Context matters:

Essays on factors affecting the supply of audit quality and audit outcomes



Ulrike Thürheimer

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by

Ulrike Thürheimer

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Table of Contents

Chapter 1 – Introduction 1

1.1 Introduction to the research questions 2
1.2 Overview and findings of the dissertation chapters 4
1.3 Contribution of the dissertation 6
1.4 Outline of the dissertation 7

Chapter 2 - Involvement of Component Auditors in Multinational Group Audits: Determinants and Audit Outcomes 9

2.1 Introduction 10
2.2 Background Information 12
2.2.1 REGULATORY CONCERNS, DEVELOPMENTS, AND SETTING . 12
2.2.2 PRIOR RESEARCH 14
2.3. Determinants of Component Auditor Involvement and Type of Component Auditor 16
2.4. Audit Outcomes of Component Auditor Involvement 17
2.5. Methodology 20
2.5.1 SAMPLE SELECTION 20
2.5.2 EMPIRICAL MODELS 22
2.6. Results 26
2.6.1 DESCRIPTIVE STATISTICS 26
2.6.2 DETERMINANTS OF COMPONENT AUDITOR INVOLVEMENT 33
2.6.3 COMPONENT AUDITOR INVOLVEMENT AND AUDIT OUTCOMES 38
2.6.4 THE EFFECT OF ISA600 ON COMPONENT AUDITOR INVOLVEMENT AND AUDIT OUTCOMES 41
2.6.5 ADDITIONAL ANALYSES 44
2.6.6 SENSITIVITY ANALYSES 51
2.7. Conclusions and Limitations 52
Appendices Chapter 2 54

Chapter 3 – The Effect of National Inspection Regimes on Audit Quality 61

3.1 Introduction 62
3.2 Background and hypotheses development 65
3.3 Data, descriptive statistics, and research design 68
3.3.1 SAMPLE SELECTION AND DESCRIPTION 68
3.3.2 EMPIRICAL MODELS 70
3.4 Results 76
3.4.1 DESCRIPTIVE STATISTICS 76
3.4.2 MULTIVARIATE ANALYSIS 89
3.4.3 ADDITIONAL ANALYSES 111
3.4.4 SENSITIVITY ANALYSES 112
3.5. Conclusions and Limitations 116
Appendices Chapter 3 118

Chapter 4 – The effect of the interaction between litigation and regulatory risk on audit outcomes **121**

4.1 Introduction *122*
4.2 Background and hypotheses development *124*
4.3 Research design and sample selection *130*
4.3.1 PROXIES FOR LITIGATION RISK AND REGULATORY RISK 130
4.3.2 EMPIRICAL MODELS 132
4.3.3 SAMPLE SELECTION AND DESCRIPTION 134
4.4. Results *136*
4.4.1 DESCRIPTIVE STATISTICS 136
4.4.2 MULTIVARIATE ANALYSES 138
4.4.2 ADDITIONAL AND SENSITIVITY ANALYSES 147
4.5. Conclusions and Limitations *148*
Appendices Chapter 4 ..... *150*

Chapter 5 – Conclusion **155**

5.1 Summary of main findings *156*
5.2 Contribution and implications *157*
5.3 Limitations and future research *158*

References **161**

Valorization Addendum **173**

Curriculum Vitae **177**

Chapter 1 – Introduction

1.1 Introduction to the research questions

The purpose of an audit, the process of providing assurance over and expressing an opinion on financial statements, is to enhance the degree of confidence of users in the audited financial statements (IAASB, 2009). Users of financial statements will only rely on the auditor's opinion if they believe that the audit is of high quality. Hence, auditing derives its value from audit quality and audit quality is fundamental for the functioning of capital markets (DeFond & Zhang [2014]).

There is not one commonly accepted definition of audit quality, which generally depends on the viewpoint of the party defining audit quality (Knechel et al. [2013]). Furthermore, audit quality can be defined as binary (audit failure or no-failure)[1], or as continuous (ranging from low to high quality) (DeFond & Zhang [2014]; Francis [2011])[2]. Regardless of the exact definition of audit quality, most definitions acknowledge that audit quality is engagement-specific and dependent on the circumstances under which the audit was conducted (Francis [2011]). Audit quality is thus shaped by multiple different factors, including engagement-specific, audit firm-specific, national and contextual factors (IAASB [2014]). These factors determine the auditor's ability and incentives to supply audit quality, client demand for audit quality and shape the auditor-client relationship and audit work (DeFond & Zhang [2014]). Auditor ability is determined by audit inputs, the audit process and auditor expertise, while auditor incentives for audit quality can be market-based in the form of reputation and litigation risk and arise through the risk of regulatory intervention which imposes a minimum standard of audit quality. Contextual factors that determine the institutional environment, such as regulation and standard-setting, can further affect audit inputs, the audit process and auditor incentives, by imposing minimum requirements or monitoring auditor work effort. Furthermore, all of these supply and contextual factors not only affect audit quality, but also other audit outcomes, such as auditor conservatism and audit fees.

This dissertation is comprised of three chapters that investigate how audit outcomes are affected by engagement-specific and contextual factors that determine auditors' supply of audit quality, in a variety of settings. These settings, which are addressed in the next paragraphs, relate to situations that are of current and continued concern to the audit profession, regulators, standard-setters and the public.

[1] A standard binary definition of audit quality is that audit quality is the market assessed joint probability that an auditor both discovers a misstatement and reports the misstatement (DeAngelo [1981]).
[2] For example, DeFond and Zhang [2014] define higher audit quality as providing greater assurance that the financial statements reflect the firm's underlying economics.

In the first study (Chapter 2) of this dissertation, I explore how audit inputs and incentives in group audit settings affect audit outcomes. I further explore how a change in context, that is a change in audit standards, affects the supply of audit quality. Specifically, I explore how engagement-specific variation in the use of component auditors across engagements of multinational groups is associated with audit quality and fees. Component auditors are auditors that audit the financial statements of a group component and are under the supervision of the principal (group) auditor who is ultimately responsible for assurance over and quality of the group financial statements. The engagement of component auditors is an economic tradeoff for the principal auditor. On the one hand, using component auditors can result in efficiency gains, reduce costs and exploit local knowledge and expertise of component auditors. On the other hand, by accepting responsibility for the work of component auditors, the principal auditor faces an agency problem due to information asymmetry about the performance of component auditors who, without holding ultimate responsibility for their audit work on components, might shirk. To address the principal-agent problem in group audits, audit standards require the principal auditor to satisfy him/herself that the involvement of component auditors does not result in compromised audit quality, for example through undertaking quality checks and reviews and supervision of component's audit work. This is a costly task and complex coordination and communication challenges arise. For this reason, international and national regulatory and standard-setting bodies have voiced significant concerns over the quality of these group audits in recent years, especially of multinational group audits where audit work spans across jurisdictions. These standard-setters have and are revising audit standards on group audits. Hence, I assess whether a change in group audit standards that strengthened the requirements for principal auditors affects audit quality.

