



The effect of SOX mandated PCAOB inspections

An examination of going concern opinions and restatements

Abstract

In this thesis I examine the effect of PCAOB inspections on audit quality. I focus on the sample period from the start of the inspection, 2004, till 2015 in order to determine whether there has been a continuous increase in audit quality. I measure audit quality by the propensity to issue GCOs and the number of financial statement restatements. As a sensitivity analysis I use the absolute value of discretionary accruals as well. The results suggest that audit firms that have received PCAOB inspection reports with audit deficiencies are less likely to issue GCOs and are also less likely to restate when receiving significantly deficient results, compared to audit firms who received clean reports. The level of absolute discretionary accruals however, does significantly decrease for client firms with auditors who received PCAOB inspection reports with audit deficiencies.

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1) Introduction

The Sarbanes-Oxley Act (SOX Act) was signed into law in July 2002. This Act was initiated in response to accounting scandals such as Enron and WorldCom. It aims to prevent the occurrence of such fraudulent cases in the future through increased disclosure requirements, internal control requirements and higher penalties for not adhering to laws. The overall purpose of all these rules is to increase the reliability of financial reporting. Since the external auditor plays an important role in the reliability of financial reporting, there has also been a significant change in auditor responsibilities after the introduction of SOX. These great responsibilities are reflected in the public's critical attention regarding the audit profession, with for instance the downfall of Arthur Andersen after the Enron scandal. The Public Company Accounting Oversight Board (PCAOB) is a part of the SOX Act and was also introduced in 2002. This is a private sector, nonprofit corporation, who oversees the audits of public companies and broker-dealers. Prior to this, the accounting profession has always been self-regulated.

The PCAOB performs firm inspections and provides inspection reports on conducted audits in order to protect investors and other stakeholders. After the instatement of the PCAOB, the oversight of accounting firms was no longer self-regulated but shifted to independent regulation. The four primary responsibilities of the PCAOB are registration of accounting firms, inspections of registered public accounting firms, standard setting for public accounting firms and enforcement of compliance with SOX (SEC, 2013). According to the PCAOB, inspections are their most important responsibility since this is a key tool in restoring public confidence in audited financial statements (PCAOB, 2005). The PCAOB therefore spends most of its resources on inspections of public accounting firms and has access to confidential information during the inspections. This paper examines whether the introduction of the PCAOB firm inspections have had an effect on audit quality.

The effect of the PCAOB inspections on audit quality is important for several reasons. First, the objective of these inspections is to increase audit quality. There have been several studies that have found an increase in audit quality in the post-SOX period. However, it is also important to examine whether this effect is just temporary due to new regulations that companies have to adhere to, or whether SOX and the PCAOB inspections have really led companies to invest in higher audit quality in later years as well. Second, the PCAOB inspections can also be used as a motivation for audit firms to increase audit quality. This can be explained by various reasons. For instance, an audit firm might want to maintain a reputation of providing high quality audit services because of the many other benefits this can create for the firm. The firm can then actively seek for better ways to improve audit quality such as

investing in training current employees or hiring higher educated or more experienced auditors. It can also be explained by the power of the PCAOB, meaning that audit deficiencies can result in sanctions or investigations and disciplinary proceedings (Knechel, Krishnan, Pevzner, Shefehik, & Velury, 2012). This increased power would mean that not providing high quality audits might have serious consequences for the audit firm. The firm can be sanctioned or auditors can be prohibited from conducting audits of public companies. This might also lead to investigations from regulatory bodies or other institutions. Last, higher audit quality can help in restoring the credibility of financial statements and increase the public trust. When PCAOB inspection reports result in a generally high audit quality reputation of firms, investors can regain confidence in financial statement audits, which is what SOX hopes to achieve.

The central research question that is addressed in this study is; has there been an effect of PCAOB inspections on audit quality for annually inspected audit firms? In order to answer this research question, I examine the effect of the PCAOB inspection results on the propensity to issue going concern opinions and on the number of financial statement restatements. The sample period ranges from 2004 till 2015 to capture not just the effect right after the introduction of SOX but also in later years. The goal is to examine whether there has been a continuous increase audit quality or whether this effect has diminished over time. The data is gathered from the PCAOB inspection reports and client data is collected from the Audit Analytics database and financial variables from the Compustat database.

The first test shows that there is a significant negative relationship (-0.241) between receiving a PCAOB inspection report with audit deficiencies and issuing GCOs. There is an insignificant relationship between receiving a significantly deficient inspection result and issuing GCOs. This suggests that the number of GCOs does not increase over time and that audit firms are thus not opting for a more conservative approach after receiving “unclean” inspection reports. The second model shows a significant negative relationship (-0.010) between receiving a PCAOB inspection report with significant audit deficiencies and requesting a financial statement restatement. There is an insignificant relationship between receiving a deficient inspection result and restatements. This confirms that audit firms are not more cautious in their auditing practices after the PCAOB inspections. Because these results are inconsistent with expectations, I perform a sensitivity analysis by using a third proxy for audit quality. I find a significant negative relationship between receiving a PCAOB inspection report with audit deficiencies and the absolute level of discretionary accruals. This means discretionary accruals decrease after receiving deficient inspection results and is thus consistent

with expectations. Discretionary accruals are a measure for earnings management and this decrease could have been caused by higher audit quality.

This study contributes to existing literature in a number of ways. First, this study contributes to literature regarding the effectiveness of the SOX act, and in particular the PCAOB inspections. Since higher audit quality improves the reliability of financial statements (Behn, Choi, & Kang, 2008), this would mean the SOX-Act has met its main objective with regards to the inspections. Second, many prior studies on the effects of the SOX-Act have focused their sample period on the years after the introduction of SOX. There have not been many studies on the effect of the PCAOB inspection in later years and after the global financial crisis. New insights into the effect of these inspections can provide important information to regulators on whether the PCAOB inspections have been successful in later years and can point in a certain direction for future regulation. Another issue that has changed the economic setting in prior years is the economic crisis. Humphrey, Kausar, Loft & Woods (2011) argue that while auditors were not blamed initially for the major corporate collapses, this has changed since about 2010. The question has been raised as to how major financial institutions could have collapsed so quickly after having received clean audit reports. This has led to negative attention for auditors yet again, which means that PCAOB inspections should be of increased importance after the financial crisis. Because of this, the results might be different in later years after the financial crisis compared to the first few years right after the introduction of SOX. Third, I use two proxies for audit quality in order to compare if two measures lead to the same conclusions. If so, this would give a stronger idea of the situation than if there are conflicting outcomes. Lastly, this study focuses on annually inspected audit firms. Studies have focused on triennially inspected audit firms because there is such a large number of small firms and because the impact of SOX implementation is likely to be huge on small audit firms due to high costs. However, annually inspected audit firms are of equal importance. In fact, the largest ten audit firms in the US audited 4,212 out of 6,935 publicly listed companies, which accounts for 60.7%. Even though this group of annually inspected firms only consists of ten firms in 2016, these firms account for 60% of the US market audit services.

The implications of this study are most important for users of financial statements. Researchers and regulators that are interested in the success of the PCAOB inspections can find relevant information in this study. The success of current regulation might be a guideline for subjects that are of importance for future regulation. For other users of financial statements such as investors, this study could mean that the reliability has improved due to the higher audit quality.

2) Prior literature and hypothesis development

In this chapter I first provide a short theoretical background on auditing and the demand for the PCAOB. Second, the history of the PCAOB is given and some prior evidence on the effectiveness of PCAOB inspections is shown. Third, measures of audit quality are discussed and explained and lastly, the hypotheses are formulized.

2.1 Theoretical background on auditing

There are several theories that can be used with regards to the auditing profession. Auditing theory can be used to explain the need for auditors, it describes how communication between firms and their environment works.

