Economic consequences of public oversight of the audit market

ECONOMIC CONSEQUENCES

OF PUBLIC OVERSIGHT OF THE AUDIT MARKET

MONA OFFERMANNS

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Promotores:

Prof. dr. A. Vanstraelen

Prof. dr. R. Knechel (University of Florida, USA)

Prof. dr. E. Peek (Erasmus University Rotterdam)

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Maastricht, October 2011

Mona Offermanns

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1
INTRODUCTION

1.1 The role of public oversight and the PCAOB inspection process

Today's economy without outside financing would be unthinkable. Capital markets play an increasingly important role and so do all mechanisms designed to secure their proper functioning. In fact, half of all US households own stocks, either directly or indirectly (Investment Company Institute and Securities Industry Association 2005). And for the more than 46,000 companies listed worldwide in June 2011, the monthly value of share trading added up to US$ 5 trillion (World Federation of Exchanges 2011). The use of external sources of financing, especially via the stock market, is based on the concept that firms can credibly communicate their true economic performance by means of financial statements.

The audit of companies' financial statements represents an important mechanism to certify the quality of the disclosed information. An audit is designed to provide an independent view on the reliability of the information provided by management. If investors lose confidence in the adequacy of the financial information, this may increase cost, reduce market participation, and reduce the availability of capital which harms financial stability and the well-

being of individual firms (Financial Services Authority and Financial Reporting Council 2010). The financial crisis in 2008, with its aftermath still present, has caused a global resurrection of the debate regarding the optimal regulation of financial markets. In that context, regulators are yet again considering potential enhancements to the audit function (Doty 2011; European Commission 2010; Goelzer 2008). While the auditor has not been the cause of the financial crisis, there are still concerns about a lack of auditor skepticism in connection with key areas of management judgment (Financial Services Authority and Financial Reporting Council 2010).

In evaluating steps to advance the regulation of auditing along with other aspects of financial markets, it is important to assess prior regulatory changes and their impact. As all new provisions need time to achieve their full effect, it is important to understand the extent to which enhancements have been achieved and what areas need further improvement. In general, there are opposing viewpoints regarding the regulation of the audit profession. Proponents of a public oversight mechanism over the audit profession argue that an independent enforcer is effective because it can secure information from entities and can intervene, ex post, by imposing sanctions (La Porta et al. 2006). On the other hand, there used to be a common notion that the threat of reputational losses and litigation from investors in case of audit failure is sufficiently high to keep audit firms from providing substandard audit quality. The demise of Arthur Andersen, once one of the Big 5 audit firms in the world, provides an example for the effectiveness of private contracting. Nevertheless, as a result of the Enron scandal, we have witnessed a move towards stricter regulation as part of which a public oversight system of the audit profession was created in the US.

By means of the Sarbanes-Oxley Act (hereafter referred to as SOX), U.S. Congress (2002) has created the Public Company Accounting Oversight Board (PCAOB) to "oversee the audits of public companies in order to protect the interests of investors" (PCAOB 2011). The PCAOB began operations in 2003 and assumes responsibility for establishing auditing and independence standards, conducting inspections of registered audit firms, and disciplining noncompliance with laws and standards governing the audits of public companies. Traditionally, the audit profession had mainly been subject to self-regulation and peer reviews. The newly established system of reviews independent from the audit profession involves periodic PCAOB inspections

of audit firms that issue audit reports on client firms with publicly traded debt or equity (hereafter referred to as client firms or issuers).

Audit firms with more than 100 issuers are inspected annually and the remaining smaller audit firms with fewer than 100 issuers are inspected every three years. The inspections involve an evaluation of the audit firm's quality control policies and procedures as well as a review of a selection of past audit engagements. The PCAOB selects engagements based on the risk of material misstatements, which it considers a function of issuer, office, and audit partner characteristics. The inspection process comprises an evaluation of various issues, including the audit firm's practices, policies and procedures for client portfolio and partner management, foreign affiliate arrangements, and the monitoring of audit performance (PCAOB 2011). Also, inspectors evaluate the appropriateness and sufficiency of audit procedures, collected evidence, and documentation for the audit engagements under investigation (Glover et al. 2009).

The PCAOB publicly discloses the outcome of the inspection process in an inspection report for each audit firm but does not reveal the identity of clients selected for review. The Appendix of this dissertation provides a sample of excerpts from inspection reports to illustrate the different types of deficiencies. The inspection report describes the nature and specifics of engagement-specific deficiencies, which arise if an audit firm departs from professional standards in one (or more) of its inspected engagements (PCAOB 2011). Engagement-specific deficiencies relate to the failure to prevent or detect a material GAAP misstatement (GAAP-related deficiency) or the failure to properly perform the audit according to Generally Accepted Auditing Standards (GAAS-related deficiency). The report further indicates whether the inspection led to the detection of quality control defects within the audit firm. The type of quality control deficiencies detected remains non-public information unless the firm fails to address these deficiencies within a one year period. Throughout this dissertation, the terms 'clean' and 'deficient' are used to categorize different types of inspection reports. A clean or non-deficient report does not contain any deficiencies while a deficient report mentions one or more quality control or engagement-specific deficiencies of the audit firm.

Parallel to the developments in the US, also other countries initiated changes to their established systems of oversight on the audit profession. In Australia, for example, the Australian Securities and Investments Commission (ASIC) has conducted its first round of inspections to assess compliance with

audit quality requirements in 2006 (ASIC 2008). EU member states had to set up independent oversight bodies by 2008 following the adoption of the revised Eighth EU Council Directive (EU 2006). According to the Directive, all publicly listed entities need to be subject to independent quality assurance reviews at least every six years. In the UK, the Professional Oversight Board (POB) became the new independent supervisor of the audit profession that monitors the Audit Inspection Unit's (AIU) work in 2004 and has conducted inspections since 2005. The German auditor oversight commission was created in 2005 with the first inspections completed in 2008 (Auditor Oversight Commission 2011). In France, the High Council for Auditors (H3C) became an independent authority with financial autonomy in 2008.

While oversight systems in countries other than the US were shaped to mimic the structure of the already established PCAOB (Baker et al. 2008), there still exist major differences between the US and European oversight systems (Hazgui et al. 2011). For example, the German oversight body inspects all audit firms of public interest entities and follows a triennial inspection cycle for smaller audit firms and an annual inspection cycle for audit firms with more than 25 public clients (Auditor Oversight Commission 2011). In the UK, only audit firms with more than 10 public interest entities are subject to the full direct inspection of the AIU at least every three years (AIU 2008). And in France, a large number of auditors of public interest entities are still inspected by the professional bodies of accountants (Hazgui et al. 2011).

Given the similarities and differences in the types of independent audit oversight and review systems established across the countries in the world, a more detailed understanding of the effectiveness of any of these systems can help on the way to design an ideal and harmonized oversight system. This would also be in line with the objectives of the European Group of Auditors' Oversight Bodies (EGAOB 2011) and the International Forum of Independent Audit Regulators (IFIAR 2011), that promote effective public audit oversight within Europe and on a global level, respectively.

Undoubtedly, a review mechanism conducted by a public body provides fewer grounds for questioning the independence of reviewers compared to a self-regulated peer review. However, how can we be sure that inspectors' interests are properly aligned and there is no need for another layer of checks on the inspectors? With every inspector yet needing another inspector, there appears no end in sight of the creation of additional oversight bodies and

mechanisms. For that reason, it is important to evaluate very carefully to what extent created public oversight mechanisms are beneficial. This holds in particular as there is evidence that already established oversight mechanisms such as the peer review system in the U.S. were effective at signalling audit quality (Casterella et al. 2009). Among the potential benefits of an independent review mechanism are more information and less uncertainty regarding the auditor's quality, higher levels of assurance provided by the audit firms, and the prevention of audit failures.

Next to the desired beneficial effects of a public oversight system, also its costs need to be kept in mind when evaluating its overall impact. The PCAOB's budget is financed from fees paid by companies whose financial statements must be audited by audit firms registered with the PCAOB. The accounting support fees have more than tripled from 2003 reaching more than US$ 150 million in 2009 (PCAOB 2011). These fees, however, might not be the only cost to the investor. For example, audit fee increases resulting from the inspection activity can represent an additional outflow of resources out of the company. For that reason, an examination of the consequences of inspection activity can bring forward unknown expenditures and thus yield a more complete picture of overall costs to investors. In the end, regulators should be concerned about the relative effectiveness of the oversight system, hence what matters is whether the presumed increase in effectiveness is worth the cost and whether inspections are the best way to improve audit quality.

Also, the described costs and benefits are unlikely to apply to each audit firm to the same extent. Given the large variety in the size of audit firms it is difficult to design policy measures that are well-fitted for all sizes of clients or audit firms. For example, the cost of SOX404 was found to exceed benefits for small companies (Gao et al. 2009). Similarly, the inspections conducted by the PCAOB might not be sufficiently calibrated and adapted to auditor and client characteristics, such that they might benefit large and small audit firms or clients to a different extent. Indeed, criticism has already been voiced regarding inspector's 'one size fits all' approach (Daugherty and Tervo 2010b). Moreover, the large audit firms, especially the Big4, are involved in the policy development process and can thus potentially influence any approved measures in their favour while small audit firms or individual investors can't. Thus, there is a risk that smaller firms face higher cost in proportion to the benefits accruing to them. Hence, in a suitable analysis of the costs and benefits of a public oversight system the effect on the smaller audit

firms and their clients should not be neglected. For that reason, I put specific emphasis on smaller audit firms (with less than 100 clients) in this dissertation.

Evidently, it is important to gain more information regarding the consequences of auditor oversight. An analysis intended to develop a deeper understanding of the associated cost and benefits requires information on the inspected audit firms and the inspection result. Information regarding the inspection result of each inspected audit firm is available from the PCAOB. Even though the UK has started to report publicly on individual firms in 2008, it only does so for the large audit firms. Hence, inspection results for a considerable number of individual audit firms over several years are available for the US, only. For that reason, this dissertation makes use of US data to address the economic consequences of public oversight on the audit profession. More specifically, I examine investor and audit firm responses to PCAOB inspections by means of three studies, each of which examines a particular consequence of the inspection activity. The following section outlines each of the three studies more in detail.

1.2 Outline and contribution of the dissertation

Mechanisms of auditor oversight and in particular the system of periodic independent inspections of audit firms are designed with the main goal to restore public confidence in the audit and in financial reporting (Olson 2008). As auditor appointments must be approved by shareholders each year and stability of financial markets depends on investor confidence, it is the shareholders' perception of audit quality that matters. As the inspection report is ultimately aimed at investors, I examine in chapter two whether inspection reports contain meaningful information about audit quality for investors. Chapter two is based on the argument that an informative signal about audit quality affects firm value through its effect on information quality. In particular, I assume that the quality of financial statement information is not perfectly observable. Consistent with the conventional idea that auditing imposes bounds on management's discretionary accounting choices, I argue that increases (decreases) in perceived audit quality narrow (widen) accounting signals' perceived ranges of precision. All in all, the inspection report can help investors to update their beliefs about current audit quality as well as about how the inspections will change future audit quality.

In chapter two, I analyze a sample of 224 first-round and 134 second-round inspection reports, issued between January 2005 and March 2010. I examine the market response to PCAOB inspection reports by measuring the abnormal size-adjusted absolute stock returns of clients audited by the inspected audit firms during an event period around the days the inspection reports get public. To ensure that the observed effect is driven by the inspection report, I investigate whether report-specific characteristics are systematically associated with the market response on the publication date. Further, I explore whether the market response is caused by information that impacts investor uncertainty about accounting quality by examining the association with changes in investors' reliance on announcements of quarterly earnings. The findings indicate that the inspection reports are informative to investors. The observed market response to inspection reports is economically significant and can be reliably attributed to the information in the inspection report. Also, at least part of the market response to the publication of PCAOB inspection reports can be associated with revisions in investors' beliefs about accounting information quality.

Next to its deliberate impact on investor perceptions of audit quality, the inspection process is also intended to improve actual audit quality. To what extent the inspection process is successful in improving audit quality, however, depends on the extent to which the inspection process triggers changes in auditor behaviour. Chapters three and four address this issue by analyzing audit firm responses to the inspection result. As large annually inspected audit firms display limited variation in inspection results and are subject to a different inspection cycle, I examine audit firm responses of triennially inspected firms. Those firms are important as they audit almost 80% of the companies with revenue of less than $100 million (Olson 2008). From a conceptual point of view, inspections cause a change in the auditor's incentive structure because detected deficiencies present a risk to audit firms. An auditor's reputation can be harmed by means of the publicly visible report that contains information about each audit firm. Further, regulatory sanctions or litigation can follow. Hence, audit firms are expected to incorporate this risk into their audit planning, pricing, and portfolio management decisions.

Chapter three addresses pricing decisions and examines the impact of inspections on audit fees. In response to updated beliefs concerning inspectors' quality standards and the resulting likelihood of penalties subsequent to the inspection, auditors are likely to make adjustments following the inspection

(post-inspection) in areas that were criticized by inspectors. Given the assumption that the market for audit services is competitive, adjustments in audit effort are reflected in audit fees and hence, I expect fees to increase in response to a deficient inspection report. The question whether audit firms adapt their procedures in response to inspections is not as straightforward as it might seem at first sight as there has been extensive criticism of the PCAOB, its inspection procedures, and the inadequate amount of resources spent on enforcement. Hence, it is uncertain whether the pressure of the PCAOB is sufficiently large such that audit fees and effort are increased for clients of deficient firms.

The analysis in chapter three is based on a cross-section of 1,302 client-year observations of 139 triennially inspected US audit firms over the period 2003 through 2009. More specifically, I examine whether changes in residual audit fees from pre- to post-inspection periods are higher for clients of audit firms with a deficient inspection report. Further, I investigate whether there is cross-sectional variation in the extent of fee adjustments among deficient audit firms depending on the strength of pre-inspection fee pressure. Fee pressure causes a focus on low audit cost and might thus compromise audit quality, resulting in larger deficiencies and necessary adjustments. Higher pre-inspection fee pressure and thus larger fee increases are expected under conditions of high competition or low demand for audit quality prior to the inspection. In addition, I investigate employee changes over the same time period to corroborate the premise that fee adjustments are indeed reflective of effort. Overall, in spite of publicly voiced doubts regarding the effectiveness of PCAOB inspections, chapter three provides evidence for changes in audit firm behaviour. More specifically, the results are consistent with the argument that deficient audit firms react to inspections by putting in additional audit work.

Chapter four examines changes in portfolio management decisions in response to PCAOB inspections. I argue that there are two possible portfolio management strategies in response to an increase in risk caused by a deficient inspection result. On the one hand, the audit firm can decrease average portfolio riskiness by focusing on clients with lower audit risk and financial risk. On the other hand, the audit firm can increase average expertise by focusing on clients within its area of industry specialization. Prior studies that suggest portfolio risk reduction in response to auditor business risk (Johnstone and Bedard 2004; Johnstone 2000; Shu 2000; Raghunandan and Rama 1999) do not measure variations in auditor business risk at the audit firm level. And

experimental studies that suggest the use of expertise to address risk (Asare et al. 2005; Hackenbrack and Knechel 1997) do not measure expertise based on the audit firm's industry expertise. Hence, the PCAOB inspections provide a unique setting to investigate auditors' risk management strategies observable from acceptance and discontinuance decisions in response to audit firm-specific changes in auditor business risk.

In chapter four, I thus investigate audit firm portfolio management decisions in response to inspections. The examination of changes in client characteristics over time and of categories of predecessor and successor auditors yields preliminary insights into the forces influencing the audit market of small audit firms. I further investigate to what extent newly accepted and discontinued clients differ from each other and from the median client in the portfolio pre- and post-inspection depending on the inspection result. Given that an expected effect on client portfolios might hold in particular for extreme portfolios, I also examine changes in the tails of the distribution of mean audit firm year portfolio characteristics. The results of chapter four provide further evidence for changes in audit firm behaviour. The findings are consistent with an increase in portfolio industry expertise of deficient audit firms relative to clean audit firms in response to the inspection. Contrary to expectations, there is no evidence for a consistent decrease in portfolio riskiness in response to a deficient inspection report.

Chapter four examines audit firms' portfolio characteristics during an extended post-SOX environment, which is particularly useful in sight of a potential threat of risk accumulation in the portfolios of smaller audit firms. During the post SOX period, it appears that annually inspected audit firms discontinue their risky clients in response to capacity constraints (Dey and Robin 2011; Hogan and Martin 2009; Landsman et al. 2009) while at the same time a number of small audit firms leave the market for public audit clients (DeFond and Lennox 2011; Read et al. 2004). The analysis in chapter four provides, however, no indication for an accumulation of risk at the smaller or the deficient audit firms during the post-SOX period.

Chapter 5 concludes this dissertation by presenting a summary of the main results, implications, and avenues for future research. This dissertation contributes to the literature on the costs and benefits of the PCAOB and its inspection process. It provides evidence for the value relevance of the audit itself and of information concerning its quality. It further adds to the knowledge on audit firms' pricing and risk management strategies. This

dissertation addresses the need for more policy-related research called for by Chua (2011) and its relevance is emphasized by its close alignment to one of the PCAOB's key strategic objectives, being the assessment of the nature and magnitude of the costs and benefits of PCAOB initiatives on investors, public companies, and audit firms (PCAOB 2010).

2

INVESTOR REACTIONS TO PCAOB INSPECTION REPORTS[1]

2.1 Introduction

Following the high-profile financial reporting scandals that marked the beginning of this millennium, it has become a top priority for regulators to restore public confidence in the audit and financial reporting (Olson 2008). The inspections conducted by the PCAOB, while ultimately aimed at restoring investor confidence, can have two immediate potential benefits: (1) pressure audit firms to improve their audit processes and procedures and (2) generate a meaningful signal of audit quality to investors. Whereas prior research has strongly focused on the effects of inspections on audit quality (Gramling et al. 2011; Lennox 2011; Hermanson and Houston 2009; Carcello et al. 2008) and on client reactions to inspection reports (Lennox and Pittman 2010) , this study is the first to examine the information content of the PCAOB inspection reports to investors.

The PCAOB inspection report is arguably the only product of the inspection process that is visible to outside investors. The basic premise of this

[1] This chapter is based on a working paper co-authored with Erik Peek.

chapter is that the report's signal about audit quality, if informative, affects firm value through its effect on information quality. In particular, I assume that the quality of financial statement information is not perfectly observable, causing outside investors to assume that accounting signals have a range of possible precisions. Consistent with the conventional idea that auditing imposes bounds on management's discretionary accounting choices, I argue that increases (decreases) in perceived audit quality narrow (widen) accounting signals' perceived ranges of precision. Ambiguity-averse investors process accounting information as if they take a worst-case assessment of quality and thus charge an ambiguity premium for firms with accounting signals that have a wide range of precision (Epstein and Schneider 2008). A change in perceived audit quality may thus cause an immediate stock price response because investors adjust the ambiguity premium that they demand on their investment.

Whether the PCAOB inspection reports succeed in providing meaningful information about audit quality is far from clear. There are several factors that may potentially impair the reports' informativeness to investors. First, the reports' information content depends strongly on the quality of the inspections. The fact that deficiencies were found at all Big4 audit firms suggests that the system of PCAOB inspections is potentially more rigorous than the old peer review system (Francis 2004). However, the effectiveness of the inspection process is not undisputed, as it has been argued that expertise has been exchanged for perceived independence of inspectors (Palmrose 2005). Second, it is possible that investors consider the information in the inspection reports to be unreliable, coarse, or outdated by the time these reports become public. In particular, prior studies have raised concerns about the lack of transparency on inspection procedures and outcomes, the lack of staff to conduct inspections within schedule, and long delays in the publication of inspection reports (Lennox 2011; Glover et al. 2009; Hodowanitz and Solieri 2005). Third, inspection reports do not allow investors to establish the identity of clients reviewed during the inspection, making it difficult to assess to what extent detected deficiencies in audits of presumably the most risky clients are reflective of an audit firm's average audit quality.

In this study, I analyze a sample of 224 first-round and 134 second-round inspection reports, issued between January 2005 and March 2010. I measure the market response based on an absolute return metric (Cready and Hurtt 2002) during the event periods around inspection report stamp dates. I find abnormal size-adjusted absolute stock returns of clients audited by the

inspected audit firms. This finding indicates that the inspection reports are informative to investors. To examine the economic significance of the market response, I compare abnormal absolute returns around the inspection report stamp dates with the abnormal absolute returns in the three-day period around quarterly earnings announcement dates during the 160 trading days prior to the stamp dates. The average size of responses to inspection reports is 14 percent of the average size of responses to earnings announcements during the first round of reports and increases to up to 29 percent during the second round.

I also examine whether potential report-specific determinants of inspection report informativeness are systematically associated with the absolute market response on the publication dates. The abnormal size-adjusted absolute stock returns in response to inspection reports are significantly higher for reports that disclose GAAP-related deficiencies and significantly lower for reports that have been preceded by one or more deficiency-related client restatements. Also, the market response to surprise inspection reports, being all first-round reports as well as those second-round reports that report an inspection outcome that is different from the audit firm's first inspection outcome, is stronger than the response to second-round reports that report an unchanged inspection outcome. Moreover, the magnitude of the market response increases over time, presumably because of investors' increasing familiarity with the inspection reports, and decreases with the publication delay. These systematic associations not only support the relevance of report-specific characteristics but also underline that the observed market response can be reliably attributed to the information in the inspection reports.

In the main tests, I measure information content using absolute returns rather than signed returns. I do so because I can neither observe nor measure whether the inspection report reveals good or bad news to investors. First, I do not know investors' prior expectations about audit quality. Second, and just as importantly, I expect that the report affects investors' beliefs about audit quality in two potentially opposite ways. That is, the report helps investors to update their beliefs about *current* audit quality as well as about how the inspections will change *future* audit quality. To illustrate, for investors anticipating low audit quality a clean inspection report, i.e., not disclosing any audit deficiencies, may reflect good news about current audit quality. However, such a report may also reflect bad news by showing that the inspections did not effectively expose the suspected deficiencies and, consequently, will not improve audit quality. A deficient inspection report, on

the other hand, may signal bad news about current audit quality but may also be a positive signal for future audit quality as the audit firm has to initiate remedial actions to strengthen its audit process. Changes in perceptions of both current and future audit quality can influence the current stock price of the company.

For completeness, I do perform an exploratory analysis of the average signed market response to the inspection reports, both by inspection round (first versus second) and report content (clean versus deficient). This analysis reveals that the signed market response to first-round (second-round) inspection reports is significantly positive (not significantly different from zero), on average. This finding suggests that, on average, investors had pessimistic beliefs about audit quality prior to the publication of the first inspection reports and is consistent with regulators' concerns that the investing public lacked confidence in the audit. While good and bad news second-round reports average out in the signed test, they are still informative as shown by the significant absolute market response. I do not find that the signed market response to clean reports is significantly different from the response to reports of deficiencies. This indicates that clean reports do not, on average, contain more unexpected positive news than deficient reports.

Finally, I explore the relevance of information quality in causing investors to respond to the PCAOB inspection reports. In particular, I predict that if the inspection reports affect investor uncertainty about accounting quality, the market response on the inspection report publication date must be systematically associated with changes in investors' reliance on quarterly earnings reports. I indeed find evidence that the more negative the average market response to the inspection report, the more positive is the change in earnings announcement date stock price variance around the inspection report publication date. This finding confirms the idea that at least part of the market response to the publication of PCAOB inspection reports can be attributed to revisions in investors' beliefs about accounting information quality.

This chapter contributes to the literature in the following three ways. Prior studies on the PCAOB inspection reports implicitly assume that the shareholders of client firms care about the audit quality signal provided by the reports, thus pressuring client firms to change auditor or audit firms to take steps in order to avoid audit deficiencies. This study's finding that stock markets respond to the inspection report explicitly shows that this assumption is valid. This study also adds to the literature on audit quality differentiation by

showing that the PCAOB inspection reports contain useful information about audit quality. I emphasize that this finding particularly applies to the non-Big4 sector of the audit market, since the empirical tests are structured such that each of the inspection reports, most of which refer to non-Big4 audit firms, receives equal weight in the analysis. Furthermore, by showing that a commonly available signal of audit quality has a value effect, this study contributes to the literature on the value of the audit. More specifically, the magnitude of the market response to inspection reports, which reaches about 29 percent of market responses to earnings announcements, is of economic significance and provides evidence that the audit is of value to investors.

The remainder of this chapter is structured as follows. In the next section, I describe the PCAOB inspection report more in detail. Section 2.3 reviews the literature on the PCAOB inspections and develops the research questions. Section 2.4 describes the methodology and Section 2.5 discusses the empirical results. Section 2.6 concludes and outlines the limitations of the study.

2.2 The PCAOB inspection report

The result of the inspection process is publicly disclosed by means of an inspection report for each audit firm. Chapter one describes the inspection process and contents of the inspection report more in detail. While not disclosing the identity of inspected clients, the inspection report contains information about detected engagement-specific deficiencies and the existence of quality control deficiencies.[2] Details about quality control deficiencies are only published, however, if the audit firm does not address the PCAOB's concerns sufficiently within a one-year period. However, in many cases where quality control defects coincide with engagement-specific deficiencies, the inspection report's discussion of engagement-specific deficiencies is potentially informative about the nature of the quality control defects.[3] I use the terms clean and deficient to categorize different types of inspection reports. A clean report does not contain any deficiencies while a deficient report mentions one or more quality control or engagement-specific deficiencies.

[2] Engagement-specific deficiencies relate to the failure to prevent or detect a material GAAP misstatement (GAAP-related deficiency) or the failure to properly perform the audit according to Generally Accepted Auditing Standards (GAAS-related deficiency).

[3] The link between engagement-specific deficiencies and quality control defects becomes apparent from the fact that all inspection reports that describe one or more engagement-specific deficiencies also indicate that one or more quality control defects have been detected.

Publication of the inspection report occurs in two ways. On the inspection report stamp date, the audit firm receives the inspection report and can choose to disclose its content to the public. The PCAOB also publishes all inspection reports on its website on a date that I refer to as the report publication date. E-mail conversations with PCAOB representatives reveal that the publication date might be one or a few days later than the stamp date, depending on the number of reports issued on the same date as well as the time required to prepare them for public release. However, anecdotal evidence from newspaper articles supports the fact that the inspection result is already publicly known on the day following the stamp date (Hughes 2007; Johnson 2007; Leone 2007; Hughes 2006; Johnson 2005; Reuters 2005), at least for some audit firms.

Prior studies have examined audit firms' and clients' reactions to PCAOB inspection reports. Studies show that small audit firms with deficient inspection outcomes have deregistered with the PCAOB (DeFond and Lennox 2011; Daugherty et al. 2009; Read et al. 2004). Results are inconclusive on whether deficient inspection reports have caused audit firms to adjust audit quality (Lennox 2011; Gramling et al. 2011; Carcello et al. 2008). With regard to client reactions, Lennox and Pittman (2010) find that audit firms' market shares do not systematically change after the detection of engagement-specific deficiencies. However, even though PCAOB inspection reports have no observable average effect on market share, they can still provide valuable information for a subgroup of clients or audit firms. For example, Abbott et al. (2008) show that clients with effective audit committees or high potential agency conflicts are more likely to switch to a successor auditor without GAAP-related deficiencies.

To the best of my knowledge, there are only two prior studies that analyze investor perceptions of PCAOB inspections, both of which do not specifically examine the inspection report itself. Robertson (2006) shows in an experimental setting that nonprofessional investors expect the credibility of future audit opinions to improve more for triennially inspected firms and for firms responding to the inspection reports with concessions. Dee et al. (2009) find a negative stock market reaction to news of PCAOB sanctions imposed upon one Big4 audit firm. This chapter thus takes a first step to fill the evident gap of research on the usefulness of inspection reports to investors.

2.3 Theory and main hypothesis

The PCAOB inspection reports provide a novel type of public information on all audit firms. In face of the on-going discussion on the effectiveness of the PCAOB's inspection process, I examine whether the inspection reports succeed in providing meaningful information about audit quality. The assumption underlying the analysis is that meaningful signals of audit quality are of value relevance to investors. My explanation for why this assumption is valid is as follows.

Prior research has shown that management's incentives to present transparent and informative financial statements vary across firms. In the presence of reporting discretion, the precision of accounting information disclosed by management consequently varies and is not precisely known by investors, causing them to assume a range of possible precisions. A commonly accepted consequence of auditing is that it assures compliance with generally accepted accounting principles and reduces management's discretion to present financial statements of low precision. I thus assume that auditing mitigates investor uncertainty about the future and/or past precision of public accounting information, in particular by tightening the lower bound of the range of precisions.

Following prior theory and research on investor behaviour under information ambiguity (e.g., Epstein and Schneider 2008), I expect that the auditing-related reduction in uncertainty about accounting precision will lower the return that ambiguity-averse investors require on their investment. Hence, if the PCAOB inspection reports affect investors' beliefs about audit quality, their belief revisions can be expected to cause stock price adjustments. In particular, the following scenarios could occur. If the report induces investors to downwardly (upwardly) update their beliefs about past audit quality, thereby widening (narrowing) the perceived range of precisions of past accounting information, I expect that they re-interpret past accounting information with greater (less) skepticism (Epstein and Schneider 2008).[4] Such belief revisions would consequently lead to a negative (positive) stock price adjustment. Similarly, the report could induce investors to update their beliefs about future audit quality and the range of possible precisions of future accounting information. Anticipated changes in future uncertainty about

[4] Following Epstein and Schneider (2008), investor skepticism implies that investors assign greater weight to negative news than to positive news.

accounting quality would affect the ambiguity premium that investors currently demand on their investment and, consequently, affect stock prices.

There is some prior evidence for the value relevance of audit quality, primarily focusing on the negative market reactions to extreme events that signal low audit quality. Firth (1990) finds negative market reactions around release dates of UK Department of Trade investigation reports containing criticism of an auditor's work for some of its listed clients. Moreover, past studies have shown that clients of Arthur Andersen experienced a significant negative market reaction around event dates related to the Andersen-Enron affair, as for example the admission that documents had been shredded (Huang and Hang 2009; Cahan et al. 2009; Krishnamurthy et al. 2006; Chaney and Philipich 2002). There is also evidence that this reputation effect spilled over to other Big5 auditors (Huang and Hang 2009; Autore et al. 2009). Gleason et al. (2008) find that following accounting restatements contagious negative stock market reactions occur within the same industry. And finally, Dee et al. (2009) find a negative market reaction to a PCAOB sanction.

It thus appears that security prices incorporate information derived from typically extreme events that are indicative of low-quality audits. Given prior theoretical and empirical evidence, I expect that audit quality information is value relevant. However, it is not obvious that these findings hold for less extreme cases of audit failure or extend to positive news about audit quality. Furthermore, whether the PCAOB inspection reports succeed in visualizing audit quality is not clear a priori. In particular, the informativeness of the inspection reports depends on the quality of the inspection process, which is not undisputed. On the one hand, there are indications that the process is more promising than the old peer review system because of inspectors' greater independence, better access to audit process and outcome information, and the availability of more resources (Gunny and Zhang 2011; Carcello et al. 2008; Francis 2004). On the other hand, the inspection process has been criticized extensively. The fact that the PCAOB conducts some reviews at its own rather than at the firms' offices could inhibit the assessment of expertise and work ethics (Lennox 2011; Newman and Oliverio 2009). Moreover, inspectors have been argued to lack sufficient technical and in-depth experience (Glover et al. 2009).

Even if the inspection process yields accurate results, the signal might still be too coarse or out-dated by the time the inspection reports become public. In particular, the inspection procedures and outcomes are not

transparent and there are long delays in the publication of inspection reports (Lennox 2011; Glover et al. 2009; Hodowanitz and Solieri 2005). Furthermore, inspection reports do not reveal the identity of the clients reviewed during the inspection, making it difficult to assess to what extent the detected deficiencies are reflective of an audit firm's average quality. Also, the anecdotal description of deficiencies in inspection reports can lead to incorrect perceptions of audit quality (Wainberg et al. 2010). I note, however, that the inspection report could be useful and value relevant to investors also if it helps them to construct a crude ranking rather than an accurate point estimate of audit firms' relative quality. Potentially any kind of information on an audit firm's work ethics, attitudes and procedures could be helpful in achieving this. All in all, whether the inspection report helps investors in differentiating audit quality remains an empirical question. Using client firms' absolute abnormal stock returns around their audit firm's PCAOB inspection report stamp date as a measure of the inspection reports' informativeness, I test the following hypothesis:

> **Hypothesis:** During the event period surrounding the stamp date of their audit firm's PCAOB inspection report, client firm's absolute abnormal stock returns are significantly greater than zero.