In the second study (Chapter 3) of this dissertation, I investigate the relationship between audit quality and the introduction of public oversight over the audit profession internationally. The introduction of public oversight has been the most fundamental institutional change in the audit landscape of the last decades. Public oversight boards (POBs) are independent of and charged with regulatory oversight over the audit profession, replacing a system of self-regulation. With inspections as the main work effort of POBs to detect and improve audit quality deficiencies, POBs can drive improvements in the audit process, thus affecting auditor ability. Public oversight can also affect auditor incentives to supply audit quality through the threat of regulatory sanctions on auditors, which can subsequently lead to reputational damages and litigation risk. From a theoretical viewpoint, regulatory oversight through mechanisms such as inspections by POBs can provide investors with confidence that

audits meet a minimum level of quality standards and independence requirements (Aobdia & Shroff [2017]), thereby mitigating agency conflicts inherent in auditing (Watts & Zimmerman [1980]). However, the resources and costs required to conduct independent inspections are large, and regulatory agencies may not be competent to conduct inspections, or have the wrong incentives, thus being ineffective in fulfilling its task of serving the public (Stigler [1971]). Since the effectiveness of public oversight over the audit profession is not uncontested, I investigate the effect of the commencement of inspections of national POBs worldwide on audit quality.

In the third study of this dissertation (Chapter 4), I investigate how two major incentives for auditors to supply audit quality, litigation and regulatory risk, interact and jointly affect auditor behavior and audit outcomes. Prior literature has investigated the effect of either regulatory risk, which poses a threat to auditors by means of financial, criminal or professional penalties, or litigation risk, which can lead to lawsuits and financial penalties, on audit outcomes. However, little is known about whether and how multiple risks interact to affect auditor behavior and audit outcomes. On the one hand, these risks could reinforce each other since both can lead to large penalties for auditors in case of audit failures (Peecher et al. [2013]). On the other hand, regulatory risk and litigation risk, which both impose penalties on auditors in case of audit failure, could act as alternative disciplining mechanisms and thus not have an incremental effect (Ye & Simunic [2017]; Fung, Raman, and Zhu. [2017]). Auditors can react to these risks in multiple ways, including increasing their fees to compensate for risk or higher audit effort, or by reporting more conservatively to avoid audit failure. Hence, in the third study I investigate whether and how two main incentives, litigation and regulatory risk, affect auditor conservative reporting behavior and audit pricing.

1.2 Overview and findings of the dissertation chapters

In this section, I provide a brief overview of each of the studies of this dissertation, including the setting, methodology and findings.

In study one (Chapter 2), I first explore the determinants of the involvement of component auditors (these can be part of the principal auditor's network or unaffiliated auditors) in the audit of large multinational clients and then examine how the involvement of component auditors (network or unaffiliated auditors) influences engagement audit quality and fees. Using the unique Australian setting of longstanding disclosures of audit fees paid to the principal and component (network and unaffiliated) auditors in the annual reports of MNEs, I find that almost half of all MNE audits in the sample covering the years 2006 to 2013 involve

component auditors. The likelihood and extent of component auditor involvement is associated with complexity and internationalization of MNEs, as well as principal auditor characteristics. Further, the extent of involvement of network auditors is determined by internationalization and size of MNEs, while the involvement of unaffiliated auditors is determined by principal auditor characteristics. The revision to the group audit standard (ISA 600) significantly reduced the extent of unaffiliated component auditor involvement. Furthermore, the results show that more involvement of component auditors is associated with lower audit quality (measured using earnings and revenue management proxies), while these audits are at the same time associated with higher audit fees. Audit quality is lower for network and unaffiliated auditors and the revision of the group audit standard (ISA 600) had no effect on audit quality or audit fees.

In the second study of this dissertation (Chapter 3), I investigate the effect of the commencement of audit firm inspections by POBs internationally on audit quality and whether the effect of inspections on audit quality differ for large (Big 4) and small (non-Big 4) audit firms. Further, I describe differences in inspection characteristics related to the inspection approach, disclosure of inspection results and enforcement ability of POBs worldwide and consider the effect of these different inspection characteristics on audit quality. Using a generalized difference in difference design that exploits the staggered commencement of inspections in 50 countries, I find that for a sample of publicly listed clients over the period 2003 to 2012, audit quality (measured as earnings and revenue management proxies) increases after inspection commencement. I further find that the effect of inspection commencement is higher for clients of Big 4 audit firms compared to clients of non-Big 4 firms. Lastly, the results show that the effect of inspection commencement is conditional on POBs disclosing inspection results publicly.

In the third study of this dissertation (Chapter 4), I examine whether and how litigation and regulatory risk jointly affect auditor conservative reporting behavior and audit fees. I exploit the U.S. setting which features variation in auditor litigation risk across different U.S. states, both in terms of third-party and damage apportionment standards which capture different dimensions of litigation risk. Further, regulatory risk increased during the sample period 2001-2009 with the introduction of public oversight over the audit profession, and specifically the introduction of inspections of audit firms at different time periods. Using these empirical proxies for litigation and regulatory risk, I find evidence these risks jointly increase audit fees, and conservative auditor reporting. Further, this effect is attributed to non-global audit firm

networks (Non-Big 6). This suggests that litigation and regulatory risks reinforce each other, rather than acting as substitutes.

1.3 Contribution of the dissertation

Overall, this dissertation contributes to the body of knowledge about factors that drive auditors to supply audit quality, and on the contextual factors that influence the supply of audit quality. Specifically, I examine settings that are of current and continued interest and concern to the audit profession, regulators and standard-setters, and the public at large: the audit quality consequences of group audits and the effectiveness of public oversight worldwide, as well as the interaction between regulatory and litigation risk.

The first study (Chapter 2) demonstrates that in line with concerns of regulators and standard-setters, audit quality problems are prevalent in group audits involving component auditors, regardless of whether these components are part of the principal auditor's network or unaffiliated. Further, while the revisions to auditing standard ISA 600 reduced the involvement of unaffiliated auditors, audit quality problems in group audits involving components persist after the revision. This large-scale study based on longstanding disclosures in the Australian setting contributes to the scant but emerging empirical literature on group audits and thus supports regulatory concerns that to date have been based on limited evidence. Further, this study is also informative to audit practitioners that work in group audit settings, and standard-setters (i.e. the PCAOB and IAASB) that are currently revisiting the audit standard on group audits. Furthermore, users of group financial statements should be aware of the audit concerns surrounding group audits and the potential impact on the quality of group financial statements. Based on our findings, users might benefit from more public disclosure about involvement and extent of involvement of component auditors, especially given the lack of public disclosure in most jurisdictions.

The second study (Chapter 3) contributes to the emerging literature on the benefits of the introduction of public oversight over the audit profession and in particular on the introduction of audit firm inspections in an international setting. The study provides evidence of audit quality improvements after commencement of inspection programs in jurisdictions worldwide and thus extends and generalizes the existing findings in the literature that concentrate on the effect of inspections in the US setting or international inspections by the US public oversight board. This study further describes differences in characteristics of inspection systems related to the work approach, disclosure and enforcement ability of POBs worldwide and provides evidence on the effect of inspection disclosure on reputation incentives for audit

firms. This description and analysis is useful in informing the ongoing discussions and decisions about mutual recognition of public oversight across countries and (re)design of POBs and their characteristics going forward.

The third study (Chapter 4) contributes to understanding how different incentives for auditors affect auditor behavior and audit outcomes jointly. This question is important since it is largely unclear what the main contextual or institutional drivers for auditor behavior and outcomes are (Francis [2011]; Minutti-Meza [2014]), and how different risks that affect auditors work jointly (DeFond & Zhang [2014]). By identifying a setting that allows me to investigate how two forms of regulatory risk and litigation risk jointly affect auditor behavior and audit outcomes, I show that both risks reinforce each other. However, I also find evidence that high litigation and regulatory risk increases auditor conservative reporting.