One of the most common theories in auditing is agency theory. According to Jensen & Meckling (1976) an agency relationship can be defined as a contract under which one or more persons (the principal) engages another person (the agent) to perform a service on their behalf which involves delegating some decision making authority to the agent. Agency theory describes how this relationship works, what problems occur and what the costs of these problems are. When discussing the agency problem, some assumptions are made with regards to human behavior. It is assumed that individuals handle in their own self-interest, with bounded rationality and are risk averse. These three factors would mean that an agent working on behalf of a principle, will not always do what is in the best interest of the principle. Instead, they might choose to do what is best for themselves. In order to minimize this problem, the principle can provide incentives for the agent to ensure maximization of the principle's welfare or even pay the agent to guarantee that he will not take any actions that are against the principle's best interest. Costs associated with these practices are referred to as bonding costs. Another way to ensure this is monitoring the agent when he is performing the work. These costs are considered monitoring costs. Clearly, it is not possible to monitor the agent at all times or there might still be incentives for the agent to act in his own self-interest. The reduction in welfare for the principle in this case is referred to as the residual loss. According to Jensen & Meckling (1979) these three cost components can be summed up as the agency costs.

There are several components to agency theory. Eisenhardt (1989) distinguishes between the moral hazard problem and the adverse selection problem, which both stem from information asymmetry between the two parties. The moral hazard problem generally refers to a situation in which the agent has incentives to behave inefficiently when their interest is not in line with that of the principle. This situation might arise when the principle can't actually observe the behavior of the agent but can view the outcome of his work. In an adverse selection problem,

the principle is able to observe the agent's behavior but he can not see the performance (Soltani, 2000). This is where auditing financial statements comes in. Organizations provide annual financial statements in order to provide information on their results of operations, financial position and cash flows. Readers of financial statements might be credit extenders, investors and trade unions, who use the information in their decision-making. The need for financial reporting and disclosure comes from information asymmetry and conflicts of interest between a firm and its stakeholders (Healey & Palepu, 2001). The firm has the best knowledge of what is going on within the company whereas stakeholders can only see a company from the outside. This information asymmetry can be reduced through transparent financial reporting. However, since the firm is responsible for preparing financial statement, they also have the ability to alter the company's financial reports. Though stakeholders usually have the common demand for a fair and true presentation of financial statements, managers might have different incentives, e.g. meeting or beating analyst forecasts, income smoothing or increasing short-term earnings and share price. Healey & Palepu (2001) explain how accounting numbers are not necessarily relevant unless their compliance with accounting standards is monitored. The PCAOB inspections introduce another attempted level of minimizing information asymmetry. History has shown that even though auditors are in place, they might have the wrong incentives as well. Through monitoring of auditors the principle-agent problem can be reduced.

Another common theory for auditing is Limperg's theory of inspired confidence. According to Hayes, Wallage & Gortemaker (2014) the demand for auditors comes directly from the association of stakeholders in the organization. Stakeholders expect to be reciprocated for their participation in the company by accountability from management. Due to the possible differences between the incentives of stakeholders and management the reports might be biased, this is why an audit is required. Lastly, legitimacy theory refers to the degree to which firms are perceived as legitimate in the eyes of society. Since PCAOB inspections are mandatory, it is not a question of whether a firm wants to appear legitimate by being subject to such an inspection. However, it might be an extra incentive for firms to provide high quality audits. Receiving positive PCAOB inspection reports could add to the appeared legitimacy of the audit firm.

2.2 PCAOB

In this section I first discuss the history of the PCAOB and what was done prior to the PCAOB inspection programs. I address the difference between the two situations and the PCAOB inspection process. In the second part of the section prior research is discussed.

2.2.1 The inspection process

Before the PCAOB was in place, audit firms were subject to the American Institute of Certified Public Accountants (AICPA) peer review since the 1970s. The goal was to improve audit quality by finding audit deficiencies and reporting these deficiencies to the inspected firms. It was then expected that the firms in question take corrective actions (Casterella, Jensen, & Knechel, 2009). The AICPA peer review program had some criticism that firms were allowed to choose their own reviewer, which could mean that firms attempt to strategically influence the outcome of the report. Also, when receiving a negative review, audit firms tend to switch reviewers in the future (Lennox & Pittman, 2010). Under the new PCAOB inspections, this is no longer a problem since firms are not able to choose who performs the inspection.

According to the PCAOB website there are 2,013 firms registered with the PCAOB at the end of 2016, which included 1,113 domestic firms and 900 non-US firms. 780 audits performed by 198 of these accounting firms were inspected, which means that not nearly all of the registered companies are inspected by the PCAOB (PCAOB, 2016). The PCAOB uses a risk-based inspection approach when it comes to selecting accounting firms for inspection. Assurance engagements and portions of engagements are chosen based on an internally developed risk model (Gunny & Zhang, 2013). The assurance engagements chosen for inspection are considered to have a high risk of material misstatement by the client and/or a high risk of audit deficiencies. In theory, this risk-based inspection program would be the best solution to spend the limited resources in order to improve audit quality for the assurance engagements that are of potential high risk to the capital markets (Eutsler, 2016). Since these inspections are conducted on high risk audits, this would mean that firms with no audit deficiencies are of very high quality. The PCAOB inspections mostly consist of two parts: first, the quality of the performed work on a certain assurance engagement is examined and second, the auditor's quality control system is reviewed. As will be explained in the following section, the inspection report consists of two parts that are either made public or kept private.

Though this might seem like an improvement, the switch from the AICPA peer review to the PCAOB inspections is actually a trade-off between the expertise of CPAs and the independence of the PCAOB inspectors (DeFond, 2010). Even though this was perceived as a problem, prior studies have actually found the AICPA peer review program to be successful. Colbert & Murray (1998) find that audit quality is positively associated with the number of previous reviews that the firm has had. The results show that the peer review scores improve over time. Casterella et al. (2009) study the effectiveness of the self-regulated peer review at signaling audit quality and find that the review is actually quite successful.

As mentioned, the PCAOB is a part of the SOX Act that was introduced in 2002. This meant the end of 50 years of self-regulation for the audit profession in the US. According to the PCAOB (2005) “inspections are the board’s core function and the fundamental tool congress gave the board to restore public confidence in audited financial reporting”. The number of firms that are inspected by the PCAOB fluctuates each year since some firms cease to issue audit opinions while other firms issue audit opinions for the first time. Generally, the PCAOB inspects firms that fall into two categories: annually and triennially inspected firms. Firms that are inspected annually issue audit reports for more than 100 clients while triennially inspected firms issue audit reports for 100 or less clients. In 2016, ten companies were classified as having more than 100 clients (PCAOB). The remaining 1,103 domestic firms are inspected triennially.

2.2.2 Prior research on the PCAOB

Gramling et al. (2011) examine whether audit firms who are inspected triennially are more likely to issue a going concern opinion for financially distressed clients subsequent to their PCAOB inspection than prior to their inspection. This is done for firms who have received a PCAOB report with deficiencies as well as firms that received a clean report. The focus is on the first inspection report issued by the PCAOB so the time frame ranges from 2005 to 2007, in which all inspections were conducted for the first time. Their sample consists of 202 firms that are inspected triennially, 26 firms are excluded because they are inspected annually. The results show that audit firms with audit deficiencies are more likely to issue going concern opinions subsequent to their PCAOB inspection than prior to their inspection. For the firms with no reported audit deficiencies, there is no such result.

DeFond & Lennox (2011) also examine the effect of the SOX Act on triennially inspected firms, with small auditor exists and audit quality in particular. The authors explain how the increase in audit quality after the introduction of the PCAOB inspections is due to the low quality audit firms leaving the market. The authors propose that the structure of the audit market changed after the introduction of the SOX Act and the PCAOB inspections. This can partly be explained by the higher costs associated with compliance to the high standards. It might be more beneficial to companies that have few audit clients to exit the market because the costs will simply be too high. These high costs will be even higher for low quality audit firms due to greater scrutiny and higher penalties. Because of these firms exiting the market the dynamics of the market will change. This change however, can result in either higher or lower audit quality. It’s been found that larger audit firms tend to provide higher quality audits (DeAngelo, 1981), this would mean that when small audit firms leave the market, the overall audit quality

in the market would go up. On the flipside, when audit firms exit the market, the remaining firms will experience an increase in the number of clients. If firms are not able to keep up with this increasing number of clients, this will damage audit quality. The former is the case in this study, with the results suggesting that the PCAOB inspections incentivize low quality audit firms to leave the market and audit quality improving as a result.

