seeing as the strength is generally derived from this interaction between factors. An index captures this in the model. Two, an index based on internationally recognized corporate governance factors increases the comparability with other settings and therefore the external validity.” (Isidro & Marques, 2013, p.301)

The characteristics used for the boardScore are those identified by the mentioned papers, given they were obtainable, either directly or indirectly by creating them using other variables, from the ISS database available to me. These characteristics include: All directors attended at least 75% of all meetings, the CEO serves on the board of two or fewer public companies, the board is more than 50% independent, board size is greater than 5 but smaller than 16, the CEO has no related-party transactions, the compensation committee is comprised of solely independent directors, the nominating committee is comprised of solely independent directors, the audit committee is comprised of solely independent directors, the CEO is not also chairman of the board (better known as no CEO duality) and the board is elected annually.

I also added two variables in an attempt to proxy for two of the variables used in both papers that were not directly or indirectly obtainable. Similar to the three other committees, I created a variable denoting that the governance committee is comprised of solely independent directors. This to proxy for the variable denoting the existence of a corporate governance committee and the requirement that it met in the past year. A second variable not available to me was that on the existence of a policy on outside directorship. To proxy, I used the mentioned required limit in both papers of four or fewer boards and made a variable denoting a firm where all directors comply with this limit.

In total, this results in twelve variables, meaning the boardscore can range from 0 to 12. By design, a higher value indicates a firm, its board and its committees meet more of the practices identified as high quality and the firm can therefore be seen as having a higher governance quality. In

order to reject the null hypothesis, a difference in boardScore should cause a difference in likelihood of using a non-GAAP performance measure in executive compensation.

3.1.2.3 Other and Control variables

Besides the variables identified and captured in the boardScore, several other board characteristics are also used based on prior empirical research. Contrary to those characteristics captured by the boardScore, these do not have clear predictions of their effect on governance quality and/or do not have a set threshold to determine high quality. As such, these cannot be used in an index approach. These factors are the level of financial expertise of the board, the age of the board, the tenure of the board and the amount of shares and voting power held by the board.

While theory predicts and studies have found a positive effect of financial expertise on governance quality, there is no level to be used as a baseline or minimum in order to allow inclusion in an index (Larcker, Richardson, & Tuna, 2007). Furthermore, directors with financial expertise may not always act in the best interest of shareholders in their advisory roles, instead acting in the interest of the (type of) institution their expertise originates from, such as a commercial banker being (somewhat) biased towards financing through bank loans. This then indicates (perceived) governance quality may instead decline with financial expertise (Güner, Malmendier, & Tate, 2008). As such, it is included as a separate variable defined as the percentage of the board with financial expertise.

The second factor is the age of the directors. While age can be seen as a proxy for director experience, which increases a director's ability to monitor properly, certain calls for reform of board of director rules and practices have argued becoming older also has a negative impact on a director's effectiveness. Similar to being too busy (which is captured by the boardScore) being too old lowers a director's ability to properly monitor management (Core, Holthausen, & Larcker, 1999). While a clear limit of 70 has been argued, allowing for the creation of a binary variable able to be included in an index, neither of the two papers using the boardScore consider age. This, combined with the potential ambiguous effect, made me choose to add the average age of the board separately.

Director tenure is home to a similar debate to director age. On the one hand, longer tenure means a director has more experience and knowledge about the firm and industry and is therefore better equipped to monitor management. On the other hand, however, the longer tenure simultaneously makes the director more likely to have bonded with the firm or management, be dependent on the firm or management, or otherwise have their independence impaired, making them less likely to properly monitor management (Vafeas, 2003). In order to control for these effects, the average tenure of the board is added to the regression.

Meanwhile, voting power held invites the debate on the effectiveness of stock based compensation. With the used variables capturing voting power for any director, including directors that are also part of management, the effects on both groups need to be considered. For management, stock based compensation is theoretically a way to align incentives between management and shareholders by making management shareholders. However, whether this effect is achieved in practice is often disputed, due to the compensation being an incentive in and of itself and given management's control over the stock price (Healy & Wahlen, 1999). A similar unclear relation about the effect of share holdings and voting power has been documented on the effectiveness of the board (Core, Holthausen, & Larcker, 1999). As such, a variable denoting the average percentage of outstanding shares held by the board is added to the regression to denote the average voting power of the board.

Besides these board characteristics, several other factors need to be controlled for to avoid the large endogeneity issues corporate governance is home to due to its complex and interrelated nature. Therefore, several often used variables in papers surrounding corporate governance and non-GAAP measures are used.

The first often used factor is the intangible intensity. This as the traditional GAAP result of intangible heavy firms (such as high-technology or pharmaceutical firms with their high R&D investments) has been found to have a low information content. These firms are therefore more likely to use non-GAAP measures, and this effect is expected to extend to executive compensation (Lougee & Marquardt, 2004). I follow the approach in the Lougee and Marquardt paper and define intangible intensity as intangible assets divided by total assets.

The second often used factor is the growth potential of a firm. Similar to high-technology intangible intense firms, the GAAP earnings of firms with strong growth potential has lower information content, making these firms similarly more likely to use non-GAAP measures (Lougee & Marquardt, 2004). Beyond the increase in likelihood, Klein (Klein, 2002b) found a negative relation between high growth firms and audit committee independence, warranting inclusion. The market to book value of equity is a common measure of growth potential, as it captures the market's expectation of the future growth potential (Jiang, Lee, & Anandarajan, 2008). As such, I will use it as well.

As noted by Larcker et al. (2007), debtholders are another group of stakeholders that help monitor the firm and management in order to safeguard their investments. Their presence needs to be controlled for, which is generally done in the literature through the leverage ratio. Definitions of the leverage ratio differ between papers, but I follow the definition of Isidro and Marques (2013), which is debt divided by total assets.

The final major variable that is commonly used in the literature is the earnings volatility. This is another characteristic of GAAP measures with low information content that is caused by, in this case, low persistence. These firms are therefore also more likely to use non-GAAP measures (Frankel, McVay, & Soliman, 2011; Lougee & Marquardt, 2004). Second, compensation risk is expected to be related with firm risk, proxied for through earnings volatility, and the compensation decision is expected to be related with the compensation risk (Core, Holthausen, & Larcker, 1999). In this thesis I follow the approach by Isidro and Marques (2013) by taking the standard deviation of return on assets over the past three fiscal years.

Another factor found by Klein (2002b) to be negatively associated with audit committee independence is past negative earnings in the last two years or longer. Related are the findings of higher and more opportunistic use of non-GAAP when a firm reports a loss (Black, Black, & Christensen, 2014). In order to take these effects into account, three indicator variables are added to the regression: whether the firm reported a loss for the current fiscal year, whether the firm reported a loss for the previous fiscal year and whether the firm reported a loss for the previous two (or longer) fiscal years.

Audit quality is another factor to control for. As opportunistic use of non-GAAP measures has been found to be a substitute for earnings management, and audit quality raises the difficulty of earnings management, audit quality could influence the choice of compensation base as well towards the easier to manipulate measure. For audit quality, an indicator variable is used denoting whether a firm is audited by a big 4 firm or not. This as big 4 firms are considered to provide higher quality audits.

Size of the firm is generally used to control for a variety of different effects and incentives, such as political costs due to higher public scrutiny and complexity of operations (Jiang, Lee, & Anandarajan, 2008). This, combined with a found relation between size and board independence requires inclusion as a control variable (Frankel, McVay, & Soliman, 2011). Like leverage, several different methods exist and are used as operationalisation of firm size, I use the natural logarithm of total assets.

Lastly, industry and year dummies are included to control for trends over time and fixed industry effects. This is especially needed as a trend over time and differences in usage between

industries have already been identified by research from Audit Analytics (2016) and Isidro and Marques (2013). For industry, the groups are based on the division classification of SIC codes⁸.

For an overview and some more detail on the variables used, see the variable definitions table in the appendix.

3.2 Sample and data

3.2.1 Sample selection and data collection

Sample selection and data collection started with the dataset provided to me by my supervisor. This dataset comprised 611 random DEF14A proxy filings made between March 2006 and December 2015 by 265 unique firms deemed to potentially use a non-GAAP measure for executive compensation. From this dataset, information on the use of non-GAAP measures was manually collected.

To determine whether a firm used a non-GAAP measure or not, the used performance measures for the compensation earned during the fiscal year were gathered from the compensation discussion and analysis sections of the proxy statements and subsequently analysed to determine whether the used measures could be classified as a non-GAAP measure with a GAAP equivalent.