1.4 Outline of the dissertation

The following three chapters present the three studies that were introduced in this chapter. Chapter 2 presents the study on the determinants of and audit outcomes from the involvement of component auditors in multinational group audits. Chapter 3 presents the study on the effect of the commencement of national inspection regimes on audit quality. Chapter 4 presents the study on the interaction between litigation and regulatory risk and its effect on audit outcomes. Chapter 5 concludes this dissertation by summarizing the main findings of the studies, discussing the implications and limitations, and offering directions for future research.

Chapter 2 - Involvement of Component Auditors in Multinational Group Audits: Determinants and Audit Outcomes[3][4]

Abstract: We study the determinants of involvement of component auditors (either network and/or unaffiliated) in multinational (MNE) group audits and associated audit outcomes. We identify the involvement of component auditors, using unique Australian disclosures of group audit fees paid to the principal and component auditors. We first document that MNE complexity, degree of MNE internationalization, and auditor characteristics determine the extent and type of component auditor involvement. Next, we find that increased involvement of component auditors is associated with lower audit quality and higher audit fees. We then investigate the impact of the revision of the international auditing standard related to group audits, which expanded the principal auditor's responsibilities, and show that, while this reduced the involvement of unaffiliated (but not network) auditors, quality problems remain.

[3] This chapter is based on a working paper with Elizabeth Carson, Roger Simnett, Ann Vanstraelen and Greg Trompeter.

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2.1 Introduction

The quality of multinational (MNE) group audits is a key area of concern for standard-setters and regulators (International Auditing and Assurance Standards Board (IAASB) [2015a], [2015b], [2019a], International Forum of Independent Audit Regulators (IFIAR) [2018], the Public Company Accounting Oversight Board (PCAOB) [2016], [2017]).[5] This concern stems, in part, from the results of audit inspections by regulators, which have identified numerous examples of poor coordination and oversight when component auditors—and foreign component auditors in particular—are involved in an MNE group audit (e.g., Doty [2011], [2017], IFIAR [2018]). Problems with the quality of audits involving component auditors have also been highlighted by major international audit failures, such as those involving Parmalat, Royal Ahold, Satyam Corporation, and, more recently, BT.

Despite these high-profile failures, published research on MNE group audits has been scant, primarily due to data constraints. Exceptions are the work of Dee, Lulseged, and Zhang [2015], who document, for a small sample of Securities Exchange Commission (SEC) issuers, negative market reactions and a decline in earnings response coefficients (ERCs) when the fact that part of an audit is outsourced to auditors, besides the principal auditor, is disclosed for the first time. From a survey of group audit leaders, Downey and Bedard [2019a] identify coordination and communication issues as key challenges in global group audits. With the recent introduction of the PCAOB's requirement that firms disclose which audit firms are leading and which are assisting in audits,[6] a number of concurrent papers exploring U.S. group audits have emerged (e.g., Burke, Hoitash and Hoitashet al. [2019], Dee et al. [2018]).[7]

Our study investigates these concerns about MNE group audits, using large-scale longitudinal empirical evidence. It explores the determinants of component auditor involvement and the associated audit outcomes. Using longstanding Australian disclosures, we

[5] For example, James Doty, former chairman of the PCAOB, said in 2011, in relation to multinational group audits: "Our inspectors often see more than the principal auditor—or signing firm—does. In many cases principal auditors rely on high-level reports from subsidiary auditors. They often don't review the work papers of the other auditors. Our inspectors do. And they often find problems in that work." Internationally, IFIAR's 2017 inspection findings reveal that group audits have frequent adverse findings at the engagement level (IFIAR [2018]).

[6] PCAOB Rule 3211 on Form AP, Auditor reporting of certain audit participants, effective for audit reports issued on or after June 30, 2017.

[7] The evidence based on first-time disclosures of component auditors in the United States appears mixed. Burke et al. [2019] report that the total percentage of audit hours conducted by component auditors harms audit quality (i.e., higher likelihood of restatement) while the mere use of a component auditor and the total number of component auditors that participated in the engagement do not affect audit quality. In contrast, Dee et al. [2018] document that audit quality is lower (i.e., higher discretionary accruals) when a component auditor is involved and that the use of more than one component auditor leads to lower audit quality compared to the use of only one component auditor, while there is no support for the idea that the percentage of the audit conducted by component auditors influences audit quality.

identify the extent of involvement of principal and component auditors (including whether a component auditor is a member of the principal auditor's network or unaffiliated) in MNE group audits. The disclosure of group audit fees in Australia allows us to analyze questions that cannot be answered in the U.S. setting, where only audit hours are disclosed. Furthermore, in contrast to the U.S., Australian audit fee disclosures do not contain a minimum threshold for fees paid to component auditors, allowing all such instances to be identified. The international auditing standard used in our setting also differs from the U.S. equivalent.[8] Finally, we can observe audit fee disclosures for principal and component auditors over an extensive period.

We first explore which client and auditor characteristics are associated with the involvement of component auditors. Next, we examine whether this involvement is associated with variation in audit quality and fees. We further examine whether there is any incremental effect on quality and fees if the component auditor is from the principal's network or is unaffiliated with the principal auditor.[9] Finally, we examine the effects of a regulatory change aimed at strengthening the principal auditor's responsibilities and clarifying procedures around the conduct of MNE group audits, with the objective of improving their quality. Specifically, we explore the impact of the revision of the international standard on group audits (ISA 600, operational for audits of accounting periods ending on or after December 15, 2010) on the association between involvement of component auditors in MNE group audits and audit outcomes.

We identify 4,869 MNE group audits during the period of 2006–2013. We choose this period to provide sufficient observations both before and after the revision of ISA 600. We find that 2,349 (48.2 percent) of these audits involve component auditors, for which the median percentage of the audit fee paid to component auditors is 24%. We find that the likelihood and extent of involvement of component auditors is determined by the complexity and internationalization of the MNE as well as characteristics of the principal auditor. We observe some differences in the determinants of the involvement of different types of component auditors: that is, the size and degree of internationalization of the MNE affects the extent of use of network auditors but not of unaffiliated ones. As expected, Big 4 and large non-Big 4 auditors, MNE specialists, and auditors with higher subsidiary location coverage are more

[8] For example, the IAASB requires that the principal auditor take full responsibility for the work performed by component auditors, while the PCAOB allows division of responsibility between principal and component auditors.

[9] The choice of type of component auditor (network or unaffiliated) is commonly a second-order decision, generally determined after having decided to use a component auditor in the group audit. This is further discussed in the hypothesis section.

(less) likely to use network (unaffiliated) auditors. Further, we find that revised ISA 600 significantly reduced the involvement of component auditors.

Next, we find that the increased use of component auditors is costlier and associated with lower audit quality (as measured by earnings management and revenue management proxies), which is consistent with regulatory concerns. When we distinguish between type of component auditor—network versus unaffiliated—for group audits using component auditors, quality problems appear to be associated with both types. Overall, we do not find evidence that the revision of ISA 600 affected audit fees or improved the quality of group audits using component auditors.