In contrast to the above named studies, Carcello et al. (2011) examine whether there has been an improvement of audit quality amongst big 4 firms after the PCAOB inspections. The authors measure audit quality by the change in auditee abnormal accruals after the first two PCAOB inspections. The results show a significant reduction in the auditee abnormal accruals after the first inspection and a further reduction after the second inspection. The overall conclusion is that the PCAOB inspections have led to higher audit quality amongst big 4 firms.

Nagy (2014) explains how the PCAOB inspection reports consist of two parts. Part I is a publicly available report that documents the audit deficiencies of the audit firm. Part II focuses on the firm's quality controls and whether there are any internal control weaknesses. This part is only made public if the firm in question does not address these weaknesses within a 12-month period. Nagy (2014) examines the impact on audit firm reputation when the second part of the report is also made public. The results show that firms who have experienced publicly disclosed internal control deficiencies experience a larger decrease in market share than firms who do not have publicly available internal control deficiencies.

Other studies on the effectiveness of the PCAOB inspections are that of Lamoreaux (2016) and Gunny & Zhang (2013). Lamoreux (2016) examines the effect of the PCAOB inspections on foreign SEC registrants. The PCAOB inspections are mandated for all companies that are SEC registered, but some countries prohibit the PCAOB to have access to their domestic audit firms. The author finds that the audit firms that are subject to PCAOB access produce higher quality audits than firms who are not subject to PCAOB access. Prior to the PCAOB inspections there was no difference between the two groups of audit firms. Foreign firms are examined between 1999-2012 in order to capture the difference in difference effect prior and after SOX. The test is done in later years to capture the effects of when the PCAOB gains access to audit firms. He uses different variables for the year in which the PCAOB gains access to firms, one year prior to this year and the two years afterwards. Audit quality is significantly higher in the two years after the PCAOB gains access when compared to the year before and the year where access is gained. This shows that companies improve audit quality after inspections and not so much in anticipation of inspections. Gunny & Zhang (2013) examine whether the PCAOB inspections are able to distinguish actual audit quality from

perceived audit quality. They do this because the PCAOB is an important tool in improving the public's perceived audit quality. The authors find that PCAOB inspections with seriously deficient reports are associated with lower audit quality for triennially inspected auditors. For annually inspected auditors, the results are conflicting.

2.3 Audit quality

In order to determine the long-term effectiveness of the PCAOB inspections I examine the improvement in audit quality. Audit quality can be defined in a number of ways. For instance, the market-assessed joint probability that there are material errors in the financial statements and that the auditor is able to detect these errors and also reports them (DeAngelo, 1981) or the likelihood that an auditor issues an unqualified report when the financial statements contains a material error (Lee, Liu, & Wang, 1999). The different definitions for audit quality all represent that there needs to be a certain level of competence and independence from the auditor in order to provide high quality audits.

There are several measure used in order to proxy for audit quality. Gunny & Zhang (2014) describe how the propensity to issue a going concern opinion can be used as a measure for earnings quality. A modified going concern opinion (GCO) means that the auditor has serious doubts about the firms' ability to continue as a going concern. Because a modified GCO imposes costs on a client, managers generally have incentives to pressure auditors into providing a clean GCO. If auditors were to give in to these pressures, auditor independence would be impaired and thus audit quality as well. Gunny & Zhang (2014) describe GCOs as a very direct measure of audit quality since the opinion is directly given by the audit firm with no other influences. Other than GCOs, restatements are also often used as a proxy for audit quality. Restatements occur when material misstatements in previous financial statements are restated. In the case of restatements, management also has incentives to pressure auditors since restatements have shown to lead to a decrease in market share (Palmrose, Richardson, & Scholz, 2004; Gordon, Henry, Peytcheva, & Sun, 2008). It is also a direct measure of audit quality since the audit firm in question is directly responsible for finding material misstatements and requesting the restatement. Lastly, DeFond & Zhang (2014) explain how discretionary accruals can be used as a measure for audit quality. High levels of discretionary accruals usually represent earnings management and low financial reporting quality. Auditors are supposed to detect and report discretionary accruals if they are of material effect. However, this is not a direct measure for audit quality since the level of discretionary accruals can be determined by other factors besides audit quality.

2.4 Hypothesis development

Several studies on the effect of the PCAOB inspections on audit quality are described in the above section. When looking at the data range for these studies, all studies are conducted in the years immediately after the introduction of SOX or after the first PCAOB inspection. Lamoreux (2016) extends his sample period to 2012, but only because the PCAOB only gained access to firms in some countries in later years. Gramling et al. (2011) provide some suggestions for future research that I would like to address in this thesis. Since the authors only examine the effect after the first time PCAOB inspection report and don't find any change in the propensity to issue a going concern opinion for firms with no audit deficiencies, they encourage future research to examine whether the impact of the PCAOB inspection process is diminishing over time or whether the inspection process is encouraging audit firms to continuously improve audit performance.

Since the PCAOB inspects audit engagements and determines whether there are any audit deficiencies found, it is to be expected that firms who receive audit deficiencies will address these issues in their future audits. This would mean that audit quality will improve in the year after the PCAOB inspection report results in audit deficiencies. I use two proxies for audit quality and also two categories for PCAOB inspection reports, namely identified audit deficiencies and significant audit deficiencies. For this I am following the research method of Gunny & Zhang (2013) who categorize between deficient if there is any audit deficiency identified by the PCAOB inspection and significantly deficient if an audit deficiency is discovered and if the PCAOB has indicated that the audit firm failed to prevent a departure from GAAP that may lead to a financial statement restatement. To examine the differences between categories, I develop the four following hypotheses:

Hypothesis 1a: The propensity to issue a GCO for annually inspected audit firms increases when firms receive a PCAOB inspection report with audit deficiencies.

Hypothesis 1b: The propensity to issue a GCO for annually inspected audit firms increases when firms receive a PCAOB inspection report with significant audit deficiencies.

Hypothesis 2a: The number of financial statement restatements of annually inspected audit firms' clients increases when firms receive a PCAOB inspection report with audit deficiencies.

Hypothesis 2b: The number of financial statement restatements of annually inspected audit firms' clients increases when firms receive a PCAOB inspection report with significant audit deficiencies.

I focus on examining annually inspected firms instead of triennially inspect firms because of the earlier mentioned importance to the audit market as a whole. Since prior studies have found significant increases in audit quality after the PCAOB inspections (Gramling et al., 2011; Lamoreaux, 2016; Gunny & Zhang, 2013), I expect there to be an increase in later years as well. This effect might stabilize over the years since there is only so much an audit firm can change after inspections. There might still be room for improvement of audit quality but this may call for new regulation. There are several ways in which the PCAOB inspections can cause an increase in audit quality. A part of the increase in audit quality can be explained by an increased level of competence. This is due to the fact that the auditor's ability to detect material misstatements determines the level of external audit quality (Abbott, Daugherty, Parker, & Peters, 2016). Even though big 4 firms and other large accounting firms, defined by more than 100 clients, have also experienced an increase in audit quality in the post-SOX period (Carcello et al., 2011), I expect smaller audit firms to have more growth opportunities. This means that these companies can increase auditor competence by either hiring higher educated or experienced auditors or by training current employees. The larger accounting firms on the other hand, are usually already very active in this area in order to maintain reputations. This would mean that they have less to gain than smaller, upcoming companies with regards to quality and reputation. Another reason for the increase in audit quality is that firms might fear the consequences of not adhering to the new rules. Audit quality will thus improve because auditors know that their work is subject to review and that there will be sanctions when their work is done poorly (Deis Jr. & Giroux, 1992). This gives them the power to withstand client pressures. However, it might also be the case that firms need time to adapt to the new SOX regulations. During the first few years this would lead to an improvement of audit quality but it is not sure whether this effect will stagnate in later years.