2.4 Methodology

2.4.1 Sample selection

The sample is selected from the set of inspection reports for US audit firms published on the PCAOB website by the end of April 2010. Since a third inspection report has not yet been published for the majority of audit firms, I focus in this chapter on the first two rounds of inspection reports. For each inspection report, I hand-collect the information contained within the inspection reports, match it with the audit firm's clients using AuditAnalytics, and obtain client financial and price information from Compustat and CRSP, respectively. The sample thus consists of the intersection of all public PCAOB inspection reports and these three databases. I further restrict the dataset to include only auditor-client combinations with at least one financial year-end available prior to the inspection report stamp date. These selection criteria yield a final sample of 358 inspection reports issued between January 2005 and March 2010 and 7,642 related client firm-report observations.

2.4.2 Hypothesis test

To test the main hypothesis, I measure the market response of all clients audited by the inspected audit firms.[5] I first calculate client firms' daily size-adjusted returns (RET_{jt}) as the difference between the client firm's return and the mean return of firms in the same decile of market capitalization on the respective day. I then calculate the averages of client firms' standardized and mean-centered daily absolute size-adjusted returns ($ABSRET_j^{AVG}$) during an n-day event period starting one day prior to the inspection report stamp date:

$$ABSRET_j^{AVG} = \frac{1}{N}\sum ABSRET_{jt} = \frac{1}{N}\sum \frac{\left|RET_{jt}\right| - mean\left(\left|RET\right|\right)_j}{std\left(\left|RET\right|\right)_j} \qquad (2.1)$$

where $\left|RET_{jt}\right|$ is the absolute size-adjusted return of client firm j on day t of the n-day event period. $mean\left(\left|RET\right|\right)_j$ and $std\left(\left|RET\right|\right)_j$ are the mean and standard deviation of client firm j's absolute size-adjusted returns during the 140-day estimation period that ends 11 days prior to the stamp date. I then calculate the measure of abnormal price variance, labelled U-statistic, by first averaging $ABSRET_j^{AVG}$ across client firms within inspection reports and then across inspection reports. This procedure ensures that each inspection report receives equal weight in the analysis and results are not unduly influenced by the large audit firms.[6] I choose to examine measures based on absolute returns rather than squared returns because such measures have been shown to be more powerful in detecting unsigned price responses (Subramaniam 1997; Cready and Mynatt 1991).

To calculate the standard error of the U-statistic and test whether the statistic is significantly greater than zero, I follow a two-step approach. First, I calculate the standard deviation of $ABSRET_t$ for each day in the event period. As the sample has some clustering of inspection stamp dates in calendar time, I calculate standard deviations as:

[5] An analysis based on the selection of inspected clients only is not feasible since the identity of the inspected clients is non-public information.

[6] Only 8 and 16 inspection reports belong to Big4 and annually inspected firms, respectively, all of which show deficient inspection results. Hence, a sensitivity analysis based on the large audit firms only is not feasible.

$$std_t = \left[\frac{1}{Nclients^2} \sum_{i=1}^{Nclients} \sum_{j=1}^{Nclients} a_i a_j \right]^{0.5} \quad (2.2)$$

where a_i and a_j are set equal to the mean-adjusted values of $ABSRET_{it}$ and $ABSRET_{jt}$ if observations i and j are from the same inspection stamp date and set equal to zero otherwise, and *Nclients* is the number of client firms in the sample.[7] Second, I use the resulting event day-specific standard errors (i.e., std_t x $Nclients^{0.5}$), which I label s_t, to estimate the standard error of the U-statistic as follows:

$$s(U) = \left\{ \begin{pmatrix} 1 & \cdots & 1 \end{pmatrix} \begin{bmatrix} s_{t-1}^2 & \rho s_{t-1} s_t & \cdots & \rho^{N-1} s_{t-1} s_{t+N-1} \\ \rho s_t s_{t-1} & s_t^2 & & \\ \vdots & & \ddots & \vdots \\ \rho^{N-1} s_{t+N-1} s_{t-1} & & \cdots & s_{t+N-1}^2 \end{bmatrix} \begin{pmatrix} 1 \\ \vdots \\ 1 \end{pmatrix} \right\}^{0.5} \quad (2.3)$$

where N is the number of days in the event period and ρ is the time series correlation of $ABSRET_{jt}$, which I estimate using all available daily client firm returns during the estimation periods. I use an event period of three trading days centered on the inspection report stamp date. As the number of days between the inspection report stamp date and the issuance date is unknown and might vary across reports, I check whether the results are sensitive to the length of the event period in the results section.

I also estimate a random coefficients regression model of standardized and mean-centered daily absolute size-adjusted returns ($ABSRET_{jt}$) on indicator variables for the event periods around the inspection report stamp dates ($D^{Inspection\ report\ date}$) and the quarterly earnings announcement days ($D^{Earnings\ announcement\ date}$). For each client firm, I include 161 days in the regression, representing the period starting 150 days prior to and ending 10 days after the report stamp date. The model is as follows:

$$ABSRET_{jt} = \beta_{0j} + \beta_{1j} D^{Inspection\,report date} + \beta_{2j} D^{Earnings announcement date} + \varepsilon \quad (2.4)$$

This random coefficients model allows variation in the coefficients across the j inspection reports and accounts for correlated errors within each inspection

[7] This procedure is conceptually similar to estimating clustered standard errors in a panel regression analysis.

report. The reported coefficients are average coefficients across inspection reports, thereby assigning each inspection report equal weight. Given my prediction that the market responds to inspection reports, I expect that β_1 is positive. The ratio of β_1 to β_2 further quantifies the economic significance of the information in the inspection report relative to the information announced during quarterly earnings announcements.

2.4.3 Additional analysis: cross-sectional variation in the market response

The importance of the audit quality signal in reducing ambiguity about information quality potentially varies across inspection reports, as reports differ in content and timing of publication. I therefore test in a separate analysis whether cross-sectional differences in report-specific characteristics are systematically associated with the absolute market response on the publication dates. In particular, I expect that three characteristics of the information in the inspection report affect how investors respond: (1) the surprise component of the inspection result; (2) the value relevance of the information in the report, and (3) investors' familiarity with the reports. Below I describe in more detail what empirical measures of these characteristics are examined in the analysis.

To examine the effect of the surprise component of the inspection result on the market response, the analysis includes the following three measures: *NONEWS*, *DELAY*, and *RESTATEMENT*. I assume that an inspection outcome is less of a surprise if it brings similar information as the previous report. By definition, the first-round inspection report provides novel information and thus contains a substantial surprise component. In a similar way, a second-round inspection outcome that deviates from the first-round outcome also reflects new information. I therefore include an indicator variable, labelled *NONEWS*, which equals one for all second-round inspection reports that disclose unchanged outcomes compared to the first-round inspection report. As the two possible inspection outcomes I distinguish clean and deficient and predict *NONEWS* to be negatively associated with the absolute magnitude of the market response to inspection reports.

Another factor that may influence the surprise component of the inspection result is the publication delay. Disclosure timeliness is important as the usefulness of information decreases with reporting delay (Atiase et al. 1989; Givoly and Palmon 1982). The longer the period between the inspection and the publication of the inspection outcome, the more likely it is that inspection-

related information has leaked to the market before its publication, has been anticipated by other correlated information releases, or is simply no longer relevant. I predict that the publication delay (labelled *DELAY*), which is measured as the natural logarithm of the number of days between the end of the inspection period and the inspection report stamp date, is negatively associated with the market response.[8] Because the publication delay likely has a marginally decreasing effect on the market response, I also include squared values of *DELAY* in the analysis.

In addition, I examine the association of the market response with a more direct measure of whether a correlated announcement has preceded the inspection report publication, i.e., *RESTATEMENT*. This measure is an indicator variable that equals one if the inspection report mentions that a client firm has made a restatement because of a factor that led to a deficiency. Gleason et al. (2008) show that investors respond to accounting restatements. I therefore expect that restatements cause investors to anticipate part of the information (in particular deficiencies) in the inspection report, thereby reducing the market response on the inspection report publication date.

Given the theory that inspection reports affect stock prices because they cause investors to update their beliefs about the precision (possible range) of accounting information, I expect that the market response will be stronger if the inspection report provides a direct signal of client firms' accounting precision. As such, I predict that the market response is positively associated with *GAAPDEFICIENCY*, an indicator variable that equals one if the inspection report includes at least one GAAP-related deficiency (cf. Abbott et al. 2008).

Further, I expect that the more experienced investors have become with the reports' format and information content and the more benchmark reports are available, the more accurately and homogeneously investors respond to the audit quality signal in the report.[9] If so, the market response to inspection reports should increase over time. I therefore predict that the market response

[8] To make coefficients in the regression analysis easily interpretable, I subtract the sample minimum from each value of *DELAY*, such that the minimum value of *DELAY* becomes equal to zero.

[9] As both clean and deficient reports were issued on the very first report stamp dates (21/01/2005 and 09/02/2005), it is unlikely that the results of familiarity are driven by adjustments in expectations that could have occurred in case early published reports had been either all clean or all deficient.

to the inspection reports is positively associated with *FAMILIARITY*, measured as the rank of the inspection report stamp dates.

In summary, I estimate the following regression equation to examine the association between the 358 report-specific averages of $ABSRET_j^{AVG}$, as defined in equation (1), and report characteristics:

$$\begin{aligned} Average\left(ABSRET_{jt}^{AVG}\right) = \quad & \gamma_{0j} + \gamma_1 NONEWS + \gamma_2 DELAY + \gamma_3 DELAY^2 + \\ & \gamma_4 RESTATEMENT + \gamma_5 GAAPDEFICIENCY + \\ & \gamma_6 FAMILIARITY + \sum \gamma_{7c} CONTROL_c + \varepsilon \end{aligned} \quad (2.5)$$

where all variables are as defined earlier. In this regression I control for *FIRMSIZE*, which I define as the natural logarithm of the audit firm's number of clients, and *#DEFICIENCIES*, which I define as the natural logarithm of the number of deficiencies disclosed (plus one) in the inspection report.[10] The inclusion of *FIRMSIZE* controls for the possibility that investors' prior knowledge about audit quality is a function of audit firm size.[11]

2.4.4 Additional analysis: revised beliefs about the quality of accounting information

The theory implies that the audit quality signal contained in the inspection report is value relevant because it affects investor ambiguity about the quality of management's accounting disclosures (Epstein and Schneider 2008). I expect that with low-quality audits, management can choose to either provide low or high quality information, thereby increasing investor ambiguity about the precision of accounting signals. High-quality audits, however, raise the lower bound of the range of possible precisions, as some minimum level of information quality is assured, thereby reducing investor ambiguity. Consequently, following a change in perceived audit quality, investors will not only adjust their estimates of firm value, but also adjust their reliance on future public accounting signals.

The change in audit quality can affect investors' reliance on future accounting signals in two opposite directions. First, I expect that the inspection

[10] For triennially inspected firms, the measure *FIRMSIZE* is based on the exact number of clients as indicated in the inspection report and for annually inspected firms, it is based on the count of clients in Audit Analytics.

[11] Another reason for including *FIRMSIZE* is that the fewer clients an audit firm has, the more likely it is that the inspected engagements relate to the client firms in our sample. This is because the ratio of inspected clients to the overall number of clients typically decreases with firm size.

report induces investors to reweigh *past* accounting signals. If a negative market response to an inspection report primarily reflects investors becoming more sceptical about past accounting signals, i.e., assigning lower precision to past positive signals, such a response will be associated with a contemporaneous increase in investor uncertainty. Following Holthausen and Verrecchia (1988), I expect that this reduction in the perceived average precision of investors' current information set causes investors to increase their reliance on future (post-inspection report) accounting signals. Second, the negative market response could also reflect an increase in the ambiguity premium that investors demand on their investment. This would occur if investors expect that the downward revision in perceived past audit quality will, at least partly, persist into the future, making the precision of *future* accounting signals less certain than it was previously perceived. Following Epstein and Schneider (2008), I expect that this increase in future information ambiguity reduces investors' reliance on future (post-inspection report) accounting signals.

Based on these arguments, I predict that the inspection report-induced change in perceived future and/or past audit quality, measured as the signed market response to the publication of the inspection report, is associated with the average change in investors' responses to quarterly earnings announcements from prior to after the inspection report stamp date. Given that I do not know which of the described opposite effects empirically dominates, I make no predictions about the sign of the relationship.

To test the prediction, I create a dataset of client firms' quarterly earnings announcements during the years 2004 to 2010. I only include clients having price data and earnings announcements dates available for at least eight quarters. This requirement yields a sample of 94,172 client-quarters, related to 238 inspection reports. Using this sample, I measure the abnormal market response to each earnings announcement as the residual from a pooled regression of (1) the average of the standardized and mean-centered daily absolute size-adjusted returns during a three-day period around the earnings announcement date on (2) the absolute value of the price-scaled change in quarterly earnings, indicator variables for negative and decreased quarterly earnings, indicator variables for quarters (1–4) and years (2004–2010), and client fixed effects. In this regression earnings are measured before extraordinary items and changes in quarterly earnings are measured relative to quarterly earnings in the same quarter of the previous fiscal year.

Next, I take the mean residual by client firm for each of the following two periods: two years prior to the inspection report stamp date (pre-period) and two years after the inspection report stamp date (post-period).[12] Finally, I split up the sample of clients based on whether the size of the average signed market response to the inspection report is above or below the median and compare the changes in the mean abnormal market response to earnings announcements from the pre- to the post-period between both subsamples. I perform this analysis for first-round and second-round reports separately.

2.5 Results

2.5.1 Inspection results and descriptive statistics

Table 2.1 provides an overview of the report- and client-specific characteristics of the sample. Panel A displays the inspection outcomes. The final sample includes 358 PCAOB inspection reports, of which 224 are first-time reports and 134 are second-round reports. Overall, there are 169 deficient reports (47 percent) that mention both, quality control and engagement-specific deficiencies. Also, 49 inspection reports (14 percent) list no engagement-specific deficiencies but quality control defects and 140 reports (39 percent) are clean. Out of the 82 firms with clean second-round reports, 53 firms (65 percent) had a deficient inspection report in the first round. These 53 cases thus represent a change from a deficient to a clean report. At the same time, out of the 52 deficient second-round reports, 7 reports (13 percent) correspond to a change from a clean to a deficient report. Evidently, there are no inspection reports that mention engagement-specific deficiencies without reporting quality control defects. A comparison of the first and the second inspection round indicates some improvement, as in the first round only 26 percent of the reports re clean while this fraction increases to 61 percent for the available reports of the second inspection round.

Panel B shows descriptive statistics for the report- and client-specific variables. 21 percent of the inspection reports in the sample are second-round reports that provide the same result as the audit firm's previous report; eight percent of the reports mention one or more deficiency-related restatements made by client firms prior to the inspection report stamp date; nine percent of the reports disclose one or more GAAP-related deficiencies.

[12] We exclude clients that have less than four quarters available in one or both periods.

TABLE 2.1 Inspection results and descriptive statistics

Panel A: Inspection results

Engagement deficiencies	*Quality control defects*	*First-round reports*		*Second-round reports*		*All reports*	
		Number of reports	*%*	*Number of reports*	*%*	*Number of reports*	*%*
No	no	58	25.89	82	61.19	140	39.11
	yes	30	13.39	19	14.18	49	13.69
Yes	yes	136	60.71	33	24.63	169	47.21
Total		224	100.00	134	100.00	358	100.00

Panel B: Report- and client-characteristics

	N	*Mean*	*StdDev*	*Minimum*	*Median*	*Maximum*
Report characteristics:						
NONEWS	358	0.21	0.41	0.00	0.00	1.00
EXP(DELAY)	358	276.96	196.20	25.00	202.00	1,174.00
RESTATEMENT	358	0.08	0.27	0.00	0.00	1.00
GAAPDEFICIENCY	358	0.09	0.29	0.00	0.00	1.00
EXP(#DEFICIENCIES)	358	1.42	2.93	0.00	0.00	30.00
EXP(FIRMSIZE)	358	124.83	624.29	1.00	9.50	5,327.00
Client characteristics:						
ESTRET	7,642	0.00	0.24	-0.79	0.00	0.74
LOSS	7,642	0.27	0.44	0.00	0.00	1.00
LEVERAGE	7,642	0.21	0.22	0.00	0.15	0.95
EXP(CLIENTSIZE)	7,642	2,547.46	7,461.52	7.16	396.81	56,033.75

(This table is continued on the next page)

TABLE 2.1 (Continued)

Notes: Report-characteristics: NONEWS is an indicator variable equal to one for second-round inspection reports with an inspection result that is not different from the first-round inspection report; DELAY is the natural logarithm of the number of days between the end of the inspection period and the inspection report stamp date; RESTATEMENT is an indicator variable that equals one if the inspection report mentions that one of the audit firm's clients has made a (deficiency-related) restatement prior to the inspection report stamp date; GAAPDEFICIENCY is an indicator variable that equals one if the inspection report discloses at least one GAAP-related deficiency; #DEFICIENCIES is the number of audit engagements with engagement-specific deficiencies mentioned in the inspection report; FIRMSIZE is the natural logarithm of the audit firm's number of clients.
Client-characteristics: ESTRET is the client's cumulative market adjusted return during the 140-day estimation period that ends 11 days prior to the inspection report stamp date; LOSS is an indicator variable that equals one if the client firm's net income in the fiscal year immediately prior to the inspection report stamp date is negative; LEVERAGE is the sum of current and long-term debt divided by total assets at the financial year-end immediately prior to the inspection report; CLIENTSIZE is the natural logarithm of the market value of the client firm on the financial year-end date immediately prior to the inspection report stamp date. All client variables have been winsorized at the 1st and 99th percentile.

The reports' publication delay ranges from 25 days to more than three years but is less than one year for the majority of the sample firms. The median audit firm in the sample has a firm size of 10 clients. Audit firm size ranges from 1 client to up to 5,327 clients. The median client in the sample has a zero market adjusted return during the estimation period, has a leverage ratio of 15 percent, and a market capitalization of close to $397 million. The following sections describe the results of the empirical tests.

2.5.2 Absolute market response to inspection reports

Table 2.2 displays the results of the univariate and multivariate (main) hypothesis tests. Panel A reports the U-statistics, as defined in the methodology section, by inspection round. The U-statistic has a value of 0.0497 ($p<0.10$) for the first-round report publications. The economic interpretation of this result is that around first-round inspection report stamp dates, client firms' absolute size-adjusted stock returns are, on average, about 0.05 standard deviations above their normal levels. For the second-round reports the U-statistic equals 0.1506 ($p<0.01$). Overall, the univariate results indicate that both the first- and second-round reports are informative and value relevant to investors.

TABLE 2.2 Analysis of the absolute market response to inspection report publications

	First-round reports		*Second-round reports*	
Panel A: Univariate test of absolute abnormal returns				
	U	*T-statistic*	*U*	*T-statistic*
Standardized abnormal absolute size-adjusted returns	0.0497	1.34*	0.1506	2.39***
Panel B: Random coefficients regression analysis of absolute abnormal returns				
	Non-announcement days only	*All (announcement and non-announcement) days*	*Non-announcement days only*	*All (announcement and non-announcement) days*
β_0: Intercept	0.0077	0.0080	-0.0073	-0.0089
	(2.04)**	(2.03)**	(-2.70)***	(-3.41)***
β_1: $D^{\text{Inspection report date}}$	0.0656	0.0620	0.1327	0.1089
	(1.97)**	(1.85)**	(2.39)**	(2.03)**
β_2: $D^{\text{Earnings announcement date}}$	-	0.4429	-	0.3791
	-	(11.78)***	-	(9.56)***
Number of reports	224	224	134	134
β_1/β_2	-	0.14	-	0.29

(This table is continued on the next page)

TABLE 2.2 (Continued)

Notes. Panel A displays the results of a univariate analysis of the market response to inspection report publications. The U-statistic is defined as the average of the standardized and mean-centered daily absolute size-adjusted returns during the three-day event period around the inspection report issuance date. Returns are first averaged across client firms within inspection reports and then averaged across inspection reports, such that all inspection reports receive an equal weight. T-statistics are based on standard error estimates that have been adjusted for cross-sectional dependence and autocorrelation among daily absolute size-adjusted returns following the procedures outlined in the methodology section. **Panel B** displays the average coefficients of random coefficients regression analyses of the relationship between standardized and mean-centered daily absolute size-adjusted returns ($ABSRET_{jt}$) and indicator variables for the three-day event periods around inspection report issuance dates ($D^{Inspection\ report\ date}$) and quarterly earnings announcement dates ($D^{Earnings\ announcement\ date}$). The random coefficients model accounts for variation in the coefficients across inspection reports. The number of client firms included in this regression is 3,954 for the first-round report regression and 3,688 for the second-round report regression. The number of days included in the regression for each client firm is 161 days, coming from the period starting 150 days prior to the inspection report issuance date and ending 10 days after the inspection report issuance date. The regressions in the third and fifth column include all observations; the regressions in the second and fourth column exclude all observations where $D^{Earnings\ announcement\ date}$ equals one.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels (one-tailed), respectively.

Panel B reports the results of the random coefficients regression analysis for the first- and the second-round reports separately. Columns one and three contain the results of the regression using only days without an earnings announcement (referred to as the non-announcement days only sample), while the regressions in columns two and four are based on all trading days within the period (hereafter referred to as the all days sample). For the first-round reports, the coefficient on $D^{Inspection\ report\ date}$ (β_1) is significantly positive, with values of 0.0656 and 0.0620 ($p<0.05$) in the non-announcement days only sample and all days sample, respectively. For the second-round reports, β_1 increases in magnitude to, respectively, 0.1327 and 0.1089 ($p<0.05$). These findings show that there is a significant average market response to both the first- and second-round inspection reports and provide support for the main hypothesis.

The economic significance of the market response can be quantified by comparing the market response on publication dates to the market response on earnings announcement dates. The ratio of the two coefficients β_1 and β_2 shows that the average size of the market response to inspection reports is 14 percent of the average size of the response to earnings announcements for first-round inspection reports and increases to 29 percent for the second round of reports.

This finding emphasizes that the magnitude of the market response to PCAOB inspection reports is of economic significance.

2.5.3 Cross-sectional variation in the market response to inspection reports

Table 2.3 reports the regression results for model (2.5), which specifies the relationship between the absolute market response to inspection reports and report-characteristics. As predicted, I find that *DELAY* has a significantly negative coefficient of -0.4960 ($p<0.10$), indicating that publication delay reduces the informativeness of inspection reports to investors. The significantly positive coefficient on $DELAY^2$ (0.1129; $p<0.05$) indicates that the marginal effect of increases in publication delay, calculated as -0.4960 + 0.2258x*DELAY*, becomes less negative as delay increases and at one point turns positive. The point at which the marginal effect turns positive is at a publication delay of approximately 234 days, which is slightly above the sample median. This nonlinearity in the relationship between publication delay and the market response to the inspection report may be the result of the interplay between two factors. One factor is that the information about inspection outcomes becomes stale as time passes. The other factor is that a long publication delay may be the result of disagreement between the PCAOB and the audit firm, may increase investor uncertainty about the inspection outcome and, consequently, make the inspection report more relevant to investors.

The coefficient on *RESTATEMENT* is significantly negative (-0.3076; $p<0.05$), as predicted, which suggests that investors anticipate part of the information in the inspection report when one or more deficiency-related client restatements precede the inspection report publication date. Consistent with my expectation, the coefficient on *NONEWS* is negative, suggesting that inspection reports that disclose a first-time inspection result or a change from deficient to clean (or vice versa) are more informative to investors than other reports; however, the coefficient on *NONEWS* is (just) not significantly different from zero (-0.1422; $p=0.11$).

The results in Table 2.3 also show that inspection reports that disclose one or more GAAP-related deficiencies, which I assume to be a more direct signal of clients' accounting precision, lead to a significantly larger market response than inspection reports without such deficiencies. In particular, the coefficient on *GAAPDEFICIENCY* is 0.4221 ($p<0.01$).

TABLE 2.3 Regression analysis of the relationship between the absolute market response to inspection reports and report-specific characteristics

	Predicted sign	*Report specific regression analysis: Dependent variable is Average($ABSRET_j^{AVG}$)*	*Report-client specific regression analysis: Dependent variable is $ABSRET_j^{AVG}$*
Intercept		0.4579	0.5011
		(1.60)	(2.17)
Inspection report characteristics:			
NONEWS	-	-0.1422	-0.2151
		(-1.63)	(-3.24)***
DELAY	-	-0.4960	-0.5161
		(-1.91)*	(-2.58)***
DELAY2	+	0.1129	0.1177
		(1.97)**	(2.61)***
RESTATEMENT	-	-0.3076	-0.2705
		(-2.56)**	(-2.41)**
GAAPDEFICIENCY	+	0.4221	0.3393
		(3.00)***	(2.90)***
FAMILIARITY	+	0.2636	0.2410
		(1.98)**	(2.03)**
#DEFICIENCIES	?	-0.0151	0.0107
		(-0.21)	(0.18)
FIRMSIZE	?	-0.0015	-0.0133
		(-0.06)	(-0.61)
Client risk measures:			
ESTRET	-	-	-0.1695
			(-3.91)***
LOSS	+	-	0.0510
			(1.77)*
LEVERAGE	+	-	-0.0071
			(-0.18)
CLIENTSIZE	+	-	0.0019
			(0.34)
N (Number of reports)		358	
N (Number of client firms)			7,642

Notes: This table shows the results of two regression analyses. The dependent variable in the report-specific regression analysis is the report-specific average of $ABSRET_j^{AVG}$, client firms' standardized and mean-centered absolute size-adjusted returns in the event period. The dependent variable in the report-client specific regression analysis is $ABSRET_j^{AVG}$. The report-client-specific regression uses a random coefficients procedure: coefficients of the client-specific variables and the intercept are allowed to vary across inspection reports and the table displays average coefficients. Client-specific and report-specific variables have been defined in Table 2.1. T-values are listed in brackets underneath the coefficients.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels (two-tailed), respectively.

In addition, the market response to inspection reports increases as a function of the number of previously disclosed reports, labeled *FAMILIARITY* (0.2636; $p<0.05$). This finding suggests that investors' familiarity with inspection reports is a positive determinant of the reports' usefulness. Finally, the control variables *#DEFICIENCIES* and *FIRMSIZE* are not significantly associated with the market response to inspection reports. Overall, the findings confirm my expectations. The results indicate that the market reaction to inspection reports is systematically associated with report-specific characteristics that determine the informativeness of the audit quality signal. This finding provides further evidence that the observed market response is indeed caused by the inspection reports and the audit quality signal contained within them.

To explore the effect of client risk on the market response and to test whether risk characteristics of audit firms' client portfolios may be driving the above results, I replicate the above analysis after controlling for client risk measures. In particular, I estimate a random coefficients model that specifies $ABSRET_j^{AVG}$, as defined in equation (2.1), on report- and client-specific characteristics and industry dummies.[13] Note that in this analysis, I estimate the model using client firm-report observations. I therefore use a random coefficients procedure to account for the variation in unknown prior expectations of investors (and dependence among client firm-report observations) and make sure that each inspection report obtains equal weight in the analysis. The last column in Table 2.3 displays the results of this analysis. The table shows the estimated fixed effects for the report- and client-specific explanatory variables. The reported fixed effects for the client-specific variables are the averages of the individual report-specific coefficients.

The results in Table 2.3 show that client firms' stock return during the 140-day estimation period (preceding the inspection report publication date), which is labeled *ESTRET*, is negatively associated with the market response to the inspection report publication (-0.1695; $p<0.01$). In addition, the coefficient on *LOSS*, which is an indicator variable that is equal to one if the client firm reported a loss in the most recent fiscal year prior to the inspection report publication, is significantly positive (0.0510; $p<0.10$). The coefficients on the measures for leverage and client size are not significantly different from

[13] In this analysis, I winsorize all continuous client-specific variables at the 1st and 99th percentile. Industry dummies are based on Fama and French's 48 industry categorization.

zero.[14] These findings show that the magnitude of the market reaction to inspection reports is negatively associated with client performance and suggest that client risk affects the value relevance of inspection reports to investors. More central to my analysis, note that the coefficients on the variables measuring inspection report characteristics remain consistent with those found in the previous analysis.

2.5.4 Signed market response to inspection reports

In the previous analyses I have chosen to measure the informativeness of inspection reports using absolute returns rather than signed returns. As explained in the introduction, I do so because I cannot accurately categorize inspection reports into bad versus good news reports. Nonetheless, two characteristics of the inspection reports may allow a crude assessment of the sign of the news in the report, thus warranting an exploratory analysis of signed market responses. First, if prior to the start of the PCAOB inspection program investors lacked confidence in the audit and the first-round inspection reports helped to gradually restore such confidence, I expect that the first-round reports trigger more positive market responses, on average, than the second-round reports. Second, under the strict assumption that investors' prior expectations about audit quality are not strongly correlated with the inspection outcomes and investors do not interpret clean inspection reports with skepticism, I expect that clean inspection reports trigger more positive market responses, on average, than deficient reports.

Table 2.4 shows the average (signed) size-adjusted returns during the three-day event periods centered on the inspection report stamp dates. Like in the main hypothesis test, I first average returns across client firms within inspection reports and then across inspection reports to ensure that all inspection reports receive equal weight in the analysis. I calculate standard errors of the average (signed) size-adjusted returns and t-statistics following the procedures outlined in the methodology section. The results in Table 2.4 show that the signed market response to first-round inspection reports is significantly positive, whereas the signed market response to second-round reports is not significantly different from zero. This finding suggests that the

[14] The results remain qualitatively unchanged when using the natural logarithm of total assets as measure of client size. I acknowledge that risk measures are associated with return volatility. Higher return volatility during the estimation period renders it more difficult to find an abnormal market reaction during the event period. Thus, there are two potentially offsetting effects that influence the relationship between abnormal returns and risk.

first-round inspection reports helped in removing the negative bias in investors' beliefs on audit quality. While second-round reports with positive and negative news about audit quality average out in the signed test, they are still informative to investors as shown in the tests based on absolute returns.

The insignificant difference between signed responses to clean and deficient reports shows that, on average, investors have not perceived the news in clean reports as more positive than the news in deficient reports. This finding may suggest that investors were more positive a priori about audit firms receiving clean reports than about audit firms receiving deficient reports or they have interpreted (some) clean inspection reports with skepticism. Based on the available data, I cannot distinguish between both explanations.

TABLE 2.4 Analysis of the signed market response to inspection report publications by inspection round and report content

	First-round reports		*Second-round reports*	
	U-statistic	*T-statistic*	*U-statistic*	*T-statistic*
Clean reports	0.0933	3.28***	-0.0010	-0.22
	N = 58		N = 82	
Deficient reports	0.0691	2.43**	-0.0034	-0.07
	N = 166		N = 52	

Notes: This table shows the results of a univariate analysis of the signed market response to inspection report publications, categorized by inspection round (first versus second) and report content (clean reports versus deficient reports). The U-statistic is defined as the average of the standardized and mean-centered daily signed size-adjusted returns during the three-day event period around the inspection report publication date. Returns are first averaged across client firms within inspection reports and then averaged across inspection reports, such that all inspection reports receive an equal weight. T-statistics are based on standard error estimates that have been adjusted for cross-sectional dependence and autocorrelation among daily (signed) size-adjusted returns following the procedures outlined in the methodology section.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels (two-tailed), respectively

2.5.5 Revised beliefs about the quality of accounting information

Table 2.5 displays the averages of the measure of the abnormal market response to clients' quarterly earnings announcements. I calculate averages by groups defined along two dimensions: (1) period and (2) investors' response on the inspection report stamp date. The results in Panel A show that the average abnormal market response or investors' reliance on quarterly earnings, increases from the period prior to the first-round inspection report stamp date to the period after this date. However, the observed increase in investors' reliance on quarterly earnings is only significantly different from zero in the sample of first-round inspection reports that induced a below-the-median market response on the report stamp date (difference: 0.0413; $p<0.01$). Also, the observed increase in investors' reliance is significantly lower in the sample of first-round reports that induced an above-the-median market response (difference in differences: -0.0372; $p<0.10$). This finding suggests that the market response on first-round inspection report stamp dates is negatively associated with the contemporaneous change in investor uncertainty, presumably because the market response reflects investors reweighing previously disclosed accounting information. I interpret this finding as evidence that the market response to the first inspection report can at least partially be attributed to revisions in investor beliefs about the (past) quality of accounting information.