Collectively, our results contribute to the emerging literature on group audits and are relevant for audit practice and standard-setters. In particular, our findings provide standard-setters with evidence to support future modifications to auditing standards for group audits. We note that the revised ISA 600 provided the initial basis for the recent PCAOB initiatives to examine the work of the principal auditor's regarding supervising the work of other auditors (Hanson [2016]). Given the relative lack of transparency about the identity and extent of use of component auditors in most countries, our findings also speak to calls for greater disclosure of this information.

The remainder of our paper is organized as follows. Section 2.2 provides the relevant background for this study. Section 2.3 develops our research questions on the determinants of component auditor involvement and type of component auditor. Section 2.4 develops hypotheses on audit outcomes relating to the use of component auditors. Section 2.5 describes the method and empirical models. Section 2.6 presents the descriptive statistics as well as results of the main analyses, sensitivity analyses and robustness tests. Section 2.7 concludes, discusses the limitations of the study, and provides suggestions for future research.

2.2 Background Information

2.2.1 REGULATORY CONCERNS, DEVELOPMENTS, AND SETTING

The quality of group audits, especially those extending across borders and where a substantial part of the audit is performed by component auditors, is a major concern of audit regulators (e.g., ASIC [2015], IFIAR [2018], PCAOB [2016], [2017], IAASB [2015a], [2015b], [2019]). Both major standard-setters, the PCAOB and the IAASB, have current initiatives to address concerns about quality of these audits. The IAASB was the first to revise its standard (ISA 600), with the revisions aimed at improving the procedures around the conduct of group audits and the overall objective of improving their quality. Revised ISA 600, effective for periods

ending on or after December 15, 2010, expanded the principal auditor's involvement in the work of component auditors, with components operating in foreign jurisdictions being identified as a risk factor (ISA 600 revised).[10] This revised standard resulted in an increase in the requirements for involvement of the group auditor and a greater distinction between different types of component auditors, recognizing that a principal auditor could not necessarily rely on the work of a component auditor simply because the latter came from the same audit-firm network.[11] In contrast to the IAASB, the PCAOB's group audit project has first mandated disclosure of component auditors involved in material areas of an audit (PCAOB 2015) while continuing to consider the role and responsibilities of the engagement partner.[12] Additionally, while ISA 600 does not require disclosure of component auditors, it states that the responsibilities for a group audit reside solely with the engagement partner. Hence, unlike the PCAOB standard, there is no option of sharing responsibility between principal and component auditors.

To investigate our research questions, we exploit the Australian setting, which is subject to IAASB standards and has a longstanding statutory disclosure rule, Australian Corporations Act s300 (11B) (a).[13] The law requires all Australian listed companies to publicly disclose, in the notes to the financial statements, group audit fees paid to (1) the principal audit firm, (2)

[10] The ISA 600 (IAASB [2002]) requirements pre-2010 consisted of a total of only 18 paragraphs and four requirements, three being considerations that were required of the auditor (to consider: whether the auditor's own participation is sufficient to be able to act as the principal auditor (para. 6); the professional competence of the other auditor (para. 7); and the significant findings of the other auditor (para. 12), and a requirement, to "perform procedures to obtain sufficient appropriate audit evidence, that the work of the other auditor is adequate for the principal auditor's purposes, in the context of the specific assignment" (para. 8)). The revised ISA 600 contain 40 paragraphs of requirements and 66 paragraphs of explanatory material represented a considerable extension to the four requirements contained in the preceding ISA 600.

[11] The IAASB continues to consider the issue of group audits in their standard-setting initiatives. After identifying additional concerns about the responsibilities of the engagement partner in specific circumstances, and an invitation to comment, the IAASB aims to revise ISA 600 with an exposure draft targeted for December 2019 (IAASB (2019) "Proposed Strategy for 2020-2023 and Work Plan for 2020-2021," available at http://www.ifac.org/publications-resources/proposed-strategy-2020-2023-and-work-plan-2020-2021).

[12] The final rule (Release No. 2015-008) was approved by the PCAOB on December 15, 2015, and approved by the SEC on May 10, 2016. The PCAOB continues to explore issues related to the role and responsibilities of the lead auditor. It sought supplemental comments on this issue in September 2017 (Docket 42): "The supplemental request for comment we are considering today builds on our initial proposal in April 2016: to strengthen existing requirements for the lead auditor's involvement in the work of other auditors; and to establish a more uniform approach to a lead auditor's supervision of other auditors" (Doty [2017]).

[13] This disclosure has been in the Australian Corporations Act for over 25 years, following the disclosure of audit fees and non-audit fees in Australia since at least the 1980s. This reflects a legislative desire to better understand the quantum of audit fees and related auditor independence issues. These legislative requirements are supported by AASB 1054. While the disclosures require fees paid to the principal auditor, network auditors, and unaffiliated auditors, they do not require identification of the name of the specific network members or unaffiliated audit firm/firms involved. We include the standards for this audit fee disclosure and an example in appendix 2A of this chapter. To our knowledge, the Australian audit fee disclosures for group audits are the most comprehensive available. The closest in level of detail are the United Kingdom, but fees paid to unaffiliated auditors are not required to be disclosed (ICAEW [2014]).

other member firms within the principal auditor's network, and (3) other auditors unaffiliated with the principal auditor.[14] This allows us to analyze questions that cannot be answered in the U.S. setting, such as the efficacy of regulatory and standard-setting initiatives aimed at addressing concerns around quality of group audits.

Australia differs from the United States in several important ways, one of which is that audits are undertaken in accordance with IAASB standards. Of particular interest in this study is the impact of the revision of an international auditing standard, ISA 600, on group audits. Australian disclosures also identify the involvement of component auditors in group audits based on audit fees, not audit hours. In Australia, information about all fees (of any quantum) paid to component auditors is provided; however, the identity of component auditors is not disclosed. In comparison, U.S. Form AP requires identification of component auditors conducting significant (i.e., at least 5%) audit work only (PCAOB [2017]) as well as the number and aggregate percentage of other accounting firms that individually represent less than 5% of total audit hours. Another difference is that, in Australia, the disclosure of fee split and component-auditor involvement is located in the notes to the financial statements, while in the United States, information about significant component auditors is on Form AP, submitted to the PCAOB and available on its website.