3) Research method

3.1 Sample

For this study I use all PCAOB reports from inspections conducted from 2004 till 2015. The inspection reports are usually issued in the year after inspection, which means the inspection report dates range from 2005 till 2016. Sometimes two reports are issued in the same year, yet the inspections are from different years. The inspections range till 2015 because the 2016 inspection reports are not available yet and I also need data on going concern opinions for the year $t+1$. From the PCAOB inspection reports, I check whether there were any audit deficiencies found or whether the inspected firms received a clean report and record the audit firm that was inspected and the year of inspection. After this, the audit clients are identified in the Audit Analytics database and the corresponding financial variables are extracted from Compustat. Since the inspections are performed on the most recent financial statement audits the data will be examined from the year prior to the year of inspection. With the exception of Marcum LLP, all other firms show audit deficiencies in every PCAOB report. This result is actually consistent with the study of Gunny & Zhang (2013).

As of the year 2014 there are 10 audit firms with more than 100 public company audit clients. These firms were thus subject to annual PCAOB inspection as of 2015. Prior to this, there were 9 companies, with Marcum LLP making the list as of the 2015 inspections. From 2004 till 2007 there were 8 companies inspected annually with MaloneBailey, LLP making the list as of the 2008 inspections. In 2016, the annually inspected firms are BDO USA, LLP, Crowe Horwath LLP, Deloitte & Touche LLP, Ernst & Young LLP, Grant Thornton LLP, KPMG LLP, MaloneBailey, LLP, Marcum LLP, RSM US LLP and PricewaterhouseCoopers LLP. Table 1 shows the list of all firms who were inspected annually during the sample period. Some of the firms have changed names over the years, which is why there are 14 firms in the list instead of 10, but these firms are still inspected annually under their new company name.

Table 1: Annually inspected audit firms

Audit firm	Years inspected
BDO Seidman LLP	2004 – 2009
BDO USA LLP	2010 – 2015
Crowe Chizek & Company LLP	2004 – 2007
Crowe Horwarth LLP	2008 – 2015
Deloitte & Touche LLP	2004 – 2015
Ernst & Young LLP	2004 – 2015
Grant Thornton LLP	2004 – 2015

KPMG LLP	2004 – 2015
MaloneBailey LLP	2008 – 2015
Marcum LLP	2015
McGladrey & Pullen LLP	2004 – 2010
McGladrey LLP	2011 – 2014
RSM US LLP	2015
PricewaterhouseCoopers LLP	2004 - 2015

Notes: This table consists of all audit firms that are annually inspected during the period of 2004 till 2015. At the end of the sample period, 10 audit firms were annually inspected. 14 audit firms make the list due to changes in firm names. BDO Seidman LLP became BDO USA LLP as of 2010, Crowe Chizek & Company LLP became Crowe Horwath LLP as of 2008, McGladrey & Pullen LLP became McGladrey LLP in 2011 and RSM US LLP as of 2015.

In order to gather all client data, I look up all audit firms available in the Audit Analytics database. I download two datasets from the Audit Analytics database for restatements and GCOs. I identify the 14 firm names and remove all observations from other firms for both datasets, then I merge the two datasets, which left me with 146,004 observations. I remove all observations from non-annually inspected audit firms and merge this with the date on PCAOB inspection results and am then left with 89,466 observations. Counting the number of different company keys led to 13,559 firms. To find the client list I delete all duplicate observations from the list to get a list of companies to investigate on Compustat. There is data available on Compustat for 9,123 firms. After dropping all missing values for the relevant variables, I am left with 6,469 firms. I then merge this with the Audit Analytics database and delete observations that weren't available in both datasets. The final sample consists of 6,394 client firms, as presented in table 2.

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Table 2: Sample Selection

Available audit firms (including different names for the same firm)	14
Number of clients	13,559
Less: firms not available in Compustat	4,436
Less: firms with missing observations in Compustat	2,654
Less: firms that don't match the Audit Analytics dataset	75
Final sample	6,394

Notes: The final sample consists of 10 audit firms with 6,394 audit clients and a total of 40,181 observations.

3.2 Research design

Prior research often includes a time variable that indicates the period before or after SOX. The difference between the two periods is examined to determine the effectiveness of the PCAOB inspections. Since my sample period merely covers the post-SOX period and the continuous effectiveness of the PCAOB inspections there will be no post-SOX indicator variable in the model. The following models for the propensity to issue going concern opinions and for the number of financial statement restatements are based on that of Gunny & Zhang (2013). I will determine whether audit firms have deficiencies in line with Gramling et al. (2011), who state that an audit deficiency occurs when, according to the inspection team, the audit firm did not obtain sufficient audit evidence in order to reach the audit opinion. The model for going concern opinions is stated as follows:

$$GCO_{t+1} = \alpha_0 + \beta_1 DEF_t + \beta_2 SIG_DEF + \beta_3 ZMIJ_t + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 LOSS_{t-1} + \beta_7 CFO_t + \beta_8 RETURN_t + \beta_9 YEAR + \varepsilon_t \quad (1)$$

GCO takes the value of 1 if the firm in question receives a going concern opinion after the year of inspection and 0 otherwise. The variable *DEF* is an indicator variable that takes the value of 1 if the PCAOB inspection report identifies audit deficiencies and 0 otherwise. The variable *SIG_DEF* is also an indicator variable that takes the value of 1 if the audit firm receives a PCAOB inspection report with significant audit deficiencies, 0 otherwise. These are the variables of interest since I want to examine whether receiving an inspection report with a deficiency or significant deficiency leads to a higher propensity to issue going concern opinions.

The control variables in this model are *ZMIJ*, *SIZE*, *LEV*, *LOSS* and *CFO* and *RETURN*. *ZMIJ* is a bankruptcy measure variable that measures the probability of a company going bankrupt based on the return on assets (ROA), the financial leverage and the firms' liquidity (Zmijewski, 1984). The probability of bankruptcy is calculated as follows:

$$P(B) = -4.3 - 4.5ROA + 5.7FLEV - 0.004LIQ \quad (2)$$

SIZE is measured by the natural logarithm of a firms' total assets and is included in the model because larger firms tend to have higher negotiating power in times of financial distress, this would mean that going concern opinions can be avoided. *LEV* measures the financial leverage of a firm and is included in the model in order to determine how close a firm is to violating debt covenants. *LOSS* takes a value of 1 if a company has suffered a loss in the

previous year, 0 otherwise. Firms with recurring losses are more likely to fail and thus receive going concern opinions. Cash flows (*CFO*) are included in the model because negative cash flows are associated with the probability of going bankrupt (Gunny & Zhang, 2013). Like *ZMIJ*, *RETURN* is also a measure for financial performance and measures the return on assets.

The second proxy for audit quality is financial statement restatements and the model is stated as follows:

$$\text{RESTATE}_t = \alpha_0 + \beta_1 \text{DEF}_t + \beta_2 \text{SIG_DEF} + \beta_3 \text{SIZE}_t + \beta_4 \text{MTB}_t + \beta_5 \text{LEV}_t + \beta_6 \text{IND}_t + \beta_7 \text{YEAR} + \varepsilon \quad (3)$$

In this model *RESTATE* takes the value of 1 if the firm was subject to a financial statement restatement and 0 otherwise. The variables of interest are still *DEF* and *SIG_DEF* since these indicate whether there is an effect on the number of restatements when firms receive an inspection report with audit deficiencies or significant deficiencies. The control variables added to the model differ from those in the GCO model. The variables *LEV* and *SIZE* remain the same, namely the firms' financial leverage and the natural logarithm of the firms' assets. *MTB* stands for the market-to-book ratio and is calculated as the market value of equity divided by the book value of equity. This variable is added to the model because firms with high growth opportunities might have higher incentives to manage earnings, which could lead to higher levels of restatements. Lastly, the control variable *IND* takes a value of 1 for the SIC industry codes 35, 36, 38 and 73 because these firms are more likely to restate (Burns & Kedia, 2006). Variables descriptions for both models are given below in table 3.