The results for the second-round reports, displayed in Panel B of Table 2.5, are consistent in trends with the results in Panel A. However, the changes in investors' reliance on quarterly earnings around the second-round report stamp dates are not significantly different from zero. This may be the result of the interplay between the two potential effects of inspection reports, i.e., investors' belief revisions about *past* versus *future* audit quality, as discussed in the methodology section. In particular, investors may not increase their reliance on quarterly earnings after the publication of negatively received second-round inspection reports if they are less confident that future audit quality will improve than they were after receiving a similar report in the first round. However, given that the number of usable second-round inspection reports in Panel B is 65 (versus 173 first-round inspection reports in Panel A) and the tests in Panel B may consequently lack power, the finding should be interpreted with caution.

TABLE 2.5 Analysis of the change in the abnormal market response to earnings announcements from prior to after the inspection report stamp date

Response to the inspection report	*Pre period abnormal response to earnings announcements*		*Post period abnormal response to earnings announcements*		*Post minus pre*	
	Mean	*T-statistic*	*Mean*	*T-statistic*	*Mean*	*T-statistic*
Panel A: First-round inspection reports						
Below the median	-0.0099	-1.06	0.0314	3.11***	0.0413	2.67***
Above the median	0.0003	0.04	0.0045	0.29	0.0042	0.35
Above minus below	0.0102	0.76	-0.0269	-1.44	-0.0372	-1.89*
Panel B: Second-round inspection reports						
Below the median	-0.0035	-0.44	0.0135	1.51	0.0170	1.30
Above the median	0.0090	1.50	0.0121	0.92	0.0032	0.22
Above minus below	0.0125	1.26	-0.0013	-0.08	-0.0139	-0.72

Notes: This table displays the averages of investors' abnormal responses to client firms' quarterly earnings announcements. Averages are calculated by groups defined along two dimensions: (1) period (two years prior to versus two years after the inspection report stamp date) and (2) investors' average response to the inspection report publication (size of the signed market response above versus below the sample median). Clients are included in the sample if they have at least four quarters available in each of the two periods. The client-specific abnormal response to quarterly earnings announcements is calculated as the client-specific mean residual of a pooled regression of (1) the average of the standardized and mean-centered daily absolute size-adjusted returns during a three-day period around the quarterly earnings announcement date (EARNRET) on (2) the absolute value of the price-scaled change in quarterly earnings (before extraordinary items, relative to quarterly earnings in the same quarter of the previous fiscal year), indicator variables for negative and decreased quarterly earnings, indicator variables for quarters (1 – 4) and years (2004 – 2010), and client fixed effects. This pooled regression is estimated using all available client-quarter observations for the period 2004–2010 (excluding clients with less than eight client-quarter observations). All t-statistics are based on clustered standard errors (clustered by inspection report).
*,**,*** Significant at the 0.10, 0.05, 0.01 levels, respectively.

2.5.6 Sensitivity of results to the length of the event window

To test whether the results are sensitive to the chosen length of the event period, I define two longer event windows of six and eleven days. Both event periods start one trading day before the inspection report stamp date, thus allowing for the possibility that the PCAOB may use up to one or two weeks, respectively, to post the inspection report. When using the alternative event windows, most results remain qualitatively unchanged, as described below.
The U-statistic has values of, respectively, 0.0580 ($p<0.05$) and 0.0660 ($p<0.01$) for the six- and eleven day event window in the sample of first-round reports, and 0.0897 ($p<0.05$) and 0.1593 ($p<0.01$) for the two event windows in the sample of second-round reports. For first-round reports, the coefficient on $D^{Inspection\ report\ date}$ (β_1) is significantly positive for both event windows, with (rounded) values of 0.05 and 0.06 ($p<0.10$) in the non-announcement days only sample and the all days sample, respectively. For second-round reports, β_1 equals 0.07 and 0.06 ($p<0.05$) for the two samples when using a six-day event period; β_1 increases to 0.15 and 0.14 ($p < 0.01$) for the two samples when using an eleven-day event period.

In the analysis of the cross-sectional variation in the market response the coefficients on *DELAY*, $DELAY^2$, *RESTATEMENT*, and *GAAPDEFICIENCY* remain significant in the predicted direction when using a six-day event window. When using an eleven-day event window, the coefficients on *NONEWS*, *RESTATEMENT*, *GAAPDEFICIENY* and *FAMILIARITY* remain (become) significant in the predicted direction. The coefficient on *FAMILIARITY* in the six-day window analysis and the coefficients on *DELAY* and $DELAY^2$ in the eleven-day window have the predicted sign but are just not significant at the ten percent significance level. Overall, the results of this robustness check indicate that the effects of publication delay and investors' familiarity with inspection reports are somewhat sensitive to the chosen length of the event window; however, the regression results robustly support the idea that report-characteristics are systematically associated with the magnitude of the market response to inspection report publications.[15]

[15] In the regression analysis that includes the client risk control variables, *ESTRET*, *NONEWS*, *DELAY*, $DELAY^2$, *RESTATEMENT*, and *GAAPDEFICIENCY* remain significantly associated with the magnitude of the market response in the predicted direction, irrespective of the length of the event window. The coefficient on *FAMILIARITY* becomes insignificant in the six-day window analysis; the coefficient on *LOSS* becomes insignificant in the six-day and eleven-day analyses. In contrast, the coefficient on *LEVERAGE* becomes significantly positive, as

The results of the analysis of changes in investors' reliance on quarterly earnings are sensitive to increases in the length of the event period. In particular, the change in investors' abnormal response to earnings announcements from the period before to the period after the inspection report publication date is no longer significantly associated with the signed market response to the inspection report if I measure the market response as the signed return during a six-day or eleven-day event period. This finding is, however, not unexpected as in broader event periods the signed return can be significantly affected by noise trading or information events that are unrelated to the inspection report publication. I therefore interpret this robustness check with caution and place more reliance on the results obtained when using a three-day event period.

2.6 Conclusion

This study provides evidence that investors respond to PCAOB inspection reports, indicating that these reports provide meaningful information about audit quality. Moreover, I find that the market response is systematically related to report-specific determinants of inspection report informativeness, also after controlling for client risk. In particular, the market response is significantly associated with the information surprise component, the publication delay, the presence of GAAP-related deficiencies or client restatements, and the timing of the inspection report. Furthermore, I find that the market response to first-round inspection reports is associated with changes in investors' reliance on quarterly earnings information.

The results of this study have important implications. The finding that investors respond to inspection reports indicates that the creation of the PCAOB inspection process provides certain informational benefits. That is, it shows that the inspection reports reveal useful information to investors and improve the transparency of audit quality levels provided by the various audit firms. The signal about audit quality that an informative report provides may help to restore investor confidence. In addition, the report's informativeness is

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predicted, in the eleven-day analysis. These results confirm that client risk affects the market response but does not drive the association between the market response and report-characteristics.

crucial in incentivizing client firms and their shareholders to act upon the outcome, thereby creating pressure on the audit firm to improve audit quality.

Finally, the findings can be interpreted as evidence that the audit is value relevant. I emphasize that the results do not imply that the inspection process is without flaws. There is likely still room to further improve the inspection process and to generate an even more informative inspection report. The nature of the data does not allow me to further investigate which components of the inspection report are particularly useful to investors. Future research may address this issue.

3

PCAOB INSPECTIONS AND AUDIT FEES

3.1 Introduction

Next to its effect on investors as addressed in chapter two, the purpose of the newly implemented PCAOB inspections is to improve audit quality (U.S. Congress 2002). To what extent this can be achieved depends on the degree to which the inspection process triggers changes in auditor behaviour. Related studies deal with changes in financial reporting quality (Carcello et al. 2008) or changes in mean fees at the audit firm level (Lennox 2011) following the inspection. To the best of my knowledge, this study is the first to examine the impact of inspections on client-level audit fees. It is important to incorporate client-specific characteristics in evaluating audit fee changes. Further, an analysis at the client-level allows for investigation of cross-sectional differences in fee adjustments across clients. The insights obtained help to evaluate the costs and benefits of the inspection process. They can be useful to regulators and oversight bodies in setting guidelines regarding the implementation and future development of auditor review systems in other countries.

The publicly disclosed PCAOB inspection report contains information about each audit firm. Discovered audit deficiencies can lead to a change in

the auditor's incentive structure for two reasons. First, an auditor's reputation can be harmed, and second, regulatory sanctions and penalties can follow. I argue that auditors update their assessment of PCAOB inspectors' views on the appropriateness of chosen audit effort and hence the likelihood of reputation damage and penalties as a result of the inspection. In response to these updated beliefs, auditors are likely to make adjustments in areas that were criticized by inspectors.

The straightforward response to prevent sanctions as result of discovered audit deficiencies is an increase in audit effort. Audit firms have certain flexibility in adjusting effort due to excess capacity, shifts of resources from non-public clients, hiring of new employees, and more work done by existing team members. Given the assumption that the market for audit services is competitive (Elliott 1998; Simunic 1980), changes in effort and thus cost are reflected in audit fees. Alternatively, the auditor may charge a fee premium to cover expected future losses. The increase has to be sufficiently large to cover the non-remote risk of sanctions by the PCAOB in case of non-compliance. However, it is unlikely that clients will accept a substantial increase in fees without additional work being conducted by the auditor. I therefore predict audit effort and fees to rise for clients of deficient firms if the pressure of the PCAOB is sufficiently large.

There exist cross-sectional differences in the extent of fee pressure influencing the auditor. The higher fee pressure the more auditors are tempted to provide low cost audits and cut back on audit effort (Coram et al. 2004; Imhoff 2003; Houston 1999). Fee pressure is likely to be higher for clients with low demand for audit quality as low demand for monitoring of the financial reporting process is associated with lower quality audit committees and less-developed auditor selection procedures (Engel et al. 2010; Jensen and Payne 2005). As costs are being prioritized to a much larger extent than quality, low demand for audit quality is negatively related to audit fees (Copley et al. 1994). Also, competition leads to higher fee pressure, provided that audit firms have difficulties differentiating themselves based on audit quality ex-ante (Fiolleau et al. 2009). In both cases, audit firms are more likely to cut back on audit procedures and hence, the likelihood of providing low audit effort increases. Accordingly, I expect the severity of deficiencies and hence the extent of effort adjustments to vary cross-sectionally depending on the degree of fee pressure.

To what extent deficiencies mentioned in the inspection report present a sufficient incentive for the auditor to make adjustments is uncertain for several reasons. First, there has been extensive criticism of the PCAOB inspectors' technical and in-depth expertise (Glover et al. 2009). As described in chapter two, it takes an extended period of time before the inspection results get published, the identity of the inspected clients remains unknown, and the high quality Big4 audit firms have repeatedly received deficient inspection reports in the US. Thus, even though reports are informative, it remains unclear to what extent the inspection result can cause severe damage to an audit firm's reputation. Also, it is uncertain to what extent the PCAOB will use its discretion in imposing sanctions on audit firms. Therefore, I address whether audit firms are sufficiently incentivized to change their behaviour by means of an empirical analysis.

I examine residual audit fees in a cross-section of 1,302 client-year observations of triennially inspected audit firms over the period 2003 through 2009. Using the term deficient for audit firms with one or more detected deficiencies and the term clean or non-deficient for audit firms without detected deficiencies, I find that the inspections lead to an increase in audit fees for clients of deficient audit firms while controlling for client characteristics and a trend in time. The finding is robust to alternative design specifications such as an alternative measure of abnormal fees based on a prediction interval instead of a point prediction of fees. The fee increase occurs specifically in those settings where high fee pressure might have compromised audit quality, as the change in abnormal fees is larger for auditors that face high competition prior to the inspection and for clients that display low demand for audit quality prior to the inspection. At the same time, deficient audit firms are associated with an increase in the number of professionals employed, which suggests that the observed fee adjustments are reflective of increased audit effort rather than an enlarged fee premium for future losses.

As a result, in spite of publicly voiced doubts regarding the usefulness of PCAOB inspections, there is evidence of changes in audit firm behaviour. As long as investors and inspectors apply similar standards of audit quality, the inspection process identifies cases of substandard effort and helps to improve audit quality. If, however, the additional work required by inspectors does not lead to a reduction in audit risk that is worth the increase in fee from the investors' point of view, the change in audit firm behaviour caused by the inspection process may not be in the best interest of investors.

The remainder of the chapter proceeds as follows. Section 3.2 describes prior literature on the effects of PCAOB inspections. Afterwards, testable hypotheses are developed. The research design is outlined in section 3.4, which is followed by a discussion of the results. Section 3.6 contains sensitivity checks and section 3.7 provides conclusions and limitations.

3.2 Prior literature

Prior research addresses the relationship between PCAOB inspections and audit quality in different ways. From a conceptual point of view, researchers and practitioners state arguments for and against the inspection process' capability to identify audit deficiencies and improve audit quality. The inspection process itself is described comprehensively in chapter one. Some expect to see quality improvements due to independent and objective inspection personnel with complete access to client documentation and more resources at their disposal than under the peer review system (Gunny and Zhang 2011; Carcello et al. 2008; Francis 2004). Others criticize the inspection process because of limited staff and expertise, inadequate transparency of procedures and inspection outcomes, and slow timing of feedback (Lennox 2011; Glover et al. 2009; Newman and Oliverio 2009; Hodowanitz and Solieri 2005; Palmrose 2005).

In addition to the conceptual discussion, a number of studies examine the association between inspection outcomes and indicators of audit quality empirically.[16] Clients of audit firms with deficiencies discovered during the inspection process display higher levels of abnormal accruals (Gunny and Zhang 2011; Van de Poel et al. 2009). Gunny et al. (2007) find that non-Big4 auditors with high abnormal audit fees and high total fees are more likely to have engagement-specific deficiencies. Furthermore, clients of auditors with deficiencies are not more likely to meet analyst forecasts and the available evidence is inconclusive on whether they are less likely to receive a going-concern opinion (Gramling et al. 2011; Gunny and Zhang 2011). More insights regarding the effect of the inspection process, however, can be obtained from examining reactions to the inspection rather than client characteristics of clean and deficient audit firms.

[16] While the PCAOB specifically considers engagement-specific quality, the selected engagements might still be representative of all of the audit firm's engagements and deficiencies in the audit procedures might recur for other clients. Also, deficiencies in the audit firm's quality control policies and procedures are likely to affect all clients.

Preliminary assessments of the inspection process' impact are derived from audit firm reactions to inspection activity. Negative inspection outcomes for small audit firms have resulted in deregistration with the PCAOB (Daugherty et al. 2009; Read et al. 2004). And audit firms without public clients have voluntarily registered with the PCAOB in order to signal audit quality (Read et al. 2004). This supports the notion that PCAOB oversight and inspections are effective. On the other hand, surveyed small audit firms do not see an improvement in audit quality or public confidence in the audit profession resulting from the inspection process (Daugherty and Tervo 2010a). Audit firms' written replies to inspection reports provide some indication that certain firms react to deficient audit reports by improving their audit processes. However, they also indicate that either some of the PCAOB criticism is not valid or not all audit firms are willing to change their audit procedures (Jessup and Young 2009). Results based on audit firms' public responses should be evaluated carefully, however, as they might be influenced by response-bias and the audit firms' underlying incentives. For example, audit firms might have the desire to diminish the reputational damage resulting from a deficient inspection by downplaying the deficiency or criticizing inspectors.

For that reason, a number of studies have addressed audit firm reactions based on presumably more objective measures of audit quality. Carcello (2008) finds that absolute abnormal accruals decrease following inspections irrespective of the inspection result. As the observed decrease in accruals is unrelated to the inspection result, however, it does not appear to be clearly linked to the inspections. Also, measures of financial reporting quality are strongly influenced by incentives of client management. An examination of audit fees can provide a test of audit firm reactions to the inspections that is less distorted by client reporting incentives. According to Lennox (2011), mean fees of small audit firms with identified engagement-specific deficiencies stay lower compared to non-deficient firms and do not increase following the inspection when controlling for an upward trend in time.

This chapter's analysis differs from Lennox (2011) in three ways. First, it is conducted at the client level while controlling for a more comprehensive set of client characteristics that might drive variations in fees. Second, I employ a different measure of deficient audit firms that includes quality control defects which are more likely to permeate throughout the whole audit firm and apply to all of an audit firm's clients rather than just a subset of engagements. Third,

an analysis at the client level allows to investigate cross-sectional differences in fee adjustments across clients in association with the inspection outcome.

3.3 Theoretical background and hypothesis development

According to inspectors' judgments, audit firms with a deficient inspection report have conducted audits with effort below the PCAOB's quality standards (hereafter referred to as insufficient effort). According to the PCAOB (2011), deficient audit firms did not "obtain sufficient competent evidential matter to support its audit opinion". As shown by Causholli et al. (2010), the provision of insufficient effort can occur when clients are unable to observe the exact quality of their audit and when associated expected losses are sufficiently small. Audit fees are observable and provide some indication of the effort conducted by the auditor. However, due to the credence good attributes of an audit, the level of effort needed to achieve a minimum standard of audit quality for the particular client remains fairly unknown to external parties and the client. For that reason, independent inspections are designed to check whether the amount of effort provided is in accordance with quality standards.

The auditor determines the level of effort supplied and fees charged at each audit based on risk factors and reputation concerns (Schelleman and Knechel 2010; Stefaniak and Houston 2009; Hay et al. 2006; Nelson 2006; Lyon and Maher 2005; Larcker and Richardson 2004; Johnstone and Bedard 2003; Seetharaman et al. 2002; Reynolds and Francis 2001). The detection of deficiencies by the PCAOB inspectors may cause a change in the auditor's assessment of expected losses from insufficient effort and may therefore lead to a change in auditor behaviour.

Expected losses arise from potential loss of clients and regulatory penalties. I show in chapter two that the inspection reports are informative to investors and that they are associated with changes in perceived uncertainty about financial reporting quality. Moreover, client firms with effective audit committees or with high potential agency conflicts are more likely to switch to an auditor without GAAP-related deficiencies (Abbott et al. 2008). On the other hand, inspection reports are not intended to categorize audit firms into two groups of high and low quality firms due to the non-random selection of engagements and topics for review. Also, Lennox and Pittman (2010) find no evidence of a change in audit firms' market shares as a result of deficient

inspection results. Thus, the threat from client switching behaviour in response to the deficiencies mentioned in the inspection report might be limited.

Even though clients might not switch after a deficient report was published, the PCAOB is authorized to conduct disciplinary proceedings, impose sanctions, and communicate inspection results to regulatory and law enforcement agencies (Gunny and Zhang 2011; Wegman 2006; Farrell and Shadab 2005). In fact, the PCAOB has demonstrated its preparedness to impose sanctions for violations of standards in connection with inspections in several cases by revoking the registration of audit firms and censuring, suspending, or barring auditors (PCAOB 2011; Gilbertson and Herron 2009). Moreover, audit firms also have an incentive to prevent publication of detected quality control deficiencies. These are only published when not addressed properly by the firm within a year and might be associated with harmful client losses given that these deficiencies apply to the audit firm as opposed to selected engagements. Overall, detected deficiencies raise the probability that sanctions and penalties are imposed, thus causing a likely change in the expected losses faced by the auditor.[17]

In response to this change, I expect auditors to address the issues criticized by inspectors to prevent sanctions and penalties and to rebuild their reputation. While the auditor may charge a fee premium to cover expected future losses which will also affect audit fees, this is unlikely to satisfy inspectors. The risk of regulatory penalties as a result of PCAOB inspections is less remote than the risk of litigation, given that a problem has already been detected. Also, clients are unlikely to accept fee changes without adjustments to audit work. For that reason, an increase in effort appears to be the straightforward way to address the deficiency.

The audit production process comprises technology and effort as fixed and variable factors of production, respectively (Hope et al. 2011). Even though advances in audit technology have rendered auditing less labour intensive (Elliott 1998), human resource compensation still is the major part of audit fees (Texas Society of Certified Public Accountants 2000). Audit firms

[17] While the threat of an inspection provides an ex-ante incentive for auditors to change their behaviour, there was a high level of uncertainty surrounding the type of clients to be inspected, the kind of issues to be addressed, and the strictness of inspectors. Also, while firms are informed about inspections a number of months in advance, they only learn during the inspection about certain engagements selected for inspection. Hence, anticipation of issues likely to be criticized is difficult prior to inspection, and especially prior to the first inspection round.

have flexibility in adjusting human resource inputs as a result of excess capacity, shifts of resources from non-public clients, and new employee hires. Firms can thus alter audit effort by assigning more or better experienced personnel to a client's team, or let the existing team members conduct more work. In any case, fees will increase as extra hours or more expensive hours are billed to the client.[18]

Using fees as a proxy for effort is based on the assumption that the market for audit services is competitive (Elliott 1998; Craswell et al. 1995; Simunic 1980). In fact, prior studies confirm that especially the market for smaller audit firms is highly fragmented and competitive (Sirois and Simunic 2010; GAO 2008). Competition implies that fee changes are mainly caused by changes in cost rather than profit margin. Prior evidence corroborates that fees are reflective of audit effort (Schelleman and Knechel 2010; Bell et al. 2001; Menon and Williams 2001; Simunic and Stein 1996; Davis and Ricchiute 1993).

Even though auditors with deficient inspection reports might be associated with low quality, they can raise fees in face of competition for a number of reasons. First, the inspection gives audit firms a convincing argument for fee increases when having the annual meeting with the audit committee to determine current year's audit fees. Second, clients with deficient audits likely accept fee rises since they are unlikely to get a lower fee at another audit firm. A client with a once deemed deficient audit is likely to remain within the inspector's focus. The potential new audit firm, being informed by the old auditor about the fact that the audit was deemed deficient by inspectors, is thus unlikely to risk the provision of a deficient audit in the next inspection round. Furthermore, clients' switching cost deter auditor changes as long as the benefit of switching does not exceed its cost.

Thus, I argue that firms with detected audit deficiencies will respond by increasing fees such that post-inspection fees are higher than pre-inspection fees.[19] Hence, I state the main hypothesis as follows:

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[18] Efficiency improvements would work against finding a change in abnormal audit fees.

[19] As part of the inspection process, all inspected audit firms may get comments from inspectors about audit procedures that need improvement but only the serious deficiencies are publicly disclosed in the inspection report. The inspectors are likely to specifically investigate areas of prior deficiencies in the following inspection round. Hence, both clean and deficient auditors are likely to address inspectors' comments and increase effort as a result of the inspection process. As the audit firms with deficient inspection results need to address more severe deficiencies and experience higher pressure due to the publicity of the deficiencies, they are likely to make larger adjustments to effort.

Hypothesis 1: Clients of deficient audit firms are associated with higher increases in audit fees from pre- to post-inspection than clients of non-deficient audit firms.

While inspectors' quality standards for raising deficiencies are unknown, deficiencies related to low audit effort rather than differential interpretation of auditing standards are likely to occur predominantly under certain conditions.[20] Cross-sectional differences in fee pressure are likely associated with the severity of deficiencies. All other things equal, the lower the fees the lower the amount of effort compensated. With higher fee pressure, there is a smaller time budget and higher reluctance to request for additional audit hours, which forces the auditor to cut back on audit procedures to stay within the planned audit cost. High fee pressure can lead to reductions in quality of audit staff, fewer budgeted hours, less substantive tests of details, more reliance on internal audit departments of questionable quality, acceptance of doubtful evidence, inadequate samples, and thus more lenient reporting (Engel et al. 2010; Lennox and Pittman 2010; Jensen and Payne 2005; Carcello et al. 2002; Copley et al. 1994). Hence, the likelihood of deficient audits increases in settings of high fee pressure. I identify two drivers of fee pressure based on supply and demand characteristics.

Higher levels of competition are associated with lower fees (Maher et al. 1992; Sanders et al. 1995) and can even lead to reductions in audit quality under certain conditions (Chaney et al. 2003). As explained by Fiolleau et al. (2009), it is hard for the audit firm to differentiate itself from its competitors ex-ante and thus the firm with the lowest price often wins the job even though the client uses quality as selection criteria. Hence, fee pressure and thus the extent to which effort lays below inspector's standards likely increases with the level of competition faced by the auditor. As a result, the extent of effort and fee adjustments required to address inspectors' criticisms is likely to be larger for audit firms that face high competition prior to the inspection. As PCAOB inspections change the audit environment for all audit firms, also competitor audit firms' incentives to provide a low audit fee are reduced and thus fee raises are possible in settings of high competition. Hence, I argue that deficient firms confronted with high competition prior to the inspection are associated with higher increases in audit fees following the inspection, leading to the following hypothesis:

[20] I expect substandard effort due to human error to be distributed randomly across clients.

Hypothesis 2a: The difference between deficient and non-deficient audit firms' increase in client audit fees rises with the degree of competition faced prior to the inspection.

A deficient inspection result does not, by definition, indicate substandard audit performance on all of an audit firm's clients. Next to supply effects, also demand effects can cause high fee pressure. The auditor is needed to provide an independent assessment of the accuracy of accounting information. The larger the information asymmetry between the firm and outside providers of financing, the higher the value attached to the external auditor. Prior studies have identified agency cost and associated signalling needs as drivers of demand for high quality auditors (Hope et al. 2011; Knechel et al. 2008; DeFond 1992; Francis and Wilson 1988; Watts and Zimmerman 1983). Thus, clients with low demand for audit quality are required to be audited by law but obtain few benefits from the audit.

Low demand for monitoring of the financial reporting process is associated with lower compensation of audit committee members (Engel et al. 2010) and less developed auditor selection procedures (Jensen and Payne 2005). Lower quality audit committees might be less committed to vigilant oversight and thus less likely to signal high expectations regarding the auditor's provision of quality, resulting in less effort on the auditor's side (Carcello et al. 2002). A low quality auditor selection process results in cost being prioritized to a much larger extent than quality. Hence, low demand for audit quality is negatively related to audit fees (Copley et al. 1994). Thus, fee pressure and consequently the extent to which procedures lie below inspector's quality standards is likely to be higher for clients with low demand for audit quality. As a result, I predict the difference in the increases in client fees for clean versus deficient audit firms to be more pronounced for low-demand clients, leading to the following hypothesis:

Hypothesis 2b: The difference between deficient and non-deficient audit firms' increase in client audit fees declines with the client's pre-inspection demand for audit quality.

3.4 Research design

3.4.1 Sample selection

The sample selection is based on the inspection reports for US audit firms available on the PCAOB website by April 2010. I match the inspected audit firms with their respective audit clients in Audit-Analytics and add financial information from Compustat for the years 2000 through 2009. The sample thus consists of the observations contained in the intersection of these three data sources.[21] All observations with zero audit fees, with missing data, or categorized within the Financials (SIC codes 6000–6700) or Utilities (SIC codes 4000–4900) industries are removed. Further, I exclude annually inspected audit firms as they represent a different segment of the audit market without variation in inspection results and with a deviating inspection cycle. To ensure proper representation of client firms in all time periods, I keep only auditor-client combinations with at least one financial year-end following the first inspection, at least one financial year-end between 2003 and the start of the first inspection, and at least one financial year-end in the period between 2000 and 2002. As the audit firms are likely to make adjustments in their procedures and effort allocations at some point between the first and the second inspection, I include all client financial year-ends following the first inspection and prior to the start of the second inspection. This yields a final sample of 1,777 client-year observations for 288 clients and 139 audit firms associated with inspections conducted between May 2004 and May 2007. Out of these, 475 observations are for the period 2000 through 2002 and 1,302 observations for the period 2003 through 2009.

3.4.2 Empirical model

To examine changes in fees in response to PCAOB inspections, it is important to control for changes in underlying client characteristics. Accordingly, I measure abnormal audit fees as the deviation from 'normal' audit fees predicted based on client characteristics. As predicted fees need to be based on

[21] As Audit-Analytics neither contains all inspected audit firms nor the full set of an audit firm's clients, it is not possible to match the inspected audit firms with all of their clients. Furthermore, information is incomplete for certain client observations due to missing data or missing identifiers for matching the different databases. Because of these reasons, a number of inspection reports are excluded from the analysis.

the audit pricing function absent of PCAOB effects,[22] I estimate the following pooled audit fee regression model for the years 2000 through 2002 using ordinary least squares regression:

$$\begin{aligned} LOGAUDITFEE &= \alpha_0 + \alpha_1 LOGASSETS + \alpha_2 LEVERAGE + \alpha_3 INVREC \\ &+ \alpha_4 ROA + \alpha_5 LOSS + \alpha_6 SEGMENTS + \alpha_7 OPINION \\ &+ \alpha_8 FOREIGN + \alpha_9 BUSY + \alpha_{10} SHORTTENURE + \varepsilon \end{aligned} \quad (3.1)$$

In this model, LOGAUDITFEE is measured as the natural logarithm of audit fees as reported in Audit Analytics. The client-specific explanatory variables are selected based on the meta analysis of audit fee studies by Hay et al. (2006) and are measured using data obtained from Compustat. As measure of client size, I include LOGASSETS, the natural logarithm of total assets. To account for client risk, I include LEVERAGE, the sum of the company's current and long term debt divided by total assets and INVREC, the sum of inventories and receivables scaled by total assets. Indicators of client performance are ROA, measured as net income divided by total assets, and LOSS, a dummy variable for a loss in the current year. Client complexity is measured by SEGMENTS, the number of business segments reported. Additional dummy variables indicative of higher levels of audit effort needed on specific engagements are OPINION, FOREIGN, and BUSY. OPINION equals one when a going-concern opinion is issued as reported in the Audit Analytics database. FOREIGN equals one whenever foreign income taxes are paid. And BUSY is set to one for audits conducted during the busy season with financial year-ends in December. Finally, SHORTTENURE is one in the first three years of the auditor-client relationship to account for possible low-balling.

I predict audit fees for the years 2003 until 2009 using the coefficients estimated in regression (3.1). This approach assumes that any changes in the coefficients between the estimation and the prediction periods due to factors other than the PCAOB inspections, if existing, are time wise not correlated

[22] Using the period during which inspections were conducted to predict fee residuals would result in an inappropriate benchmark and downward bias in the results (Freckleton 2002). However, to address potential concerns regarding the influence of other SOX-related requirements on fees, I conduct sensitivity tests to examine whether the results obtain in spite of the potential downward bias using a fee prediction model based on the years 2003 through 2009.

with the individual inspections at the audit firms.[23] I obtain the predicted value of LOGAUDITFEE and reverse the logarithm to yield the predicted value of AUDITFEE. I then subtract the predicted value from the actual value of AUDITFEE to get abnormal audit fees (ABNFEE), a measure of the audit fee component unexplained by client-specific characteristics. This fee component contains possible audit firm-specific quality effects such as fee premia for industry specialists (Francis et al. 2005; Casterella et al. 2004; Craswell et al. 1995) and client-specific effects not controlled for in the model. As long as these effects do not change systematically with the inspection outcome, the use of ABNFEE is appropriate to address the question at hand.