Next, data was collected for the other variables in the regression. For all firms in the provided sample information on accounting variables was obtained from Compustat starting from January 2000 and ending in June 2017 (the latest available datapoint), this in order to have a sufficient amount of observations for the backwards looking variables. Information on governance and director characteristics was obtained from ISS, starting in 2007 (the earliest available datapoint) and ending in 2016 (again the latest available datapoint). Lastly, information on audit quality characteristics for the robustness checks was gathered from Audit Analytics for the observations left in the final sample. As this information was only added for the robustness check, it will not be reflected in the rest of this chapter.

This resulted in a starting sample 3266 firmyear observations for the 265 firms which slowly shrank to 127 firmyear observations from 60 firms between 2009 and 2015 due to data availability issues. These could be missing variables or firms/years missing from the used databases. While this is a small sample and a significant drop in observations, this is to be expected given the manual data collection involved and the difference in covered time period between the large, initial Compustat sample and the manual sample. However, the amount of observations is still above the minimum

⁸ For instance, codes between 2000 and 3999 are classified as being in the manufacturing division. See the variable definition table in the appendix for a more detailed description.

levels required for the used tests to be unaffected. For a more detailed overview of the sample selection process, see the sample selection table in the appendix.

3.2.2 Data preparation and regression diagnostics

In order for the regression to provide correct results, the sample and design have to be tested for a number of assumptions. Not meeting these assumptions could mean the regression results are biased and inaccurate.

The first assumption of the logistic regression model is a good model fit. For accurate results, the used model should include all relevant information, and only that relevant information. In other words, no over or under fitting. In order to test this assumption, two tests were performed. The first is the Hosmer-Lemeshow χ^2 goodness of fit test, the second is the linktest. For the main regression model outlined above, both tests show a good model fit by not rejecting their null-hypothesis of a properly specified model. For all tabulated models, the results of the Hosmer-Lemeshow test are reported in the table. The number of groups used is reported as well.

The second assumption is a lack of (multi)collinearity. This as two or more highly correlated variables could make the regression coefficients unstable and unreliable. Again, two tests were performed. The first is an inspection of the correlations tables found in table 5 of the appendix. As no correlation is above 0.9, this is a first sign there is no (multi)collinearity problem. The second test is through the Variance Inflation Factor (VIF). The VIF is often used to determine collinearity problems. There are several thresholds used in practice, with two of the most common ones being 5 and 10. The reported VIFs in table 7 show no VIF beating this threshold, further showing there are no major issues with regards to (multi)collinearity warranting further attention.

The final assumption to control for is the effect of outliers. Like (multi)collinearity, outliers can have a great influence on the regression results, especially in a small sample such as this one. In order to detect outliers and limit their effect, a combination of several methods was used. First, all non-discrete variables were checked on observations outside of their interquartile range (IQR). Observations out of this IQR are far enough from the mean to be considered potential outliers. Five variables were found to have such observations: boardScore, average percent of shares held, leverage, earnings volatility and market to book ratio.

Next, the standardized Z-score was determined for these variables. The standardised Z-score is another measure of an observation's distance from the mean, listing the distance from said mean in standard deviations. A common threshold for outliers is a Z-score of 3.29 (in absolute value), tagging values in the top and bottom 0.05 percent of the distribution as (potential) outliers. The

amount of observations found to exceed this threshold is 10. A second common threshold is a Z-score of 3 (in absolute value). When using this threshold, the amount of outliers increases by 1, to 11. These observations were examined in more detail. As they were not data entry errors, are therefore part of the distribution and, as such, have information value, they were kept. In order to limit their (potential) effect on the regression, all variables except for the boardScore were winsorized at the 1st and 99th percentile. To further prevent undue influence by outliers to bias the found results, several robustness checks are performed in paragraph 4.4 using different methods of dealing with outliers.

Chapter 4: Results and analysis

In this chapter the results are discussed. Paragraph 4.1 begins by describing the basic descriptive statistics, correlations matrix and some other basic statistics such as time trends. Paragraph 4.2 then covers the results of the Welch difference of means test. Following that, paragraph 4.3 covers the results of the main regression model and analyses the results. Lastly, paragraph 4.4 covers the robustness checks and other statistics.

4.1 Descriptive statistics

Table 3 covers the basic descriptive statistics of the entire sample, with panel A showing the seven major statistics (the mean, standard deviation, minimum, maximum, median, 25th percentile and 75th percentile) of the non-discrete variables and panel B showing the frequency of the discrete variables.

These statistics show 64.6% of the sample use a non-GAAP measure for executive compensation. This is a substantial majority, but also shows a significant percentage of firms do not use any non-GAAP measures to determine their executive's pay. The practice is most prevalent in the manufacturing and transportation & communications industry, with 75 and 83.3 percent of firms in those industries using non-GAAP measures for compensation respectively. This result mirrors that by Isidro and Marques (2013) on the use of non-GAAP measures in the financial disclosure setting. This increase in use for both settings indicates a potential link between the two settings.

The governance quality of the average firm in the sample is very high, with a mean (median) boardScore of 10.472 (11.000) indicating most firms meet the thresholds for nearly all quality characteristics. This is substantially higher than the found mean by Isidro and Marques (2013) of 2.1 (median 2.0), indicating my sample contains firms with much better corporate governance quality. This big difference in score is most likely caused by two differences between my research and theirs.

The first difference is the fact their score consists of only ten characteristics, while mine consists of twelve. Of the three additional variables included in mine⁹, two are present in roughly 95% of all observations (see table 4 for more details), which can partially explain the difference. The second difference that likely explains the big difference in scores is the difference in setting. Isidro and Marques study a European sample, while my sample consists of firms listed in the US. The US generally has higher quality governance, as found by Aggarwal et al. (2009). When they compared

⁹ The three additional characteristics captured in my score are: The CEO is not also chairman of the board, The CEO serves on the board of two or fewer public companies and Board size is greater than 5 but smaller than 16. Of the nine characteristics that overlap, seven overlap fully and two overlap partially. The partially overlapping characteristics are the governance committee and policy on outside directorship characteristics I captured differently due to data availability issues. See paragraph 3.1.2.2 for a more detailed explanation on these partial overlaps.

governance quality between US and non-US based firms through a governance index (on which both Isidro and Marques' and mine are based), they found US based firms to, on average, have higher scores than their foreign counterparts, including European firms. The difference in score is therefore likely explained by these two differences.

However, my found level of governance also differs greatly from that found by Aggarwal et al. (2009) for their sample of US based firms. Their average US based firm meets 59% of the characteristics, while the average firm in my sample meets 87%. This difference is most likely caused by a difference in size between the two scores. Their score is significantly larger than mine, capturing 44 characteristics covering more aspects of corporate governance than I do, such as audit quality, which can again help explain the difference.

A more detailed look at the boardScore is provided by table 4 in the appendix, which covers the frequency of the twelve characteristics. As shown, all attributes other than a lack of CEO duality are present in over 50% of the sample, with nine of the attributes being present in over 90%. A difference in score between two firms is therefore most likely caused by a lack of CEO duality (present in only 45.7% of the sample) or having an annually elected board (present in only 56.7% of cases).

The high quality of governance in my sample, with 82.7% of the sample having a score of 10 or higher, needs to be taken into account when making inferences about the effect of governance quality. While the high average quality is a positive sign for regulators and investors who desire and depend on high quality governance, it may cause the results of my thesis to only hold for firms with high quality board and governance.

Table 3 further shows 22.4 (median of 20) percent of board members can be considered to have financial expertise. Given the mean (median) board size of 9.598 (9.000), the average board has 2.15 (1.8) directors with financial expertise. The average age of the board is 61.579 (median 61.778) years old. This is lower than the proposed age limit of 70, but there is one board with an average age of over 70. The average tenure for a director is 4.694 (median 4.200) years and directors generally do not own a large stake in the company, owning a mean (median) percentage of outstanding shares of 0.4 (0.2).

The average firm in the sample is seen by the market as having high growth potential, as shown by a mean (median) market to book value of 8.269 (2.756). With a mean (median) leverage ratio of 28.4% (27.6%), just over a quarter of the firm's assets is funded by bank loans and other debt. The average sample firm has assets worth 16 603 (median 3 457) million dollars. Audit quality is

very high in this sample, with a big 4 auditor being employed by 97.6% of the sample firms. While, like the high average governance quality, this is a good sign for investors and other stakeholders, this can cause issues for the regression. In order to combat this, a robustness check is performed in paragraph 4.4 with different audit quality characteristics.