Table 3: Variable definitions

Dependent variables	Definition
<i>GCO</i>	Indicator variable which is equal to 1 if a firm receives a going concern audit opinion in year t+1, 0 otherwise
<i>RESTATE</i>	Indicator variable which is equal to 1 if a firm misreported that resulted in a restatement, 0 otherwise
Independent variables	Definition
<i>DEF</i>	Indicator variable which is equal to 1 if the audit firm receives an inspection report with audit deficiencies in year t, 0 otherwise
<i>SIG_DEF</i>	Indicator variable which is equal to 1 if the audit firm receives an inspection report where the PCAOB inspection identified a departure from GAAP, 0 otherwise

Control variables	Definition
<i>ZMIJ</i>	The Zmijewski bankruptcy score, calculated in equation (2)
<i>SIZE</i>	The natural logarithm of total assets
<i>LEV</i>	The financial leverage, calculated as total liabilities divided by total assets
<i>LOSS</i>	Indicator variable which is equal to 1 if a firm reports a negative net income amount, 0 otherwise
<i>CFO</i>	Net operating cash flows
<i>RETURN</i>	Return on assets, measured by net income divided by total assets
<i>MTB</i>	The market-to-book ratio is calculated as the market value of equity divided by the book value of equity
<i>IND</i>	Indicator variable which is equal to 1 if a firm operated in industries 35, 36, 38 or 73, 0 otherwise

4) Empirical results

In this section, I first provide the descriptive statistics and correlation matrix of both models. I then provide the results to the multivariate regression analysis and lastly, I provide a sensitivity analysis for the model.

4.1 Descriptive statistics

Table 4 shows descriptive statistics for all variables. Since some variables are used in both models, they are added to one table. Panel A provides the mean, median, standard deviation, minimum and maximum value of all variables. The average value for going concern opinions is 0.036, which means that majority of the firms have actually not received any going concern audit opinions during the sample period. You can see that the average value for deficiency scores is almost equal to 1, which represents the finding that almost none of the audit firms have received a clean PCAOB inspection report during the sample period. The average value for firms with significant audit deficiencies is 0.440, which means that just under half of the audit firms have significant audit deficiencies. As for the control variables, the average value of the bankruptcy score is -1.166, the average firm size measured by the natural logarithm of total assets is 6.613, the average debt to equity ratio is 0.518, 32.8% of all firms report losses in the period prior to inspection, the average cash flow of operations is 532 and the average return on assets is equal to -0.041.

In panel B the variables for the GCO model are partitioned on whether the audit firm received a PCAOB inspection report with audit deficiencies, significant audit deficiencies or no audit deficiencies. Marcum LLP is the only audit firm that falls into the category of no identified audit deficiencies. One notable thing is that their clients are more likely to be classified as financially distressed than the clients of audit firms that have identified audit deficiencies or significant deficiencies. The table shows that there is a higher propensity to issue a going concern opinion for clients of audit firms with no identified audit deficiencies as opposed to audit firms with identified audit deficiencies (0.491, 0.034 and 0.038). The mean value of the control variables shows that the clients of audit firms with no identified audit deficiencies have higher bankruptcy scores, are more inclined to have suffered losses in the previous period, have negative operational cash flows and lower returns on assets. The firms also appear to be much smaller as well as having a higher debt to capital ratio.

For the second hypothesis I examine the additional variables *RESTATE*, *MTB* and *IND* in panel A of table 4. As stated in the table, on average, 9.6% of the client firms have been subject to a financial statement restatement. The average market-to-book ratio of equity is 2.968 and

on average, 32.2% of the firms are considered to be operating in industries that have proven to be more likely to restate.

In panel C, the variables for the restatement model are partitioned on whether or not the audit firm received a PCAOB inspection report with audit deficiencies, significant audit deficiencies or no audit deficiencies. This table shows that the number of restatements is higher for firms whose auditors have received inspection reports with audit deficiencies or significant audit deficiencies, than for firms with no audit deficiencies (0.095, 0.097 and 0.063). These firms tend to be larger in size, have higher market-to-book ratio's and lower financial leverage. There does not seem to be a real difference in industry composition between the three groups.

Table 4: Descriptive statistics

Panel A: Descriptive statistics for dependent variables, independent variables and control variables (N=40,181)

	Mean	Median	Std. Dev.	Min	Max
<i>GCO</i>	0.036	0	0.188	0	1
<i>RESTATE</i>	0.096	0	0.295	0	1
<i>DEF</i>	0.998	1	0.044	0	1
<i>SIG_DEF</i>	0.440	0	0.496	0	1
<i>ZMIJ</i>	-1.166	-1.492	2.587	-4.731	19.3
<i>SIZE</i>	6.613	6.570	2.091	0.601	11.5
<i>LEV</i>	0.518	0.496	0.315	0.033	2.466
<i>LOSS</i>	0.328	0	0.469	0	1
<i>CFO</i>	532	57	1576	-119	11,081
<i>RETURN</i>	-0.041	0.033	0.299	-2.533	0.345
<i>MTB</i>	2.968	2.087	5.070	-19	32.2
<i>IND</i>	0.322	0	0.467	0	1

Panel B: Descriptive statistics for GCO model, partitioned on audit deficiencies (N=40,181)

	No audit deficiencies		Audit deficiencies		Significant audit deficiencies	
	Mean	Median	Mean	Median	Mean	Median
<i>GCO</i>	0.494	0	0.034	0	0.038	0
<i>ZMIJ</i>	2.978	0.783	-1.170	-1.475	-1.179	-1.514
<i>SIZE</i>	3.090	3.191	6.778	6.738	6.421	6.377
<i>LEV</i>	0.709	0.435	0.518	0.498	0.517	0.495
<i>LOSS</i>	0.823	1	0.331	0	0.322	0
<i>CFO</i>	-4.497	-2.561	597	69	453	45.2
<i>RETURN</i>	-0.726	-0.417	-0.040	0.034	-0.039	0.033

Panel C: Descriptive statistics for restatement model partitioned on audit deficiencies (N=40,181)

	No audit deficiencies		Audit deficiencies		Significant audit deficiencies	
	Mean	Median	Mean	Median	Mean	Median
<i>RESTATE</i>	0.063	0	0.095	0	0.097	0
<i>SIZE</i>	3.090	3.191	6.778	6.738	6.421	6.377
<i>MTB</i>	1.687	1.129	3.044	2.096	2.876	2.082
<i>LEV</i>	0.709	0.435	0.518	0.498	0.517	0.495
<i>IND</i>	0.304	0	0.320	0	0.325	0

Notes: The sample consists of 6,394 client firms over the years 2004 till 2015, with 40,181 observations. Panel A shows the descriptive statistics for the whole sample and for the variables used in both models. The mean, median, standard deviation, minimum and maximum values are given. Panels B and C provide the descriptive statistics for the two models separately and the statistics are partitioned on whether or not the audit firm employed by the client firm received a PCAOB inspection report with audit deficiencies, significant audit deficiencies or no audit deficiencies in that year.