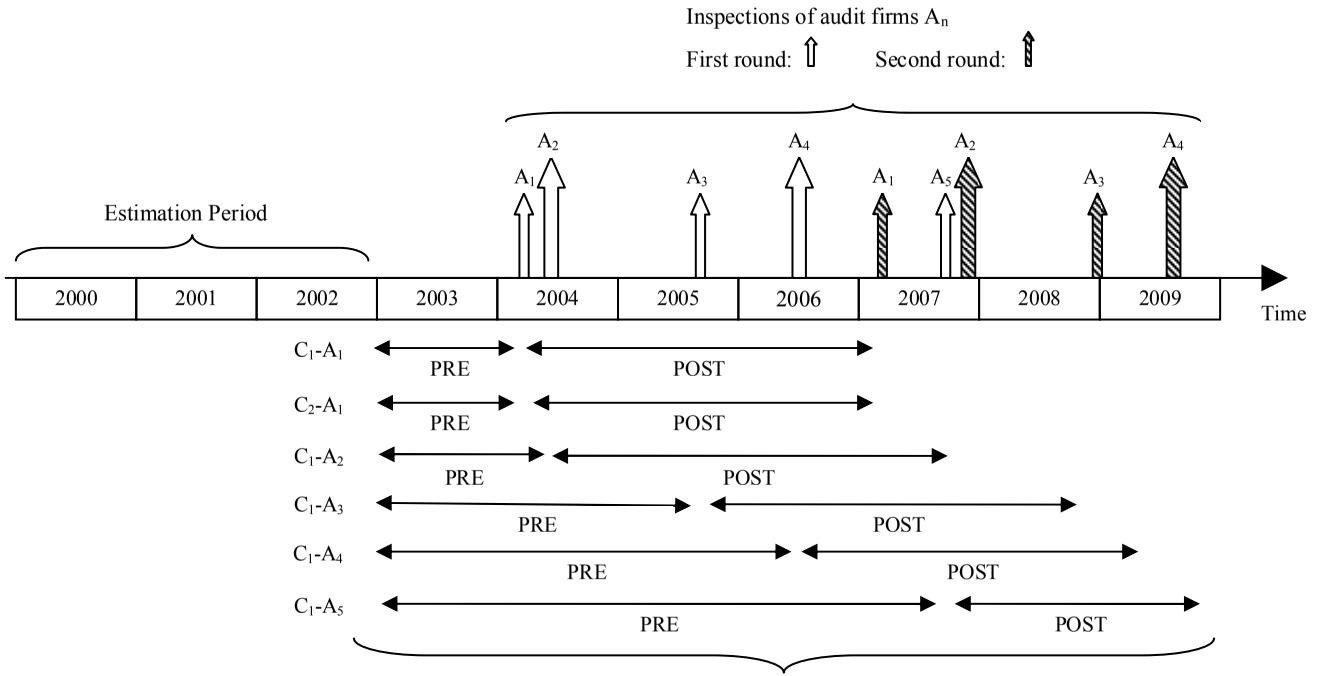
The change in abnormal fees is calculated as the difference between ABNFEE for all available pairs of pre- and post-inspection financial year-ends for each client. Financial year-ends after the first day of the inspection period are categorized as post-inspection.[24] This design uses the client firm as its own control. The change in abnormal fees is scaled by the number of years between the two observations to obtain an equivalent of a yearly change and is divided by the pre-inspection value of AUDITFEE to achieve a measure of the relative change in abnormal fees (ΔABNFEE).

In my empirical models I take advantage of the specific timing of the inspections at different dates for different clients over several years. This is illustrated in Figure 3.1. For all clients of audit firm A_1, for example, the pre-inspection period consists of financial year-ends ending before the start of the first inspection in year 2004, while the post-inspection period contains financial year-ends after 2004 and before the second inspection at the beginning of 2007. For all clients of audit firm A_3, on the other hand, the pre-inspection period contains all financial year-ends before the start of the first inspection in year 2005, while the post-inspection period includes all financial year-ends after 2005 and before the second inspection at the end of 2008. As the inspections are spread over several years, there is a low chance of an alternative event being distributed similarly over time.

[23] Even if changes on the respective fee drivers occurred simultaneously with the individual inspections at the different audit firms, this would only influence the results in the unlikely case that deficient audit firms' clients scored consistently higher than clean audit firms' clients on the fee drivers.

[24] Audit firms indicate in their response letters to the draft inspection reports, that they have already implemented certain changes to address inspectors' criticisms. Hence, it is likely that some adjustments to effort and fees are made already after the inspection and not only after the date on which the inspection report is made public.

FIGURE 3.1 Timeline depiction of the estimation period and the measurement periods around inspections



Any alternative event, for example the implementation of a regulatory change, would have to be spread over time in a similar fashion as the inspections and would have to impact clients of deficient firms to a stronger degree than clients of non-deficient firms to drive the observed fee effect.

To test the first hypothesis, I regress the change in abnormal fees (ΔABNFEE) on an indicator for deficient audit firms (DEF), year dummies, and control variables. I control for higher fees commonly associated with ineffective internal controls (Elder et al. 2009) and compliance with SOX section 404b (cf. Raghunandan and Rama 2006).[25] TO_ICINEF identifies clients that have effective internal controls in the pre-inspection year and have ineffective internal controls in the post-inspection year. FROM_ICINEF identifies clients that change from ineffective to effective internal controls. Similarly, TO_404b is a dummy for clients that do not fulfil the size criterion for accelerated-filers ($75million market capitalization) in the pre-inspection year but have to comply with 404b in the post-inspection year.[26] FROM_404b identifies clients that fulfil the size criterion in the pre-inspection year but do not in the post-inspection year. Hence, I estimate the following regression model:

$$\begin{aligned}\Delta ABNFEE = {} & \alpha_0 + \alpha_1 DEF \\ & + \alpha_2 TO\_ICINEF + \alpha_3 FROM\_ICINEF \\ & + \alpha_4 TO\_404b + \alpha_5 FROM\_404b + \alpha_{6j} YEAR_j + \varepsilon\end{aligned} \tag{3.2}$$

I predict the coefficient for DEF (α_1) to be significantly positive if inspections cause deficient audit firms to raise fees more than non-deficient audit firms.

For testing hypothesis 2a, I measure the degree of competition faced by the audit firm prior to the inspection. Following Kallapur et al. (2010), I calculate local audit market concentration as the Herfindahl index of small

[25] Section 404b requires management's evaluation of the effectiveness of internal controls to be audited by the external auditor. It is not possible to control for these aspects in the fee prediction model as no data on internal controls was available prior to SOX in 2002.

[26] Accelerated filers need to comply with section 404b for all year-ends on or after 15th November 2004. Non-accelerated filers do not need to comply with section 404b. A company is an accelerated filer if it has aggregate market value of voting and nonvoting common equity held by non-affiliates of $75 million or more as of the last business day of the issuer's most recently completed second fiscal quarter. A company exits the accelerated filer status if it has aggregate market value of voting and nonvoting common equity held by non-affiliates of $50 million or less as of the last business day of the issuer's most recently completed second fiscal quarter. Due to the unavailability of free-float data for the sample, I approximate the size criteria by using total market capitalization at financial year-end.

audit firms at the city (Metropolitan statistical area) level for each year. I follow the U.S. Census Bureau's definition of Metropolitan statistical areas (MSAs) as defined in OMB Bulletin No. 10–02 (2009). As small audit firms cannot effectively compete with large audit firms for large clients, I define the audit market based on all clients smaller or equal in size (total assets) to the largest client of a small audit firm (Kallapur et al. 2010). The Herfindahl index is defined as follows:

$$H = \sum_{i=1}^{N} \left[s_i / S \right]^2 \tag{3.3}$$

where N is the total number of small audit firms in the MSA, s_i is the size of the audit firm i as measured by number of clients, and S is the total size of the audit market in the MSA. I report the sensitivity of the results to alternative specifications of the Herfindahl index based on aggregate size of client firm's assets and fees and to an alternative definition of the audit market consisting of clients of small audit firms, only. COMPETITION is measured as the median-scaled Herfindahl index multiplied by minus one to allow for easier interpretation. Higher values for COMPETITION indicate lower levels of concentration and thus higher levels of competition in the local market.

I test hypothesis 2a by regressing the change in abnormal fees on DEF, COMPETITION, and the interaction term DEFxCOMPETITION. As in model (3.2), I control for a time trend in audit fees and changes in fees related to ineffective internal controls and compliance with section 404b as shown below:

$$\begin{aligned} \Delta ABNFEE = {} & \alpha_0 + \alpha_1 DEF + \alpha_2 COMPETITION \\ & + \alpha_3 DEFxCOMPETITION \\ & + \alpha_4 TO\_ICINEF + \alpha_5 FROM\_ICINEF \\ & + \alpha_6 TO\_404b + \alpha_7 FROM\_404b + \alpha_{8j} YEAR_j + \varepsilon \end{aligned} \tag{3.4}$$

I expect a significantly positive value for α_3 if the change in abnormal fees is larger for deficient firms that have faced intense competition in the pre-inspection period.

The test of hypothesis 2b is based on a measure of demand for audit quality. The demand for audit quality is driven by the desire to attain a lower cost of capital as the auditor acts as monitoring mechanism and improves the quality of disclosed financial information and reduces agency costs (Hay and

Davis 2004). Improved financial statement information reduces the risk to investors (Botosan 1997). The audit can also serve as organizational control mechanism in companies with increasing levels of hierarchy (Abdel-Khalik 1993). Following prior literature (Knechel et al. 2008; Abbott et al. 2008; Hay and Davis 2004; DeFond 1992; Firth and Smith 1992; Healy 1985), I identify clients with low demand for audit quality based on a number of criteria. Company size (total assets) is associated with unobservability of management's action and loss of organizational control. Hence, the larger the firm, the more important gets the role of the auditor. Higher levels of leverage are associated with agency conflicts between creditors and shareholders because of the potential transfer of wealth and with creditors' demand for reliable financial statement information for enforcement of debt covenants. Higher percentages of short-term accruals (inventory, receivables, and payables as percentage of total assets) indicate higher vulnerability to manipulation and transactional complexity, both increasing the need for high reliability of financial reports. Growth in sales is associated with increased complexity as well as potential loss of organizational control.

I create a dummy variable that identifies low demand clients (LOWDEM). It is one whenever a client scores below the median on at least two out of the following four characteristics prior to the inspection: (1) leverage, (2) total assets, (3) inventory, receivables, and payables as percentage of assets, and (4) yearly percentage growth in sales. The test of hypothesis 2b is obtained by regressing the change in abnormal fees on DEF, the indicator for clients of audit firms with deficiencies, LOWDEM, the indicator for low-demand clients, and on the interaction of the two (DEFxLOWDEM). Again, I control for a time trend in audit fees as well as fee changes related to ineffective internal controls and compliance with section 404b:

$$\begin{aligned}\Delta ABNFEE = {} & \alpha_0 + \alpha_1 DEF + \alpha_2 LOWDEM + \alpha_3 DEFxLOWDEM \\ & + \alpha_4 TO\_ICINEF + \alpha_5 FROM\_ICINEF \\ & + \alpha_6 TO\_404b + \alpha_7 FROM\_404b + \alpha_{8j} YEAR_j + \varepsilon\end{aligned} \tag{3.5}$$

I expect a significantly positive value for α_3 if the change in abnormal fees is larger for clients of deficient firms that display low demand for audit quality in the pre-inspection period. I examine the sensitivity of the results to a more refined measure of LOWDEM based on an additional fifth category, the percentage of shares held by ordinary investors (free float). Higher proportions

of free float indicate lower holdings of company officers, directors and controlling-interest investors as well as related institutional investors controlled by directors or executives. As ordinary shareholders do not have access to inside information and require reliable financial statement information, a higher proportion of free float is associated with higher demand for audit quality. As the use of free float reduces the number of observations considerably due to data unavailability, however, I refrain from using it in the main analysis.

3.5 Results

3.5.1 Descriptives and audit fee model

Panel A of Table 3.1 provides an overview of the sample characteristics for the estimation period 2000 through 2002. Audit fees paid by the clients lie between $19,307 and $330,000 with a mean of $72,430. The average client in the period has total assets of slightly less than $21.2 million with inventory and receivables representing 29 percent of that amount. Average leverage is at 51 percent and average ROA is -0.91.[27] The average client reports one business segment. Overall, 64 percent of the observations are loss-making, 32 percent receive going-concern opinions, and 7 percent report foreign income. Moreover, 64 percent of the audits are conducted during busy season in December and 62 percent of the engagements have had the same auditor for three years or less. Also, 85 percent of the audits are conducted by audit firms with deficiencies.

Panel B of Table 3.1 shows the estimation result of the audit fee model for the years 2000 through 2002.[28] The model based on 475 observations explains 45 percent of the variation in audit fees. I focus the discussion of results on the significant coefficients, all of which are in the direction commonly found in prior literature (Hay et al. 2006). LOGASSETS has a significantly positive coefficient of 0.333 ($p<0.01$) indicating that larger clients pay higher fees. ROA attains a significantly negative coefficient of -0.116 ($p<0.01$), which shows that clients with lower profitability are associated with

[27] The high negative value for ROA is likely to be partly driven by the financial crisis. Gunny et al. (2007) find a mean negative ROA and a high fraction of loss firms in a comparable sample for the period 2005–2007.

[28] When adding DEF as additional indicator variable, it remains insignificant and the main results are unchanged. Hence, deficient firms do not charge significantly different fees in the estimation period when controlling for client characteristics.

higher audit fees. SEGMENTS has a significantly positive coefficient of 0.094 ($p<0.01$) as more complex clients pay higher audit fees. Moreover, the significantly positive coefficients on FOREIGN (0.192, $p<0.05$) and BUSY (0.103, $p<0.05$) indicate that higher audit fees are charged to clients with operations in foreign countries and with audits conducted during busy season.

TABLE 3.1 Audit fee prediction model

Panel A: Descriptive statistics for the estimation period 2000–2002

	N	*Mean*	*StdDev*	*Minimum*	*Median*	*Maximum*
AUDITFEE	475	72,430	57,869	19,307	55,283	330,000
ASSETS	475	21,161,619	36,203,726	1,000	8,533,000	251,059,000
LEVERAGE	475	0.513	0.853	0.000	0.232	3.650
INVREC	475	0.293	0.243	0.000	0.270	0.745
ROA	475	-0.906	1.856	-7.361	-0.107	0.218
LOSS	475	0.636	0.482	0.000	1.000	1.000
SEGMENTS	475	0.857	1.040	0.000	1.000	6.000
OPINION	475	0.318	0.466	0.000	0.000	1.000
FOREIGN	475	0.074	0.262	0.000	0.000	1.000
BUSY	475	0.634	0.482	0.000	1.000	1.000
SHORTTENURE	475	0.617	0.487	0.000	1.000	1.000
DEF	475	0.853	0.355	0.000	1.000	1.000

Panel B: Pooled regression model of audit fees in estimation period 2000–2002

Dependent variable: LOGAUDITFEE	*Coefficient*	*T-statistic*
Intercept	5.342	(15.33)***
LOGASSETS	0.333	(16.10)***
LEVERAGE	-0.019	(-0.54)
INVREC	0.057	(0.55)
ROA	-0.116	(-6.01)***
LOSS	0.043	(0.75)
SEGMENTS	0.094	(4.00)***
OPINION	0.094	(1.48)
FOREIGN	0.192	(2.07)**
BUSY	0.103	(2.07)**
SHORTTENURE	0.071	(1.42)
Adjusted R-squared	0.445	
Number of observations	475	

(This table is continued on the next page)

TABLE 3.1 (Continued)

Notes: Panel A shows descriptive statistics for all observations in the estimation period 2000 through 2002. All continuous variables have been winsorized at the 5th and 95th percentile. Variables are defined as follows: AUDITFEE is the amount of audit fees paid by the client for the audit in the particular financial year. ASSETS are total assets of the client firm. LEVERAGE is measured as the sum of current and long-term debt divided by total assets and INVREC is the sum of inventory and receivables of the client divided by total assets. ROA is net income divided by total assets. The indicator variable LOSS takes a value of one when net income is below zero. SEGMENTS reports the number of business segments reported by the client. OPINION indicates whether a going concern opinion was issued and BUSY indicates whether the financial year-end lies in December. FOREIGN has a value of one when the client reports foreign income. SHORTTENURE equals one for engagements with tenure of three or less years. And DEF indicates whether the client was audited by an audit firm with a deficient inspection result. **Panel B** shows the result of a pooled OLS regression analysis of the natural logarithm of audit fees on common fee determinants. The fee determinants are defined as described in Panel A. LOGAUDITFEE is the natural logarithm of audit fees and LOGASSETS is measured as the natural logarithm of total assets. This regression includes observations for 288 audit clients.
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

The sample for the period 2003 through 2009 contains 139 audit firms. Out of those, 109 auditors have deficiencies while 30 auditors are without detected deficiencies. The number of clients per audit firm varies between one and seventeen clients with an average of two clients. Table 3.2 lists descriptive statistics. Mean audit fees of $104,065 are higher compared to the estimation period. The average client is larger, with mean total assets of $27.5 million, slightly more profitable with ROA of -0.85 and reports more business segments than in the estimation period. 7% percent of the engagements have had the same auditor for three years or less.[29] The average client has sales growth of 23 percent, has short term accruals that amount to 50 percent of total assets, and has 74 percent of shares held by ordinary investors. Panel B compares clients of deficient and clean audit firms. Deficient audit firms have more clients and clients of deficient audit firms pay significantly higher fees, have more assets and report more segments.

Untabulated results reveal that prior to the inspection deficient firms' clients with low demand for audit quality have lower audit fees than clients with high demand for audit quality, while clean firms' high- and low-demand clients do not have significantly different fees. This provides an initial indication that deficient audit firms where inclined to provide low effort when facing high fee pressure of low demand clients prior to the inspection.

[29] The low value of SHORTTENURE is driven by the sample selection procedure that requires clients to have the same auditor already during the estimation period.

TABLE 3.2 Descriptive statistics

Panel A: Descriptive statistics for all client observations in the sample period 2003–2009

	N	*Mean*	*StdDev*	*Minimum*	*Median*	*Maximum*
AUDITFEE	1302	104,065	84,019	19,307	74,850	330,000
ASSETS	1302	27,450,720	52,268,535	2,000	9,239,500	706,365,000
LEVERAGE	1302	0.513	0.920	0.000	0.160	3.650
INVREC	1302	0.274	0.238	0.000	0.212	0.745
ROA	1302	-0.847	1.846	-7.361	-0.111	0.218
LOSS	1302	0.621	0.485	0.000	1.000	1.000
SEGMENTS	1302	1.575	1.232	0.000	1.000	9.000
OPINION	1302	0.310	0.463	0.000	0.000	1.000
FOREIGN	1302	0.068	0.251	0.000	0.000	1.000
BUSY	1302	0.650	0.477	0.000	1.000	1.000
SHORTTENURE	1302	0.067	0.250	0.000	0.000	1.000
ICINEF	1302	0.017	0.129	0.000	0.000	1.000
404b	1302	0.154	0.361	0.000	0.000	1.000
DEF	1302	0.846	0.361	0.000	1.000	1.000
SHORTTERMACC	1302	0.500	0.429	0.033	0.389	1.645
SALESGROWTH	1150	0.230	0.681	-0.768	0.100	2.292
FREEFLOAT	950	73.476	23.411	6.000	78.000	100.000

Panel B: Variable means by inspection result for the sample period 2003–2009

	CLEAN		*DEFICIENT*		*Difference*	*T-statistic*
	N	*Mean*	*N*	*Mean*	*in means*	
AUDITFEE	201	83,611	1101	107,799	24,188	(4.60)***
ASSETS	201	14,956,881	1101	29,731,612	14,774,732	(6.24)***
LEVERAGE	201	0.614	1101	0.494	-0.120	(-1.58)
INVREC	201	0.297	1101	0.270	-0.027	(-1.32)
ROA	201	-0.957	1101	-0.827	0.130	(0.92)
LOSS	201	0.632	1101	0.619	-0.013	(-0.33)
SEGMENTS	201	1.428	1101	1.602	0.174	(1.98)*
OPINION	201	0.338	1101	0.305	-0.033	(-0.93)
FOREIGN	201	0.045	1101	0.072	0.027	(1.63)
BUSY	201	0.672	1101	0.646	-0.026	(-0.71)
SHORTTENURE	201	0.070	1101	0.066	-0.004	(-0.17)
ICINEF	201	0.015	1101	0.017	0.002	(0.24)
404b	201	0.129	1101	0.159	0.030	(1.07)
SHORTTERMACC	201	0.540	1101	0.493	-0.047	(-1.34)
SALESGROWTH	158	0.163	992	0.241	0.078	(1.52)
FREEFLOAT	143	74.853	807	73.232	-1.621	(-0.76)

Notes: ICINEF and 404b identify observations having ineffective internal controls and fulfilling the size criteria to comply with SOX section 404b, respectively. SHORTTERMACC is the percentage of short term accruals measured as inventories, receivables, and payables scaled by total assets. SALESGROWTH is the yearly percentage growth in sales. FREEFLOAT equals the percentage of total shares in issue available to ordinary investors. The remaining variables are defined in Table 3.1. Continuous variables have been winsorized at the 5th and 95th percentile. *, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

Table 3.3 provides an overview of abnormal audit fees (ABNFEE) for the years 2003 through 2009.[30] The table shows mean abnormal fees for clean and deficient audit firms pre- and post-inspection. Mean abnormal fees of clean and deficient audit firms' clients do not differ significantly pre-inspection. Abnormal fees of both clean and deficient audit firms' clients increase from pre- to post- inspection but deficient audit firms' fees increase to a stronger degree. Clients of deficient firms have significantly higher abnormal fees compared to clients of clean audit firms in the post-inspection period. This is consistent with the argument that audit firms deemed deficient by inspectors take action following the inspection.

TABLE 3.3 Univariate results

		Pre		*Post*		*Pre minus Post*
Clean	*A*	20,779	B	40,332	*A-B*	-19,552 (-1.71)*
Deficient	*C*	22,846	D	72,981	*C-D*	-50,135 (-7.64)***
Clean minus Deficient	A-C	-2,067 (-0.35)	B-D	-32,649 (-2.77)***		

Notes: This table shows mean abnormal audit fees for the four different categories created by PRE versus POST and CLEAN versus DEFICIENT and the mean difference in abnormal fees between the four categories. Abnormal audit fees are obtained by reversing the logarithm on the residuals from the fee model displayed in Table 3.1. PRE and POST distinguish the time periods prior to and after the inspection. The categories CLEAN and DEFICIENT refer to the inspection result for the audit firm. T-values are provided in brackets underneath
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

3.5.2 Multivariate results

Panel A of Table 3.4 shows the results of the regressions used to test the three hypotheses. All models use the change in abnormal audit fees (ΔABNFEE), hereafter referred to as change in fees, as dependent variable. The regression in column (I) contains 1,430 change observations and yields an R-square of seven percent. DEF has a significantly positive coefficient of 0.141 ($p<0.01$) indicating that fees of deficient firms' clients increase significantly more than

[30] The fact that average abnormal audit fees are positive in all four categories can be explained by the general increase in fees in the post-SOX period while the prediction is based on coefficients from a pre-Sox model. To make sure this does not drive the results, the analysis of fee changes uses the client's post-Sox abnormal fees as control.

fees of non-deficient firms' clients following the inspection. This provides support for the first hypothesis. The significantly positive coefficient on TO_ICINEF (0.423, $p<0.01$) shows, as expected, that fees increase for clients with ineffective internal controls. Also, the significantly positive coefficient on TO_404b (0.151, $p<0.05$) indicates a fee increase when the auditor needs to give an opinion on the effectiveness of internal controls. Moreover, the year dummies are insignificant.

Column (II) of Panel A shows the test of hypothesis 2a. DEF yields a significant positive coefficient of 0.165 ($p<0.01$). While COMPETITION itself is not significant, the interaction term DEFxCOMPETITION is significant with a coefficient of 0.398 ($p<0.05$). The coefficients for the control variables obtain similar values as in regression (I).

Panel B provides further insights regarding the interpretation of the interaction terms. As shown by the effect for CLEAN at COMPETITION=0 (0.065, n.s.), clients of clean audit firms that have faced the median level of competition prior to the inspection are not associated with fee increases. Moreover, there is no variation in fee increase for clients of clean audit firms depending on the level of competition since the effect for COMPETITION at DEF=0 is insignificant (-0.063, n.s.). In contrast, at the median value of competition, clients of deficient firms are associated with fee increases following the inspection as shown by the value for DEF at COMPETITION=0 (0.230, $p<0.01$). The size of the fee change for clients of deficient audit firms increases with rising levels of competition faced by the audit firm prior to the inspection as shown by the effect for COMPETITION at DEF=1 (0.335, $p<0.01$). Thus, the difference between clean and deficient firms' fee increases gets more pronounced with competitive fee pressure. This provides support for hypothesis 2a.

I test the sensitivity of the results to alternative specifications of the COMPETITION variable. Basing the Herfindahl index on aggregate size of client firm's assets or fees yields coefficients similar in magnitude, but the t-statistics of the interaction terms remain below significance levels. Defining the audit market as consisting of only small audit firms' clients confirms the support for hypothesis 2a based on all three specifications of the Herfindahl index (aggregate number of clients, assets, or fees).

TABLE 3.4 Differences in abnormal audit fees

Panel A: Regression model of changes in abnormal audit fees

	(I)	(II)	(III)
	Δ*ABNFEE*	Δ*ABNFEE*	Δ*ABNFEE*
Intercept	0.085	0.065	0.191
	(1.11)	(0.84)	(2.15)**
DEF	0.141	0.165	0.032
	(3.03)***	(3.48)***	(0.52)
COMPETITION		-0.063	
		(-0.45)	
DEFxCOMPETITION		0.398	
		(2.19)**	
LOWDEM			-0.178
			(-2.13)**
DEFxLOWDEM			0.231
			(2.3)**
TO_ICINEF	0.423	0.425	0.390
	(3.03)***	(3.03)***	(3.16)***
FROM_ICINEF	-0.093	0.052	-0.070
	(-1.51)	(0.32)	(-0.90)
TO_404b	0.151	0.148	0.164
	(2.58)**	(2.52)**	(2.43)**
FROM_404b	0.061	0.055	0.153
	(0.68)	(0.62)	(1.18)
YEAR2005	0.010	0.025	-0.026
	(0.14)	(0.34)	(-0.34)
YEAR2006	0.036	0.049	0.010
	(0.51)	(0.68)	(0.13)
YEAR2007	0.008	0.018	-0.014
	(0.11)	(0.25)	(-0.18)
YEAR2008	-0.025	-0.019	-0.02
	(-0.31)	(-0.24)	(-0.23)
YEAR2009	0.032	0.038	-0.024
	(0.32)	(0.38)	(-0.23)
R-squared	0.070	0.077	0.067
Number of observations	1430	1430	1228

(This table is continued on the next page)

TABLE 3.4 (Continued)

Panel B: Effect sizes in different groups

	Δ*ABNFEE*	Δ*ABNFEE*
CLEAN at COMPETITION=0	0.065	
	(0.84)	
DEF at COMPETITION=0	0.230	
	(3.48)***	
COMPETITION at DEF=0	-0.063	
	(-0.45)	
COMPETITION at DEF=1	0.335	
	(2.85)***	
CLEAN at LOWDEM=0		0.191
		(2.15)**
DEF at LOWDEM=0		0.223
		(3.03)***
CLEAN at LOWDEM=1		0.013
		(0.13)
DEF at LOWDEM=1		0.276
		(3.43)***

Notes: Panel A displays the results of three regressions of abnormal audit fee changes. ΔABNFEE measures the change in abnormal audit fees based on the difference between available year observations of ABNFEE pre- and post- inspection scaled by the number of years that lie between them and by the value of audit fees in the pre period. ΔABNFEE is winsorized at the 1st and 99th percentile. DEF indicates clients of deficient audit firms. TO_ICINEF indicates clients that change from no internal control deficiency to having an internal control deficiency. FROM_ICINEF has a value of one when a client changes from having an internal control deficiency to having no internal control deficiency. TO_404b and FROM_404b indicate whether a client changed from not fulfilling the size criteria for compliance with SOX section 404b to fulfilling the criteria for section 404b compliance (TO_404b) and vice versa (FROM_404b). Year dummies are included to control for a trend in time. Column (II) contains the variable COMPETITION, measured as the median-scaled Herfindahl index for the Metropolitan Statistical Area where the audit firm is located multiplied by minus one. The regression in column (III) contains LOWDEM, an indicator variable for client firms with low demand for audit quality, that equals one whenever a client lies below the median on at least two out of the following four characteristics: total assets, leverage, short term accruals, and yearly percentage growth in sales. The regressions in column (I) and (II) include observations associated with 288 audit clients and 139 audit firms. The regression in column (III) is based on 259 audit clients and 129 audit firms. Standard errors are adjusted for clustering at the client-level in all three regressions. T-values are stated in brackets underneath the coefficients. **Panel B** provides further information on the effect sizes within the different categories created by the interaction terms. It displays the effect of COMPETITION within the DEF and CLEAN categories based on the results of regression (II) in Panel A. It further shows the effect size within the four different categories created by LOWDEM and DEF based on the results of regression (III) in Panel A. T-values are listed in brackets underneath.
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

Column (III) of Panel A shows the test of hypothesis 2b. The intercept of 0.191 ($p<0.05$) represents the change in fees for clean audit firms' clients with high demand for audit quality. To interpret the coefficients for DEF (0.032, n.s.), LOWDEM (-0.178, $p<0.05$) and DEFxLOWDEM (0.231, $p<0.05$), I refer to the effect sizes displayed in Panel B. A significant fee increase is observable for high-demand clients of both clean and deficient audit firms as shown by the significant effect sizes in the two categories CLEAN at LOWDEM=0 and DEF at LOWDEM=1. While fees do not increase significantly for low-demand clients of clean audit firms, fees increase significantly for low-demand clients of deficient audit firms (DEF at LOWDEM=1). Hence, the difference clean and deficient audit firms' clients fee increases is most pronounced for clients with low demand for audit quality. The significant interaction term DEFxLOWDEM provides support for hypothesis 2b.

An alternative specification of the LOWDEM variable uses the upper five deciles of free float as fifth category for identifying clients with high demand for audit quality. With a reduced number of 808 observations, the main effect of LOWDEM is not significant any longer but the interaction effect DEFxLOWDEM remains significantly positive, confirming the support for hypothesis 2b. The results also obtain when excluding total assets from the definition of LOWDEM to make sure the effect is not mainly driven by size.

Overall, the results indicate that deficient audit firms increase their fees significantly following the inspection while larger increases are observable in settings of high fee pressure caused by competition or low demand for audit quality. For the firms in the sample, the yearly increase in abnormal fees for deficient audit is comparable in magnitude to the increase due to compliance with section 404b.

3.5.3 Personnel adjustments

To provide further evidence that the observed fee increases reflect increases in effort rather than a fee premium to account for future expected losses, I examine changes in human resources for a subset of audit firms. Public Accounting Report (2008) publishes a yearly list of the top 100 public accounting firms in the US with information on the number of partners (PARTNERS) and professionals (PROFESSIONALS) working for the audit firm. I analyze changes in the number of employees using the twenty audit

firms in my dataset that are included the top 100 lists for the years 2004 until 2008.

To calculate the change in personnel, I make use of a similar procedure as used for the change in abnormal fees. To obtain the change in professionals (ΔPROFESSIONALS) for each audit firm, I take the difference between the pre- and post- values of PROFESSIONALS for each available pair of pre- and post-inspection financial year-ends for every audit firm. By means of this design, I use the audit firm as its own control. The change in professionals is scaled by the number of years lying between the two observations to obtain an equivalent of a yearly change and is divided by the pre-inspection value of PROFESSIONALS to achieve a measure of the relative change in professionals. The same procedure is followed to obtain ΔPARTNERS.

I regress both measures of change in audit firm employees on an indicator variable for deficient audit firms (DEF) and a number of control variables as shown below. I control for employee changes due to changes in audit firm growth and changes in the client portfolio as measured by the change in revenue (ΔREVENUE) and the change in the number of clients (ΔCLIENTS). If deficient firms react to inspections by adjusting effort they likely need to increase their human resource capacity by hiring additional employees. A significantly positive coefficient on DEF indicates that deficient audit firms are associated with an increase in professionals or partners, respectively that is not related to a growth in audit firm revenue from tax or other services or the number of clients. Hence, I estimate the following regression equations:

$$\Delta PROFESSIONALS = \alpha_0 + \alpha_1 DEF + \alpha_2 \Delta REVENUE + \alpha_3 \Delta CLIENTS + \alpha_{4j} YEAR_j + \varepsilon \quad (3.6)$$

$$\Delta PARTNERS = \alpha_0 + \alpha_1 DEF + \alpha_2 \Delta REVENUE + \alpha_3 \Delta CLIENTS + \alpha_{4j} YEAR_j + \varepsilon \quad (3.7)$$

I also extend the model to include COMPETITION and the interaction term DEFxCOMPETITION to examine the extent to which adjustments in personnel echo the stronger adjustment of audit fees in settings of high pre-inspection fee pressure. Since this analysis is based on audit firm-specific observations of employees, an analysis based on variations in client-specific demand for audit quality is not applicable.