2.2.2 PRIOR RESEARCH

Using a qualitative approach, Barrett et al. [2005] were among the first researchers to examine coordination of work in multinational audits. They document, based on an in-depth case study of a Big 4 firm, that component auditors are not passive followers of interoffice instructions but exercise considerable discretion. Hanes [2013] provides a review of the literature in management and social psychology, focusing on how geographically distributed work affects coordination and communication, knowledge sharing, work design, and the social

[14] The total fee for the group audit is negotiated between the principal auditor and the client prior to the start of the engagement and is contained in the engagement letter. The principal auditor determines the work to be undertaken by component auditors, and the fees to be allocated to them which is based on size of the component, amount of audit work done, and country-specific charge rates. Based on discussions with audit partners, there is usually little room for audit fee negotiations between principal and component auditors, especially when those are network firms. In cases where a client component requires a statutory audit, it is common that the client or its component negotiates the audit fee directly with the component auditor, irrespective of whether the auditor is a network or unaffiliated firm. In practice, the audit fee allocated to component auditors is often perceived as insufficient to cover the full costs of the component auditor's work.
In Australia, the audit fees disclosed for an MNE group audit consist of the fees paid to the principal auditor, fees paid to members of the principal auditor's network and unaffiliated component auditors (including amounts where the client contracts for and directly pays for the services of component auditors). The audit fee disclosures thus represent work effort of the principal and component auditors and can be influenced by audit fee negotiations or allocation decisions between principal and component auditors (Downey et al. [2018]).

identity of people conducting the work. In a similar vein, Gunn and Michas [2018] investigate the role of auditor multinational expertise in dealing with the complexity of MNE group audits and document, based on a U.S. sample, and find that audit quality is higher for auditors with MNE group audit expertise, specific expertise in the country where a significant subsidiary is located, or both. Further, Sunderland and Trompeter [2017] discuss problems faced in practice when conducting global group audits. Most recently, Downey and Bedard [2019a] examine challenges associated with co-ordination of group audit teams. With a survey of 147 U.S. group audit leaders, they show that clients' size/regulatory status and global structure contribute to coordination and communication challenges while language and cultural barriers are less important. They further show that tacit coordination helps group auditors mitigate challenges, while modularization and ongoing communication appear less effective.

The first archival study in the United States examining group audits was by Dee et al. [2015], who found that ERCs are lower and discretionary accruals are higher for companies that disclose for the first time the engagement of other auditors for a portion of the audit. The authors acknowledge the limited generalizability of these findings, given their small sample of 149 U.S. audits relating to small audit firms not acting as principal auditors for any SEC issuer.

Prompted by the increased regulatory attention, a number of recent concurrent working papers use the disclosure requirement of PCAOB Form AP on leading and participating auditors in the audit of SEC issuers. Burke et al. [2019] find, for a sample of 881 U.S public issuers with Form AP and an audit report due date between June 2017 and June 2018, that the total percentage of audit hours conducted by component auditors is associated with lower audit quality in the form of higher likelihood of quarterly restatement, longer audit delay, and higher audit fees. Further, they document that the mere use of a component auditor and the total number of component auditors in an engagement are associated with higher audit fees but not with restatement likelihood and audit delay. These results appear to contrast with those of Dee et al. [2018], who document that audit quality is lower (measured by discretionary accruals) when a component auditor is involved and that the use of more than one component auditor leads to lower audit quality and higher fees. Dee et al. find no support for the idea that the percentage of the audit work conducted by component auditors influences audit quality or audit fees.

2.3. Determinants of Component Auditor Involvement and Type of Component Auditor

Based on our discussion above, inspection findings (PCAOB [2016], Harris [2017], IFIAR [2018]) and prior research (Sunderland and Trompeter [2017], Downey and Bedard [2019a], Burke et al. [2019]), we examine the factors that influence the decision to involve a component auditor. With regard to client characteristics, group auditors of MNEs with extensive, diverse international operations might face a greater need to involve component auditors, due to resource and time constraints or legal, language, and cultural barriers.[15] With regard to auditor characteristics, audit firms with access to global networks and principal auditors with more expertise in auditing MNEs or in a client's industry may be able to better handle a MNE group audit and thus have less need for component auditors. Audit firm or partner changes, however, might increase need for involvement of component auditors, as the new lead auditor needs time to become acquainted with the MNE. Subsidiary companies might also prefer to retain their legacy auditors (Sunderland and Trompeter 2017). Further, when the audit falls into the auditor's busy season, auditors might be more inclined to use component auditors. Hence, we explore whether the decision to involve component auditors and the extent of this involvement is a function of (1) client complexity, (2) client internationalization, and (3) auditor characteristics.

We also consider whether revised ISA 600 affected the group auditor's involvement decision. As mentioned in section 2, while the revised standard did not change the principal auditor's overall responsibility for the group audit, it enhanced the requirements on the principal auditor to supervise the component auditor. Since we do not have clear expectations about the determinants of component auditor involvement, we formulate the following research question.

> *Research Question 1: Which client and auditor characteristics are associated with the involvement of component auditors?*

Component auditors can either be part of the principal's audit firm network or unaffiliated. The decision as to which type to use can be considered a second-order choice, compared to the first decision whether to involve any component auditor.[16] This decision may

[15] MNE client characteristics include subsidiary characteristics.

[16] Based on discussions with Australian audit partners involved in MNE group audits this is largely a two-stage decision process, where in the first stage it is determined whether and to what extent to involve a component auditor, and in the second stage the type of component auditor (network or unaffiliated) is decided on. The factors affecting the first and second stage are likely different. For example, in the first stage, the resource availability

be a function of auditor characteristics (including the availability of a network auditor in the component's location), client preferences, and costs (Sunderland and Trompeter [2017]). MNE group audits conducted by global networks can be expected to draw on network members. Principal auditors might trust auditors from within their network more, might have more information about their quality controls, or might already have a working relationship with them. We also consider whether the enhanced requirements of revised ISA 600 affect the involvement of different types of auditors. We formulate the following research question to explore the determinants of type of auditor involvement.

> *Research Question 2: Which characteristics are incrementally associated with the involvement of component auditors from the firm's network versus unaffiliated firms?*

2.4. Audit Outcomes of Component Auditor Involvement

As outlined previously, many of the concerns about MNE group audits relate to the involvement of component auditors. If a component auditor is used, there is the potential for information asymmetry between the principal auditor and the various component auditors (agents). The use of component auditors thus creates a multi-layered principal-agent problem for the signing partner. Bargaining power of the different parties might vary, depending on whether the component auditor is part of the audit firm network or is unaffiliated. In theory, the principal auditor must be able to satisfy him/herself that the involvement of component auditors does not result in compromised audit quality. In other words, the involvement of component auditors in the group audit forces the principal auditor to address this multi-layered principal-agent problem, regardless of the type of component auditor involved.

However, as described by Sunderland and Trompeter [2017], the use of component auditors might help or hurt. On the upside, a component auditor can help alleviate language and cultural barriers and provide knowledge of local regulations, including tax laws. In line with this argument, Barrett et al. [2005] document that component auditors exercise considerable discretion in responding to local relationships and risks. On the downside, unless

and cost of the principal auditor likely plays a large role, while in the second stage the availability and reliability of potential component auditors plays a role. Further, in specific circumstances, subsidiaries with a statutory audit requirement (e.g. based on size requirements in certain jurisdictions) might be able to choose their auditor independently of the parent firm. And in jurisdictions in which the principal auditor is not licensed (and no reciprocity agreement is in place), there will be a need to engage a component auditor. We cannot identify these cases specifically.

they are also the statutory auditor for that component, conducting work as a component auditor might not be considered a priority if time and resources are limited. Further, organization theory points to coordination and communication failures when interdependent teams operate in complex environments (Puranam, Raveendran, and Knudsen [2012]). Downey and Bedard [2019a] empirically confirm significant communication and coordination challenges in group audit teams. In line with the concerns raised by regulators and standard-setters, we hypothesize that audit quality is lower when component auditors are involved.

The costs of an MNE group audit include expenses related to audit effort, both on the part of the principal auditor and of any component auditors. With component auditors, there are likely significant costs related to coordination, which might include supervision and oversight, quality reviews, and re-doing work. However, the cost of visiting subsidiaries is less when component auditors are involved. Overall, we expect that the costs of coordination outweighs the visiting costs and hypothesize that involving component auditors is associated with higher audit fees. Collectively, we test the following hypothesis.