Table 5 shows the correlation matrix for both hypothesis 1 and 2. This table shows that in the sample, GCOs are negatively associated with audit deficiencies, which is significant at the 0.01 level. This means that when an audit firms receive an inspection report with audit deficiencies, the propensity to issue GCOs actually becomes lower. This is also shown in the partitioned descriptive statistics table. However, if audit quality would actually improve this would have to imply that there would be more GCOs following an inspection report with audit deficiencies. GCOs are positively associated with significant audit deficiencies. However, this correlation is insignificant. There is a positive correlation between the bankruptcy score and the propensity to issue a GCO (0.430), which you would expect since these firms are more likely to go bankrupt in the future. The same applies for the variable *LOSS* (0.245), since a loss in the prior period would be more likely to result in bankruptcy as well. There is a significant negative correlation between a firms' return on assets (-0.453), the cash flow of operations (-0.065) and firm size (-0.243) and the propensity to issue a GCO, meaning that when operational cash flows, returns on assets or firm size increases the propensity to issue a GCO decreases. Lastly, when the debt to equity ratio increases, the propensity to issue a GCO increases as well (0.257). Meaning that firms with high levels of debt are considered to be more financially unstable than firms finance with higher levels of equity.

Table 5: Correlation matrices

Panel A: Correlation matrix for the GCO model

	<i>GCO</i>	<i>DEF</i>	<i>SIG_DEF</i>	<i>ZMJ</i>	<i>SIZE</i>	<i>LEV</i>	<i>LOSS</i>	<i>CFO</i>
<i>DEF</i>	-0.108***							
<i>SIG_DEF</i>	0.008	0.039***						
<i>ZMJ</i>	0.430***	-0.071***	-0.004					

<i>SIZE</i>	-0.243***	0.075***	-0.082***	-0.115***				
<i>LEV</i>	0.257***	-0.027***	-0.004	0.842***	0.157***			
<i>LOSS</i>	0.245***	-0.047***	-0.011**	0.357***	-0.386***	0.091***		
<i>CFO</i>	-0.065***	0.015***	-0.045***	-0.024***	0.568***	0.061***	-0.189***	
<i>RETURN</i>	-0.453***	0.102***	0.005	-0.717***	0.420***	-0.255***	-0.577***	0.128***

Panel B: Correlation matrix for the restatement model

	<i>RESTATE</i>	<i>DEF</i>	<i>SIG_DEF</i>	<i>SIZE</i>	<i>MTB</i>	<i>LEV</i>
<i>DEF</i>	0.005					
<i>SIG_DEF</i>	0.004	0.039***				
<i>SIZE</i>	-0.032***	0.075***	-0.082***			
<i>MTB</i>	0.005	0.011**	-0.016***	-0.038***		
<i>LEV</i>	-0.006	-0.027***	-0.004	0.157***	-0.097***	
<i>IND</i>	-0.007	0.002	-0.006	-0.187***	0.016***	-0.169***

Notes: Panels A and B in this table show the Pearson correlation coefficients for both the GCO and the restatement model. Significance is indicated with the stars behind the coefficients.

* Indicates significance at $p \leq 0.10$ based on two tailed tests

** Indicates significance at $p \leq 0.05$ based on two-tailed tests

*** Indicates significance at $p \leq 0.01$ based on two-tailed tests

The second part of the table shows the correlations between the variables in the restatement model. There is a positive correlation between receiving an inspection report with identified audit deficiencies as well as significant audit deficiencies and restatements, which is as expected. However, both correlations are not significant. This means that we can not say for sure that there is a positive correlation between these variables. In this model, there does not seem to be a significant correlation between the financial leverage, the type of industry that a company operates in, the market-to-book ratio and the number of restatements. There is a negative correlation (-0.032) between firm size and the number of restatements, implying that larger firms are less subject to restatement than smaller firms.

4.2 Multivariate regression analysis

Table 6 provides the regression results for the GCO model. The variables *ZMIJ*, *SIZE*, *LEV*, *CFO* and *RETURN* are winsorized at the 1st and 99th percentile. This means that the values that are in this range are replaced with the 1st and 99th percentile values. I winsorize variables in order to account for extreme large or small outliers that might affect the regression results. The table provides variable coefficients and their p-values in parenthesis. Year fixed-effects are included in the model, none of these values were significant at the 0.10 level.

Model (1) presents the regression results for the full sample. The variable of interest is whether or not a firm has received an inspection report with identified audit deficiencies or an inspection report with significant audit deficiencies. The coefficient for regular deficiencies (-

0.241) is significant at the 0.01 level. This means that there is a significant negative relationship between receiving an inspection report with audit deficiencies and the propensity to issue a GCO in the next year. This result contradicts expectations since I expect audit firms to be more cautious in their audit work and issue more GCOs after receiving an inspection report with audit deficiencies. It appears to be that the firms who employ auditors who have had PCAOB inspection reports with audit deficiencies are actually less likely to receive a GCO. This would thus mean that audit firms who receive unclean inspection reports are not choosing for a more conservative auditing approach by issuing more GCOs. When looking at audit firms who receive significantly deficient inspection reports, there is a positive effect on the propensity to issue a GCO. However, this coefficient is not significant. When comparing the two deficiency variables with each other by using a Wald test, I find there is a negative relationship significant at the 0.01 level (p-value = 0.000). This suggests that the two variables together are significant to the model. It does however mean that the results are against expectations. Since the effect is negative, this means that the propensity to issue a GCO actually decreases when receiving a significantly deficient inspection report compared to a clean inspection report. I do not find evidence to support hypothesis 1a or 1b when using GCOs as a proxy for audit quality, since audit quality seems to decrease. These results are consistent with the results of Gunny & Zhang (2013), who also could not find any results when measuring audit quality with the propensity to issue GCOs.

Even though the results are against expectations, it might still be a logical outcome in this sample. The descriptive statistics in table 4 panel B show that the clients of audit firms with deficient or significantly deficient inspection results, have much better financial performance than the clients of audit firms with clean inspection reports. This could mean that increasing the number of GCOs is simply not necessary for the firms in this sample. This would explain why there is a negative relationship between receiving a deficient PCAOB inspection report and GCOs instead of a positive relationship.

As for the control variables in model (1), firm size (-0.015), return on assets (-0.143) and losses in prior periods (-0.009) all have a negative effect on the propensity to issue a GCO. The Zmijewski bankruptcy score has a positive effect (0.017) on the propensity to issue a GCO and the leverage effect is insignificant.

The model (2) regression includes firms who have a deficient inspection result or a significantly deficient inspection result. Due to the fact that there is only a very small portion of the total sample that received a clean report, which is omitted from the second model, the results are very similar to that of the first model. Model (3) includes firms with either no

deficiencies or with significant audit deficiencies. What is noticeable is that the regression result for the *SIG_DEF* coefficient is similar to the *DEF* coefficient in the first model. This is due to the fact that the firms who received a deficient result only are omitted from the sample, but the remaining firms still have deficient and significant deficient results. The *DEF* variable is considered to be replaced in this model with the *SIG_DEF* variable. There is not much difference in the coefficients or significance of the control variables between the three different models.

Table 6: Regression results of the propensity to issue GCOs on PCAOB inspections

Variable	(1)	(2)	(3)
<i>Intercept</i>	0.374*** (0.000)	0.131*** (0.000)	0.431*** (0.000)
<i>DEF</i>	-0.241*** (0.000)		
<i>SIG_DEF</i>	0.001 (0.523)	0.001 (0.520)	-0.231*** (0.000)
<i>ZMIJ</i>	0.017*** (0.005)	0.016*** (0.000)	0.032*** (0.000)
<i>SIZE</i>	-0.015*** (0.000)	-0.015*** (0.000)	-0.016*** (0.000)
<i>LEV</i>	0.016 (0.659)	0.018 (0.159)	-0.055*** (0.002)
<i>LOSS</i>	-0.009*** (0.002)	-0.009*** (0.000)	-0.007** (0.026)
<i>CFO</i>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
<i>RETURN</i>	-0.143*** (0.000)	-0.146*** (0.000)	-0.066*** (0.000)
Value <i>DEF</i> + <i>SIG_DEF</i>	-0.240		
Wald test on <i>DEF</i> + <i>SIG_DEF</i> = 0	163***		
Number of observations	40,181	40,102	17,676
Adjusted R-square	0.247	0.238	0.278
P-value	0.000	0.000	0.000