The results displayed in column (I) and (III) of Table 3.5 reveal that both professional and partner changes are strongly related to the change in revenue

(0.627, p<0.01 and 1.258, p<0.05) while being unrelated to the change in the number of clients. DEF has a significantly positive coefficient of 0.084 (p<0.05) in column (I) with ΔPROFESSIONALS as the dependent variable, while being insignificant in column (II) with ΔPARTNERS as the dependent variable. The extended models in column (II) and (IV) confirm the described relationships with the exception that DEF attains a significant positive coefficient of 1.473 (p<0.01) also in the regression with ΔPARTNERS as the dependent variable. COMPETITION has a significantly negative effect in both models (-0.136, p<0.01 and -0.37, p<0.05) and the interaction term DEFx-COMPETITION is significant (0.249, p<0.05) only in the model with ΔPROFESSIONALS as dependent variable. The results suggest that deficient audit firms hire additional personnel following the inspection. The effect holds in particular for professionals as the number of partners is less flexible. The increase in hired professionals reflects the stronger rise of audit fees in settings where audit quality might have been compromised prior to the inspection.

TABLE 3.5 Changes in audit firm personnel

	ΔPROFESSIONALS		*ΔPARTNERS*	
	(I)	(II)	(III)	(IV)
Intercept	-0.042	-0.062	-0.551	-0.592
	(-0.51)	(-0.79)	(-2.62)**	(-2.88)***
DEF	0.084	0.598	0.102	1.473
	(2.82)**	(4.47)***	(1.61)	(3.19)***
ΔREVENUE	0.627	0.109	1.258	0.117
	(4.98)***	(4.07)***	(2.45)**	(2.62)**
ΔCLIENTS	-0.053	-0.053	0.288	0.273
	(-1.07)	(-1.01)	(1.31)	(1.17)
COMPETITION		-0.136		-0.370
		(-3.09)***		(-2.54)**
DEFxCOMPETITION		0.249		-0.259
		(2.81)**		(-0.58)
Y2005	-0.066	-0.062	0.352	0.322
	(-0.78)	(-0.73)	(1.66)	(1.46)
Y2006	0.008	0.015	0.599	0.553
	(0.09)	(0.17)	(2.82)**	(2.40)**
Y2007	-0.015	-0.006	0.441	0.387
	(-0.17)	(-0.07)	(2.31)**	(1.85)*
R-squared	0.539	0.549	0.357	0.382
Number of observations	97	97	97	97

(This table is continued on the next page)

TABLE 3.5 (Continued)

Notes: This table displays the results of regressing the change in the number of audit firm professionals (ΔPROFESSIONALS) and the number of audit partners (ΔPARTNERS) on an indicator for deficient audit firms (DEF) and a number of control variables. ΔPARTNERS measures the change in the number of partners of an audit firm from pre- to post-inspection. ΔPROFESSIONALS measures the change in the number of professionals employed by the audit firm from pre- to post-inspection. ΔREVENUE measures the change in audit firm overall audit fee revenue. ΔCLIENTS controls for a change in the number of audit clients of the audit firm. The year dummies Y2005, Y2006, and Y2007 are based on the financial year-end of the audit firm and are included to control for a growth trend over time. The regressions in column (II) and (IV) extend the models in column (I) and (III), respectively, by adding COMPETITION and the interaction term COMPETITIONxDEF. COMPETITION indicates the degree of competition an audit firm faces prior to the inspection. It is measured as the median-scaled Herfindahl index for the Metropolitan Statistical Area where the audit firm is located multiplied by minus one. The regression contains all available combinations of pre- and post-inspection year observations for each audit firm, respectively, yielding 97 change observations for 20 audit firms. Standard errors are adjusted for clustering at the audit firm-level. T-values are stated in brackets underneath the coefficients.
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

3.6 Sensitivity checks

To address potential concerns that a pre-SOX fee prediction model does not properly account for fee changes caused by SOX requirements apart from the PCAOB inspections, I repeat all tests using fee residuals from a fee prediction model based on the post-SOX years 2003 through 2009. The results are qualitatively similar and conclusions regarding all hypotheses persist. To evaluate the impact of additional design choices on the results, the following sections contain a number of further tests to confirm the results of the main hypothesis.

3.6.1 Fees outside the prediction interval

When generating an individual point prediction of fees, one needs to acknowledge that the prediction is associated with uncertainty due to random disturbance and the use of estimated regression coefficients from a sample (Neter et al. 1983). The uncertainty can be incorporated by creating a confidence interval around the predicted value. While actual fees might deviate from the point prediction of fees, they might still lie within the prediction interval. This section contains an additional test to check whether

the main hypothesis still holds when using a more conservative measure of abnormal fees based on a prediction interval around the point prediction of fees rather than on the point prediction itself.

I generate the alternative measure of abnormal fees outside the prediction interval (ABNFEE2) by subtracting the border value of the 95 percent prediction interval from all audit fee values outside the prediction interval. Audit fee values within the prediction interval are set to zero. The upper border of the prediction interval gets subtracted from all audit fee values above it and the lower border of the prediction interval gets subtracted from all audit fee values below. The change in abnormal fees (ΔABNFEE2) is calculated as the difference between available year observations pre- and post-inspection scaled by the number of years that lie between them.[31]

I regress ΔABNFEE2 on indicator variables for deficient audit firms (DEF) and control for fee changes associated with ineffective internal control opinions and compliance with 404b. Year dummies are included to control for a trend in time. This results in the following regression model:

$$\begin{aligned}\Delta ABNFEE2 = {} & \alpha_0 + \alpha_1 DEF + \alpha_2 TO\_ICINEF + \alpha_3 FROM\_ICINEF \\ & + \alpha_4 TO\_404b + \alpha_5 FROM\_404b + \alpha_{6j} YEAR_j + \varepsilon\end{aligned} \tag{3.8}$$

The results displayed in Table 3.6 confirm the prior conclusions. DEF has a significantly positive coefficient indicating that clients of deficient firms are associated with larger fee increases. Thus, the pattern of higher abnormal fees for deficient firms in the post-inspection period recurs also with the more conservative measure of abnormal fees.

3.6.2 Post-SOX model of biannual fee changes

As the estimation period for the fee model is based on pre-SOX data, it is possible that the coefficients of the prediction model do not truly reflect the post-SOX fee relationship. Even though I include control variables for the two major effects on audit fees (ICINEF and 404b) in the prior regression models, I also test a model of biannual audit fee changes as off 2003 to address this issue. However, as it is not clear whether a two-year period gives audit firms appropriate time to implement changes following the inspection, the alternative specification of the test used in the main analysis is still preferred.

[31] ΔABNFEE2 is winsorized at the 1st and 99th percentile.

TABLE 3.6 Audit fee changes beyond the prediction interval

Dependent variable: ΔABNFEE2	*Coefficient*	*T-statistic*
Intercept	0.012	(0.76)
DEF	0.026	(2.99)***
TO_ICINEF	0.067	(2.42)**
FROM_ICINEF	-0.008	(-0.27)
TO_404b	0.015	(1.63)
FROM_404b	-0.001	(-0.04)
YEAR2005	-0.009	(-0.60)
YEAR2006	-0.004	(-0.27)
YEAR2007	-0.017	(-1.06)
YEAR2008	-0.015	(-0.91)
YEAR2009	-0.016	(-0.97)
R-squared	0.080	
Number of observations	1430	

Notes: This table provides the results of a regression similar to Regression (I) in Table 3.4 but with a different measure of abnormal audit fees. The regression models the change in abnormal audit fees (ΔABNFEE2) as a function of an indicator variable for clients of deficient audit firms (DEF). ΔABNFEE2 measures the change in abnormal fees where abnormal audit fees are based on the deviation from a prediction interval rather than a point prediction. ABNFEE2 is (1) the deviation of the actual value of LOGAUDITFEE from the border of the 95% prediction interval around the audit fee point prediction generated using the audit fee model in Table 3.1 or (2) zero in case the actual value of LOGAUDITFEE falls within the prediction interval. The change in abnormal fees (ΔABNFEE2) is calculated as the difference between available post- and pre-inspection year-observations scaled by the number of years that lie between them. ΔABNFEE2 is winsorized at the 1st and 99th percentile. Control variables are as described in Table 3.4. The regression includes observations associated with 288 audit clients and 139 audit firms. Standard errors are adjusted for clustering at the client-level.
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

I create a measure of the biannual change in the natural logarithm of audit fees (ΔLAUDITFEE). ΔLAUDITFEE is regressed on an indicator variable for clients of deficient audit firms (DEF), an indicator variable for changes over an inspection (INSPECTION), the interaction DEFxINSPECTION, controls for the changes in the underlying client characteristics used in model (3.1), and the control variables used in model (3.2). The results are displayed in table 3.7.
While audit fee changes of both clean and deficient firms' clients are positive in general, clients of clean firms are associated with a smaller increase over the inspection as indicated by the coefficient on INSPECTION (-0.012, $p<0.05$). Clients of deficient firms, on the other hand, are associated with a larger increase over the inspection, as shown by the interaction coefficient

INSPECTION*DEF (0.015, p<0.05). The results again confirm hypothesis one.

TABLE 3.7 Biannual audit fee change model

Dependent variable: ΔLAUDITFEE	*Coefficient*	*T-statistic*
Intercept	0.020	(4.22)***
INSPECTION	-0.012	(-2.17)**
DEF	-0.002	(-0.39)
INSPECTION*DEF	0.015	(2.37)**
TO_ICINEF	0.028	(3.05)***
FROM_ICINEF	-0.044	(-5.49)***
TO_404b	0.010	(2.61)***
FROM_404b	0.006	(0.85)
ΔLOGASSETS	0.023	(9.61)***
ΔLEVERAGE	0.005	(2.36)**
ΔINVREC	0.013	(1.42)
ΔROA	-0.003	(-2.96)***
TO_LOSS	0.006	(1.28)
FROM_LOSS	0.006	(1.37)
ΔSEGMENTS	-0.002	(-1.04)
TO_OPINION	0.012	(2.14)**
FROM_OPINION	0.003	(0.46)
TO_FOREIGN	0.004	(0.50)
FROM_FOREIGN	-0.011	(-1.68)*
TO_BUSY	-0.010	(-0.96)
FROM_BUSY	-0.022	(-3.26)***
FROM_SHORTTENURE	-0.003	(-0.55)
R-squared	0.268	
Number of observations	724	

Notes: This table shows the results of a biannual audit fee change model. ΔLAUDITFEE measures the biannual change in the natural logarithm of audit fees. The model controls for changes in all audit fee determinants used in the audit fee model in Table 3.1 (ΔLOGASSETS, ΔLEVERAGE, ΔINVREC, ΔROA, TO_LOSS, FROM_LOSS, ΔSEGMENTS, TO_OPINION, FROM_OPINION, TO_FOREIGN, FROM_FOREIGN, TO_BUSY, FROM_BUSY, FROM_SHORTTENURE). The model also contains the control variables TO_ICINEF, FROM_ICINEF, TO_SOX404b, FROM_SOX404b, and year dummies as defined in Table 3.4, results of which are not displayed for reasons of brevity. The regression includes observations associated with 288 audit clients and 139 audit firms. Standard errors are adjusted for clustering at the client-level.
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

3.6.4 Post-SOX model of audit fees

I also run an audit fee model using only observations in the Post-Sox period from 2003 onwards. I regress the natural log of audit fees (LAUDITFEE) on an indicator for clients of deficient audit firms (DEF), an indicator for the post-inspection period (POST), the interaction term POSTxDEF, controls for client characteristics used in model (3.1), and year dummies. A significantly positive interaction term obtains even after including industry dummies and audit firm fixed effects. This model is considered inferior to the design used in the main analysis however, as the inclusion of additional interaction terms to test hypotheses 2a and 2b would raise potential issues of multicollinearity and bias.

I use an unbalanced panel in the prior test to rule out any potential confounding effects of the second inspection. For that reason, I check the sensitivity of the results to using a reduced set of clients which form a balanced panel. I run the model described above using only clients with data available in all years of the period 2003 through 2006, thus before the second-inspection round has started. The results are not displayed but again confirm the prior conclusions regarding the main hypothesis.

3.7 Conclusion

In view of recent regulatory changes that establish independent inspections of US audit firms, this chapter examines to what extent inspections cause a change in audit fees. In line with the theoretical arguments, this chapter's findings reveal that audit fees of deficient audit firms' clients increase more than those of client audit firms' clients from pre- to post-inspection, controlling for client characteristics and a trend in time. More specifically, the larger increase in fees of deficient audit firms is more pronounced in settings of high fee pressure created by high competition or low demand for audit quality prior to the inspection. The results are consistent with an overall increase in auditor effort for deficient audit firms, especially in settings where fee pressure might have compromised audit quality. At the same time, deficient audit firms are associated with an increase in the number of professionals employed, which further corroborates that the fee increase reflects effort adjustments rather than a fee premium to cover future expected losses.

A few data limitations and avenues for future research need to be addressed. It would be desirable to have a fully balanced sample of audit clients across the ten-year period. However, due to data availability, a reasonable

sample size is only achievable by including clients as soon as at least one year of information is available for each of the three (estimation, pre-, and post-inspection periods). Further, the lack of available data on ownership structure or salaries prevents a feasible analysis using a more refined measure of demand for audit quality. As the PCAOB does not disclose the identity of the inspected clients, it is impossible to directly investigate fee changes for the client-engagements where particular deficiencies were raised. Obtaining information on the inspected clients would allow a more direct test of the effect of inspections on auditor effort and fees. This point is left for future research.

It further needs to be acknowledged that inspectors' judgments and quality standards may be influenced by a different set of incentives than auditors' or investors' judgments. More specifically, inspectors are likely to care less about efficiency since they do not bear the cost of the audit. Also, they might put more emphasis on avoiding audit failures while at the same time aiming for continued reporting of deficiencies to defend their existence. It is thus possible that the additional work required by inspectors may in fact not be in the best interest of investors as it does not lead to a reduction in audit risk worth the fee increase from the investors' perspective. This would be in line with statements of audit firms about inspections causing a development towards a 'form over substance audit [. . .] that loses sight of the real audit objective' and about increases in audit hours and fees without an improvement in audit quality (Daugherty and Tervo 2010a). In this context, the increase in fees in particular for clients with low demand for audit quality is potentially worrying as the additional audit effort on non-complex clients might not be needed by investors. In their response letters, audit firms have complained that inspectors' expectations cause audits to get prohibitorily expensive for small clients (PCAOB 2005). Nevertheless, as above mentioned statements originate from affected firms they are unlikely to serve well as an objective evaluation criteria of inspectors' quality standards. To what extent inspectors' quality standards reflect investors' view of the costs and benefits of audit work remains to be addressed by future research.

This chapter adds to the literature on the cost and benefits of independent reviews of audit firms at a time where review systems are established and refined across the world and where doubts regarding the effects of PCAOB inspections have been voiced. While prior studies have either looked at client-level fees prior to inspections or at fees at the audit firm level, this is the first

study to provide insights about changes in client-level fees. The study contributes to the literature by showing that the established US inspection system seems to provide sufficient incentives for audit firms to adjust their behaviour and increase audit effort. Also, the observable fee changes present insight into the size of one cost component faced by clients and investors as result of the inspections. Moreover, the chapter extends the literature on the potentially adverse effects of high fee pressure caused by competition and client-specific demand characteristics. The insights can be useful to regulators and oversight bodies throughout the world in setting guidelines regarding the detailed implementation and future development of audit firm reviews.

4

PCAOB INSPECTIONS AND CLIENT PORTFOLIO MANAGEMENT

4.1 Introduction

Academics as well as practitioners are still in the process of understanding all aspects of the US public oversight system's impact on the audit profession. As argued in chapter three, deficiencies stated by PCAOB inspectors represent a risk to audit firms due to potential losses from reputational damage, regulatory penalties, or litigation. If so, audit firms are expected to incorporate this risk into their audit planning, pricing, and portfolio management decisions. While chapter three has focused on pricing decisions, changes in audit firms' client portfolios in response to PCAOB inspections yet remain to be examined.

In this chapter, I examine the research question whether audit firms adjust their portfolio management decisions in reaction to changes in auditor business risk triggered by the inspections. I argue that there are alternative portfolio management strategies in response to an increase in auditor business risk. On the one hand, the audit firm can decrease average portfolio riskiness by focusing on clients with lower audit risk and/or lower financial risk. Prior

studies suggesting portfolio risk reduction in response to auditor business risk (Johnstone and Bedard 2004; Johnstone 2000; Shu 2000; Raghunandan and Rama 1999) do not measure variations in auditor business risk at the audit firm level but rather use client-specific characteristics or inherent audit-firm size as surrogate. Hence, further evidence is needed to confirm that neither underlying correlated client-related risks nor large audit firm-specific behaviour unrelated to auditor business risk are the main drivers of prior results on the relationship between auditor business risk and auditor portfolio decisions.

On the other hand, the audit firm can increase the proportion of the portfolio for which it possesses industry expertise (hereafter referred to as portfolio industry concentration) by focusing on clients within industries for which the audit firm is specialized. Prior experimental studies suggest the use of expertise to address risk (Asare et al. 2005; Hackenbrack and Knechel 1997), however, they measure expertise based on staff rank, rather than the audit firm's industry expertise. Hence, it is not clear to what extent audit firms make use of their inherent industry-specific knowledge to address changes in auditor business risk. The PCAOB inspections provide a unique setting to investigate auditors' risk management strategies in response to audit firm-specific changes in auditor business risk.

I study audit firm portfolio management decisions by investigating variation in characteristics of newly accepted and discontinued clients. I examine to what extent newly accepted and discontinued clients differ from each other and from the median client in the portfolio pre- and post-inspection depending on the inspection result. While I do not find that deficient audit firms consistently respond to an increase in auditor business risk by reducing audit or financial risk of their client portfolio, there is evidence that deficient audit firms' portfolio industry concentration increases relative to clean audit firms. Additional tests reveal that the inspections do not seem to impact the tails of the distribution of mean portfolio characteristics and thus do not predominantly affect firms with especially risky or unspecialized client portfolios.

This study contributes to the literature in the following ways. First, it adds to the knowledge about the impact of the PCAOB inspection process by examining changes to client portfolio management decisions in response to the inspections. This helps to understand to what extent the inspection process impacts auditors' decision making, which is necessary for evaluating the benefits of a public review system. The study contributes to the academic literature as it addresses the importance of auditor business risk in portfolio

management decisions by means of an auditor-specific measure of auditor business risk that varies across time and audit firms. The results yield insights regarding audit firms' use of different risk management strategies by showing that auditors use industry expertise to address auditor business risk. Also, increased focus on industry expertise as strategy to reduce auditor business risk appears to be the preferred choice over reductions in portfolio audit risk or client financial risk.

Further, this chapter contributes to the knowledge about the structure of the third-tier audit market in an extended post-SOX environment where both first- and second-tier audit firms (hereafter referred to as large or annually inspected firms) are found to be resigning from their riskier clients (Dey and Robin 2011; Hogan and Martin 2009; Landsman et al. 2009). With large audit firms disposing of their risky clients, it appears that the most risky clients would concentrate in the portfolios of the remaining third-tier audit firms (hereafter referred to as small audit firms). At the same time, a number of small audit firms decided to cease all SEC audits in response to SOX with the majority of their clients switching to local or regional audit firms (DeFond and Lennox 2011; Read et al. 2004). Small audit firms are important as they audit almost 80% of the companies with revenue of less than $100 million (Olson 2008). However, they might not be well-equipped to manage the increased risk of their client portfolio and face threats to their continued existence (Hogan and Martin 2009). The results of this study provide no indication for an accumulation of risky clients in the portfolios of small audit firms as a result of SOX. Also, changes in the dynamics of the audit market in terms of an increased demand for audit firms with a clean inspection report are not apparent.

The remainder of the chapter proceeds as follows. Section 4.2 contains the theoretical motivation underlying the hypotheses. Section 4.3 describes the research design used to test the hypotheses, followed by a discussion of the results in section 4.4. Finally, conclusions and limitations are provided.

4.2 Theoretical motivation

Small audit firms (with less than 100 issuer clients) are subject to a triennial cycle of PCAOB inspections since 2004, details of which are described in chapter one. From a conceptual point of view, a deficient inspection result as stated by PCAOB inspectors is likely to impact auditor business risk, the "risk

that the audit firm will suffer a loss resulting from the engagement" (Johnstone 2000, p.4). If deficiencies are reported by inspectors, the risk of litigation might increase as investors perceive a higher chance of winning a lawsuit against the auditor. An official documentation of deficiencies within the audit firm can make potential filers of lawsuits more confident. At the same time, the risk of regulatory penalties increases. While the extent and severity of sanctions yet remains to be observed with the inspection and enforcement mechanisms getting more established, the PCAOB has already demonstrated its preparedness to impose sanctions in several cases by revoking the registration of audit firms and censuring, suspending, or barring auditors (PCAOB 2011). Also, the disclosure of a PCAOB disciplinary sanction against a certain audit firm represents an additional threat to the audit firm's reputation. However, as the audit firm can prevent the publication of adverse findings for several years by non-consensus or appeal (Doty 2011), it is unclear to what extent the increase in risk is sufficiently high to warrant the auditor's action.

Prior literature has addressed the relationship between auditor business risk and portfolio management decisions in several ways. Client public trading status as proxy for auditor business risk is associated with the likelihood of client discontinuance (Johnstone and Bedard 2004). Auditor business risk is also associated with a lower likelihood of client acceptance in an experimental setting (Johnstone 2000). Studies addressing the concept of auditor business risk at the audit firm level are based on the argument that auditor size is a driver of expected future losses because wealthy auditors have deep pockets and thus have more to lose (Bockus and Gigler 1998; DeAngelo 1981). In line with this argument, there is evidence that BigN audit firms are less likely to serve as successor auditor after resignations (Shu 2000; Raghunandan and Rama 1999). However, continuous measures of future audit firm losses based on aggregate portfolio size do not explain variations in audit quality (Gaeremynck et al. 2008), raising doubts about the appropriateness of size as measure of auditor business risk.

With regard to shifts in auditor business risk over time, Choi, Doogar, and Ganguly (2004) find that the riskiness of Big6 auditor client portfolios is responsive to changes in the audit litigation liability environment. However, the authors admit the difficulty to disentangle the auditor's response to the litigation liability environment from changes in underlying economic factors. Given the criticism of audit firm size as measure of audit risk and the lack of

variation over time, an audit firm-specific measure of audit risk that varies both across audit firms and time can add to the discussion about the effect of auditor business risk on client portfolio management decisions. The PCAOB inspection process results in a shift in auditor business risk that varies across both audit firms and time. In response, the auditor faces several options.

First, the auditor might decide not to take on any more public clients or even to deregister with the PCAOB. There is evidence that many small audit firms deregister in response to the increased scrutiny following SOX (DeFond and Lennox 2011; Daugherty et al. 2009; Read et al. 2004). If the audit firm decides to continue auditing public clients, it can pursue several strategies to address the increase in auditor business risk. The auditor can adjust effort and fees to address the increase in risk. In fact, Johnstone and Bedard (2003) find that higher billing rates decrease the negative effect of auditor business risk on the likelihood that a client gets accepted. And in chapter three, I provide evidence that continuing clients of deficient audit firms are associated with an increase in abnormal fees following the inspection.

However, it is unclear whether a firm can raise fees sufficiently to cover the full incremental effort that would be needed to cover the additional risk without losing clients. Indeed, the PCAOB Board is concerned about indications that audit firms do not sufficiently address all deficiencies by means of increases in effort (Doty 2011). Hence, alternative risk management strategies are likely to be pursued in addition. In fact, Elder et al. (2009) provide evidence that auditors use an array of different client risk management strategies with discontinuance being used for the more extreme levels of risk. Deficient audit firms can thus adjust their portfolios to decrease auditor business risk originating from the expected future cost of penalties and litigation aggregated over all clients.

Adjustments in client portfolios are evident in two portfolio-related decisions, client acceptance and client discontinuance decisions. Both acceptance and discontinuance decisions involve the client as second party. Newly accepted clients are selected from the set of clients that are interested in engaging the auditor. The auditor's ability to adjust portfolio risk may be reduced if potential clients do not display the desired risk characteristics. Similarly, client discontinuance decisions are the outcome of a negotiation process between the client and the auditor. While certain studies differentiate between client- and auditor-initiated switches (e.g. Landsman et al. 2009), the categorization is unlikely to capture the underlying dynamics of the auditor

change. In the end, an auditor might decide to resign as result of its client's unwillingness to accept a fee raise or might decide to cut fees in order to keep a client that considers switching. Thus, conceptually, there does not seem to be a clear distinction between auditor- and client-initiated switches. Further, the decision whether to disclose a resignation in the 8-K filing might be influenced by concerns about negative perceptions on the side of potential new clients as well as market participants. For that reason, I regard all auditor switches as discontinuance decisions in my main analysis and conduct sensitivity checks with auditor- and client-initiated switches separately.[32]

I regard auditor business risk as a function of client financial risk, audit risk, and auditor-specific factors given a certain client base. As auditor business risk is positively interrelated with client-related risks (Johnstone 2000), it is possible to reduce auditor business risk by reducing aggregate audit risk or financial risk of clients within the auditor's portfolio. Audit risk is the risk that the auditor may unknowingly fail to modify his opinion on materially misstated financial statements (AICPA 1983). Client financial risk is defined as the risk that the client's economic conditions will deteriorate (Huss and Jacobs 1991).

A deficient inspection report raises auditor business risk given an un-changed client base. The auditor can achieve a reduction in the level of auditor business risk to the acceptable pre-inspection level by adjusting his client portfolio. Both client continuance and acceptance decisions are part of an active portfolio management strategy and are thus influenced by auditor business risk (Johnstone and Bedard 2004). I therefore predict deficient audit firms to discontinue the audit of more risky clients and/or accept less risky clients relative to their portfolio.[33] Non-deficient audit firms, on the other hand, do not face the increase in business risk associated with a deficient inspection report. If anything, they adjust their estimate of auditor business

[32] Even though Abbot et al. (2008) provide evidence for client switches in response to GAAP-related deficiencies, the number of GAAP-related deficiencies (in contrast to GAAS-related deficiencies) is rather small and Lennox and Pittman (2010) find no impact on market shares. Hence, the impact of switches driven by clients' desire for auditors with clean inspection reports seems to be limited and is assumed to influence neither acceptance nor discontinuance decisions to a strong extent.

[33] If low risk clients display an increased interest in audit firms with clean inspection report, there might be limited low risk clients in the set of potential new clients for deficient firms and low risk firms might be particularly likely to switch away from deficient audit firms. Hence, this would work against finding an effect for hypothesis one.

risk downwards since a clean inspection report makes penalties and litigation less likely.

As the final outcome of the inspection is neither known to the public nor to the firm prior to the inspection report date,[34] I define pre- and post-inspection time periods based on the inspection report date. If audit firms use portfolio management decisions to address changes in auditor business risk, deficient firms' portfolios are predicted to decrease in riskiness relative to clean firms' portfolios in reaction to the inspection result, leading to the following hypothesis:

> **Hypothesis 1:** Deficient audit firms are associated with a post-inspection decrease in portfolio riskiness relative to clean audit firms.

Also, the audit firm may address the increase in risk by focusing on clients within its area of industry specialization. With in-depth knowledge of a particular industry, the auditor develops a thorough understanding of unique risks and audit approaches for the industry and can thus better evaluate the audit risk and financial risk associated with clients within that industry. At the same time, an industry specialist has a well-founded position in assessing management's judgments incorporated in financial reporting decisions as he can benchmark against best practices in the industry. In fact, auditors with industry expertise are more likely to detect errors (Owhoso et al. 2002) and deliver higher quality audits (Bruynseels et al. 2011; Knechel et al. 2007; Carcello and Nagy 2004; Wright and Wright 1997). Prior literature also recognizes the use of auditor expertise as possible risk management strategy (Asare et al. 2005; Hackenbrack and Knechel 1997). An audit firm that uses industry expertise as strategy to address an increase in auditor business risk accepts especially new clients within the firm's specialization industry and discontinues clients outside the firm's specialization industry. Therefore, I predict that the portfolio gets more concentrated, leading to the second hypothesis:

[34] While audit firms receive a draft of the inspection report prior to the inspection report date, response letters show that audit firms expect that final conclusions can be adjusted based on the audit firm's comments and discussion with the Board.

Hypothesis 2: Deficient audit firms are associated with a post-inspection increase in portfolio industry concentration relative to clean audit firms.

4.3 Research design

4.3.1 Measures of portfolio riskiness and portfolio industry concentration

For testing hypothesis one, I employ several measures of risk established in prior literature (Landsman et al. 2009; Johnstone and Bedard 2004).[35] Audit risk is measured by ASSETS, the natural logarithm of total assets, INVREC, the ratio of inventories and receivables to total assets, and ABSDISACC, absolute discretionary accruals based on the cross-sectional Jones model reported in DeFond and Subramanyam (1998). Audit risk increases with size due to increasing complexity. A higher fraction of inventory and receivables out of total assets indicates transactional complexity and vulnerability to manipulation, also indicating higher audit risk. Further, higher levels of discretionary accruals and hence higher levels of discretion used by management regarding reported financial information relative to their industry peers are associated with the risk of misstatement and thus higher audit risk. Client financial risk is measured by ROA, net income divided by average total assets, LEVERAGE, the ratio of short- and long-term debt to total assets, and CASH, the ratio of cash to total assets. Less profitable and more highly leveraged companies represent higher financial risk to the auditor. Similarly, the lower the fraction of cash a firm has on hand, the higher the likelihood of financial difficulty and hence, the higher financial risk.

For testing the second hypothesis, I develop a measure of industry specialization, ISPECIALIST, based on Krishnan (2001), who defines an auditor as industry specialist if the share of an auditor's clients in a particular industry is larger than 1/n with n being the number of industries the audit firm's clients operate in. This measure of industry specialization focuses on the auditor's choice of investment in a certain industry and correlates better with firm reported measures of industry specialization than other commonly available measures (Krishnan 2001). I refine this measure by using client's total assets rather than the number of clients and by requiring the auditor's portfolio

[35] A correlation analysis of the separate risk measures shows that Cronbach's alpha is too low for a composite risk measure based on factor analysis.

industry share to be at least twenty percent larger than 1/n. To take into account differences in audit firm and industry sizes, I additionally define ISPECIALIST to equal one if more than one fifth of an audit firm's portfolio belongs to a certain industry and if the auditor audits more than one fifth of the overall industry. I report sensitivity of the results to alternative specifications of the industry specialization measure that are based on the number of clients rather than total assets and that use different cut-off levels for portfolio and overall industry shares.

As audit firm-specific measure of portfolio industry concentration, I use the Herfindahl index as follows:

$$ICONC\_P = H = \sum_{i=1}^{N} [p_i / P]^2 \tag{4.1}$$

where N is the total number of industries audited by the auditor, p_i is the size of the audit firm's portfolio share in industry i and P is the total size of the auditor's portfolio. Higher values for ICONC_P indicate higher levels of portfolio industry concentration.

4.3.2 Sample selection

The sample used in this study is based on all client observations in Audit Analytics that have a first-time inspection report for their auditor available on the PCAOB website by the end of April 2010. Financial information for all available twelve month financial years of the clients between 2003 and 2009 is retrieved from Compustat.[36] I exclude observations in the industries Financials (SIC codes 6000–6700) and Utilities (SIC codes 4000–4900). As this study focuses on the smaller audit firms, all clients of annually inspected audit firms are excluded. Annually inspected firms have a different timing cycle of inspections and they have not been associated with clean inspection reports as of this point in time (with one exception). I focus on first-round inspections as a second-round inspection report has not yet been published for all audit firms. Hence, I exclude all client-year observations after the publication of a second-round inspection report.[37] Further, all observations with incomplete data on the

[36] As (1) Audit Analytics does not contain all audit clients and (2) identifiers for matching Audit Analytics and Compustat are missing for some clients, the analysis does not contain all inspection reports published on the PCAOB website.