Firms failing to turn a profit is relatively sparse, with 11.0% of the sample reporting a loss for the current year, 9.4% reporting a loss the year before and 5.5% reporting losses for the previous two years or longer. In general, it can be concluded firms in my sample are profitable.

Moving on from the descriptive statistics, the correlations matrix are found in table 5 and provide some preliminary evidence of a link between board quality and the decision to use a non-GAAP measures for executive compensation, as both the Pearson and Spearman matrix show a significant, positive correlation between the two.

Besides the correlation between the dependent and intendent variable, a few other correlations with the use of non-GAAP measures are significant. The level of financial expertise of the board and the average percentage of shares held by the board is significantly negatively correlated with the choice to use non-GAAP measures. Audit quality, leverage ratio and firm size on the other hand are significantly positively correlated with the use. These significant correlations similarly provide early evidence of a relation. However, as always, correlation does not mean causation.

Lastly, the time trends in governance quality and frequency of non-GAAP based compensation are examined. These time trends provides no support for a link between governance quality and the use of non-GAAP measure, contrary to the correlations. While a positive trend can be seen in the governance quality, no real trend can be found in the use of non-GAAP measures. As can be seen in figure 1, the overall trend in the usage of non-GAAP measures looks to be declining, going from 71.4% in 2009 to 50% in 2015. However, looking at figure 2, a large dip in the number of observations for 2015 indicates the averaged results for this year may not be reliable enough for trend analyses such as this. When 2015 is discounted, there is no clear trend visible in figure 1. Given this lack of overall trend, the time trends provide no evidence of a relation between governance quality and usage of non-GAAP measures.

The time trend in boardScore is shown in figure 3. The average boardScore shows an increasing trend over the sample years, even when 2015 is discounted, meaning governance quality increased over time. The increase seem to be slowing down, but given that the average score is approaching its maximum possible level that is to be expected.

4.2 Difference of means test

Table 6 shows the results of the Welch difference of means tests performed. These results show several firm characteristics differ significantly between firms that do and firms that do not use non-GAAP measures for compensation purposes.

First, firms that use non-GAAP measures are larger, as shown through a higher mean natural log of total assets (8.889 versus 7.291). Second, these firms use more debt financing, as evidenced by the higher leverage ratio (33.2% versus 19.6%). Further, directors on the board own a smaller stake in the firm, with the mean percentage of outstanding shares being lower (mean of 0.2 versus 0.6 percent); the boards contain less directors that can be classified as having prior financial expertise (mean percentage of the board classified as a financial expert of 20.2 versus 26.4) and audit quality is higher, with more firms being audited by a big 4 auditor (100% versus 93.3%).

Lastly, and most importantly, the boardScore is higher for firms that do use non-GAAP measures, providing further indication of a link between governance quality and the choice to use non-GAAP measures for executive compensation, which would result in the rejection of the null hypothesis. Furthermore, it provides preliminary evidence of a positive relation. The means and frequencies of other firm characteristics and factors are not significantly different between the two groups.

These results, and especially the insignificant mean differences on the other firm characteristics, are interesting when compared to the found effects of these same factors on the use, usefulness and opportunism of non-GAAP measures in the financial disclosure setting. A detailed discussion of these results and potential for future research will be given in the analysis of the regression results.

As a final note, the difference in audit quality warrants some more attention. While the fact all firms that use non-GAAP measures for executive compensation are audited by a big 4 auditor is a positive sign for share- and other stakeholders, as it indicates all these firms are subjected to high quality audits, it causes problems for the regression. This result therefore further warrants the robustness checks with other audit quality measures in paragraph 4.4.

4.3 Main regression results

The regression results for the logistic regression model outlined in paragraph 3.1.2 are shown in table 7. These results, overall, are consistent with those provided by the Welch difference of means test above.

The main result of the regression is the highly significant (p-value 0.003) and positive coefficient on boardScore. This indicates firms with higher governance quality are more likely to compensate management based on non-GAAP measures with a GAAP equivalent than firms with lower quality governance. Therefore, this result indicates a rejection of the null hypothesis. There is a difference in use of non-GAAP measures for compensation purposes between high and low quality boards.

Going further, the difference in use between firms with different governance and board quality levels provides evidence of the usefulness of non-GAAP measures. The (higher) use by high quality boards in their efforts to curb management opportunism by aligning incentives between said management and shareholders shows their usefulness as performance measures.

However, there are a few possible explanations for this. The first is simply a high(er) default usefulness of non-GAAP measures that higher quality boards are better equipped to recognise and use than lower quality boards. This would provide evidence fully on the side of proponents of non-GAAP measures.

A second explanation considers the higher governance quality as a requirement for the board to be able to withstand management pressures and the accompanying negatives associated with non-GAAP measures, as is often argued as a benefit of high quality governance (Jennings & Marques, 2011). Rather than being able to recognising the high(er) usefulness, the higher governance quality creates the high(er) usefulness. Under this explanation, the regression results provide evidence more on the side of the opponents of non-GAAP measures, due to their usefulness not existing by default, but needing to be created and opportunism and other negatives needing to be curbed.

However, as argued in the hypothesis development section, under lower quality governance, boards are more susceptible to management pressures. This pressure is expected to be a desire to be compensate based on non-GAAP measures. As such, under the alternative explanation one would expect to find no effect of governance quality, with higher quality boards able to create and use high(er) quality non-GAAP measures while lower quality boards are more likely to succumb to the management pressure leading them to compensate based on (lower quality) non-GAAP measures. Seeing as there is difference, either this second explanation is less likely than the first explanation, or the expectation of management's desire to be compensated based on non-GAAP measures (under low quality governance) is wrong and has to be reconsidered.

A third explanation is related to the found increase in use in the disclosure setting when more traditional management opportunism such as earnings management are made more difficult (Doyle, Jennings, & Soliman, 2013; Isidro & Marques, 2015). Considering corporate governance has

as one of its main goals curbing management opportunism, the governance quality should be one of the causes of this substitution effect, with research confirming this theory for acts such as earnings management (Klein, 2002a). If the substitution effect under high governance quality extends to the compensation setting, the higher governance quality indeed causes the higher use of non-GAAP measures, but not due to high(er) usefulness of the measures, but due to management opportunism.

However, this explanation is similarly less likely than the first. For one, in order for a firm's to be considered as having high governance quality, the board need to be able to withstand management pressure and opportunism such as this. Furthermore, in the compensation setting, the board (and more specifically, the compensation committee) is in charge of the compensation decisions, including whether to use non-GAAP measures as a base, and this decision has to be ratified by the shareholders. This differs from the disclosure setting where management itself is in charge of the decision to use or show non-GAAP measures. As such, this substitution of opportunism effect of governance quality transferring between the two settings is unlikely. Therefore, the results provide early evidence supporting non-GAAP measures being (more) useful measures of firm performance.

Looking beyond the boardScore, several other factors are also significant in both the regression and the difference of means test. Financial expertise is negatively related to the likelihood of using a non-GAAP measures and significant at the 5% level (p-value 0.038). The existence of debt holders also significantly influences the likelihood of compensating based on non-GAAP measures, with the coefficient on the leverage ratio being significant at the 1% level (p-value 0.005) and positive. Firm size is the final significant factor, likewise being significant at the 1% level (p-value 0.000) and positive. Larger and more leveraged firms are therefore significantly more likely to compensate based on a non-GAAP measure with a GAAP equivalent.

However, there are also differences between the Welch difference of means test results and the regression. The average percentage of shares held by the board is no longer significant in the regression, indicating this significant difference between the two groups is not a significant predictor of the likelihood of using the non-GAAP measure. The opposite is found for firms reporting a loss last year. While there is no significant difference between the two groups, the regression coefficient is significant, albeit at the 10% level (p-value 0.056). This indicates whether a firm reported a loss last year is a mildly significant predictor of the likelihood of using non-GAAP measures for executive compensation. The final difference is the expected dropping of the audit quality proxy from the regression. Again, to show the effect this has on the regression result, a robustness check is performed in paragraph 4.4 using several other audit quality measures.

These results warrant some further discussion, as their implications, especially when compared to the financial disclosure setting, are interesting, even for the insignificant results.