P-values are given in parentheses under the coefficients

Year fixed effects are included in the model

* Indicates significance at $p \leq 0.10$ based on two tailed tests

** Indicates significance at $p \leq 0.05$ based on two-tailed tests

*** Indicates significance at $p \leq 0.01$ based on two-tailed tests

Table 7 represents the regression results for the restatement model. The variables *SIZE*, *MTB* and *LEV* are winsorized at the 1st and 99th percentile in order to account for extreme

outliers. Again, year fixed-effects are added to the model but are all insignificant at the 0.10 level. The variables of interest are again *DEF* and *SIG_DEF*. In model (1), there seems to be a positive relationship (0.001) between receiving a deficient inspection report and the number of restatements. However, this result is insignificant. The regression shows a negative relationship (-0.010) between receiving a significantly deficient inspection report and the number of restatements, significant at the 0.01 level. When comparing the two coefficients by using a Wald test, the results are insignificant. As mentioned, I expect audit firms with identified audit deficiencies will be more cautious in their auditing practices. This would result in a higher number of restatements than prior to the PCAOB inspection. However, it seems to be that the number of financial statement restatements is actually lower after the PCAOB inspections than before. Even though this is against expectations, this might be explained by a lack of material mistakes that would lead to restatements. It could be that restatements are just not needed for the firms in the sample.

Regarding control variables in model (1), there is an insignificant relationship between the market-to-book ratio and restatements, and firm leverage and restatements. There is a significant negative relationship between firm size and restatements, meaning that when firm size decreases the likelihood of restatement increases. Lastly, the industry codes have a significant negative effect on restatements. Meaning that firms in the industries 35, 36, 38 and 73 have a lower likelihood of restatements. There is not enough evidence to support hypotheses 2a and 2b.

Models (2) and (3) have the same limited samples as in the GCO regression, and the results are also quite similar. Between the first two models, there is not much change between coefficients and/or significance. This is again due to the fact that there is only a very small portion of the full sample omitted from the second model. When looking at model (3), I again find that the result for *SIG_DEF* is similar to the result for *DEF* in the first model since the firms with audit deficiencies are removed from the sample. The coefficient is now negative yet still insignificant, which means I can not say that there is a relationship between deficiency scores and restatements.

Table 7: Regression results for the number of restatements on PCAOB inspections

Variable	(1)	(2)	(3)
<i>Intercept</i>	0.166*** (0.000)	0.168*** (0.000)	0.168*** (0.000)
<i>DEF</i>	0.001 (0.957)		

<i>SIG_DEF</i>	-0.010*** (0.004)	-0.010*** (0.003)	-0.006 (0.869)
<i>SIZE</i>	-0.003*** (0.000)	-0.003*** (0.000)	-0.001*** (0.000)
<i>MTB</i>	0.000 (0.456)	0.000 (0.462)	0.001 (0.224)
<i>LEV</i>	-0.000 (0.930)	-0.000 (0.986)	-0.002 (0.761)
<i>IND</i>	-0.009*** (0.004)	-0.009*** (0.005)	-0.008 (0.102)
Value <i>DEF + SIG_DEF</i>	-0.009		
Wald test on <i>DEF + SIG_DEF = 0</i>	0.09		
Number of observations	40,181	40,102	17,707
Adjusted R-square	0.009	0.008	0.010
P-value	0.000	0.000	0.000

P-values are given in parentheses under the coefficients

Year fixed effects are included in the model

* Indicates significance at $p \leq 0.10$ based on two tailed tests

** Indicates significance at $p \leq 0.05$ based on two-tailed tests

*** Indicates significance at $p \leq 0.01$ based on two-tailed tests

4.3 Sensitivity analysis

Since the results are inconsistent expectations, I use another proxy for audit quality as a sensitivity analysis. I examine whether the use of this third proxy will still give me the same result or if this third proxy indicates an increase in audit quality.

4.3.1 Discretionary accruals model

As mentioned earlier, discretionary accruals are an indirect measure of audit quality. It measures the level of earnings management exercised by company management (Cornett, Marcus, & Tehranian, 2008). Discretionary accruals represent financial reporting quality since they are not a consequence of any operational business activity. They are influenced by management and are subject to earnings management. High levels of discretionary accruals thus represent poor financial reporting quality. It is then the auditor's job to identify and report material discretionary accruals, and so earnings management is an indirect measure of audit quality. In order to determine discretionary accruals I use the modified Jones model (Dechow, Sloan, & Sweeney, 1995) where discretionary accruals are calculated as follows:

$$DA_t = TA_t - [\beta_1(1/A_{t-1}) + \beta_2(\Delta REV_t - \Delta REC_t) + \beta_3(PPE_t)] \quad (4)$$

The coefficients are the parameters from the following total accruals regression:

$$TA_t = \beta_1(1/A_{t-1}) + \beta_2(\Delta REV_t - \Delta REC_t) + \beta_3(PPE_t) + \varepsilon_t \quad (5)$$

In order to perform the robustness check I download additional data from Compustat in order to calculate total accruals and the absolute value of discretionary accruals. I use the absolute value of discretionary accruals because accruals can be adjusted both downwards and upwards in different situations. I am not examining the sign of discretionary accruals in this thesis. All variables used to calculate discretionary accruals are winsorized at the 1st and 99th percentile in order to account for outliers in the sample.

After calculating discretionary accruals for my sample group I merge the dataset with the existing dataset used for the main multivariate analysis in chapter 3. I delete all missing variables and the final sample for this model consists of 34,332 observations of 5,638 firms. The regression is run as follows:

$$|DA_t| = \alpha_0 + \beta_1 DEF_t + \beta_2 SIG_DEF + \beta_3 ZMIJ_t + \beta_4 SIZE_t + \beta_5 LEV_t + \beta_6 LOSS_{t-1} + \beta_7 CFO_t + \beta_8 MTB + \beta_9 RETURN_t + \beta_{10} YEAR + \varepsilon_t \quad (6)$$

The model works the same as the GCO and restatement model but now I examine the influence of PCAOB inspection reports on the level of absolute discretionary accruals during the same period of 2004 till 2015. The dependent variable in equation (6) is the absolute value of discretionary accruals, other than this the independent variables and control variables are the same as were used in the GCO model and restatement model. All variables are related to financial performance because a firms' financial characteristics tend to have an influence on managements' decision to manage earnings in order to influence stakeholder perceptions, smooth income, avoid violating debt covenants and/or create reserves (Mintz & Morris, 2016).

4.3.2 Results discretionary accrual model

Table 8 provides the descriptive statistics for discretionary accruals partitioned on whether the audit firm has any identified audit deficiencies by the PCAOB. The table shows that the average level of discretionary accruals is higher for firms with auditors who have received inspection reports without audit deficiencies than for firms with auditors who have

audit deficiencies or significant deficiencies (0.261, 0.072 and 0.075 respectively). There also seems to be a higher bankruptcy score, a higher debt to equity ratio, a higher probability of losses in the prior period, lower operational cash flow, lower market-to-book-ratio and smaller returns for firms with auditors that have no identified audit deficiencies. These companies also tend to be smaller in size.

Table 8: Descriptive statistics partitioned on audit deficiencies

	No audit deficiencies		Audit deficiencies		Significant audit deficiencies	
	Mean	Median	Mean	Median	Mean	Median
<i>DA</i>	0.261	0.159	0.072	0.041	0.075	0.043
<i>ZMIJ</i>	3.590	0.979	-1.165	-1.466	-1.175	-1.494
<i>SIZE</i>	2.931	2.828	6.815	6.775	6.549	6.493
<i>LEV</i>	0.784	0.465	0.521	0.500	0.521	0.499
<i>LOSS</i>	0.780	1	0.329	0	0.318	0
<i>CFO</i>	-5.700	-2.789	605	72.9	482	53.1
<i>MTB</i>	1.547	1.256	3.025	2.083	2.804	2.033
<i>RETURN</i>	-0.761	-0.417	-0.038	0.034	-0.035	0.033

Notes: This table provides descriptive statistics for the discretionary accruals model, partitioned on audit deficiencies. The sample consists of 5,638 firms with a total of 34,332 observations during the period of 2004 till 2015.