[37] Due to the different timing of the inspections there is no data included for financial years as of 2007 for the audit firms that were inspected earliest. Additional tests reveal that the timing of the

variables of interest are removed and I only include audit firms for which I have client information in at least one financial year in each of the pre- and post-inspection periods.[38]

In addition, I exclude 6 deficient audit firms that exit the market for public clients during the period of investigation. Those firms, all of which have received a deficient inspection report, either decide not to take on any more public clients, deregister with the PCAOB, or are banned by the PCAOB.[39] The 28 clients of those excluded firms are significantly smaller and less profitable, with lower percentages of inventories and receivables, higher abnormal discretionary accruals, and more cash compared to the remaining clients in the sample. I also remove 24 audit firms that merge with another audit firm during the period of investigation. The exclusion of exiting and merging audit firms allows an examination of client discontinuance decisions that are not confounded by cases where the complete client portfolio disappears. A more detailed analysis of the two removed groups of audit firms is not pursued given the low number of observations within each category and the difficulty to establish whether exit and merger decisions were driven by the inspection result. The remaining observations yield a sample of 4,219 client-years associated with 1,137 audit firm portfolio years, 1,280 clients, and 216 audit firms.

4.3.3 Analysis

A first test of the two hypotheses is based on audit firm year-specific differences between discontinued and newly accepted clients. More specifically, I first calculate aggregate audit firm year-specific means for the continued and discontinued clients separately. For each audit firm year, I then calculate the difference between the mean of newly accepted and the mean of discontinued clients to obtain a measure of deviation as shown in the following equation:

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inspections is not correlated with the size of the audit firms and hence, there is no reason to expect that this will cause any bias in the results.

[38] I refrain from imposing additional restrictions such as an exclusion of audit firms with single-client portfolios as this would reduce the number of clean audit firms to an unacceptably low level.

[39] This information is obtained from the indicated reasons for client discontinuance decisions in Audit Analytics.

$$CHAR_v\_DEV_{it} = \left[\frac{\sum_a CHAR_{vait}}{n_{ait}} - \frac{\sum_d CHAR_{vdit}}{n_{dit}} \right] \quad (4.2)$$

where i denotes the audit firm, t denotes the year, and a and d stand for the newly accepted and discontinued clients, respectively. Thus, n_{ait} denotes the number of newly accepted clients of audit firm i in year t. CHAR stands for each of the v client characteristics ASSETS, DISACCABS, INVREC, ROA, LEVERAGE, CASH, and ISPECIALIST. To test the hypotheses, I estimate a set of regression models of the respective deviation measure on indicators for observations in the post-inspection report date period (POST) and for audit firms without deficiencies (CLEAN), and the interaction term POSTxCLEAN as shown below:

$$CHAR_v\_DEV_{it} = \alpha_0 + \alpha_1 POST + \alpha_2 CLEAN + \alpha_3 POSTxCLEAN + \varepsilon \quad (4.3)$$

Given the definition of CHAR_DEV, this test is restricted to a subset of audit firms with available information on switching and new clients in the same year for at least one financial year prior to and for at least one financial year after the year the inspection report gets published. This leads to a considerable reduction in the number of audit firm portfolio years that can be used for the analysis.[40] A positive (negative) value of ASSETS_DEV indicates that new clients are larger (smaller) than discontinued clients. As a result, a positive change in ASSETS_DEV shows that the difference between new and discontinued clients gets larger and thus the portfolio gets more risky. In contrast, a negative change in ASSETS_DEV indicates that the portfolio gets less risky. Hence, in line with the hypotheses, I expect the interaction term POSTxCLEAN to be statistically significant and positive for ASSETS_DEV, DISACCABS_DEV, INVREC_DEV and LEVERAGE_DEV, and negative for ROA_DEV, CASH_DEV, and ISPECIALIST_DEV.

As the measure of CHAR_DEV examines the overall difference between discontinued and accepted clients, it does not allow to distinguish whether the change in the audit firm's portfolio is driven by either new clients, discontinued clients, or both. Also, audit firms with only new or only discontinued clients in a specific year are not included. For that reason, I conduct an

[40] Only 127 portfolio years of 77 audit firms are associated with newly accepted and discontinued clients within the same year. This number is further reduced as pre- and post-inspection years need to be available for each audit firm.

additional test of the hypotheses based on separate sets of new and discontinued client observations, respectively. For each client risk characteristic v, I define an indicator variable ($HIGH\_CHAR_v$) that specifies whether the client observation lies above the median of the audit firm's yearly portfolio with respect to the particular variable (HIGH_ASSETS, HIGH_DISACCABS, HIGH_INVREC, HIGH_ROA, HIGH_LEVERAGE, and HIGH_CASH). The indicator variable ISPECIALIST indicates whether the auditor is specialized in the client's industry. For each client characteristic v and client group (new/discontinued), the following logistic regression model of the respective indicator variable on CLEAN, POST, and the interaction term CLEANxPOST is estimated:

$$HIGH\_CHAR_v = \alpha_0 + \alpha_1 POST + \alpha_2 CLEAN + \alpha_3 POSTxCLEAN + \varepsilon \qquad (4.4)$$

The regression with ISPECIALIST contains an additional variable (NCLIENTS) to control for the number of clients within the audit firm's portfolio as the likelihood for a client to be a within an audit firm's area of industry specialization is associated with portfolio size. In line with the hypotheses, I expect a statistically significant interaction term POSTxCLEAN with a positive (negative) coefficient for HIGH_ASSETS, HIGH_DISACCABS, HIGH_INVREC, HIGH_LEVERAGE, and a negative (positive) coefficient for HIGH_ROA, HIGH_CASH, and ISPECIALIST for the subset of new (discontinued) clients.

It is possible be that previously described effects concerning portfolio riskiness and industry specialization influence particularly the tails of the distribution of portfolio characteristics. For example, for auditors with very risky portfolios, it appears easier to react to the increase in business risk by adjusting their client portfolio given the availability of a large number of clients with lower risk attributes. If deficient audit firms with particularly risky portfolios get rid of their riskier clients, portfolio riskiness will become less dispersed at the high-risk end of the distribution. If, at the same time, clean audit firms with relatively low risk portfolios take on the more risky clients, dispersion of portfolio riskiness is reduced on the low risk side of the distribution.

For that reason, I conduct additional tests to examine possible changes in the distribution of clean and deficient audit firms' portfolio attributes. Quantile regression is a useful methodology to address this question as it allows to

model the quantiles of a conditional distribution of a response variable as a function of observed explanatory variables (Koenker and Hallock 2001; Koenker and Bassets 1978).[41] The method is based upon the idea that the n^{th} quantile can be defined as solution to an optimization problem, more specifically the solution to minimizing the sum of asymmetrically weighted absolute residuals. I conduct quantile regressions to examine how the quantiles of the distribution of audit firms' yearly portfolio characteristics change from pre- to post-inspection for the v characteristics. The regression model looks as follows:

$$CHAR_v\_P_{it} = \alpha_0 + \alpha_1 POST + \alpha_2 CLEAN + \alpha_3 POSTxCLEAN + \alpha_{4t} YEAR_t + \varepsilon \quad (4.5)$$

where i stands for audit firm and t for year. CHAR_P stands for the portfolio year-specific mean of the risk or industry specialization measures, respectively. I use ICONC_P as measure of industry specialization. Again, POST indicates years after the inspection report date and CLEAN denotes audit firms with non-deficient inspection reports. I estimate this regression for each of the following quantiles of the distribution: 5, 10, 50, 90, and 95. The regression contains fixed year effects to control for trends in the underlying economic conditions. A statistically significant negative (positive) coefficient on the interaction term POSTxCLEAN for regressions of quantiles below (above) the distribution's median indicates that clean audit firms display more extreme mean yearly portfolio characteristics after the inspection in comparison to deficient audit firms. The following section provides an overview of the results.

4.4 Results

4.4.1 Descriptives

To examine general changes in client characteristics of the third-tier audit market over time, Table 4.1 displays mean client characteristics by financial year for the years 2003 through 2009. The measure of client size, LOGASSETS, increases over time with a dip around 2008, which is in line with the financial crisis.

[41] The quantile regression methodology is robust to different shapes of the sample distribution. Least-squares regression, in contrast, assumes that covariates do not affect the distributional shape of the response variable.

TABLE 4.1 Mean client characteristics by financial year

	2003	*2004*	*2004 minus 2003*	*2005*	*2005 minus 2004*	*2006*	*2006 minus 2005*	*2007*	*2007 minus 2006*	*2008*	*2008 minus 2007*	*2009*	*2009 minus 2008*
LOGASSETS	15.163	15.485	0.32 ***	15.804	0.32 ***	16.018	0.21 **	16.174	0.16	15.982	-0.19 *	15.775	-0.21
DISACCABS	0.766	0.800	0.03	0.665	-0.14 **	0.661	0.00	0.656	-0.01	0.613	-0.04	0.749	0.14
INVREC	0.277	0.265	-0.01	0.268	0.00	0.263	-0.01	0.249	-0.01	0.248	0.00	0.228	-0.02
ROA	-1.115	-1.111	0.00	-0.929	0.18 *	-0.892	0.04	-0.846	0.05	-1.005	-0.16	-1.115	-0.11
LEVERAGE	0.847	0.686	-0.16 **	0.645	-0.04	0.625	-0.02	0.579	-0.05	0.695	0.12	0.821	0.13
CASH	0.185	0.228	0.04 ***	0.224	0.00	0.229	0.01	0.229	0.00	0.232	0.00	0.225	-0.01
ISPECIALIST	0.562	0.533	-0.03	0.535	0.00	0.568	0.03	0.510	-0.06 **	0.475	-0.03	0.498	0.02
Number of observations	546	672		766		773		728		507		227	

Notes: This table displays mean client characteristics by financial year for the sample of clients that can be matched with inspected audit firms. For each year, the difference compared to the prior year is displayed. Financial years are defined as containing clients with financial year-ends between the 1st of June of the current year and the 31st of May of the following year. Variables have been winsorized at the 5th and 95th percentile and are defined as follows: LOGASSETS is the natural logarithm of total assets. DISACCABS are absolute discretionary accruals. INVREC is the fraction of total assets represented by inventories and receivables. ROA is return on assets measured as net income divided by average total assets. LEVERAGE is the ratio of short- and long-term debt to total assets. CASH is the fraction of assets composed of cash. ISPECIALIST indicates whether the client is audited by an industry specialist.

*,**,*** Significant at the 0.10, 0.05, 0.01 levels, respectively.

Comparing the years 2004 and 2003, clients have significantly more cash and less debt as proportion of assets. In 2005, clients' absolute discretionary accruals are significantly lower and profitability is significantly higher than in the previous year. A significant decrease in the proportion of clients audited by an industry specialist auditor is observable in 2007. Overall, apart from the increase in size, there is no indication of a significant and consistent increase in the riskiness of the overall client base of small audit firms' over time. Also, no significant year-specific changes suggest that an event or regulatory change has considerably influenced the client base in a certain year within the period of investigation.

Table 4.2 displays descriptive statistics for the sample. Panel A shows descriptives for the 4,219 client observations. Clients range in size from total assets of US$ 128,000 to US$ 142 million. The average client is loss-making, highly leveraged, has inventories and receivables equal to 26 percent of total assets and cash equal to 22 percent of total assets. 53 percent of the client-years in the sample are audited by an auditor categorized as an industry specialist for the client's industry, 86 percent are audited by a deficient audit firm, and 60 percent are pre-inspection observations. Untabulated tests show that deficient audit firms' client observations are significantly less profitable, more leveraged, have higher levels of discretionary accruals and less cash.

Panel B displays descriptive statistics for 1,137 audit firm portfolio-years. Portfolios range in size from 1 to 38 clients with an average of 4 clients. The number of client industries represented within the portfolios varies between 1 and 18 with an average of 3 industries. Average portfolio industry concentration lies at 0.72. Further, 54 percent of the audit firm year portfolio observations are prior to the inspection and 74 percent belong to deficient audit firms.

Table 4.3 shows correlations between the selected risk variables. Certain correlations above the value of 0.3 would suggest the aggregation of the separate variables into a combined risk score. However, a value of Cronbach's alpha below 0.7 indicates that the separate variables do not measure a single underlying construct and the use of factor analysis to develop an aggregate measure of risk would not be appropriate. This also holds when considering audit risk and client financial risk separately. The conclusion is underscored by correlations below the value of 0.1, which demonstrate that the separate risk metrics represent distinct aspects of risk.

TABLE 4.2 Sample descriptive statistics

Panel A: Descriptive statistics for the client-year observations

	N	*Mean*	*Std*	*Minimum*	*Median*	*Maximum*
ASSETS	4219	25,004	36,606	128	9,190	142,804
DISACCABS	4219	0.70	1.08	0.02	0.29	4.35
INVREC	4219	0.26	0.24	0.00	0.19	0.76
ROA	4219	-0.98	1.85	-7.24	-0.22	0.22
LEVERAGE	4219	0.68	1.33	0.00	0.16	5.32
CASH	4219	0.22	0.25	0.00	0.12	0.86
ISPECIALIST	4219	0.53	0.50	0.00	1.00	1.00
PRE	4219	0.60	0.49	0.00	1.00	1.00
DEFICIENT	4219	0.86	0.34	0.00	1.00	1.00

Panel B: Descriptive statistics for the audit firm portfolio-year observations

	N	*Mean*	*Std*	*Minimum*	*Median*	*Maximum*
NCLIENTS	1137	4	5	1	2	38
NINDUSTRIES	1137	3	3	1	2	18
ICONC_P	1137	0.72	0.29	0.11	0.79	1.00
PRE	1137	0.54	0.50	0.00	1.00	1.00
DEFICIENT	1137	0.74	0.44	0.00	1.00	1.00

Notes: This table displays descriptive statistics for the sample containing only audit firms (1) that have at least one pre- and one post-inspection report observation within the years 2004 through 2009 and (2) are not associated with mergers or the intention to leave the public client market. Variables have been winsorized at the 5th and 95th percentile and are defined as follows: ASSETS is the dollar amount of total assets in thousands. DISACCABS are absolute discretionary accruals. INVREC measures the fraction of total assets represented by inventories and receivables. ROA is return on assets measured as net income divided by average total assets. LEVERAGE is the ratio of short- and long-term debt to total assets. CASH is the fraction of assets composed of cash. ISPECIALIST is an indicator variable that indicates whether the client is audited by an industry specialist. PRE indicates observations prior to the inspection report date and DEFICIENT equals one for audit firms with a deficient inspection result. NCLIENTS and NINDUSTRIES measure the respective number of clients and industries contained in the audit firm's yearly portfolio. ICONC_P is a measure of the portfolio's industry concentration based on the Herfindahl index.

TABLE 4.3 Pearson correlations

	LOGASSETS	DISACCABS	INVREC	ROA	LEVERAGE	CASH
LOGASSETS	1.000	0.431	0.095	0.504	-0.459	-0.225
		(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
DISACCABS	0.431	1.000	0.151	0.653	-0.327	-0.079
	(<.0001)		(<.0001)	(<.0001)	(<.0001)	(<.0001)
INVREC	0.095	0.151	1.000	0.105	-0.087	-0.357
	(<.0001)	(<.0001)		(<.0001)	(<.0001)	(<.0001)
ROA	0.504	0.653	0.105	1.000	-0.539	-0.090
	(<.0001)	(<.0001)	(<.0001)		(<.0001)	(<.0001)
LEVERAGE	-0.459	-0.327	-0.087	-0.539	1.000	0.059
	(<.0001)	(<.0001)	(<.0001)	(<.0001)		(<.0001)
CASH	-0.225	-0.079	-0.357	-0.090	0.059	1.000
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	

Notes: This table displays Pearson correlation coefficients between the risk measures. Variables are defined as follows: LOGASSETS is the natural logarithm of total assets. DISACCABS are absolute discretionary accruals. INVREC measures the fraction of total assets represented by inventories and receivables. ROA is return on assets measured as net income divided by average total assets. LEVERAGE is the ratio of short- and long-term debt to total assets. CASH is the fraction of assets composed of cash. Significance levels are listed in brackets underneath.

Table 4.4 displays information concerning prior auditors of newly accepted clients and new auditors of discontinued clients. More specifically, predecessor and successor auditors are separated into small and large audit firms. Small audit firms are further categorized into clean, deficient, and not yet inspected audit firms, respectively. Panel A displays predecessor and successor categories by financial year. Clearly, there is evidence for growing portfolios of the small audit firms as the total number of newly accepted clients is higher, in certain years even more than twice as high as the number of discontinued clients. The percentage of new clients switching from large audit firms lies on average slightly below 50 percent with a peak in the period 2003–2005.[42] This is in line with findings that large firms dropped their clients in the years following SOX due to capacity issues (Dey and Robin 2011; Hogan and Martin 2009; Landsman et al. 2009). The percentage of discontinued clients that switches to a large audit firm varies around an average of 15 percent. An increase in the percentage of clients switching to and from inspected firms is observable over time as the PCAOB inspection activity continues and the number of inspected firms grows.

[42] Switches from Arthur Andersen do not influence the observed frequencies in 2003 as the sample contains only a single switch from Arthur Andersen.

TABLE 4.4 Dynamics of client switches

Panel A: Predecessor and successor auditors of new and discontinued clients by financial year

		2003		*2004*		*2005*		*2006*		*2007*		*2008*		*2009*		*Total*	
Audit Firm Type		*New*	*Disc*	*New*	*Disc*	*New*	*Disc*	*New*	*Disc*	*New*	*Disc*	*New*	*Disc*	*New*	*Disc*	*New*	*Disc*
Large	n	62	5	102	4	102	7	48	13	28	8	11	12	7	2	360	51
	%	51%	13%	57%	7%	56%	13%	43%	19%	26%	13%	21%	30%	33%	18%	47%	15%
Small	n	59	34	78	52	80	42	63	53	78	48	42	28	14	9	414	266
	%	49%	87%	43%	90%	44%	81%	57%	79%	74%	77%	79%	70%	67%	82%	53%	81%
Unknown	n	0	0	0	2	0	3	0	1	0	6	0	0	0	0	0	12
	%	0%	0%	0%	3%	0%	6%	0%	1%	0%	10%	0%	0%	0%	0%	0%	4%
Total	n	121	39	180	58	182	52	111	67	106	62	53	40	21	11	774	329
	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Out of Small:																	
Clean	n	0	0	0	0	0	2	3	3	5	15	11	8	2	1	21	29
	%	0%	0%	0%	1%	0%	5%	5%	6%	6%	31%	26%	29%	14%	11%	5%	11%
Deficient	n	0	0	0	2	6	8	9	14	34	14	19	12	7	4	75	54
	%	0%	0%	0%	4%	8%	19%	14%	26%	44%	29%	45%	43%	50%	44%	18%	20%
Not inspected	n	59	34	78	50	74	32	51	36	39	19	12	8	5	4	318	183
	%	100%	100%	100%	95%	93%	76%	81%	68%	50%	40%	29%	29%	36%	44%	77%	69%

(This table is continued on the next page)

TABLE 4.4 (Continued)

Panel B: Predecessor and successor auditors of new and discontinued clients by inspection result and pre- and post-inspection period

		Deficient						*Clean*					
		New		*Chi-square test of change in proportion*	*Disc*		*Chi-square test of change in proportion*	*New*		*Chi-square test of change in proportion*	*Disc*		*Chi-square test of change in proportion*
Audit Firm Type		*Pre*	*Post*	*T-statistic*	*Pre*	*Post*	*T-statistic*	*Pre*	*Post*	*T-statistic*	*Pre*	*Post*	*T-statistic*
Large	n	256	54	18.58***	24	22	1.95	43	7	14.68***	3	2	0.00
	%	50%	31%		13%	20%		73%	28%		13%	13%	
Small	n	259	121	18.96***	146	87	0.82	16	18	14.68***	20	13	0.24
	%	50%	69%		82%	78%		27%	72%		87%	81%	
Unknown	n	0	0		8	3	0.62	0	0		0	1	1.48
	%	0%	0%		4%	3%		0%	0%		0%	6%	
Total	n	515	175		178	112		59	25		23	16	
	%	100%	100%		100%	100%		100%	100%		100%	100%	
Out of Small:													
Clean	n	5	13	21.49***	5	20	19.76***	1	2	2.03	1	3	2.13
	%	2%	11%		3%	23%		6%	11%		5%	23%	
Deficient	n	24	44	61.85***	22	27	6.76***	3	4	2.74	1	4	3.60*
	%	9%	36%		15%	31%		19%	22%		5%	31%	
Not inspected	n	230	64	3.42*	119	40	26.92***	12	12	6.58**	18	6	6.62**
	%	89%	53%		82%	46%		75%	67%		90%	46%	

(This table is continued on the next page)

TABLE 4.4 (Continued)

Notes: This table displays frequencies and percentages of new clients (New) switching from (1) large (annually inspected) audit firms, (2) clean small (third-tier) audit firms, (3) deficient small audit firms, (4) not yet inspected small audit firms, and (5) unknown predecessor audit firms, respectively. It further displays frequencies and percentages of discontinued clients (Disc) leaving to (1) large audit firms, (2) clean small audit firms, (3) deficient small audit firms, (4) not yet inspected small audit firms, and (5) unknown successor audit firms. **Panel A** displays the respective frequencies by financial year. **Panel B** provides a display by clean and deficient current audit firms and pre- and post-inspection report date periods, respectively.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels, respectively.

Panel B displays predecessor and successor categories for clean and deficient audit firms by pre- and post-inspection period. Again, there is clear evidence for growth in portfolios of clean and deficient audit firms as the number of newly accepted clients exceeds the number of discontinued clients. Both clean and deficient audit firms are associated with a significant decrease in the fraction of newly accepted clients switching from large audit firms in the post-inspection period (from 50% to 31% and from 73% to 28%, respectively). The decrease is even stronger for clean firms, thus clients of deficient large audit firms do not seem to be switching away in search of an audit firm with a clean inspection report.

At the same time, for both deficient and clean audit firms, the fraction of newly accepted clients from clean audit firms increases (from 2% to 11% and from 6% to 11%) proportionately more than the fraction of clients from deficient audit firms (from 9% to 36% and from 19% to 22%). Hence, clients do not seem to systematically avoid audit firms with deficient inspection reports.[43] Further, there is no significant difference in the proportion of deficient firms' discontinued clients switching to large or small audit firms, providing no indication for client-initiated switches in search for audit firms with clean inspection result (which are all small audit firms) as reaction to deficient inspection reports. Hence, the relative frequencies suggest that

[43] An additional analysis of audit fee changes associated with auditor switches similar to the test of the hypotheses using $CHAR_v$ reveals that newly accepted clients at clean (deficient) audit firms do no consistently pay a higher (lower) fee than they did at their previous auditor and thus there is no evidence for a fee premium (reduction) for perceived higher (lower) quality. Hence, in line with the conclusions derived from Table 4.3, the results are inconsistent with client-demand driven fee patterns or client demand being the main driver of switching behaviour after the inspection.

auditor changes are not predominantly driven by clients' desire for audit firms with a clean inspection result.

Table 4.5 provides information about pre- and post-inspection differences in the characteristics of newly accepted, continuing, and discontinued clients. Mean characteristics by client group are calculated for the pre- and post-inspection periods. Clean audit firms' newly accepted clients are significantly smaller, more leveraged, have less cash and are less likely within the audit firm's area of industry specialization. As continuing clients of clean audit firms do not display similar changes or rather do so in the opposite direction, it is likely that changes are driven by audit firm specific portfolio management decisions rather than changes in underlying economic factors. There is no significant difference in risk characteristics of deficient audit firms' newly accepted clients between the pre- and post- inspection periods. Similarly, clean audit firms' discontinued clients do not differ significantly on any of the client characteristics between pre- and post- inspection periods. Deficient audit firms' discontinued clients are less leveraged post-inspection, however.

Overall, conclusions from this first comparison of client-characteristics do not provide much evidence for a change in deficient audit firms' client portfolio management decisions in response to the inspection, at least not to the degree that the characteristics of newly accepted or discontinued clients change considerably in response to the inspection. Clean audit firms, on the other hand, seem to be associated with a change in client-acceptance decisions, as they accept smaller but more risky clients post-inspection. However, it needs to be kept in mind that a comparison of all newly accepted or discontinued clients over time irrespective of the audit firm's portfolio provides a less powerful test of the individual audit firm's portfolio management decisions than the design used to test hypothesis one and two. For that reason, I proceed with discussing the results of the hypotheses tests.

4.4.2 Tests of hypotheses

Table 4.6 displays regression results on a dataset of 73 audit firm portfolio years used to test the two hypotheses. The coefficient on POST indicates to what extent the difference between deficient audit firms' discontinued and new clients changes in the post-inspection period.

TABLE 4.5 Comparison of mean client characteristics by switch category, inspection result, and pre- and post- inspection period

	New clients						*Continuing clients*						*Discontinued clients*					
	Clean			*Def*			*Clean*			*Def*			*Clean*			*Def*		
	Pre	*Post*	*Diff*	*Pre*	*Post*	*Diff*	*Pre*	*Post*	*Diff*	*Pre*	*Post*	*Diff*	*Pre*	*Post*	*Diff*	*Pre*	*Post*	*Diff*
LOGASSETS	16.57	15.74	*	15.77	15.97		15.39	16.10	***	15.60	16.03	***	15.78	15.45		15.53	15.85	
DISACCABS	0.54	0.72		0.75	0.77		0.59	0.56		0.71	0.67		0.74	0.70		0.89	0.72	
INVREC	0.22	0.31		0.28	0.27		0.27	0.26		0.26	0.25		0.21	0.27		0.26	0.25	
ROA	-0.32	-1.03		-1.02	-1.16		-0.86	-0.67		-1.00	-0.98		-1.15	-0.80		-1.31	-1.12	
LEVERAGE	0.23	1.14	**	0.66	0.80		0.76	0.43	***	0.72	0.64		0.80	0.52		0.88	0.57	**
CASH	0.31	0.19	*	0.22	0.22		0.24	0.24		0.22	0.22		0.36	0.22		0.19	0.19	
ISPECIALIST	0.80	0.56	**	0.49	0.51		0.70	0.70		0.50	0.50		0.65	0.88		0.50	0.56	
n	59	25		516	175		204	260		1586	1119		23	16		178	112	

Notes: This table compares mean characteristics of new, continuing, and discontinued clients pre- and post-inspection for clean and deficient audit firms, respectively. In this setting, client financial year-ends later (earlier) than the inspection report date are defined as post (pre). The column Diff indicates the significance level of the difference between the means of the respective pre- and post-observations. Variables are defined as follows: LOGASSETS is the natural logarithm of total assets. DISACCABS are absolute discretionary accruals. INVREC is the fraction of total assets represented by inventories and receivables. ROA is return on assets measured as net income divided by average total assets. LEVERAGE is the ratio of short- and long-term debt to total assets. CASH is the fraction of assets composed of cash. ISPECIALIST is an indicator variable that indicates whether the client is audited by an industry specialist. 51 clients fall into both the New clients and Discontinued clients categories as they are only audited by the audit firm for one year.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels, respectively.

TABLE 4.6 Mean differences between newly accepted and discontinued clients at the audit firm year-level

	ASSETS_ DEV	*ABSDISACC_ DEV*	*INVREC_ DEV*	*ROA_ DEV*	*LEVERAGE_ DEV*	*CASH_ DEV*	*ISPECIALIST_ DEV*
Intercept	0.807	-0.132	-0.015	0.546	-0.357	0.029	0.045
	(2.84)***	(-0.83)	(-0.32)	(2.02)**	(-1.75)*	(0.60)	(0.46)
POST	-1.216	0.562	0.026	-1.159	0.687	0.052	-0.229
	(-2.45)**	(2.11)**	(0.34)	(-2.65)***	(2.23)**	(0.82)	(-1.60)
CLEAN	1.206	-0.455	0.010	2.026	-0.105	-0.156	0.560
	(1.30)	(-1.07)	(0.12)	(1.58)	(-0.23)	(-0.80)	(2.62)**
POSTxCLEAN	-3.068	0.640	-0.271	-3.639	2.171	0.345	-1.375
	(-1.69)*	(0.80)	(-2.56)**	(-1.99)*	(1.28)	(1.20)	(-5.78)***
R-squared	0.160	0.092	0.021	0.204	0.154	0.047	0.163
Number of observations	73	73	73	73	73	73	73

Notes: This table displays the results of regressions of audit firm year-specific mean differences between new and discontinued clients on indicators for financial years after the inspection report date (POST), audit firms with clean inspection reports (CLEAN) and an interaction of the two (POSTxCLEAN). POST is defined based on the audit firm portfolio year such that years after the year of the inspection report are categorized as post. Differences are calculated such that more positive (negative) differences indicate higher (lower) values of new compared to discontinued clients. ASSETS_DEV is calculated by subtracting the mean of LOGASSETS of discontinued clients out of the firm's prior year portfolio from the mean of LOGASSETS of the newly accepted clients within of the audit firm's current year portfolio. ABSDISACC_DEV, INVREC_DEV, ROA_DEV, LEVERAGE_DEV, CASH_DEV, and ISPECIALIST_DEV are calculated in the same way based on the mean of ABSDISACC, INVREC, ROA, LEVERAGE, CASH, and ISPECIALIST, respectively. T-values are provided in brackets underneath.
*, **, *** Significant at the 0.10, 0.05, 0.01 levels, respectively.

A positive (negative) coefficient on POST indicates that newly accepted clients score higher (lower) on the respective characteristic compared to discontinued clients in the post-inspection period relative to the pre-inspection period, irrespective of whether discontinued clients scored higher or lower than continued clients prior to the inspection.

The coefficient on POST is significant for ASSETS_DEV (-1.216 $p<0.05$), ABSDISACC_DEV (0.562, $p<0.05$), ROA_DEV (-1.159, $p<0.1$), and LEVERAGE_DEV (0.687, $p<0.05$). Hence, audit firms' portfolios display increasing client financial risk in terms of less profitable and more leveraged clients, and changed audit riskiness in terms of smaller clients with more extreme discretionary accruals following the inspection. The interaction term POSTxCLEAN is significant for ASSETS_DEV (-3.068, $p<0.1$) and INVREC_DEV (-0.271, $p<0.05$), where the coefficient is opposite to expectations, and for ROA_DEV (-3.639, $p<0.1$), where the coefficient is in line with expectations. Hence, there is only very limited evidence that deficient audit firms' portfolio management decisions reduce portfolio riskiness to a stronger degree than clean audit firms' portfolio management decisions. If they do, they only focus on a single portfolio financial risk characteristic, client profitability, while the portfolios get more risky in terms of audit risk. Consequently, based on the aggregate results, there is no convincing support for the first hypothesis.

With regard to industry specialization, CLEAN obtains a significantly positive coefficient (0.560, $p<0.05$) and the interaction term POSTxCLEAN attains a significant negative coefficient (-1.375, $p<0.01$). While prior to the inspection, a larger fraction of clean audit firms' newly accepted clients lies within the firm's area of industry specialization as compared to the discontinued clients, this effect reverses after the inspection. Thus, after the inspection, deficient audit firms' portfolios get more specialized relative to clean audit firms' portfolios as deficient firms focus on the portfolio share of clients within their area of industry specialization. Thus, a change in audit firms' portfolio management strategies is observable in response to the inspection which provides support for hypothesis two.

Table 4.7 displays results of the alternative hypotheses tests that consider client acceptance and discontinuance decisions separately and thereby makes use of a more extensive part of the sample. Panel A shows the results for the subset of all 772 newly accepted client observations. According to the significant coefficients on CLEAN for the dependent variables HIGH_ROA

(0.866, $p<0.01$) and HIGH_CASH (0.508, $p<0.1$), the degree to which clean audit firms' new clients are less risky than the existing portfolio is higher for clean than for deficient firms prior to the inspection. The significant interaction term for HIGH_ROA (-1.141, $p<0.05$) together with the odds ratios further shows that after the inspection, clean audit firms' clients are less profitable relative to the existing client base than before the inspection, while the opposite holds for deficient audit firms. Hence, using profitability as measure of risk, there is support for the first hypothesis. However, given the lack of significant results regarding the remaining measures of risk, this result needs to be interpreted with caution.