Looking at the factors related to the GAAP result, none of the factors related to the usefulness of GAAP earnings (intangible intensity, growth potential and earnings volatility) are significant, nor were they significantly different in the Welch test. Given previous research has found these factors of lower GAAP informativeness (except intangible intensity) to be associated with an increase in the use of non-GAAP measures in press releases, the results indicate this effect does not transfer between the two settings (Lougee & Marquardt, 2004). This is a surprising result considering the underlying reasons for the lower usefulness in the disclosure setting should (theoretically) transfer. Given this does not hold, an interesting question for further research is what performance measures are used for compensation purposes in these types of firms.

The same difference between the two settings can be found when looking at the effects of having to report a GAAP loss (reporting a loss in the current year, reporting a loss in the last year and reporting a loss in the previous two years or longer). Of these variables, only whether the firm reported a loss in the previous year is significant. However, this is only in the regression results and only at the 10% significance level (p-value 0.056). With this single, mildly significant effect, these results provide evidence this effect only very mildly transfers between the two settings. Considering a found influence of loss reporting is generally regarded as evidence of opportunism, this effect transferring only very mildly can be seen as a positive difference between the two settings.

Moving to the factors directly related to governance and governance quality, the found results are more mixed. Two of the three factors with a (potentially) ambiguous effect on board quality are not significant in either test, those being age and tenure. Financial expertise, however, is significant in both, being significant at the 5% level in the regression (p-value 0.038). The results of both tests show a negative relation, indicating firms with more financial expertise on the board are less likely to compensate based on non-GAAP measures.

Due to the (potentially) ambiguous effect, however, these results are more difficult to interpret. The lack of effect for age and tenure could be because these governance factors really have no effect, or because the ambiguous effects cancel each other out. With theory and research predicting a non-linear relationship between the age or tenure of a director and the governance quality, the latter explanation is more likely. However, there is little research into the exact relation and distribution of this effect, making correct interpretation of these results difficult. Research into the relation and distribution of the positive and negative effects of director experience can therefore provide valuable insight, allow for better research into the (potential) effects of corporate

governance and can ultimately help improve the quality of boards and governance. As it stands, the results provide no evidence of a relation between director age or tenure and the likelihood of using non-GAAP measures for compensation purposes.

The difficulties in interpreting the results of financial expertise are slightly different, as there is no non-linear relationship possible between it and governance quality. However, the potentially ambiguous effect stems from certain biases stemming from the origin of the financial expertise, such as experts with a background in commercial banking being (somewhat) biased towards financing through bank loans (Güner, Malmendier, & Tate, 2008). Unfortunately, not a lot of research has been done on the link between these biases and executive compensation decisions, making interpretation of the results difficult. Generally, financial expertise is considered to have a neutral to positive effect on governance quality in the compensation setting. As such, the negative relation between financial expertise and the likelihood of using non-GAAP measures somewhat contradicts the found effect of governance quality through the boardScore. Further research into the effect of financial expertise on the compensation decision is needed to better interpret these results. A similar small amount of research has been done on the effect of the two director experience measures discussed above on the compensation decision. Therefore, this avenue for future research is present for all three factors.

With regards to the final two factors related to governance, the existence of debt holders and auditing, both factors are significantly higher for firms that use non-GAAP measures in the difference of means test. The leverage ratio is also highly significant in the regression, being significant at the 1% level (p-value 0.005), indicating the more leveraged a firm is, the higher the chance of it using non-GAAP measures. As for auditing quality, the dropping of the audit quality measure from the regression means there are no regression results to discuss further here. These are instead covered in the robustness tests next paragraph.

Lastly, time and industry indicators are added to the regression. The (untabulated) results show that, while some industries seemed to be more likely to use non-GAAP measures when looking at the descriptive statistics, no significant difference between industries is found in the regression.

Overall, the results indicate a significant positive effect of governance quality on the likelihood of using non-GAAP measures for executive compensation, which is consistent with the usefulness approach to non-GAAP measures argued by proponents. The results also indicate several areas for potential research. The effect of age and tenure on the governance quality of a firm is not yet fully understood, with no detailed research having been done into the theorised non-linear relationship. The effect of these two factors of director experience and the effect of director financial expertise on the compensation decision is also not highly researched, especially in the current period

of high governance regulation, indicating another avenue for further research. Lastly, the results indicate firms with low usefulness of the GAAP result such as high technology firms are not more likely to compensate based on non-GAAP measures. What performance measures these firms then use instead for compensation purposes is another interesting question for future research.

4.4 Robustness checks

In this paragraph the results of three robustness tests are shown. The results of these tests can be found in table 8 in the appendix.

4.4.1 Governance quality index

The first robustness check looks at the governance characteristics captured in the governance index separately. This is done to find the effect the used approach of using a score to capture governance quality has on the results and to thereby look at the effect of individual characteristics in more detail. The first of two tests involves substituting the boardScore variables for all twelve of its factors simultaneously. In the (un-tabulated) results, half of the characteristics are omitted due to regression issues like those with the audit quality measure in the main regression. This is to be expected, given the high average frequency of ten of the twelve factors.

The remaining variables are: the CEO is not also chairman of the board; all directors attended at least 75% of all meetings; board size is greater than 5 but smaller than 16; the CEO serves on the board of two or fewer public companies; the board is elected annually and the added proxy for a policy on outside directorship indicating all directors serve on four or fewer public boards. Of these remaining variables, only the lack of CEO duality and whether all directors attended at least 75% of all meetings are significant, both at the 1% level (p-values of 0.052 and 0.062 respectively). The coefficients on both characteristics are positive.

A second test was performed to provide better results for the omitted variables. In this second test, the boardScore is substituted for one of the twelve characteristics at a time. The results of this second test differ greatly from the first, with five of the twelve characteristics being significant and only the CEO having no related party transactions being omitted. Table 8, panel A shows the results for the five significant characteristics. Interestingly, the independence of the overall board is not significant in its regression (p-value 0.396), but the independence of all four committees is, albeit at varying significance levels. The independence of the compensation committee is the most significant, being significant at the 1% level (p-value 0.007), while the independence of the other committees are less significant. Important to note, however, is the bad model fit in the regressions of the independence of the corporate governance committee characteristic and the independence of the nominating committee characteristic. The final significant variable is director attendance, which

was also significant in the first test. However, the significance of lack of CEO duality did not carry over from the first test. Like the main boardScore, the coefficient on all five significant characteristics is positive.

The results show that the main regression results are not significantly influenced by the used score approach to capture governance quality, with all significant factors in both tests showing the same positive relation as found in the main model. Further, these results provide some more detail into the specific governance quality factors that drive the results from the main regression, most importantly showing independence of the compensation committee is significantly related to the decision to compensate based on non-GAAP measures. However, they must be interpreted with care due to the high interrelation of corporate governance, which may understate the effects in tests such as test one or even bias the results in tests such as test two.

4.4.2 Other methods of dealing with outliers

In panel B of table 8, the results of several other methods of dealing with outliers are shown. In the main regression, only those variables with potential outliers were winsorized at the 1st and 99th percentile, while many other papers winsorize all continuous variables. The first column reports the results when this approach to winsorization is used.

For the second and third column, observations tagged as potential outliers through their standardised Z-score are dropped if their Z-score exceeds, as absolute value, 3.29 or 3, respectively, thereby trimming the dataset rather than winsorizing it. None of the three approaches has a significant effect on the significance or sign of boardScore. As such, the main conclusion of the paper does not seem vulnerable to outliers. However, the significance of financial expertise and leverage goes down one level for all three methods (in the case of financial expertise) or when the dataset it trimmed (in the case of leverage). As they continue to be significant, the inferences from these results also does not change.

4.4.3 Other audit quality measures

Lastly, panel C reports the results from a robustness check using three other audit quality measures. All three measures are related to the amount of fees paid by the firm to their auditor.

The level of audit fees is a commonly used indirect measure of audit quality in the literature. It is argued that firms that can provide better audits through experience or better resources can charge a premium for their high quality. Following that logic, the higher the paid fee, the higher the quality of the audit received. As such, audit fees paid can be used as proxy of audit quality (Choi, Kim, Kim, & Zang, 2010).

The first measure used is the audit fees paid as they are reported by the firm. For the second measure, this amount is scaled by total assets of the audited firm. Because larger firms are naturally more complex and require more time to audit, this naturally raises fees without raising quality. Scaling the fees can help prevent this from biasing the results.