H1a: Audit quality (audit fees) is (are) lower (higher) when component auditors are involved.

As argued above, the decision to use a network versus an unaffiliated component auditor can be considered a second-order choice. Hence, we investigate whether there is any incremental effect on audit quality and fees if the component auditor is from the network or unaffiliated. The problems of potential overreliance on the work of the component auditor can occur both when the component auditor is part of the principal's audit-firm network and when the component auditor is unaffiliated with the principal auditor. With regard to network auditors, while branded (and commonly thought of) as a single entity, a global network is typically organized as an association of national partnerships that agree to affiliate and operate under a single global brand. Consequently, each member firm serves its geographic area and is subject to the laws and professional regulations of the country in which it operates (Carson [2009]). To ensure quality, the global networks invest heavily in training, development of audit methodologies, and the maintenance of groups of technical experts worldwide. Further, they expend considerable effort to ensure consistency across member firms. For example, when new audit methodologies are introduced, they are rolled out worldwide to all member firms. These efforts should result in greater uniformity across member firms. To the extent that network member firms are expected to provide uniform quality audits (IAASB 2015b), there should be no difference between the quality of work performed by members of the principal auditor and

that performed by other members within the global network. Further, the use of local network auditors with greater local expertise may be beneficial for the principal auditor.

At the same time, if the component auditor is a member of the principal auditor's network, the principal auditor may rely on the network's quality control and inappropriately over-rely on the work undertaken by another member of the network. In other words, the principal auditor may assume that the work of fellow network members is of a quality similar to its own. This is consistent with the potential impact of attachment bias.[17] This concern is illustrated by the following quote of James Doty [2011], former chair of the PCAOB: "For many large, multi-national companies, a significant portion of the audit may be conducted abroad—even half of total audit hours. In theory, when a network firm signs the opinion, the audit is supposed to be seamless and of consistently high quality. In practice, that is often not the case."

When the component auditor is unaffiliated (and possibly without a previous working relationship) with the principal auditor, the principal auditor runs a risk when accepting responsibility for its work. In this case, the principal group auditor must engage in a cost-benefit analysis to determine the appropriate extent of review or re-performance of the component auditor's audit testing. Further, differences in regulation, practice standards, or quality controls may result in lower quality auditing where unaffiliated auditors are involved.

At the same time, arguments can be put forward as to why the use of unaffiliated auditors would not be associated with lower audit quality. For example, research in psychology on "in-group/out-group" shows inherent biases against members of other groups, as does research examining differences in auditor judgments across countries (Nolder and Riley [2014]). This might make the principal auditor more cautious when unaffiliated auditors are involved and thus supervise their work more closely. We also note that the principal auditor has an incentive to use the work of unaffiliated auditors that can be trusted to deliver high audit quality, as they have to accept responsibility for their work.

With regard to audit fees, it is unclear whether this differs for the involvement of network versus unaffiliated auditors. While the cost base of unaffiliated local audit firms might be more modest, compared to those associated with using network auditors (Sunderland and

[17] By attachment bias, we refer to the psychological observation that human judgments are affected by the subconscious biases that arise from the contextual relationships in which the judgments are made (Bazerman, Morgan, and Loewenstein [1997]). While Bazerman et al.'s conclusion that auditors cannot conduct impartial audits, due to self-serving biases, is seen as resulting from repeated interactions between auditors and their clients, it is equally applicable between parts of a global network. Although Bazerman et al.'s conclusion is questioned by King [2002], who finds that there are external pressures to neutralize unconscious biases favoring clients, there are fewer such pressures to reduce unconscious biases within a global network.

Trompeter [2017]), the use of a network auditor should be more efficient for the principal given the ongoing working relationships and established communication protocols between network members. Based on these opposing arguments, we formulate a null hypothesis for the incremental effect for network versus unaffiliated component auditors on audit quality and fees.

H1b: There is no difference in audit quality (audit fees) based on the type of component auditor.

Finally, we investigate whether the adoption of the revised ISA 600 changed audit quality and fees, for engagements that use component auditors, and whether there is any incremental effect post adoption of the revised ISA 600 for network versus unaffiliated component auditors. While the objective of the additional requirements contained in the revised ISA 600 was to improve audit quality of MNE groups involving component auditors, a number of arguments suggest this might not necessarily occur. First, component auditors are not passive followers of instructions but instead exercise considerable discretion in response to their local relationships and risks (Barrett et al. [2005]). Second, the revised ISA 600 did not change the ultimate responsibility for the MNE group audit, which continues to reside with the principal auditor. Third, the IAASB post-implementation review of the revised ISA 600 and the current proposal to address ISA 600 concerns in the IAASB Strategy 2020-2023 (IAASB [2019b]) suggests that ISA 600 is not being consistently understood and applied as intended (Sunderland and Trompeter [2017]). Furthermore, it is not clear whether there is an incremental effect post adoption of ISA 600 for network versus unaffiliated component auditors. Hence, we formulate our hypotheses on the impact of the revised ISA 600 in the null form.

H2a: The association between the involvement of component auditors and audit quality (audit fees) is not different pre and post ISA 600.
H2b: There is no difference in audit quality (audit fees) based on the type of component auditor pre and post ISA 600.

2.5. Methodology

2.5.1 SAMPLE SELECTION

To investigate our research questions and hypotheses, we leverage the unique Australian setting, described in Section 2.2.1, which requires listed entities to disclose their audit fees paid to the principal auditor, audit firms related to the principal auditor, and other

auditors. To conduct our analyses, we use a sample of multinational companies listed on the Australian Stock Exchange (ASX) over the period 2006–2013. We focus on this period because it is around the introduction of the revised ISA 600 (effective date is for client year-ends on or after December 15, 2010). To determine the sample of multinational group audits, we identify the population of ASX listed companies on the Share Price and Price Relative (SPPR) Database over 2006–2013 (16,727 observations). We obtain financial data from the Morningstar Aspect Huntley Financial database and audit-related data from the UNSW Audit Fee and Audit Reporting database and manually collect additional data from annual report disclosures.[18] From the initial sample, we remove observations in the financial sector, those with no subsidiaries, and those with only Australian subsidiaries prior to removing observations with missing financial, auditor, or additional information.[19] We show our sample selection procedure in Table 1. As a result, we retain 4,869 firm-year observations of MNEs with one or more foreign subsidiaries.

TABLE 1

Sample Selection

	Number of Observations
Population of ASX listed companies 2006-2013	16,727
Less firm-years	
with joint auditors (more than one audit firm signs the audit opinion)[20]	(29)
in the financial sector (including property trusts)	(2,906)
with no subsidiaries	(2,665)
with only Australian subsidiaries[21]	(4,273)
missing current year, t-1 or t-2 financial information on Morningstar, or missing share price data	(1,985)
Australian group audits with one or more foreign subsidiaries (MNEs)	4,869

[18] Sources for each variable are indicated in Table 2.