The regression with the dependent variable ISPECIALIST has a significant coefficient for CLEAN (1.254, $p<0.01$) and for the interaction term POSTxCLEAN (-1.144, $p<0.05$). The control variable NCLIENTS has a statistically significant coefficient (-0.016, $p<0.05$) and an odds ratio below one, indicating that the likelihood for a new client to be within the audit firm's area of industry specialization decreases with the audit firm's portfolio size. Hence, it appears that newly accepted clients of firms with larger portfolios are less likely to be within the audit firm's area of specialization. The odds ratios show that new clients of clean audit firms are less likely to be within the auditor's area of industry specialization after the inspection, while the opposite holds for deficient audit firms. Clean and deficient audit firms display significantly different behaviour with regard to portfolio specialization in response to the inspection, which provides evidence in support of hypothesis two.

Panel B displays results for the 329 discontinued client observations. POST has a significant coefficient with HIGH_ASSETS (0.676, $p<0.01$) and HIGH_ROA (0.468, $p<0.1$), indicating that discontinued clients are larger and more profitable relative to the existing client portfolio after the inspection. Also, discontinued clients of clean audit firms have more cash relative to the existing client portfolio. NCLIENTS is again associated with a significantly negative coefficient (-0.016, $p<0.1$) and a negative odds ratio, indicating that discontinued clients are less likely to be within the audit firm's area of specialization the larger the audit firm's portfolio.

TABLE 4.7 Analysis of new and discontinued clients

Panel A: Logistic regression model with new clients

	HIGH_ ASSETS	*HIGH_ ABSDISACC*	*HIGH_ INVREC*	*HIGH_ ROA*	*HIGH_ LEVERAGE*	*HIGH_ CASH*	*ISPECIALIST*
Coefficients:							
Intercept	0.346	0.203	0.378	0.179	0.140	0.282	0.157
	(14.92)***	(5.24)**	(17.72)***	(4.11)**	(2.52)	(10.02)***	(1.42)
POST	-0.174	-0.077	-0.160	0.015	0.194	-0.041	0.046
	(0.97)	(0.19)	(0.82)	(0.01)	(1.20)	(0.05)	(0.07)
CLEAN	0.453	0.145	0.420	0.874	0.137	0.516	1.254
	(2.31)	(0.27)	(1.99)	(7.81)***	(0.24)	(3.01)*	(13.46)***
POSTxCLEAN	-0.219	0.673	0.306	-1.149	0.914	-0.352	-1.144
	(0.17)	(1.51)	(0.30)	(4.69)**	(2.38)	(0.45)	(4.38)**
NCLIENTS							-0.016
							(3.69)*
AIC	1052	1063	1044	1058	1060	1056	1055
Number of observations	772	772	772	772	772	772	772
Odds ratios:							
POST at CLEAN=0	0.840	0.955	0.852	1.008	1.214	0.952	1.047
POST at CLEAN=1	0.675	1.814	1.157	0.322	2.399	0.675	0.334
CLEAN at POST=0	1.572	1.165	1.523	2.377	1.147	1.663	3.504
CLEAN at POST=1	1.263	2.214	2.067	0.760	2.266	1.179	1.116
NCLIENTS							0.984

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TABLE 4.7 (Continued)

Panel B: Logistic regression model with discontinued clients

	HIGH_ ASSETS	*HIGH_ ABSDISACC*	*HIGH_ INVREC*	*HIGH_ ROA*	*HIGH_ LEVERAGE*	*HIGH_ CASH*	*ISPECIALIST*
Coefficients:							
Intercept	-0.203	0.457	0.434	-0.180	0.626	0.022	0.722
	(1.81)	(8.83)***	(7.99)***	(1.43)	(15.86)***	(0.02)	(11.31)***
POST	0.676	-0.096	-0.036	0.468	-0.265	0.339	0.155
	(7.56)***	(0.15)	(0.02)	(3.70)*	(1.14)	(1.93)	(0.37)
CLEAN	0.465	0.171	-0.171	0.093	-0.185	1.019	0.199
	(1.08)	(0.14)	(0.15)	(0.04)	(0.16)	(4.19)**	(0.18)
POSTxCLEAN	1.008	0.566	1.240	0.407	1.290	-0.592	1.058
	(1.26)	(0.55)	(2.37)	(0.32)	(2.54)	(0.61)	(1.35)
NCLIENTS							-0.063
							(22.38)***
Likelihood ratio	446	446	445	458	436	453	427
Number of observations	329	329	329	329	329	329	329
Odds ratios:							
POST at CLEAN=0	1.966	0.908	0.965	1.597	0.767	1.403	1.167
POST at CLEAN=1	5.385	1.6	3.333	2.399	2.786	0.776	3.361
CLEAN at POST=0	1.592	1.187	0.843	1.098	0.831	2.770	1.221
CLEAN at POST=1	4.362	2.091	2.910	1.650	3.020	1.533	3.515
NCLIENTS							0.939

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TABLE 4.7 (Continued)

Notes: Panel A displays results of logistic regressions that predict the likelihood that a new client lies above the median of the audit firm's portfolio with respect to a certain characteristic based on pre- and post-inspection period (POST) and the auditor's inspection result (CLEAN). **Panel B** displays results of similar regressions using discontinued clients. The variable HIGH_ASSETS identifies clients that have more assets and are thus more risky than the median client in the audit firm's current year portfolio. Similarly, HIGH_ABSDISACC, HIGH_INVREC, HIGH_ROA, HIGH_LEVERAGE, and HIGH_CASH identify clients that score higher than the median client in the audit firm's current year portfolio on the variable ABSDISACC, INVREC, ROA, LEVERAGE, and CASH, respectively. ISPECIALIST indicates whether the audit firm is a specialist in the client's industry. NCLIENTS is a measure of the number of clients within an audit firm's portfolio and controls for the association between the likelihood of industry specialization and portfolio size. The table contains T-values in brackets underneath.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels, respectively

As no interaction term on any of the risk measures or on the ISPECIALIST variable obtains a significant coefficient, audit firms' client discontinuance decisions provide no evidence in support of hypothesis one or two.[44]

Since hypothesis two is supported only for newly accepted but not for discontinued clients, it appears that audit firms achieve portfolio adjustments in response to inspections mainly via their client acceptance decisions. Hence, audit firms seem reluctant to disrupt established client-relationships and prefer to be more critical in the selection of newly accepted clients. Also, established clients might be more willing to accept a fee raise that covers additional effort and thus reduces risk for the audit firm because they want to avoid switching cost.

Table 4.8 shows the quantile regressions used to examine changes in the tails of the distribution of audit firm year portfolio characteristics. Panels A to F list the results for portfolio means of the risk variables (ASSETS_P, ABSDISACC_P, INVREC_P, ROA_P, LEVERAGE_P, CASH_P) and Panel G lists the result for the portfolio industry concentration measure (ICONC_P). For reasons of brevity, I discuss the results of panel A to F collectively with a focus on the coefficient on POSTxCLEAN. In panel E, only the 50^{th}, 90^{th}, and 95^{th} quantile regression results are displayed as a large number of observations has LEVERAGE_P equal to zero at the lower end of the distribution. With regards to ASSETS_P, INVREC_P, LEVERAGE_P, and CASH_P, the

[44] As similar results are obtained after exclusion of single-client portfolio audit firms, the lack of statistical significance is not caused by the number of single-client portfolio firms whose discontinued clients are by definition not different from the portfolio median.

absence of significant coefficients on POSTxCLEAN indicates no consistent pattern of change in the distribution of portfolio characteristics as a consequence of the inspection result.

Panel B shows that clean audit firms have portfolios with lower absolute discretionary accruals prior to the inspection as CLEAN obtains a significant negative coefficient for all quantiles. At the same time, the distribution of ABSDISACC_P gets more extreme after the inspection as seen by the negative coefficients on POST for the 10^{th} quantile (-0.053, $p<0.01$) and the positive coefficient for the 90^{th} quantile (0.560, $p<0.05$). The coefficient on POSTxCLEAN is significant at the regression of the 50^{th} quantile (0.163, $p<0.05$), indicating that the median of the ABSDISACC_P distribution is associated with a smaller decrease in riskiness for clean audit firms relative to deficient audit firms. Panel D shows the results for ROA_P. Again, clean audit firms have less risky portfolios with higher performing clients prior to the inspection as revealed by the significant coefficients on CLEAN (1.809, $p<0.05$; 1.519, $p<0.01$; 0.434, $p<0.01$). The significant coefficient on POSTxCLEAN (-0.219, $p<0.05$) for the regression of the 50^{th} quantile demonstrates that the median of the ROA_P portfolio distribution gets more risky for clean audit firms relative to deficient audit firms.

Panel G shows quantile regressions of ICONC_P. As the regressions for the 90^{th} and 95^{th} quantiles cannot be estimated due to a lack of variation, the table only displays results for the 5^{th}, 10^{th}, and 50^{th} quantile. The significant coefficients on CLEAN (0.135, $p<0.01$; 0.191, $p<0.01$; and 0.302, $p<0.01$) demonstrate that clean firms have more concentrated portfolios prior to the inspection. Also, the significant coefficients on POST (0.080, $p<0.05$; 0.249, $p<0.01$) for the 10^{th} and 50^{th} quantile indicate that portfolios got more concentrated in response to the inspection. Finally, the significant coefficient on POSTxCLEAN (-0.176, $p<0.01$) confirms that, at the median, deficient audit firms' portfolios were associated with a larger increase in industry concentration than clean audit firms' portfolios.

The quantile regressions provide limited evidence for a differential response to the inspection of clean and deficient audit firms based on the median of the distribution of audit firms' portfolio characteristics. The results point toward a change in portfolio riskiness in terms of clients with lower discretionary accruals and higher financial performance for deficient audit firms. However, these findings hold for only two out of the six risk measures.

TABLE 4.8 Quantile regressions of mean audit firm year portfolio characteristics

Panel A: Quantile regression model of ASSETS_P

	5%	*10%*	*50%*	*90%*	*95%*
Intercept	12.808	13.291	15.178	17.091	17.535
	(59.71)***	(85.45)***	(112.83)***	(132.33)***	(125.40)***
POST	0.003	-0.076	0.037	0.445	0.413
	(0.01)	(-0.31)	(0.19)	(2.25)**	(2.42)**
CLEAN	-0.708	-0.299	0.602	0.438	0.722
	(-1.81)*	(-0.76)	(2.95)***	(1.55)	(2.51)**
POST*CLEAN	-0.338	-0.556	-0.243	-0.207	-0.047
	(-0.64)	(-0.89)	(-0.83)	(-0.53)	(-0.12)
Y2005	0.689	0.532	0.338	0.169	0.042
	(1.47)	(2.18)**	(1.94)*	(0.68)	(0.21)
Y2006	0.273	0.388	0.513	0.266	0.070
	(0.71)	(1.21)	(2.57)**	(1.39)	(0.35)
Y2007	0.593	0.737	0.660	0.052	-0.055
	(1.12)	(1.96)*	(3.03)***	(0.23)	(-0.27)
Y2008	0.405	0.557	0.694	0.025	-0.064
	(0.62)	(1.61)	(2.32)**	(0.09)	(-0.21)
Y2009	-0.006	0.127	0.269	0.001	-0.281
	(-0.01)	(0.26)	(0.76)	(0.00)	(-0.80)
Number of observations	1137				

Panel B: Quantile regression model of ABSDISACC_P

	5%	*10%*	*50%*	*90%*	*95%*
Intercept	0.049	0.101	0.487	2.061	2.761
	(4.32)***	(6.90)***	(12.86)***	(10.60)***	(9.01)***
POST	-0.016	-0.053	-0.093	0.560	0.772
	(-0.68)	(-2.69)***	(-1.73)*	(2.09)**	(1.55)
CLEAN	-0.026	-0.063	-0.167	-0.854	-1.249
	(-1.93)*	(-3.66)***	(-3.83)***	(-4.19)***	(-2.52)**
POST*CLEAN	0.016	0.035	0.163	0.271	1.121
	(0.85)	(1.61)	(2.48)**	(0.77)	(1.19)
Y2005	0.023	0.066	-0.014	-0.377	-0.388
	(1.01)	(2.32)**	(-0.29)	(-1.29)	(-0.51)
Y2006	0.025	0.050	-0.005	-0.370	-0.487
	(0.98)	(2.38)**	(-0.09)	(-1.30)	(-1.07)
Y2007	0.025	0.048	0.023	-0.536	-0.901
	(0.97)	(1.86)*	(0.37)	(-1.97)**	(-1.74)*
Y2008	0.000	0.017	-0.100	-0.645	-0.580
	(0.00)	(0.78)	(-1.33)	(-1.39)	(-0.59)
Y2009	0.029	0.031	0.200	-1.093	-1.690
	(0.93)	(0.80)	(1.55)	(-1.91)*	(-1.60)
Number of observations	1137				

(This table is continued on the next page)

TABLE 4.8 (Continued)

Panel C: Quantile regression model of INVREC_P

	5%	*10%*	*50%*	*90%*	*95%*
Intercept	0.010	0.034	0.261	0.567	0.667
	(2.54)**	(7.08)***	(21.92)***	(20.06)***	(22.92)***
POST	-0.004	-0.002	0.014	0.028	0.042
	(-0.90)	(-0.22)	(0.65)	(0.65)	(0.74)
CLEAN	-0.010	-0.028	-0.054	0.109	0.081
	(-2.71)***	(-5.75)***	(-1.70)*	(2.62)***	(2.30)**
POST*CLEAN	0.006	0.002	0.021	0.016	-0.013
	(1.37)	(0.25)	(0.46)	(0.30)	(-0.22)
Y2005	-0.002	-0.005	-0.006	-0.031	-0.015
	(-0.45)	(-0.75)	(-0.30)	(-0.73)	(-0.30)
Y2006	-0.003	-0.005	-0.003	-0.033	-0.068
	(-0.74)	(-0.52)	(-0.17)	(-0.69)	(-1.44)
Y2007	-0.002	-0.004	-0.028	-0.094	-0.059
	(-0.47)	(-0.43)	(-1.14)	(-1.38)	(-0.88)
Y2008	-0.002	0.015	-0.041	-0.133	-0.068
	(-0.36)	(1.03)	(-1.45)	(-2.48)**	(-0.78)
Y2009	-0.002	0.002	-0.065	-0.138	-0.177
	(-0.32)	(0.20)	(-1.87)*	(-2.01)**	(-2.09)**
Number of observations	1137				

Panel D: Quantile regression model of ROA_P

	5%	*10%*	*50%*	*90%*	*95%*
Intercept	-4.516	-3.450	-0.536	0.073	0.118
	(-8.53)***	(-13.03)***	(-9.80)***	(5.30)***	(6.05)***
POST	-0.777	-0.537	0.067	0.010	0.037
	(-1.19)	(-1.17)	(0.70)	(0.36)	(1.08)
CLEAN	1.809	1.519	0.434	0.028	0.023
	(2.08)**	(3.99)***	(7.23)***	(1.40)	(0.92)
POST*CLEAN	-0.814	-0.504	-0.219	0.026	0.015
	(-0.62)	(-0.87)	(-2.15)**	(0.70)	(0.41)
Y2005	0.653	0.572	0.046	-0.013	-0.024
	(0.68)	(1.19)	(0.57)	(-0.59)	(-0.77)
Y2006	0.794	0.888	0.024	-0.011	-0.010
	(1.02)	(2.14)**	(0.26)	(-0.47)	(-0.30)
Y2007	1.514	0.985	0.010	-0.025	-0.045
	(2.01)**	(2.30)**	(0.10)	(-0.75)	(-1.03)
Y2008	-1.016	0.666	-0.025	-0.076	-0.068
	(-0.71)	(0.69)	(-0.20)	(-2.10)**	(-1.08)
Y2009	1.675	1.114	-0.073	-0.112	-0.051
	(1.30)	(1.90)*	(-0.38)	(-1.50)	(-0.55)
Number of observations	1137				

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TABLE 4.8 (Continued)

Panel E: Quantile regression model of LEVERAGE_P

		50%	*90%*	*95%*
Intercept		0.425	2.092	3.192
		(10.70)***	(9.06)***	(6.52)***
POST		-0.025	0.448	0.252
		(-0.44)	(1.35)	(0.53)
CLEAN		-0.168	-0.444	0.424
		(-3.39)***	(-1.08)	(0.44)
POST*CLEAN		0.042	-0.529	-1.287
		(0.63)	(-0.98)	(-1.10)
Y2005		-0.043	-0.241	-0.805
		(-0.76)	(-0.71)	(-1.26)
Y2006		-0.084	-0.141	-0.117
		(-1.42)	(-0.35)	(-0.15)
Y2007		-0.075	-0.356	-0.696
		(-1.06)	(-0.95)	(-0.95)
Y2008		-0.073	-0.457	-0.789
		(-1.01)	(-1.14)	(-0.99)
Y2009		-0.050	-0.273	-0.025
		(-0.56)	(-0.37)	(-0.02)
Number of observations	1137			

Panel F: Quantile regression model of CASH_P

	5%	*10%*	*50%*	*90%*	*95%*
Intercept	0.004	0.015	0.144	0.379	0.525
	(1.98)**	(3.33)***	(12.80)***	(11.75)***	(12.16)***
POST	-0.002	-0.004	-0.077	-0.054	-0.032
	(-0.60)	(-0.66)	(-3.38)***	(-0.91)	(-0.54)
CLEAN	0.001	0.002	0.018	0.342	0.266
	(0.47)	(0.29)	(0.71)	(3.74)***	(5.88)***
POST*CLEAN	-0.003	-0.007	0.006	-0.083	0.031
	(-0.76)	(-0.69)	(0.17)	(-0.70)	(0.48)
Y2005	-0.001	-0.004	0.030	0.037	0.050
	(-0.33)	(-0.52)	(1.42)	(0.75)	(0.65)
Y2006	0.004	0.004	0.062	0.120	0.068
	(0.98)	(0.43)	(3.22)***	(1.92)*	(1.11)
Y2007	0.008	0.009	0.069	0.129	0.068
	(1.64)	(0.98)	(2.40)**	(1.79)*	(1.05)
Y2008	0.003	0.004	0.098	0.134	0.054
	(0.73)	(0.34)	(3.76)***	(1.80)*	(0.92)
Y2009	0.000	0.005	0.098	0.122	0.069
	(-0.02)	(0.46)	(2.01)**	(1.20)	(0.72)
Number of observations	1137				

(This table is continued on the next page)

TABLE 4.8 (Continued)

Panel G: Quantile regression model of ICONC_P

	5%	*10%*	*50%*
Intercept	0.143	0.310	0.698
	(9.23)***	(13.27)***	(24.63)***
POST	0.028	0.080	0.249
	(1.00)	(2.08)**	(6.23)***
CLEAN	0.135	0.191	0.302
	(5.25)***	(4.62)***	(9.84)***
POST*CLEAN	0.015	-0.019	-0.176
	(0.43)	(-0.34)	(-4.39)***
Y2005	-0.017	-0.074	-0.073
	(-0.64)	(-1.99)**	(-2.12)**
Y2006	-0.047	-0.111	-0.073
	(-1.59)	(-2.93)***	(-1.83)*
Y2007	-0.014	-0.138	-0.105
	(-0.43)	(-2.80)***	(-2.41)**
Y2008	-0.036	-0.125	-0.310
	(-0.79)	(-2.43)**	(-4.65)***
Y2009	-0.014	-0.145	-0.386
	(-0.15)	(-2.50)**	(-4.13)***
Number of observations	1137		

Notes: This table provides results of quantile regressions of the distribution of audit firm year portfolio means. The 5th, 10th, 50th, 90th and 95th quantiles of the distribution are predicted based on indicators for post-inspection period (POST), indicators for clean inspection reports (CLEAN), an interaction term (POSTxCLEAN), and fixed year effects. Portfolio riskiness is measured by audit firm year portfolio means of the natural logarithm of total assets (ASSETS_P), absolute discretionary accruals (ABSDISACC_P), inventory and receivables as fraction of total assets (INVREC_P), return on assets (ROA_P), leverage (LEVERAGE_P), and cash as fraction of total assets (CASH_P). Portfolio industry concentration ICONC_P is measured as the Herfindahl ratio based on clients' total assets. T-values are listed in brackets underneath the coefficients.
*,**,*** Significant at the 0.10, 0.05, 0.01 levels, respectively..

There is no evidence for variations in the tails of the distribution of portfolio riskiness depending on the inspection result. In line with the results of the previous tests of hypothesis two, there is evidence that deficient audit firms focus their portfolios more on clients within their area of industry specialization relative to clean audit firms. Again, this effect is observable predominantly based on the median regression. Thus, there is no indication for an effect that occurs specifically in the tails of the distribution of portfolio characteristics.

Overall, there is very limited evidence for a decrease in portfolio riskiness of deficient audit firms in response to the inspection. With regard to client financial risk, the results suggest consistently that deficient audit firms reduce their portfolio riskiness relative to clean audit firms by accepting more profitable clients after the inspection. Instead of adjustments in portfolio riskiness with respect to audit risk, however, a focus on its areas of expertise appears to be the audit firms' preferred response to the inspection. The results of the three different tests consistently demonstrate a post-inspection increase in deficient firms' portfolio industry concentration relative to clean audit firms. The effect becomes apparent in client acceptance decisions but not in client continuance decisions. This rules out the alternative explanation that audit firms get rid of the clients where deficiencies were found which are more likely to be outside the auditor's area of specialization.

4.4.3 Sensitivity tests

In this section, I check the sensitivity of the results to certain assumptions and to a number of alternative specifications. First, I address the assumption that auditor resignations and client dismissals are not clearly distinguishable, which implies that they can be combined into a single group of discontinued clients. Results for the discontinued clients in Table 4.5 are qualitatively unchanged when investigating auditor resignations or client dismissals separately for deficient audit firms. For clean audit firms, resigning clients are smaller post-inspection and dismissed clients have less cash and debt as percentage of assets post-inspection, however, the small number of observations in the respective categories (6 and 5 and 17 and 11), keeps me from basing conclusions on these results.

Given the already small number of observations in Table 4.6, I do not pursue separate tests for resignations or dismissals versus newly accepted clients that would result in even smaller datasets. Instead I focus on the results in Table 4.7 and create Panel B for resignations and dismissals separately. Certain coefficients that were significant in the main analysis keep the same sign but do not quite reach the same level of significance, presumably due to the lower number of observations in the test. As the interaction term is not significant in any of the regressions, the conclusions regarding hypotheses one and two are unchanged. Overall, no significant different pattern of auditor resignations and client dismissals is evident confirming the decision to combine them into a single group of discontinued clients.

I further repeat all hypotheses tests with a measure of industry specialization based on the number of clients rather than total assets of clients. The results in Tables 4.6 and 4.7 are robust to the alternative specification. The results are also robust to defining an auditor as industry specialist when the auditor's portfolio industry share is at least 1/n, 10 percent larger, or 30 percent larger than 1/n. Adjusting the cut-off level for the audit firm's portfolio industry share and overall industry share to 15 and 25 percent leads to similar, though somewhat less significant results. I also estimate the quantile regressions in Table 4.8 using the Herfindahl index based on the number of clients as measure of portfolio concentration. The results are similar with the only difference that the interaction term is not significant in the regression of the 50^{th} quantile.

I further repeat the analysis based on an alternative specification of clean and deficient audit firms where an audit firm is considered deficient based on the presence or absence of engagement-specific deficiencies in part one of the inspection report. On the one hand, details about quality control deficiencies are not disclosed in the inspection report; on the other hand, quality control deficiencies are likely to affect the audit firm's clients in general rather than only specific client-engagements. For that reason, the audit firm might perceive a different level of auditor business risk from engagement-specific deficiencies in contrast to quality control deficiencies. Regarding the analysis shown in Table 4.6, the interaction term on all risk variables is insignificant, again providing no support for hypothesis one. A significant negative interaction term on ISPECIALIST_DEV, however, confirms prior results regarding hypothesis two.

A replication of Table 4.7 reveals that in Panel A with new clients, the interaction terms on HIGH_ROA and ISPECIALIST are not significant any longer, though still in the expected direction. Panel B with discontinued clients shows a significant positive interaction term on HIGH_ROA in line with expectations and a significant positive interaction term on HIGH_ASSETS and HIGH_LEVERAGE, in contrast to expectations. Again, this does not provide convincing evidence in support of hypothesis one. Results regarding hypothesis two are unchanged. Finally, a replication of Table 4.8 again does not provide consistent support for hypothesis one while results regarding hypothesis two are stable. Overall, the results are in line with the main analysis. In addition, engagement-specific deficiencies appear to have a stronger influence on client discontinuance rather than client acceptance

decisions. The results suggest that the definition of clean based on the quality control deficiencies provides a stronger measure of the risk faced by the audit firm.

4.5 Conclusion

This chapter shows that audit firms adjust their client portfolio management decisions in response to a deficient inspection result in a way to focus on clients in the audit firm's area of industry specialization. Contrary to prediction, however, deficient audit firms do not consistently respond to an increase in auditor business risk by reducing portfolio riskiness. Only an increase in the profitability of accepted clients is observable. There are two potential explanations for a lack of findings. Either, audit firms do not incorporate audit firm business risk in client acceptance and continuance decisions and findings of prior studies on the impact of auditor business risk on client acceptance and discontinuance decisions have been driven by client-related risks correlated with audit risk or audit firm specific aspects. Alternatively, the risk of a deficient inspection report might not be sufficiently high to warrant an adjustment of client portfolio riskiness in addition to a focus on client profitability and industry expertise. Also, a general increase in the riskiness of small audit firms' client portfolios is not apparent from the results. And there is no evidence that deficient audit firms are forced to handle especially risky client portfolios as a result of less risky clients' preferences for clean audit firms.

The results are subject to the limitation that the utilized portfolio measures are based on public clients, only. However, as non-public clients are outside the focus of the PCAOB's inspection activity, the increase in auditor business risk is mainly associated with public clients. Hence, the audit firms' response should also predominantly show in client acceptance and discontinuance decisions of public clients. Further, the portfolios may be incomplete due to the lack of data on certain financial measures for specific clients. However, there is no reason to expect that the likelihood of data availability differs for clean or deficient audit firms prior to and after the inspection.

The results indicate that reputation effects of the inspection report seem to be limited as no clear pattern of client switches is observable within the audit market. Hence, the pressure created by PCAOB inspections is carried out mainly via the threat of regulatory penalties and sanctions. This underlines the

importance of enforcement mechanisms in addition to rules and regulations to make sure that the intended effects are achieved. The findings are further consistent with audit firms using industry expertise as risk management strategy. Audit firms even seem to prefer the use of industry expertise in contrast to reductions in portfolio riskiness as strategy to manage changes in auditor business risk. As industry specialist auditors are found to provide higher quality, the changes in audit firms' portfolios are likely to be associated with an improvement of audit quality relative to clean audit firms. Further, even though especially deficient audit firms do not consistently reduce portfolio riskiness, they are also not confronted with a significantly more risky client base. Hence, there appears to be no need for concern about risk accumulation at smaller audit firms.

5

CONCLUSION

5.1 Summary of results and implications

The dissertation sheds new light on various consequences of public oversight of the audit profession. More specifically, the dissertation adds to the literature on the costs and benefits of independent inspections of audit firms at a time when review systems are established and refined across the world. I address the consequences from the perspective of two affected parties: on the hand, the investor, who should be the ultimate beneficiary of the inspection process, and on the other hand, the audit firm, which is forced to put up with the inspection and experiences a direct impact on its day-to-day operations. The results contribute to academic theory and have important implications for policy makers both in the US as well as in other countries that are concerned with overseeing the audit profession.

Results of chapter two indicate that inspection reports issued by the PCAOB provide meaningful information about audit quality to investors. Even though not all clean (deficient) inspection reports contain by definition positive (negative) news to the investor, they still contain useful information about audit quality that causes a market reaction. As investors rely on the

information disclosed in the inspection reports, this suggests that investors, on average, do not impeach the credibility of inspector's judgments. Also, an observable investor reaction to inspection reports suggests hope that the inspection process is effective in affecting investor confidence in the audit and in financial markets. Chapter two further shows that the market reaction to the publication of the inspection report can be attributed to revisions in investor beliefs regarding the quality of accounting information. This clearly underlines the auditor's function as protector of information quality rather than as insurance mechanism. As the results confirm that the audit is value-relevant and that shareholders care about signals of audit quality, it is particularly worrisome that most countries other than the US do not disclose separate inspection results for each audit firm.

It further appears important that the inspection result is provided to the market as timely as possible, as the magnitude of the absolute market response is significantly associated with publication delay. In particular, concerning the PCAOB, a reduction in the median publication delay of currently more than half a year clearly appears possible. Since the informativeness of the inspection reports is specifically related to details of the report such as stated GAAP-related deficiencies, it is worth considering to what extent the PCAOB inspection report can be further improved by disclosing additional information.

At the same time, the results show that investors need benchmarks and familiarity with a new type of information disclosure to be able to interpret the information provided. Hence, future attempts to investigate the usefulness of audit firm-specific inspection reports or of pieces of information revealed by them need to allow an adequate period of time before a proper conclusion can be reached. Evidently, some time is needed before investors are sufficiently familiar with the content and a sufficient number of benchmarks are available such that the full benefits of disclosure can be reached.

To achieve the intended beneficial effect on investor confidence in the audit, however, not only the inspection reports matter, but also any changes of the actual audit process. According to chapter three, the design of the established US inspection system provides sufficient incentives for audit firms to adjust their behaviour. The results are consistent with an increase in effort in response to detected deficiencies. The increase in effort is reflected in an increase in audit fees, yet another cost of the new inspection system that needs to be kept in mind for an overall cost-benefit analysis. Observed cross-sectional differences in fee adjustments are related to the degree of pre-

inspection fee pressure and thus confirm that the extent of effort adjustments is larger in settings associated with a higher likelihood that audit quality has been compromised prior to the inspection.

Chapter four provides additional insights regarding the inspections' impact on audit firms. I find that deficient audit firms adjust their client portfolio management decisions in a way to focus on clients in the audit firm's area of industry specialization. The findings are consistent with industry expertise being used as risk management strategy. Portfolio adjustments seem to be made preferably via client acceptance decisions rather than client discontinuance decisions. Since there is no evidence for a consistent decrease in portfolio riskiness in response to a deficient inspection result, it appears that the increase in business risk faced by the audit firm can be fully addressed by increases in remunerated auditor effort and auditor expertise.

Even though chapter two shows that clients might be pressured by investors' reaction to low information quality towards better quality auditors, chapter four reveals that client demand effects are not sufficiently strong to cause a noticeable flight of clients to clean audit firms. Hence, it appears that audit firms are incentivized to fix deficiencies mainly because of the threat of regulatory penalties and sanctions. This underlines the importance of enforcement mechanisms in addition to rules and regulations to make sure that the intended effects are achieved. Also, in chapter four, I find neither that deficient audit firms handle especially risky client portfolios as a result of the deficient inspection report, nor that the client portfolios of small audit firms get more risky in general. Hence, there appears to be no need for concern about risk accumulation at smaller audit firms.

The findings of this dissertation can be useful to regulators and oversight bodies in setting guidelines regarding the future development or establishment of auditor review systems. For example, the European Union is considering reinforcing current rules with a particular emphasis on full independence of the member states' public oversight systems from the audit profession (European Commission 2010). In that context, it is important to know that in several European countries, a number of publicly listed clients are still inspected solely by professional accountancy bodies under the supervision of the respective oversight body. At the same time, financing mechanisms are often not as clearly independent of the profession as the US's accounting support fees. Also, in the UK it is considered to extend the enforcement package of the Financial Services Authority to include censure, imposition of financial

penalties and disqualification of an audit firm similar to the enforcement powers of the PCAOB (Financial Services Authority and Financial Reporting Council 2010).

Overall, the results of the three studies indicate that the particular features of the US system appear successful in providing information about audit quality to investors and causing audit firms to adapt their behaviour. However, even though the independence of the PCAOB from the profession appears to be an important feature of the US public oversight system, it is not clear whether the intended consequences could not have been achieved by means of a different approach. Generally, more research is needed on this topic before any conclusions can be taken regarding the optimal design of an auditor oversight system. The following section describes a few avenues for future research that follow directly from this dissertation.