However, audit fees have a potentially non-linear relationship with the provided audit quality. High fees from certain clients, as is often argued, creates the potential for economic dependence of the auditing firm on these clients responsible for a large chunk of their income. This economic dependence is expected to lower the independence of the auditor and thereby lower audit quality (Choi, Kim, Kim, & Zang, 2010). Because the effect of auditor size on audit quality does not have this problem of a non-linear relationship, I chose to proxy for audit quality using a size proxy in the main regression rather than a fee proxy.

A similar (potentially) negative relation to audit quality through lower auditor independence is caused by the provision of non-audit services by the auditor, as this similarly affects the economic dependence on the client. I follow the literature on this effect and use the proportion of non-audit fees to total fees as proxy (Frankel, Johnson, & Nelson, 2002).

None of the audit fee measures are significant, indicating there is no effect of auditing quality on the likelihood of firms using non-GAAP measures for executive compensation. Likewise, there is no effect on the sign or significance of the boardScore variable, indicating the omitted measure in the main regression did not influence the results. Interestingly, the model using the proportion of non-audit fees to total fees has a bad model fit when looking at the Hosmer-Lemeshow test, with the p-value indicating the null hypothesis of good model fit has to be rejected.

Chapter 5: Conclusion

The purpose of this thesis is to provide evidence on the usefulness of non-GAAP measures by using the compensation setting. This as the compensation setting has insofar received little attention, even though the same debate between usefulness and opportunism holds in the compensation setting as does for the heavily researched financial disclosure setting.

Using this gap in the literature and a novel dataset of hand-collected data on the use of non-GAAP measures in executive compensation contracts, I attempt to answer the question whether the governance quality of the firm has an effect on the likelihood of the firm using non-GAAP based compensation. This as (lack of) a relation between governance quality and non-GAAP based compensation will provide evidence on the usefulness of non-GAAP measures for compensation purposes. Given a useful performance measure for compensation purposes has to succeed in aligning incentives between management and shareholders and curbing management opportunism, a useful measure in the compensation setting is, by extension, a useful performance measure in general (Murphy, 1999).

The results indicate that a substantial majority of firms compensate based on non-GAAP measure, seeing as 64.6% of researched firms use at least one measure in their compensation contracts for the year. They further indicate a significant, positive relationship between the governance quality of a firm and the likelihood of compensating based on non-GAAP measures.

This positive relation provides evidence of the usefulness of non-GAAP measures. Firms with high quality governance are better equipped to compensate management based on useful measures by being able to resist management pressure (Bebchuk & Fried, 2003; Klein, 2002a). As such, these firms being more likely to compensate based on non-GAAP measure indicates they are useful measure of performance for compensation purposes and, by extension, in general.

This thesis also looks at the effect of other firm level characteristics prior research has identified as having an effect on the use, usage and opportunism of non-GAAP measures in the disclosure setting (Lougee & Marquardt, 2004). The found results indicate many of these effects do not seem to transfer between the two settings, such as director experience (as measured through director age and tenure) or low GAAP earnings informativeness (as measured by intangible intensity, earnings volatility and growth potential). The effect of losses also does not seem to transfer, with firms reporting a loss last year being only very mildly significant. This is a positive sign, considering a relation between the use and loss reporting is generally regarded as opportunistic.

Overall, the results indicate non-GAAP measure are a useful measure of performance, meaning my results fall on the side of proponents in the theoretical debate surrounding usefulness and opportunism of non-GAAP measures.

These results have important implications for investors and regulators. As non-GAAP measures used in executive compensation contracts can be seen as useful measures of firm performance, especially under high board quality, investors could use these two factors when evaluating the trustworthiness of a reported non-GAAP measure. However, a healthy level of scepticism is still required considering this thesis only provides early evidence. Meanwhile, the evidence is an important sign for regulators to closely monitor the use in compensation contracts and to review their current stance on non-GAAP measures, especially for the SEC given their less strict application of regulation G regarding the compensation setting.

As all research, this thesis has a number of limitations. The first major limitation is the low amount of observations. At 127, it is a small number, even for a manual sample. However, this number is still above the limits for the results of logistic regressions or difference of means tests to be unaffected. The second major limitation is the high level of governance quality across the sample. It is possible the found results only hold for firms with high governance quality, however, this does not change the main implications too much. Lastly, manual data collection, while novel and required for this type of research, is prone to user errors such as data entry errors or lack of consistency, which no amount of meticulousness and effort can truly ever 100% control for.

Finally, several avenues for future research into the compensation setting of non-GAAP measures can be identified based on the found results. Given the early evidence of higher usefulness found for non-GAAP measures used in compensation contracts, further research into the extent of this usefulness is required. It could be that use as a performance measure in compensation is a mediating variable in the research surrounding the value relevance to investors of non-GAAP measures. Next, with the comparatively lax regulation surrounding transparency in the compensation setting, at least in the United States under the SEC, research into the effect of this less strict regulation is important. This as investors require this transparency for their judgement on the trustworthiness and usefulness of the measures. Further, transparency is required in order for public scrutiny by investors and other stakeholders to further curb management opportunism. Lastly, the effect of the less strict regulation is important for regulators to review whether their current regulation has the desired effect.

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Appendix A: Tables

Table 1: Variable definition table

Panel A: Main variables		
Variable name	Captures	Definition or calculation (whichever applicable)
Use non-GAAP for compensation	Compensation decision of the board	Manually collected data from the executive compensation section of DEF 14A proxy statements
BoardScore	Board quality	An index capturing the amount of characteristics denoted as high quality that are present in a company out of a maximum of 12 See panel B for an more detailed overview
Financial expertise	The level of financial expertise present on the board to capture the effect of financial expertise on board quality	Percentage of the board with financial expertise for the year through number of directors with financial expertise/ total size of the board
Age	Age and tenure effects on board quality	Average age of the directors
Tenure	Tenure effect on the board quality	Average years of service of the directors
% of shares held	Effect of stock based compensation and ownership structure on board quality	Average percentage of shares of the firm held by the directors through average number of shares owned/number of shares outstanding
Intangible intensity	Effect of low quality traditional result	Intangible assets/total assets
Growth potential	Effect of low quality traditional result	Market value of the firm, (through share price end of fiscal year*shares outstanding), divided by book value of the firm, through total shareholder equity OR book value per share*shares outstanding whenever total shareholders' equity unavailable
Leverage	Monitoring effect of other stakeholders	Debt, through total assets – equity, divided by total assets
Earnings volatility	Effect of low quality traditional result and compensation risk	Standard deviations of return on assets (Net income for the year divided by average assets for the year) over the preceding three years
Loss this year	Effect of losses	Dummy taking a value of 1 if net income for the year is less than 0
Loss last year	Effect of losses	Dummy taking a value of 1 if net income the previous year was less than 0
Past negative earnings	Effect of losses	Dummy taking a value of 1 if net income the previous and the year before the previous was less than 0

Table 1 (continued)

Audit quality	Effect of auditor scrutiny and ease of other opportunistic actions	Dummy taking the value of 1 is the firm is audited by a big 4 audit firm
Firm Size	Various effects, such as public scrutiny and complexity of operations	Multiple: <ol style="list-style-type: none"> 1. Natural logarithm of the total assets, tagged as <i>Firm size (natural log of total assets)</i> 2. Total assets in million dollars, tagged as <i>Firm Size (total assets)</i>
Board size	Board size	Number of directors on the board for the year
S&P 500	Firm size and sample distribution	Dummy taking the value of 1 is the firm is part of the Standard and Poor (S&P) 500 index of large firms
S&P 400	Firm size and sample distribution	Dummy taking the value of 1 is the firm is part of the S&P 400 index of mid-cap firms
S&P 600	Firm size and sample distribution	Dummy taking the value of 1 is the firm is part of the S&P 600 index of small-cap firms
Industry FE	Industry fixed effects	The industry division based on the SIC code divisions, with 0100-0999 being agriculture, 1000-1499 being mining, 1500-1799 being construction, 2000-3999 being manufacturing, 4000-4999 being transportation and communications, 5000-5199 being wholesale trade, 5200-5999 being retail trade, 6000-6799 being finance, 7000—8999 being services 9100-9729 being public administration and 9900-9999 being other
Year FE	Time fixed effects	Fiscal year of the observation
Audit fees	Audit quality	Audit fees as reported by audited firm
Audit Fees (proportion of total assets)	Audit quality	Audit fees as reported by audited firm scaled by total assets of the audited firm
Proportion non-audit fees to total fees	Audit quality	Proportion of non-audit fees to total fees received for services rendered to the audited firm by the auditor
Panel B: Board score index variables		
Variable name	Captures	Definition/calculation (whichever applicable)
The board is more than 50% independent	Board independence	Dummy taking a value of 1 if more than 50% of the board is designated as independent
The audit committee is comprised of solely independent directors	Board independence	Dummy taking a value of 1 if all directors on the audit committee are designated as independent
The compensation committee is comprised of solely independent directors	Board independence	Dummy taking a value of 1 if all directors on the compensation committee are designated as independent