[19] We identify the subsidiaries and their countries of incorporation for each client firm from disclosures in the notes to the financial statements. AASB 12.2 notes that entities must disclose information that enables users of consolidated financial statements to evaluate the nature of, and risk associated with its interest in other entities. Specifically, AASB 12.10(a)(i) requires that financial statement disclosures be sufficient to enable users of consolidated financial statements to understand the composition of the group. In addition, companies must disclose related party relationships (between any parent and subsidiaries) when control exists, irrespective of whether there have been related party transactions (AASB 124.13). Thus, all controlled entities, significant or not, are disclosed in the notes to the financial statements of Australian listed companies, including the effective interest of the parent in the controlled entities.

[20] ISA 600 does not cover the conduct of joint audits.

[21] We also use a sub-sample of companies with only Australian subsidiaries for which the principal auditor does not engage a component auditor and for which all variables used in equation [2] are available in an additional analysis in section 2.6.4 (N=2,774; See Appendix 2D of this chapter). We further identify 152 audits of companies with only Australian subsidiaries that engage component auditors and for which all variables from equation [2] are available in additional analysis (reported in Section 2.6.5.4).

2.5.2 EMPIRICAL MODELS

2.5.2.1 Determinants of Component Involvement

To examine the determinants of component involvement for multinational group audits, we focus on both the likelihood and the extent of component auditor involvement as well as the type of component auditor involvement. We use the following model (ignoring subscripts).

$$\begin{aligned} &COMPONENT,\ COMPONENT\%,\ NETWORK\%\ or\ UNAFFILIATED\% = \beta_0 + \\ &\sum \beta i\ Client\ Complexity + \sum \beta_j\ Client\ Internationalization + \sum \beta_k\ Auditor \\ &Characteristics + Subsidiary\ Country / Industry / Year\ Fixed\ Effects + \varepsilon_t, \end{aligned} \quad [1]$$

where *COMPONENT* is an indicator variable equal to one if the percentage of group audit fees paid to auditors other than the principal auditors is larger than zero and zero otherwise. We use probit to analyze the dependent variable *COMPONENT* in the sample of MNEs. *COMPONENT%* captures the percentage of total group audit fees paid to auditors other than the principal auditor. *NETWORK%* captures the percentage of total group audit fees paid to network auditors. *UNAFFILIATED%* captures the percentage of total group audit fees paid to unaffiliated auditors. We use OLS regression to analyze these continuous dependent variables in the sample of MNEs with component auditors.[22]

As described earlier, we expect the determinants of component auditor involvement and extent of component (network or unaffiliated) auditor involvement to be determined by (1) client complexity, (2) client internationalization, and (3) auditor characteristics.[23] We capture client complexity with the following variables: client size, measured as the natural logarithm of total assets (*LTA*); the ratio of current to total assets (*CATA*); the quick ratio (*QUICK*); *LEVERAGE*; cash flow performance (*PERFORM)*; an indicator variable for LOSS; and the growth in sales (*SALESGROWTH*) and PPE (*PPEGROWTH*). We measure client internationalization as the natural logarithm of the number of subsidiaries (*LSUB*); an indicator variable for a high proportion of foreign subsidiaries (*FOREIGN*); an indicator variable for a low percentage of English-speaking subsidiaries (*LOWSUBSENGLISH*); an indicator variable for a low percentage of foreign subsidiaries mandating IFRS adoption for listed entities (*LOWIFRS*); an indicator variable for a high average geographic distance between Australia

[22] I first analyze the choice to include a component auditor in the audit and use the MNE sample for this analysis. I then restrict the sample to the MNEs with component auditors when analyzing the determinants of the extent of component involvement (*COMPONENT%*). This restricts the analysis to a more homogenous sample. I elaborate on why we choose to analyze the MNE with component subsample in section 2.6.1.

[23] We cannot observe client preferences or costs in our setting and therefore restrict the analysis to the three observable factors mentioned. Some variables can arguably represent both client complexity and client internationalization.

and each subsidiary country (*HIGHSUBDIST*); and an indicator variable for low average subsidiary country rule of law (*LOWRULE*).[24]

We include the following auditor characteristics as determinants of component and type of auditor involvement in our model: an indicator variable for whether the principal auditor is a *BIG4* auditor or a *LARGENONBIG4* auditor; an indicator variable for audit firm change (*ADTCHANGE*) and partner change (*PTCHANGE*) in the current year; an indicator variable for whether an audit falls into the auditor's busy season (*BUSY*); *MNESPEC* and *INDLEADER* indicate whether the auditor is an MNE specialist (Gunn and Michas 2018) or a national industry leader (e.g., Reichelt and Wang 2010), respectively; and *LOCATIONCOV*, which measures the percentage of subsidiary countries in which the principal audit firm has a network member.

We further control for companies in the *MINING* industry, given their specific characteristics and dominance in an Australian setting (Carson et al. [2012]) and include industry fixed effects (defined as two-digit GICS codes). We also include subsidiary country fixed effects to control for the time-constant differences across the countries of incorporation of an MNE's foreign subsidiaries. We thus control for time-invariant conditions that might systematically affect audits in the countries in which component auditors are likely conducting work. To make estimation feasible, we aggregate countries with few observations into regions (see Table 2, Panel E) and create indicator variables for each country or region, equal to one if the client has one or more subsidiaries in that country/region. We further include year fixed effects in the main analyses.

In a separate analysis, we investigate whether there are changes in the (extent of) component auditor involvement after the revision of ISA 600. We include all determinants discussed above and the variable *ISA600*, an indicator variable equal to one in the period after the revised ISA 600 became effective and zero otherwise. In this specification, we do not include year fixed effects, since these would subsume the effect of *ISA600*.[25] We winsorize all continuous financial variables at the first and 99th percentile. We cluster standard errors at the client-firm level. All variables are defined and their sources disclosed in Appendix 2B of this chapter.

[24] We construct indicator variables for these client characteristics to avoid multicollinearity problems when using continuous versions of these variables.

[25] We considered adding a time trend to this regression. However, descriptive statistics reveal that there is no clear linear trend over the full sample period that would justify the use of a linear time trend variable.

2.5.2.2 Analyses of Audit Outcomes

The audit outcomes of interest are audit fees (*LAFEE*) and audit quality. To measure audit quality, we rely on and are restricted to proxies of earnings and revenue management that have commonly been used as proxies for audit quality in U.S. studies (e.g., Francis and Michas [2013]) as well as in the international auditing literature across a range of countries (e.g., Francis, Michas and Seavey [2011], Kwon, Lim, and Tan [2007], Carcello and Li [2013], Lennox, Wu and Zhang [2016], Fung et al. [2017]).[26] We recognize that these are measures of financial reporting quality and might not be direct proxies for audit quality. However, financial reporting quality is a joint product of clients and auditors (Antle and Nalebuff [1991]), and the goal of auditors is to increase financial statement reliability (DeFond and Zhang [2014]). In addition, these publicly available measures of financial reporting quality are generally associated with practitioner assessments of audit quality (Aobdia [2019]). Specifically, as a measure of earnings management, we use the absolute value of total accruals ($|TA|$) and control for all regressors of the performance-adjusted Jones model and their interactions with industry-years in our audit quality model (equation [2]).[27]

We supplement the accrual-based measures of audit quality with measures of revenue management, based on the work of McNichols and Stubben [2008] and Stubben [2010] This measure has been used as a proxy for audit quality (Minutti-Meza [2013]) and in an international setting (Chen et al. [2011]). Following Chen et al. [2018], we use a one-step procedure and use the absolute value of the scaled change in accounts receivables ($|\Delta AR|$) as the dependent variable and control for the scaled change in revenue and its interaction with industry-years in our audit quality model (equation [2]).[28]

[26] In the Australian setting, we are limited in the financial reporting quality measures available, in part, due to the period under investigation. Specifically, restatements are extremely rare (e.g., Ahmed and Goodwin [2007]). Additionally, due to the large number of mining companies, going concern rates are extremely high in Australia, and the propensity to issue going concern opinions changed over the sample period, due to the impact of the global financial crisis (e.g., Xu et al. [2013]), making this an unreliable measure of audit quality for our sample period. Further, the commonly used incidence of small profit for which we have data available is less suitable for the Australian setting, as has been shown elsewhere (e.g., Coulton, Taylor, and Taylor [2005[). This is in part due to the high proportion of mining companies listed on the ASX, which have a specific accounting treatment.