5.2 Future research

This dissertation draws attention to a number of interesting topics for future research. Even though the results of the three studies indicate that the particular features of the US system appear successful in providing signals of audit quality to investors and causing audit firms to adapt their behaviour, it is important also to evaluate the effectiveness of other countries' oversight systems that comprise different features. It might be possible to achieve the desired improvements in audit quality and investor confidence in a less costly way. Comparing the impact of various oversight systems with different features can help to obtain more insights regarding which of the features are more critical in achieving the desired benefits.

Better knowledge regarding the critical features of a public oversight system is an eligible step on the way to aligning the design features of public oversight systems across countries. This turns up to be particularly important given that mutual reliance on oversight systems is a widely discussed issue (e.g. European Commission 2010). In fact, while harmonization of public oversight systems across countries is important to achieve comparability of earnings information, it is also likely to ease agreements on mutual acceptance and reliance, which avoids the cost of plural inspections.

As chapter two shows that the information contained in the auditor-specific inspection reports is value-relevant, EU policy makers might be well

advised to consider broadening the disclosure of information about the inspection result of each audit firm. In particular, a more transparent reporting of inspection results might facilitate efforts to increase recognition of non-Big4 audit firms' capacities, yet another issue raised in the Green paper of the European Commission (2010). The fact that a considerable number of non-Big4 audit firms receive a clean inspection report in contrast to the Big4 firms creates the impression that at least some of the Big4 bias is attributable to perceptions rather than merit.

Also, to learn more about the role of the inspection report in causing investor and client reactions and hence pressuring audit firms to change their behaviour, future research may investigate the differential impact of disclosure of inspection results by comparing different regimes that disclose and do not disclose the inspection result to the public. In the UK, for example, inspection results for large audit firms are publicly disclosed since 2008. At the same time, future studies may address further information components to be added to the PCAOB inspection report to make it even more informative to the investor. For example, quality control deficiencies are likely to permeate throughout the whole audit firm and likely are relevant for all of an audit firm's clients. Hence, more timely disclosure of detailed descriptions of the quality control deficiencies detected might be useful to investors.

Results from chapter three suggest that the inspections cause audit firms to increase audit effort and conduct additional audit work. Nevertheless, this does not automatically imply that inspectors' and investors' views of costs and benefits of additional audit work are fully aligned. To what extent there exist differences between the two yet remains to be addressed by future research. Also, inspections may cause the audit to become more compliance or rules oriented, actually undermining the auditor's ability to exercise judgment in the event of unusual idiosyncratic risk.

In addition, future research may examine to what extent audit firms learn about inspector attitudes and likely inspection targets such that anticipation of the inspection approach and strictness causes detected deficiencies and necessary fee adjustments to decrease with an increasing number of inspection rounds.

APPENDIX: EXCERPTS FROM PCAOB INSPECTION REPORTS

Engagement-specific deficiency

Inspection report of Baum & Company, P.A. Issued January 30, 2009

"[…] The inspection procedures included a review of aspects of the Firm's auditing of financial statements of two issuers. The scope of this review was determined according to the Board's criteria, and the Firm was not allowed an opportunity to limit or influence the scope. The inspection team identified what it considered to be audit deficiencies. The deficiencies identified in one of the audits reviewed included deficiencies of such significance that it appeared to the inspection team that the Firm did not obtain sufficient competent evidential matter to support its opinion on the issuer's financial statements. […]"

Taken from: http://pcaobus.org/Inspections/Reports/Documents/2009_Baum.pdf

Quality control deficiency

Inspection report of Baum & Company, P.A. Issued January 30, 2009

"[…] In addition to evaluating the quality of the audit work performed on specific audits, the inspection included review of certain of the Firm's practices, policies, and procedures related to audit quality. This review addressed practices, policies, and procedures concerning audit performance, training, compliance with independence standards, client acceptance and retention, and the establishment of policies and procedures. As described above, any defects in, or criticisms of, the Firm's quality

control system are discussed in the nonpublic portion of this report and will remain nonpublic unless the Firm fails to address them to the Board's satisfaction within 12 months of the date of this report. […]"

Taken from: http://pcaobus.org/Inspections/Reports/Documents/2009_Baum.pdf

GAAP-related deficiency

Inspection report of Gaines & Company, Inc. Issued November 21, 2008

"[…] Those deficiencies were – (1) the Firm's failure to identify, or to address appropriately, a departure from GAAP that related to a potentially material misstatement in the audited financial statements concerning the use of the cost method to account for a majority-owned investment; and (2) the Firm's failure to identify, or to address appropriately, departures from GAAP that related to potentially material misstatements in the audited financial statements concerning the inappropriate classification of a debenture as a long-term liability and the non-accrual of interest expense related to the issuer's notes payable and debentures. […]"

Taken from: http://pcaobus.org/Inspections/Reports/Documents/2008_Gaines.pdf

Inspection report mentions associated restatement

Inspection report of Cordovano and Honeck, P.C. Issued April 6, 2006

"[…] Following inspection fieldwork and the inspection team's discussion with the firm of the matter identified above, an issuer restated its financial statements to address a GAAP departure identified by the inspection team. […]"

Taken from: http://pcaobus.org/Inspections/Reports/Documents/2006_Cordovano_and_Honeck.pdf

No deficiency

Inspection report of Frazier & Deeter, LLC. Issued March 20, 2008

"[…]This review did not identify any audit performance issues that, in the inspection team's view, resulted in the Firm failing to obtain sufficient competent evidential matter to support its opinion on the issuer's financial statements. […] The inspection team did not identify anything that it considered to be a quality control defect that warrants discussion in a Board inspection report. […]"

Taken from: http://pcaobus.org/Inspections/Reports/Documents/2008_Frazier_Deeter.pdf

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SUMMARY IN GERMAN (DEUTSCHE ZUSAMMENFASSUNG)

Die vorliegende Dissertation ermöglicht neue Einsichten bezüglich der wirtschaftlichen Konsequenzen der öffentlichen Aufsicht über Wirtschaftsprüfer. Insbesondere werden Reaktionen der Wirtschaftsprüfungsunternehmen sowie Reaktionen der Investoren von zu prüfenden börsengelisteten Unternehmen betrachtet. Aus der heutigen globalen Wirtschaftswelt sind Kapitalmärkte kaum mehr wegzudenken. In 2011 gab es weltweit bereits mehr als 46.000 börsennotierte Unternehmen mit einem monatlichen Gesamthandelsvolumen von US$5 Billionen. Dementsprechend gewinnen auch die Mechanismen, die ein problemloses Funktionieren der Kapitalmärkte sicherstellen sollen, mehr und mehr an Bedeutung. Die Finanzierung über Kapitalmärkte basiert auf der Glaubwürdigkeit der von den notierten Unternehmen regelmäßig veröffentlichten wirtschaftlichen Ergebnisse. Die Prüfung des Jahresabschlusses durch den Wirtschaftsprüfer spielt hierbei eine wichtige Rolle, da sie der Bestätigung der Qualität und Zuverlässigkeit der veröffentlichen Ergebnisse von unabhängiger Seite dient.

Die Finanzkrise in 2008 hat weltweit die Diskussion über die optimale Regulierung der Finanzmärkte und der Wirtschaftsprüfer wieder aufleben lassen. In diesem Zusammenhang kann eine Bewertung von vorangegangenen den Wirtschaftsprüfer betreffenden gesetzlichen Veränderungen hilfreiche Informationen liefern. Unter den zu berücksichtigenden Veränderungen spielt

weltweit insbesondere die Zunahme der öffentlichen Aufsicht über die Wirtschaftsprüfer im Gegensatz zur berufsinternen Aufsicht eine zentrale Rolle.

Verschiedene Aufsichtsbehörden unterschiedlicher Länder sind in Kapitel eins kurz beschrieben. Hierzu zählt die in den Vereinigten Staaten durch den Sarbanes-Oxley Act ins Leben gerufene öffentliche Aufsichtsbehörde Public Company Accounting Oversight Board (PCAOB), die die Prüfung der Jahresabschlüsse von Unternehmen mit öffentlichem Interesse kontrolliert. Zu den Aufgaben der PCAOB gehört die Durchführung regelmäßiger unabhängiger Inspektionen der Wirtschaftsprüfungsfirmen. Einzelheiten über den Prozess der Inspektionen finden sich ebenfalls in Kapitel eins. Im Gegensatz zu anderen Ländern werden die Ergebnisse der PCAOB Inspektionen in einem Bericht für jede Prüfungsfirma einzeln veröffentlicht. Dies ermöglicht eine genaue Analyse der Konsequenzen der Inspektionen.

Die unabhängigen Kontrollen sind mit dem Ziel eingeführt worden, das öffentliche Vertrauen der Investoren in den Wirtschaftsprüfer wieder herzustellen. Daher ist es folgerichtig bei der Bewertung der Konsequenzen der öffentlichen Aufsicht bei der Reaktion der Investoren zu beginnen. Vorhergehende Studien im Zusammenhang mit den Inspektionsberichten der PCAOB befassen sich mit Reaktionen der Wirtschaftsprüfungsfirmen sowie deren Kunden-Unternehmen, jedoch nicht mit Reaktionen der Investoren.

In Kapitel zwei dieser Dissertation wird demnach die Fragestellung behandelt, ob der Inspektionsbericht informativ für Investoren ist und neue Informationen bezüglich der Qualität des Wirtschaftsprüfers enthält. Das Kapitel basiert auf dem Argument, dass ein informatives Signal über die Wirtschaftsprüferqualität die wahrgenommene Qualität der durch das Unternehmen veröffentlichen Gewinninformationen beeinflusst und demnach Einfluss auf den Unternehmenswert hat. Der Inspektionsbericht kann zu einer Aktualisierung der Meinung über die gegenwärtige sowie die zukünftige Qualität des Wirtschaftsprüfers führen wenn die darin enthaltenen Informationen ausreichend detailliert, präzise, relevant und zeitnah sind.

Der empirische Ansatz zur Beantwortung der Fragestellung in Kapitel zwei erfolgt über die Untersuchung der Marktreaktion auf zwischen 2005 und 2010 veröffentlichte Inspektionsberichte. Eine signifikante Marktreaktion auf die Inspektionsberichte ist erkennbar. Die Stärke der Markreaktion kann den spezifischen Charakteristiken der Berichte zugeschrieben werden. So ist die Reaktion stärker bei zeitnaher Veröffentlichung, der Veröffentlichung eines

neuen Ergebnisses, der Veröffentlichung einer Verletzung von Buchhaltungsrichtlinien, und dem Vorhandensein von ausreichend Vergleichsreporten zur Einschätzung der Ergebnisse. Des Weiteren ist die Reaktion schwächer wenn Informationen über defizitäre Abschlussprüfungen bereits vor dem Inspektionsbericht bekannt wurden. Ebenfalls steht die Marktreaktion zumindest teilweise in Zusammenhang mit Veränderungen in der Meinung über die Qualität der Gewinninformationen. Anhand der Resultate aus Kapitel zwei ist ersichtlich, dass die Inspektionsberichte informativ für Investoren sind.

Das öffentliche Vertrauen in den Wirtschaftsprüfer steht im Zusammenhang mit der Wirtschaftsprüfungsqualität, die ebenfalls durch die neu eingeführten Mechanismen der öffentlichen Aufsicht verbessert werden soll. Hierbei steht das Verhalten der Wirtschaftsprüfungsfirmen im Vordergrund. Im Gegensatz zu Kapitel zwei, dass die neuen Aufsichtsmechanismen aus der Perspektive der Investoren betrachtet, nehmen Kapitel drei und vier eine neue Sichtweise ein und betrachten die internen Veränderungen innerhalb der Wirtschaftsprüfungsfirmen. Theoretisch betrachtet verursachen die Inspektionen eine Veränderung in der Anreizstruktur des Wirtschaftsprüfers weil aufgedeckte Defizite ein Risiko für die Wirtschaftsprüfungsfirma darstellen. Ein Schaden für die Reputation des Wirtschaftsprüfers, die Anordnung von Sanktionen und Strafen oder sogar ein Rechtsstreit kann die Konsequenz sein. Dieses Risiko sollte sich in den Entscheidungen bezüglich der Planung, Preis- und Kundenportfoliogestaltung der Wirtschaftsprüfungsfirmen wiederspiegeln.

Kapitel drei behandelt die Fragestellung, ob die Inspektionen, und insbesondere die von den PCAOB Kontrolleuren notierten Defizite, zu einer Erhöhung der Prüfungsgebühren führen. Sollten die Prüfungsfirmen auf Grund der neuen Aufsichtsmechanismen ausreichend Anreize haben auf die Inspektionen zu reagieren, so erwarte ich einen Anstieg des Prüfungsaufwandes in den Fällen, in denen Defizite bemängelt wurden. Ein erhöhter Prüfungsaufwand spiegelt sich in erhöhten Prüfungsgebühren wieder. In welchem Maße die erwarteten Anpassungen der Prüfungshandlungen in der Tat durchgeführt werden, hängt von der Wirksamkeit des Kontrollverfahrens ab, welches von verschiedenen Seiten stark kritisiert worden ist.

Die Analyse in Kapitel drei betrachtet den Anteil der Prüfungsgebühren der nicht durch kundenspezifische Charakteristiken erklärbar ist und untersucht dessen Veränderungen in Folge der Inspektionen und die Unterschiede in den Veränderungen bei Wirtschaftsprüfungsfirmen mit und ohne Defiziten. Des Weiteren werden Fälle betrachtet, in denen die Prüfungsfirma

vor der Inspektion unter erhöhtem Druck stand die Prüfungsgebühren niedrig zu halten. Dies ist insbesondere dann gegeben wenn intensiver lokaler Konkurrenzkampf besteht oder wenn beim Kunden nur geringe Nachfrage nach hoher Wirtschaftsprüfungsqualität vorhanden ist. Durch den erhöhten Druck auf die Prüfungskosten sind diese Fälle besonders anfällig für eine Reduzierung der Prüfungsqualität. Dementsprechend erwarte ich größere Defizite in der Prüfungsqualität und stärkere Gebührenerhöhungen in Folge der Inspektionen. Zur Untermauerung des Zusammenhangs zwischen den Gebührenerhöhungen und Veränderungen im Prüfungsaufwand werden zeitgleiche Veränderungen in der Anzahl der Mitarbeiter betrachtet.

Insgesamt liefert Kapitel drei einen Nachweis, dass Wirtschaftsprüfungsfirmen mit beanstandeten Defiziten Veränderungen vornehmen und die Prüfungsgebühren erhöhen. Die Erhöhung der Prüfungsgebühren erfolgt in verstärktem Maße in Fällen, die im Vorfeld besonders anfällig für die Reduzierung der Prüfungsqualität waren. Die Ergebnisse stehen im Einklang mit einer Erhöhung des Prüfungsaufwandes als Reaktion auf die Inspektionen.

Neben Veränderungen in der Preisgestaltung sind auch Veränderungen in der Gestaltung der Kundenportfolios als Reaktion auf die PCAOB Kontrollen denkbar. Diese Fragestellung wird in Kapitel vier näher betrachtet. Ich untersuche zwei mögliche Strategien zur Portfoliogestaltung als Reaktion auf beanstandete Defizite. Einerseits kann die Wirtschaftsprüfungsgesellschaft eine Reduzierung des durchschnittlichen Portfoliorisikos durch Auswahl von Kunden mit niedrigerem Prüfungs- und Finanz-Risiko erzielen. Andererseits kann die Prüfungsgesellschaft eine Erhöhung des durchschnittliche Kompetenzlevels innerhalb des Portfolios erreichen, indem sie sich vermehrt auf Kunden konzentriert die innerhalb des Industriespezialisierungsbereiches der Prüfungsfirma liegen.

Im Gegensatz zur Studie in Kapitel vier nutzen frühere Studien bezüglich der Portfoliogestaltung keinen Maßstab für das wirtschaftliche Risiko einer Prüfungsgesellschaft, der sowohl zeitlich als auch zwischen den Prüfungsgesellschaften variiert. Außerdem bietet der Zeitraum nach dem Sarbanes-Oxley Akt einen besonders interessanten Hintergrund für eine Studie über Kundenportfolios von kleineren Wirtschaftsprüfungsfirmen. Diese könnten einer erhöhten Risikokonzentration entgegensehen, da die großen Prüfungsfirmen aus Kapazitätsgründen insbesondere ihre risikoreicheren Kunden abgeben.

Methodisch analysiert Kapitel vier die Charakteristiken der Kundenportfolios von Wirtschaftsprüfungsfirmen während eines ausgedehnten post-SOX Zeitraumes. Dabei werden insbesondere Kunden betrachtet, die in Folge der Inspektionsergebnisse das Portfolio verlassen oder neu in dieses aufgenommen werden. Die Ergebnisse von Kapitel vier zeigen einen Anstieg der Portfolio-Spezialisierung, jedoch keine Veränderung des durchschnittlichen Portfolio-Risikos in Folge der Inspektionen. Wirtschaftsprüfungsfirmen präferieren offensichtlich eine Konzentration auf Kunden im Bereich ihrer Industriespezialisierung im Gegensatz zu einem Verzicht auf besonders risikoreiche Kunden. Die Reaktion der Wirtschaftsprüfungsfirmen auf die PCAOB Kontrollen in Bezug auf die Portfoliogestaltung scheint deutlich weniger ausgeprägt zu sein als der Effekt auf die Preisgestaltung, was darauf hinweist, dass eine Anpassung des Prüfungsaufwandes und der Prüfungsgebühren die bevorzugte Antwort der Wirtschaftsprüfungsfirmen ist.

Insgesamt wirft die vorliegende Dissertation neues Licht auf unterschiedliche wirtschaftliche Konsequenzen der öffentlichen Aufsicht über die Wirtschaftsprüfer. Zu einer Zeit in der Kontrollsysteme weltweit eingeführt und weiterentwickelt werden, trägt diese Dissertation maßgeblich zur Literatur über die Folgen von unabhängigen und öffentlichen Kontrollsystemen von Wirtschaftsprüfungsfirmen bei. Die Ergebnisse erlauben diverse Schlussfolgerungen für zukünftige Richtlinien in den Vereinigten Staaten und anderen Ländern, die sich mit der Aufsicht über den Berufsstand der Wirtschaftsprüfer beschäftigen.

So erscheint es zum Beispiel sinnvoll, das detaillierte Ergebnis der Kontrollen für jede Wirtschaftsprüfungsfirma auch in anderen Ländern wie in den USA einzeln zu veröffentlichen, da die Signale über die Qualität des Wirtschaftsprüfers nützlich und relevant für den Firmenwert sind. Dies könnte einer erhöhten Anerkennung der Fähigkeiten von kleineren Wirtschaftsprüfungsfirmen dienen um einer möglicherweise unbegründeten Big4 Vorliebe vorzubeugen. Des Weiteren sollten bei einer Gesamtanalyse der Kosten eines öffentlichen Aufsichtsmechanismus die Gebührenerhöhungen der Prüfungsfirmen nicht vergessen werden. Inwieweit der erhöhte Prüfungsaufwand als Reaktion auf die Kontrollen von Investoren wertgeschätzt wird, stellt ein interessantes mögliches Forschungsthema für zukünftige Studien dar.

Letztendlich ist die Tatsache, dass das öffentliche Aufsichtssystem nach amerikanischem Vorbild zumindest teilweise die angestrebten Ergebnisse zu erreichen scheint, sicherlich nützlich in der Diskussion über die zukünftige

Ausrichtung von Aufsichtssystemen in Europa. Eine mögliche Angleichung der Charakteristiken der Aufsichtssysteme in den unterschiedlichen Ländern ist insbesondere daher ein wichtiges Thema, da die gegenseitige Akzeptanz von Kontrollmechanismen weithin diskutiert wird und die Möglichkeit bietet, die Kosten von doppelten Kontrollen zu vermeiden.

SUMMARY IN DUTCH (NEDERLANDSE SAMENVATTING)

Dit proefschrift biedt nieuwe inzichten in de economische gevolgen van onafhankelijk publiek toezicht op accountants. In het bijzonder worden de reacties van accountantskantoren en aandeelhouders van beursgenoteerde ondernemingen onderzocht. In de huidige wereldeconomie zijn kapitaalmarken niet meer weg te denken. In 2009 waren er wereldwijd meer dan 45.000 beursgenoteerde ondernemingen met een gezamenlijke marktwaarde van $80 biljoen. Terzelfdertijd winnen ook mechanismen die voor een goede werking van de kapitaalmarkten moeten zorgen aan belang. De bedrijfsfinanciering via kapitaalmarkten is afhankelijk van de geloofwaardigheid van de financiële verslaggeving van beursgenoteerde ondernemingen. De controle van de jaarrekening door de accountant speelt hierbij een belangrijke rol, omdat deze een onafhankelijk oordeel over de kwaliteit en de betrouwbaarheid van deze informatie geeft.

De kredietcrisis van 2008 heeft wereldwijd de discussie over de regulering van financiële markten en van de controle op de financiële verslaggeving doen oplaaien. Een evaluatie van eerder doorgevoerde wijzigingen in wetgeving kan dan ook nuttige informatie verschaffen. Een van de eerder doorgevoerde veranderingen omvat de invoering van onafhankelijk publiek toezicht op de accountant in tegenstelling tot het toezicht door de beroepsorganisatie zelf door middel van peer-reviews.

In hoofdstuk 1 worden toezichthouders uit verschillende landen kort beschreven, waaronder de Public Company Accounting Oversight Board (PCAOB) in de Verenigde Staten, welke als gevolg van de Sarbanes-Oxley Act in het leven is geroepen. De PCAOB ziet toe op de accountantscontrole van beursgenoteerde ondernemingen in de VS en heeft onder meer als taak het uitvoeren van onafhankelijke inspecties van accountantskantoren. In het eerste hoofdstuk wordt het inspectieproces meer in detail beschreven. In tegenstelling tot andere landen worden de resultaten van de PCAOB inspecties openbaar gemaakt in een rapport per accountantskantoor. Dit maakt een precieze analyse van de gevolgen van het inspectieproces mogelijk.

De onafhankelijke inspecties werden ingevoerd met het doel het vertrouwen van aandeelhouders in het accountantsberoep te herstellen. Het ligt daarom voor de hand om bij de analyse van de gevolgen van het inspectieproces te beginnen bij de reactie van aandeelhouders. Voorgaande studies die gebruik maken van de inspectierapporten van de PCAOB bestuderen de reactie van de accountantskantoren en de klanten van deze kantoren, maar kijken niet naar de reacties van aandeelhouders.

In hoofdstuk 2 van dit proefschrift wordt onderzocht of de inspectierapporten informatief zijn voor aandeelhouders en of ze nieuwe informatie over de kwaliteit van de controlerend accountant opleveren. De studie is gebaseerd op het argument dat een informatief signaal over de kwaliteit van de accountantscontrole, de perceptie van de kwaliteit van de financiële verslaggeving van een onderneming beïnvloedt. Een inspectierapport kan tot een bijstelling van de inschatting van de huidige en toekomstige kwaliteit van de accountant leiden indien de informatie in het rapport gedetailleerd, precies, relevant en tijdig is.

Deze vraag wordt in hoofdstuk 2 empirisch onderzocht door de marktreactie op gepubliceerde inspectierapporten te bestuderen tussen 2005 en 2010. Er is een significante marktreactie waarneembaar. De sterkte van deze marktreactie hangt samen met specifieke karakteristieken van de inspectierapporten. Zo is de reactie sterker bij tijdigere bekendmaking, de bekendmaking van een nieuw resultaat, de bekendmaking van een schending van verslaggevingsstandaarden en het voorhanden zijn van voldoende vergelijkingsmateriaal om de inspectieresultaten beter in te schatten. Eveneens hangt de marktreactie gedeeltelijk samen met veranderingen in de perceptie van de kwaliteit van verslaggevingsinformatie. Aan de hand van deze resultaten kan worden geconcludeerd dat de inspectierapporten informatief zijn voor aandeelhouders.

Het vertrouwen in het accountantsberoep hangt samen met de kwaliteit van de accountantscontrole. Deze kwaliteit zou door de nieuw ingevoerde toezichtmechanismen moeten verbeteren. In tegenstelling tot hoofdstuk 2, dat de nieuwe toezichtsmechanismen vanuit het perspectief van aandeelhouders bestudeert, worden in hoofdstuk 3 en 4 van dit proefschrift veranderingen binnen accountantskantoren bestudeerd. Theoretisch gezien veroorzaken de inspecties een verandering in de prikkels voor accountants, terwijl de mogelijke ontdekking van tekortkomingen door een inspectie een risico voor het accountantskantoor vormt. Een beschadiging van de reputatie van de accountant, het opleggen van sancties en straffen of zelfs een gerechtelijke vervolging kunnen het gevolg zijn van de publicatie van tekortkomingen door de PCAOB. Dit risico beinvloedt beslissingen omtrent de planning, prijszetting en samenstelling van de klantenportefeuille van een accountantskantoor.

In hoofdstuk 3 wordt de vraag behandeld of de PCAOB inspecties, en in het bijzonder de geconstateerde tekortkomingen, tot een verhoging van de vergoedingen van de controles leiden. Als accountantskantoren door de nieuwe regelgeving voldoende prikkels hebben om op de inspecties te reageren, is een toename van de controlewerkzaamheden te verwachten in die situaties waar tekortkomingen werden geconstateerd. Een toename van de controlewerkzaamheden wordt weerspiegelt in hogere vergoedingen. In welke mate de verwachte aanpassingen van de controlewerkzaamheden inderdaad plaatsvinden, hangt af van de effectiviteit van het inspectieproces. De effectiviteit van de PCAOB inspecties wordt echter door verschillende partijen sterk bekritiseerd.

Hoofdstuk 3 analyseert dat deel van de vergoedingen dat niet door karakteristieken van de klant kan worden verklaard. Tevens analyseert het hoofdstuk de veranderingen in deze vergoedingen als gevolg van de inspecties, alsmede de verschillen in deze veranderingen tussen accountantskantoren met en zonder geconstateerde tekortkomingen. Daarnaast worden gevallen bekeken waarbij het accountantskantoor voor de inspectie onder verhoogde druk staat om de controlevergoedingen laag te houden. Dit komt vooral voor wanneer er sterke lokale concurrentie bestaat of wanneer er bij klanten slechts beperkte vraag is naar accountantscontrole van hoge kwaliteit. Door de grote druk om de controlevergoedingen laag te houden, is de kans groot dat er op de kwaliteit van de controles wordt ingeboet. Daarom kan verwacht worden dat er in dergelijke situaties meer tekortkomingen zijn in de controlekwaliteit die kunnen leiden tot en sterkere tariefverhogingen als gevolg van de inspecties.

Om aan te tonen dat aanpassingen van de vergoedingen inderdaad het gevolg zijn van een toename van de controlewerkzaamheden, worden daarnaast ook veranderingen in het aantal medewerkers onderzocht.

Samengevat kan uit de analyse in hoofdstuk 3 worden geconcludeerd dat accountantskantoren met aangetoonde tekortkomingen veranderingen doorvoeren en hun controlevergoedingen verhogen. Deze verhoging is met name terug te vinden bij accountantskantoren die onder druk stonden om de vergoedingen laag te houden in de pre-inspectieperiode. De resultaten komen overeen met een toename van de controlewerkzaamheden als gevolg van de inspecties.

Naast veranderingen in de prijszetting, is het ook denkbaar dat accountantskantoren veranderingen in de samenstelling van klantenportefeuille's doorvoeren. Of dit ook daadwerkelijk gebeurt, wordt in hoofdstuk 4 onderzocht. Twee mogelijke strategieën als reactie op aangetoonde tekortkomingen worden bestudeerd. Enerzijds kan het accountantskantoor een verlaging van het portefeuillerisico bereiken door het selecteren van klanten met een laag controle- en financieel risico. Anderzijds kan het accountantskantoor een verhoging van de gemiddelde expertise binnen de portefeuille bereiken door zich meer te richten op klanten in bedrijfstakken waarin het kantoor gespecialiseerd is.

In tegenstelling tot voorgaande studies op het gebied van samenstelling van de klantenportefeuille wordt in de studie in hoofdstuk 4 gecontroleerd voor het economisch risico van een accountantskantoor, dat immers over de tijd en tussen kantoren verschilt. Daarnaast vormt de periode na de Sarbanes-Oxley Act een bijzonder interessante achtergrond voor een studie naar klantenportefeuille van kleinere accountantskantoren. Aangezien grotere accountantskantoren mogelijk hun meest risicovolle klanten afstoten, kan dit leiden tot een hogere concentratie van risico bij de kleinere kantoren.

Methodologisch worden in hoofdstuk 4 de karakteristieken van klantenportfefeuilles van accountantskantoren vergeleken voor en na de inspecties. Daarbij worden in het bijzonder klanten bestudeerd die als gevolg van de inspectieresultaten uit de portefeuille verdwijnen of nieuw in de portefeuille worden opgenomen. De resultaten in hoofdstuk 4 laten geen verandering zien in het gemiddelde portefeuillerisico als gevolg van de inspecties. Accountantskantoren verkiezen dus klanten in een bedrijfstak waarin ze gespecialiseerd zijn. Aanpassingen aan de klantenportefeuille worden ook met name gerealiseerd bij het aanvaarden van nieuwe klanten en niet zozeer bij het

beëindigen van een bestaande relatie met een klant. Het verhoogde bedrijfsrisico wordt dus opgevangen door verhoogde controlewerkzaamheden en meer specialisatie.

Samengevat draagt dit proefschrift bij aan de literatuur over de gevolgen van onafhankelijk publiek toezicht op accountants in een tijd waarin systemen van onafhankelijk toezicht wereldwijd ingevoerd en verder ontwikkeld worden. Een betere kennis van de gevolgen van de verschillende systemen van onafhankelijk toezicht is van belang in de afstemming tussen landen rond de ontwikkeling van systemen van onafhankelijk toezicht. Harmonisatie van toezicht zal niet enkel leiden tot een betere vergelijkbaarheid van de gerapporteerde winstcijfers, maar vermijdt ook de kosten van dubbel toezicht door onderlinge erkenning. De resultaten van deze drie studies geven aan dat onafhankelijk publiek toezicht zoals momenteel georganiseerd in de VS succesvol blijkt in die zin dat het informatief blijkt te zijn voor investeerders door inzicht te verschaffen in controlekwaliteit en daarnaast het gedrag van accountantskantoren blijkt te beïnvloeden.

Zo lijkt het bijvoorbeeld zinvol gedetailleerde resultaten van inspecties voor ieder accountantskantoor ook in andere landen dan de VS apart openbaar te maken, omdat de signalen over de kwaliteit van de accountant nuttig en relevant zijn voor de waardering van ondernemingen. Dit zou ook een grotere erkenning van de capaciteiten van non-Big4 accountantskantoren kunnen faciliëren. Daarnaast moet bij een volledige analyse van de kosten van onafhankelijk publiek toezicht, de toename in de kosten van accountantskantoren niet vergeten worden. In hoeverre toegenomen controlewerkzaamheden als reactie op inspecties door aandeelhouders naar waarde worden geschat, is mogelijk een interessante onderzoeksvraag voor toekomstige studies. Tenslotte kunnen de bevindingen van dit proefschrift nuttig zijn voor regelgevers en toezichthouders in de verdere ontwikkeling van onafhankelijk publiek toezicht.

CURRICULUM VITAE

Mona Offermanns was born on August 12, 1983 in Düsseldorf, Germany. She attended primary school and high school from 1988 to 2002 in Aachen, Germany. Subsequently, Mona started her studies at Maastricht University, the Netherlands. She followed the Bachelor program in Economics with specialization in International Business Economics. During her Bachelor studies, she spent a semester at the University of California at Santa Barbara, USA. In 2005, Mona started the pre-PhD track in form of a two-year Master's program in Business Research. During that time, she worked as a teaching and research assistant at both Maastricht University, Netherlands and the University of Auckland, New Zealand. Mona obtained her Master degree with distinction in 2007. After graduation, she completed an internship at PricewaterhouseCoopers, a large audit company in Düsseldorf, Germany. Afterwards, Mona joined the Department of Accounting and Information Management at Maastricht University as a PhD candidate. She conducted part of her research as visiting researcher at the Fisher School of Accounting, University of Florida, USA. The results of her PhD research are summarized in this dissertation and have been presented at numerous international conferences.