Table 1 (continued)

The nominating committee is comprised of solely independent directors	Board independence	Dummy taking a value of 1 if all directors on the nominating committee are designated as independent
The Governance committee is comprised of solely independent directors	Board independence	Dummy taking a value of 1 if all directors on the governance committee are designated as independent
The CEO is not also chairman of the board	CEO power	Dummy taking a value of 1 if there is no CEO duality
The CEO has no related-party transactions	CEO power	Dummy taking a value of 1 is the CEO has no related-party transactions with the firm
The CEO serves on the board of two or fewer public companies	CEO busyness	Dummy taking a value of 1 is the CEO serves on less than two boards
Board size is greater than 5 but smaller than 16	Board/director efficiency	Dummy taking a value of 1 is the board size is between 5 and 16 directors
The board is elected annually	Managerial entrenchment	Dummy taking a value of 1 if the board is elected annually
All directors attended at least 75% of all meetings	Several factors, among which director busyness and efficiency	Dummy taking a value of 1 is all directors attended 75% or more of the meetings that year
No director serves on the board of more than 4 boards	Director busyness	Dummy taking a value of 1 if no director serves on more than 4 boards

Table 2 Sample selection table

	N (observations)	N (Firms)
Manual Sample information (2006-2015)	611	265
Starting sample 2000-2017 (compustat fundamentals)	3266	265
Missing data on fiscal year, total assets or duplicate observations	(734)	-
Missing from Compustat capital IQ	(597)	(8)
Missing from manually collected sample	(1403)	(20)
Missing from ISS	(403)	(176)
Missing data on governance aspects	(2)	(1)
Final sample (2009-2015)	127	60

Table 3 Descriptive statistics

Panel A: Descriptive statistics of non-discrete variables, total sample

VARIABLES	N	mean	sd	min	p25	p50	p75	max
BoardScore	127	10.472	1.320	4.000	10.000	11.000	11.000	12.000
Financial expertise	127	0.224	0.125	0.000	0.111	0.200	0.333	0.500
Age	127	61.579	3.181	54.333	59.100	61.778	63.800	70.625
Tenure	127	4.694	2.716	0.000	2.400	4.200	6.462	11.455
% of shares held	127	0.004	0.005	0.000	0.000	0.002	0.005	0.029
Intangible intensity	123	0.384	0.231	0.000	0.200	0.433	0.545	0.808
Growth potential	127	8.269	33.984	-43.852	1.505	2.756	5.679	245.825
Leverage	127	0.284	0.204	0.000	0.139	0.276	0.395	0.916
Earnings volatility	123	0.052	0.087	0.001	0.009	0.020	0.045	0.554
Firm Size (total assets)	127	16 603	40 472	104	1 332	3 457	13 868	385 303
Board size	127	9.598	2.341	5.000	8.000	9.000	11.000	17.000

Panel B: Descriptive statistics of discrete variables, total sample

VARIABLES	N	Frequency
Use non-GAAP for compensation	127	64.6%
Loss this year	127	11.0%
Loss last year	127	9.4%
Past negative earnings	127	5.5%
Audit quality	127	97.6%
S&P 400 index	127	31.5%
S&P 500 index	127	39.4%
S&P 600 index	127	29.1%

This table shows the seven main descriptive statistics and frequencies across the sample for the non-discrete and discrete variables, respectively. For detailed variable descriptions, see table 1 in this appendix. The amount of observations differs per variable due to data availability issues.

Table 4 Descriptive statistics board score attributes

VARIABLES	N	Frequency
The board is more than 50% independent	127	98.4%
The audit committee is comprised of solely independent directors	127	93.7%
The compensation committee is comprised of solely independent directors	127	96.9%
The nominating committee is comprised of solely independent directors	127	92.1%
The Governance committee is comprised of solely independent directors	127	92.1%
The CEO is not also chairman of the board	127	45.7%
The CEO has no related-party transactions	127	99.2%
The CEO serves on the board of two or fewer public companies	127	95.3%
Board size is greater than 5 but smaller than 16	127	94.5%
The board is elected annually	127	56.7%
All directors attended at least 75% of all meetings	127	94.5%
No director serves on the board of more than 4 boards	127	88.2%

This table shows the percentage of observations meeting the criteria for the high quality governance characteristics. For detailed variable descriptions, see table 1 of this appendix.

Table 5 Correlations matrix

Panel A: Pearson pairwise correlations matrix															
	Use non-GAAP	BoardScore	Financial expertise	Age	Tenure	% of shares held	Intangible intensity	Growth potential	Leverage	Earnings volatility	Loss this year	Loss last year	Past negative earnings	Audit quality	Firm size
Use non-GAAP	1.000														
BoardScore	0.2035*	1.000													
Financial expertise	-0.2375**	0.0035	1.000												
Age	0.0879	0.1556	-0.0819	1.000											
Tenure	-0.1250	0.1527	0.0927	0.2214*	1.000										
% of shares held	-0.3223***	-0.0042	0.0245	-0.4271***	0.1750*	1.000									
Intangible intensity	0.0048	0.0948	0.0145	-0.0275	0.0853	-0.0886	1.000								
Growth potential	0.0892	0.0447	-0.1156	0.0173	-0.1475	-0.0904	-0.0522	1.000							
Leverage	0.3196***	0.0349	0.1183	0.1363	-0.1319	-0.2209*	-0.1877*	0.1114	1.000						
Earnings volatility	0.0282	-0.1101	-0.0902	-0.2769**	-0.1353	0.0083	-0.0590	-0.0062	-0.2388**	1.000					
Loss this year	0.0505	0.0265	-0.0382	-0.1094	-0.1869*	-0.0500	0.0957	-0.0566	0.0518	0.0521	1.000				
Loss last year	0.1267	0.0682	0.0217	-0.1068	-0.0668	-0.0673	0.0679	-0.0476	0.1125	0.0217	0.6599***	1.000			
Past neg. earnings	0.1068	-0.0081	-0.0382	-0.2516**	-0.0200	-0.0035	0.0485	-0.0432	0.0692	-0.0384	0.5760***	0.7477***	1.000		
Audit quality	0.2100*	0.2136*	0.1687	0.0629	-0.0919	-0.4586***	0.2498**	0.0316	0.1436	0.0882	0.0547	0.0502	0.0376	1.000	
Firm size (natural log of total assets)	0.4482***	-0.0087	-0.2927***	0.4376***	-0.0272	-0.4186***	0.0711	0.0127	0.2172*	-0.1997*	0.0452	0.0128	0.0209	0.0197	1.000

Panel B: Spearman ranked correlations matrix															
	Use non-GAAP	BoardScore	Financial expertise	Age	Tenure	% of shares held	Intangible intensity	Growth potential	Leverage	Earnings volatility	Loss this year	Loss last year	Past negative earnings	Audit quality	Firm size
Use non-GAAP	1.000														
BoardScore	0.2531**	1.000													
Financial expertise	-0.3030***	-0.0254	1.000												
Age	0.1424	0.1766	-0.1069	1.000											
Tenure	-0.1036	0.1102	0.1106	0.1762	1.000										
% of shares held	-0.5004***	-0.0229	0.2197*	-0.4718***	0.2909**	1.000									
Intangible intensity	-0.0107	0.1298	0.0527	-0.0100	0.0779	-0.0196	1.000								
Growth potential	0.0179	0.0976	0.0695	-0.0622	0.1078	-0.0176	0.0400	1.000							
Leverage	0.2897**	0.0261	0.0457	0.1514	-0.0949	-0.3172***	-0.1736	0.0920	1.000						
Earnings volatility	-0.0219	-0.0270	0.0903	-0.4086***	-0.2415**	0.0420	0.0891	0.1236	-0.0621	1.000					
Loss this year	0.0367	0.0411	-0.0237	-0.1214	-0.1990*	0.0405	0.0824	-0.1686	0.0903	0.1941*	1.000				
Loss last year	0.1179	0.0913	0.0277	-0.1351	-0.0553	0.0634	0.0634	-0.0754	0.1668	0.2101*	0.6576***	1.000			
Past neg. earnings	0.1006	0.0065	-0.0108	-0.2577**	-0.0041	0.1288	0.0405	-0.1278	0.1176	0.1114	0.5741***	0.7467***	1.000		
Audit quality	0.2265*	0.2371**	0.2233*	0.0840	-0.1210	-0.2612**	0.2473**	0.1579	0.1688	0.2473**	0.0582	0.0534	0.0399	1.000	
Firm size (natural log of total assets)	0.4358***	0.0474	-0.4306***	0.4456***	-0.0397	-0.6407***	0.0755	-0.2029*	0.1770	-0.2319*	0.0480	0.0233	0.0344	0.0239	1.000

This table shows the Pearson (panel A) and Spearman (panel B) correlations matrix for the variables included in the main regression model. For detailed variable descriptions, see table 1 in this appendix. In both tables, stars are used to indicate significance levels, with * indicating significance at the 5% level ($p < 0.05$), ** indicating significance at the 1% level ($p < 0.01$) and *** indicating significance at the 0.1% level ($p < 0.001$).