The regression output for the discretionary accruals model is presented in table 9. As opposed to the previous two models, the variable of interest, *DEF*, is significant in the direction that I expect. The coefficient (-0.065) is significant at the 0.01 level and negative, which suggests that firms who employ auditors who received a PCAOB inspection report with audit deficiencies actually experience a significant decrease in the absolute value of discretionary accruals, as opposed to firms with auditors with no identified audit deficiencies. This result is consistent with the results of Carcello et al., (2011), who do not distinguish between deficient and clean PCAOB inspection report but do find a significant reduction in client abnormal accruals in the first two years following the first PCAOB inspection for big 4 audit firms. This could mean that audit firms are becoming more conservative in their auditing practices and are “stricter” with their clients after receiving insufficient inspection reports from the PCAOB. Auditors might be more focused on identifying and correcting earnings management. However, since the absolute value of discretionary accruals is an indirect measure of audit quality, the decrease in discretionary accruals could also be management strategy from within the company. When examining firms who employ auditors that have received significantly deficient inspection reports, there is no significant effect. The coefficient for significantly deficient audit

reports is insignificant. When comparing the two deficiency variables by using a Wald test, I find that this effect (-0.065) is significant at the 0.01 level. This means clients of significantly deficient audit firms experience a stronger decrease in abnormal accruals relative to clients of audit firms with no audit deficiencies. As for models (2) and (3) the same applies as in the GCO and restatement model. No real change between models (1) and (2) and similar results for *DEF* and *SIG_DEF* in models (1) and (3).

The coefficients of the control variables suggest that firms with higher debt to equity ratio's, higher market-to-book ratio's and firms who have suffered losses in the previous period have increasing levels of discretionary accruals. A higher bankruptcy score actually has a decreasing effect on discretionary accruals (-0.048) and so do higher levels of returns (-0.129) as well as firm size (-0.012).

Table 9: Regression results discretionary accruals

Variable	(1)	(2)	(3)
<i>Intercept</i>	0.160*** (0.000)	0.093*** (0.000)	0.173*** (0.000)
<i>DEF</i>	-0.065*** (0.000)		
<i>SIG_DEF</i>	0.000 0.885	0.000 (0.883)	-0.063*** (0.000)
<i>ZMIJ</i>	-0.008*** (0.000)	-0.008*** (0.000)	-0.004** (0.025)
<i>SIZE</i>	-0.012*** (0.000)	-0.012*** (0.000)	-0.013*** (0.000)
<i>LEV</i>	0.068*** (0.000)	0.071*** (0.000)	0.056*** (0.000)
<i>LOSS</i>	0.006*** (0.000)	0.005*** (0.000)	0.001 (0.593)
<i>CFO</i>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
<i>MTB</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<i>RETURN</i>	-0.129*** (0.000)	-0.131*** (0.000)	-0.114*** (0.000)
Value <i>DEF</i> + <i>SIG_DEF</i>	-0.065		
Wald test on <i>DEF</i> + <i>SIG_DEF</i> = 0	26.09***		
Number of observations	34,221	34,162	13,999
Adjusted R-square	0.186	0.182	0.197
P-value	0.000	0.000	0.000

P-values are given in parentheses under the coefficients

Year fixed effects are included in the model

* Indicates significance at $p \leq 0.10$ based on two tailed tests

** Indicates significance at $p \leq 0.05$ based on two-tailed tests

*** Indicates significance at $p \leq 0.01$ based on two-tailed tests

5) Conclusion

The central research question that I try to answer in this theses is: has there been an effect of PCAOB inspections on audit quality for annually inspected audit firms? As mentioned, I use GCOs and restatements as proxies for audit quality and the results are inconsistent with expectations. I find that after receiving PCAOB inspection reports with audit deficiencies, audit firms are significantly less inclined to provide GCOs. There is no significant effect of deficient inspection results on the number of restatements. There does seem to be a significant effect between a significantly deficient inspection result and the number of restatements, yet this relationship is also negative and thus against expectations. These results could mean that receiving an “unclean” report does not incentivize audit firms to choose a more conservative auditing approach. Another explanation might be that there simply was no need to increase the number of GCOs and/or restatements during the sample period. Prior research that found significant positive results for these proxies inspected triennially inspected firms only, or compared triennially inspected firms with annually inspected firms. Perhaps examining the clients of triennially inspected auditors would lead to a different result.

When using a third proxy for audit quality I find results that are consistent with expectations. I use the absolute value of discretionary accruals to determine whether there has been an increase in audit quality and I find there is a significant negative relationship. This means that clients of audit firms who received a deficient or significantly deficient inspection result have significant decreasing levels of discretionary accruals. This could mean that audit firms are incentivized to choose a more conservative auditing approach that is reflected in better detection of earnings management. This result is also consistent with prior studies that have used discretionary accruals as a proxy for audit quality when examining annually inspected audit firms. Considering these conflicting results I can not give a clear answer to whether audit quality has increased or not. Based on the first two proxies I would conclude that there is no real increase in audit quality over the sample period, but because of the above mentioned reasons I can not conclude this. The third proxy on its own can mean that there has been an increase in audit quality. However, this decrease in earnings management can also be due to other factors than just audit quality. It is therefore still an unanswered question whether PCAOB inspections have led to an increase in audit quality.

This study contributes to existing literature in a number of ways. First, I add to existing literature on the effectiveness of the PCAOB inspections that were a part of the SOX Act. This study provides additional evidence as to whether the SOX Act and the PCOAB have succeeded in the goal to improve audit quality and financial reporting reliability. Second, I use two

different proxies for audit quality instead of one and I add a third proxy in the sensitivity analysis in order to compare the results between proxies. Third, I examine annually inspected firms only. These firms are responsible for the audit of the majority of US companies. Many prior studies have examined triennially inspected audit firms. I add to existing literature by providing additional evidence on annually inspected firms only. Lastly, the most important contribution is that I examine firms up till 2015 to determine whether the increase in audit quality was just temporary or has been continuously increasing over time. Many studies have focused their sample period around the period of inspection implementation to compare the before and after SOX situation. I wanted to examine whether the initial increase in audit quality continued to exist over time or whether this effect has stagnated or even decreased in later years.

The fact that I did not find an increase in audit quality in later years after the implementation of the SOX Act can provide new insights into the effectiveness of the PCAOB inspections. Even though this isn't conclusive evidence, it is surprising that the annually inspected audit firms who received PCAOB inspection reports with audit deficiencies are not choosing to be more conservative in their accounting practices afterwards. Regulators could use this information in order to further increase audit quality and financial statement reliability. For investors, these results could be conflicting. On the one hand they might question financial statement reliability due to the surprising results in the GCO and restatement model. However discretionary accruals, which have a direct effect on financial statements, are significantly lower after auditors have received PCAOB inspection reports with audit deficiencies. From this, investors could assume that the audit quality has in fact improved due to the PCAOB inspections.

Even though I contribute to existing literature by examining annually inspected audit firms only, I believe this is also a limitation of the study. Due to the amount of inspection reports to read in the limited amount of time, it was not feasible for this thesis to examine triennially inspected audit firms as well. This meant that Marcum LLP was the only audit firm that received a clean inspection report and this firm was only considered to be annually inspected as of 2015. Marcum LLP only accounted for a very small 0.62% of the sample and due to this small percentage it might not be completely explanatory to compare audit firms who received clean audit reports with audit firms who received "unclean" audit reports.

Future research could include triennially inspected firms as well in order to expand the research and compare both types of audit firms. Also, I find different results for the different proxies that I use. Perhaps future research could examine in more detail why these differences occur when using different proxies. Lastly, a suggestion for future research is to examine further

why audit firms are not issuing more GCOs and/or requiring restatements after receiving a deficient inspection report.

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