Table 6 Welch Difference of means tests

Panel A: Welch T-test difference of means discrete variables			
VARIABLES	Mean use	Mean do not use	P-value
BoardScore	10.671	10.111	0.0295**
Financial expertise	0.202	0.264	0.0096***
Age	61.786	61.203	0.3141
Tenure	4.443	5.150	0.1711
% of shares held	0.002	0.006	0.0012***
Intangible intensity	0.385	0.383	0.9605
Growth potential	10.507	4.193	0.1818
Leverage	0.332	0.196	0.0001***
Earnings volatility	0.053	0.048	0.7205
Firm size (natural log of total assets)	8.889	7.291	0.0000***
Panel B: Welch T-test difference of means non-discrete variables			
VARIABLES	Frequency use	Frequency do not use	P-value
Loss this year	12.2%	8.9%	0.5579
Loss last year	12.2%	4.4%	0.1076
Past negative earnings	7.3%	2.2%	0.1650
Audit quality	100%	93.3%	0.0832*

This table shows the results of the Welch difference of means test performed for the mean of non-discrete variables (panel A) and the frequency of discrete variables (panel B). For detailed variable descriptions, see table 1 in this appendix. In both panels, stars are used to indicate significance levels, with * indicating significance at the 10% level ($p < 0.10$), ** indicating significance at the 5% level ($p < 0.05$) and *** indicating significance at the 1% level ($p < 0.01$). The amount of observations differs between groups and variables due to data availability issues, with the *use* group containing 82 observations except for earnings volatility (80) and the *not use* group containing 45 observations except for earnings volatility (43) and intangible intensity (41).

Table 7 Main regression

VARIABLES	Main Model	VIF
BoardScore	1.021*** (0.344)	1.16
Financial expertise	-8.073** (3.896)	1.35
Age	-0.216 (0.144)	1.98
Tenure	0.216 (0.178)	1.34
% of shares held	-43.419 (78.738)	2.26
Intangible intensity	-2.285 (1.793)	1.21
Growth potential	0.020 (0.086)	1.07
Earnings volatility	6.151 (4.561)	1.30
Leverage	6.968*** (2.502)	1.28
Loss this year	-0.441 (1.598)	1.94
Loss last year	3.462* (1.813)	2.93
Past negative earnings	-3.614 (2.465)	2.76
Firm size (natural log of total assets)	1.454*** (0.392)	1.84
Constant	-5.145 (9.582)	
Industry FE	YES	
Year FE	YES	
Observations	117	
Pseudo R ²	0.506	
Model fit (25 groups)	0.203	

This table shows the result of the main regression, specifically the coefficient; significance level and standard errors for the variables, in column 1. For detailed variable descriptions, see table 1 in this appendix. Stars are used to denote the significance level with * indicating significance at the 10% level ($p < 0.10$), ** indicating significance at the 5% level ($p < 0.05$) and *** indicating significance at the 1% level ($p < 0.01$). Standard errors of the coefficients are reported in parentheses. The second column shows the Variance Inflation factor used to test for multicollinearity. The model fit statistics is the p-value from the Hosmer-Lemeshow goodness of fit test. Given the null-hypothesis of this test of a good model fit, p-values of over 0.05 indicate a good model fit while values of below 0.05 indicate a bad model fit.

Table 8 Robustness checks

Panel A: boardScore index variables separately					
VARIABLES	All directors attended at least 75% of all meetings	The audit committee is comprised of solely independent directors	The compensation committee is comprised of solely independent directors	The nominating committee is comprised of solely independent directors	The Governance committee is comprised of solely independent directors
Individual Index variable	10.165*** (3.630)	4.514* (2.612)	5.603*** (2.084)	3.396** (1.345)	3.396** (1.345)
Financial expertise	-14.011*** (4.562)	-11.025*** (3.668)	-8.530** (3.722)	-9.479*** (3.489)	-9.479*** (3.489)
Age	-0.610*** (0.228)	-0.192 (0.151)	-0.224 (0.144)	-0.297** (0.144)	-0.297** (0.144)
Tenure	0.390** (0.186)	0.267* (0.157)	0.265 (0.175)	0.263 (0.166)	0.263 (0.166)
% of shares held	-49.902 (84.397)	-33.923 (76.328)	-29.870 (78.018)	-45.385 (76.609)	-45.385 (76.609)
Intangible intensity	-1.431 (2.175)	-1.639 (1.713)	-2.832 (1.899)	-3.316* (1.901)	-3.316* (1.901)
Growth potential	0.005 (0.032)	0.034 (0.073)	0.037 (0.081)	0.060 (0.062)	0.060 (0.062)
Earnings volatility	6.847 (4.719)	4.841 (4.507)	6.216 (4.360)	5.111 (4.892)	5.111 (4.892)
Leverage (debt)	4.437** (2.242)	5.806** (2.260)	7.106*** (2.632)	6.260*** (2.274)	6.260*** (2.274)
Loss this year	0.567 (2.386)	-0.485 (1.527)	-1.246 (1.488)	-0.385 (1.382)	-0.385 (1.382)
Loss last year	3.728* (2.028)	4.914** (2.278)	3.608* (1.865)	3.411* (1.812)	3.411* (1.812)
Past negative earnings	-3.185 (2.633)	-4.975* (2.876)	-3.832 (2.630)	-4.535 (2.780)	-4.535 (2.780)
Firm size (natural log of total assets)	1.826*** (0.488)	1.153*** (0.341)	1.532*** (0.402)	1.420*** (0.379)	1.420*** (0.379)
Constant	14.909 (10.167)	1.497 (9.480)	-1.320 (8.965)	5.706 (8.460)	5.706 (8.460)
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	117	117	117	117	117
Pseudo R ²	0.552	0.456	0.499	0.479	0.479
Model fit (25 groups)	0.860	0.409	0.486	0.000	0.000

Table 8 (continued)

Panel B: Further methods to deal with outliers			
VARIABLES	Further Winsorisation	Trim at Z-score of 3.29	Trim at Z-score of 3.00
BoardScore	1.158*** (0.379)	1.254*** (0.418)	1.243*** (0.416)
Financial expertise	-7.630* (3.909)	-6.757* (3.979)	-6.679* (3.948)
Age	-0.204 (0.151)	-0.236 (0.145)	-0.235 (0.145)
Tenure	0.218 (0.177)	0.260 (0.192)	0.253 (0.192)
% of shares held	-48.874 (76.584)	-167.867 (112.899)	-164.137 (112.435)
Intangible intensity	-2.483 (1.819)	-3.277 (2.001)	-3.163 (2.012)
Growth potential	0.020 (0.087)	-0.015 (0.094)	-0.006 (0.099)
Earnings volatility	5.501 (4.404)	-0.999 (6.044)	-1.210 (6.064)
Leverage	7.157*** (2.539)	6.537** (2.716)	6.237** (2.817)
Loss this year	-0.387 (1.601)	0.122 (1.614)	0.135 (1.603)
Loss last year	3.262* (1.770)	3.491* (1.899)	3.492* (1.891)
Past negative earnings	-3.447 (2.401)	-4.044 (2.558)	-3.988 (2.557)
Firm size (natural log of total assets)	1.444*** (0.393)	1.471*** (0.411)	1.458*** (0.410)
Constant	-7.749 (10.288)	-7.130 (10.431)	-7.071 (10.388)
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	117	102	101
Pseudo R ²	0.510	0.498	0.4964
Model fit (25 groups)	0.521	0.753	0.982

Table 8 (continued)

Panel C: Other audit quality measures			
VARIABLES	Audit Fees	Audit Fees (proportion of total assets)	Proportion non- audit fees to total fees
BoardScore	1.088*** (0.357)	1.017*** (0.375)	1.184*** (0.384)
Financial expertise	-10.605** (4.400)	-13.464** (5.370)	-10.180** (4.305)
Age	-0.320** (0.156)	-0.306* (0.157)	-0.319** (0.156)
Tenure	0.301 (0.205)	0.302 (0.219)	0.248 (0.220)
% of shares held	-149.728* (84.994)	-186.190** (90.522)	-149.886* (84.749)
Intangible intensity	-0.473 (1.779)	-1.378 (1.903)	-0.539 (1.807)
Growth potential	0.008 (0.060)	-0.000 (0.037)	0.027 (0.096)
Earnings volatility	5.936 (4.854)	2.788 (4.630)	6.640 (4.972)
Leverage	7.667*** (2.508)	7.570*** (2.553)	7.783*** (2.635)
Loss this year	-0.444 (1.757)	-1.143 (1.976)	-0.262 (1.716)
Loss last year	3.788* (1.941)	4.618** (2.142)	4.120** (2.030)
Past negative earnings	-3.844 (2.550)	-4.454* (2.620)	-4.179 (2.609)
Firm size (natural log of total assets)	1.194** (0.586)	2.034*** (0.617)	1.374*** (0.416)
Audit quality measure	0.000 (0.000)	0.001 (0.001)	2.492 (3.557)
Constant	1.185 (10.653)	-5.113 (10.529)	-1.384 (10.339)
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	119	119	119
Pseudo R ²	0.545	0.565	0.548
Model fit (25 groups)	0.118	0.311	0.003

This table shows the regression results of the performed robustness checks. Panel A shows the results of a different approach to measuring governance quality where all characteristics are regressed on individually. Only the significant variables are tabulated. Panel B shows the result of various differing methods of dealing with outliers. Column 1 shows the results when all continuous variables are winsorized at the 1st and 99th percentile, column 2 shows the results when the sample is trimmed at standardized Z-scores of 3.29 (in absolute values) and column 3 shows the results when the sample is trimmed at a standardised Z-score of 3 (also in absolute value). Panel C shows the result of three tests using other audit quality measures, with column A using total fees as reported, column 2 using fees scaled to total assets for the audited firm and column 3 using the proportion of non-audit fees to total fees. For detailed variable descriptions, see table 1

in this appendix. Stars are used to denote the significance level with * indicating significance at the 10% level ($p < 0.10$), ** indicating significance at the 5% level ($p < 0.05$) and *** indicating significance at the 1% level ($p < 0.01$). Standard errors of the coefficients are reported in parentheses. The model fit statistics is the p-value from the Hosmer-Lemeshow goodness of fit test. Given the null-hypothesis of this test of a good model fit, p-values of over 0.05 indicate a good model fit while values of below 0.05 indicate a bad model fit.

Appendix B: Figures

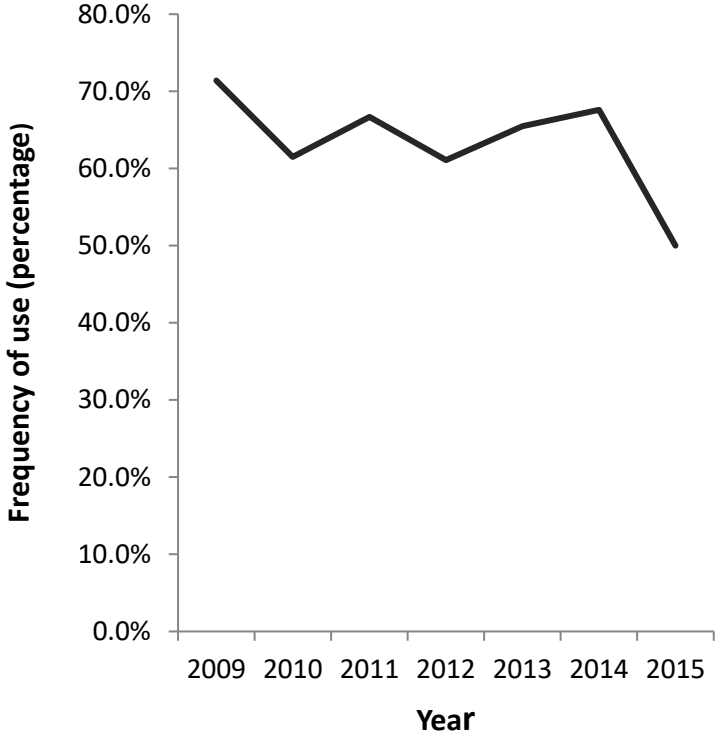


Figure 1. Time trend in the usage of non-GAAP measures

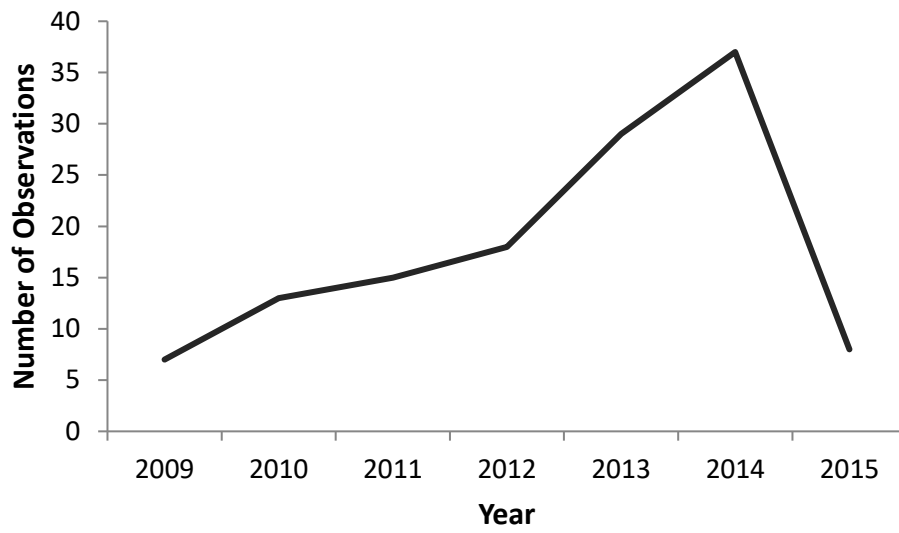


Figure 2. Time trend in the number of observations

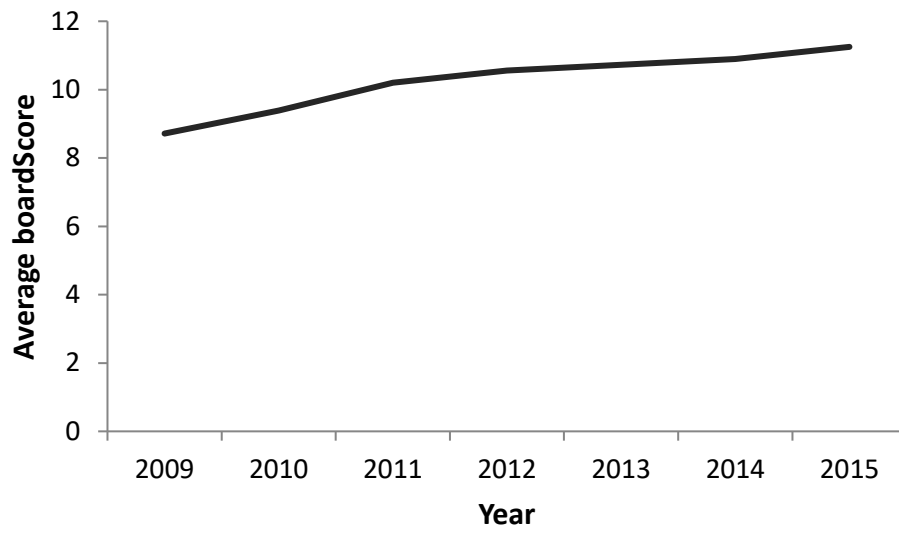


Figure 3. Time trend in the average boardScore for the year