[27] In our main analysis we use a one-stage approach, as suggested by Chen et al. [2018]. The one-stage approach avoids biased coefficient estimates that results from the two-stage approach, i.e. first estimating discretionary accruals or revenue and then using these as dependent variables. This approach is also implemented in recent papers such as those by Gipper et al. [2018] and Godsell et al. [2017].

[28] We also rerun our analysis using the two-stage approach by first calculating the conventional measure of performance-adjusted discretionary accruals, based on the work of Jones [1991] and Kothari et al. [2005] and the conventional measure of discretionary revenues as dependent variables (not tabulated). We confirm our results.

Our model of interest to investigate our hypotheses is in the form of an OLS model and is specified as follows (ignoring subscripts): [29]

$$|TA|, |\Delta AR| \text{ or } LAFEE = \beta_0 + \beta_1 Variable\ of\ Interest + \sum \beta_i Controls + [First\text{-}stage\ regressors * Industry\text{-}Year] + Subsidiary\ Country/Industry/Year\ Fixed\ Effects + \varepsilon_t. \quad [2]$$

To test the first set of hypotheses on the association between component (network or unaffiliated) auditor involvement and audit quality, the variables of interest in the audit quality analyses are *COMPONENT%* (*NETWORK%* or *UNAFFILIATED%*), capturing the percentage of group audit fees paid to component (network or unaffiliated) auditors. To alleviate the concern that we estimate mechanical relationships between the dependent variable audit fees and the continuous variables of interest that are calculated from audit fees, we construct indicator variables for high versus low component involvement (*COMPONENT25%*, *NETWORK25%*, and *UNAFFILIATED25%*) that equal one if more than 25 percent of audit fees are paid to component, network or unaffiliated auditors and zero otherwise. We choose this cut-off value since approximately 50 percent of the audits in the MNE component auditor sample pay 25 percent or more of audit fees to component auditors. We analyze this model in the sample of MNEs with components.[30]

To test our second set of hypotheses, the effect of ISA 600 on audit quality for those audits involving component auditors, we include an interaction effect between ISA 600 and extent of component involvement (*ISA600*COMPONENT%*) and different types of components (*ISA600*NETWORK%, ISA600*UNAFFILIATED%*) as well as all main effects. The variable *ISA600* equals one if the client's financial year ends on or after 15 December 2010, the effective date of the revised ISA 600 and zero otherwise.

We include the variables measuring client complexity as included in equation [1], following the literature (e.g., Francis and Michas [2013], Francis and Yu [2009], Gipper et al. [2018]). We further include the following variables as controls in the audit quality model: the volatility of sales (*SALESVOL*) and operating cash flows (*OCFVOL*) over the last three years; absolute total accruals in the prior year (*|TA|_L*); market-to-book ratio (*MB*); annualized market-adjusted return (*ANNUAL*); lagged accounts receivable (*RECTOVER_L*); and accounts payable turnover (*PAYTOVER_L*). We also control for *FOREIGN* and *LOWRULE* since the literature shows that groups tend to manage their earnings through foreign operations,

[29] In sensitivity analyses, we use tobit regression to account for the censored nature of the data.
[30] I elaborate on why we choose to analyze the MNE with component subsample in section 2.6.1.

especially those with weak institutional environments (e.g., Dyreng et al. [2012], Beuselinck et al., [forthcoming]). Further, we include the same auditor-level controls as in equation [1], except *LOCATIONCOV*.

In the audit fee model, we include the same controls as described above as well as additional variables that affect audit fees (e.g., Ferguson, Francis and Stokes [2003], Carson and Fargher [2007]): the absolute value of total accruals (|TA|), the type of audit opinion issued to the client (*MOPINION*), the year-to-year growth in assets (*GROWTH*), and the year-to-year industry growth (*INDGROWTH*). We further include measures that are likely to influence audit fees in the group audit setting: the natural logarithm of the number of subsidiaries (*LSUB*), an indicator variable for a large distance between Australia and subsidiary countries (*HIGHSUBDIST*), and the natural logarithm of the weighted average per-capita GDP of each subsidiary country (*LSUBGDP*). All financial continuous variables are winsorized at the first and 99th percentile. Similar to equation [1], we also include subsidiary country, industry, and year fixed effects.[31] We cluster standard errors by client firm. All variables are defined in Appendix 2B of this chapter.

2.6. Results

2.6.1 DESCRIPTIVE STATISTICS

Our sample consists of 4,869 multinational group audit observations over the period 2006–2013 (the MNE sample). Of these, 51.8 percent (2,520 observations) are audited by the principal auditor only, without the involvement of component auditors, and the remaining observations (48.2 percent; 2,349 observations) are audited by principal auditors and involve component auditors. We refer to the former as MNEs without component auditors and the latter as MNEs with component auditors. Of the MNEs with component auditors sample, 35.9 percent (843 observations, 285 unique companies) are audited by the principal auditor and component auditors of the principal auditor's audit firm network only, while 50.3 percent (1,182 observations, 437 unique companies) are audited by the principal auditor and unaffiliated component auditors only and 13.8 percent (324 observations, 124 unique companies) are audited by the principal auditors and a mix of network and unaffiliated component auditors.

[31] We discuss our results using client fixed effects in sensitivity analyses.

In Table 2, Panel A, we show descriptive statistics for the MNEs sample and for the samples of MNEs with and without component auditors. For those audits involving component auditors, on average, 27.8 percent of the total group audit fees are paid to components (*COMPONENT%*), of which, on average, 13.4 percent are paid to network auditors (*NETWORK%)* and 14.4 percent to unaffiliated auditors (*UNAFFILIATED%*). We show the distributions of these variables as histograms in Appendix 2C of this chapter (Graph 1, Panels A–C). [32]

The absolute value of total accruals (|*TA*|) is, on average, 16.2 percent of assets for MNEs. |*TA*| is significantly lower in the MNEs with component auditors (13.1 percent), compared to those without (19.1 percent). The average of the absolute value of change in accounts receivables (|*ΔAR*|) is 0.08 percent of total assets in the MNEs with component auditors and 0.09 percent in those without. The natural logarithm of CPI-adjusted audit fees is 4.823, on average, in the MNEs sample and significantly higher in the MNEs with component auditors sample (5.318), compared to the MNEs without component auditors sample (4.361). The descriptives for the control variables indicate that those MNEs with component auditors are significantly different from those without. On average, MNEs with component auditors are larger (*LTA*), less liquid (*QUICK*), better performing (*LOSS*; *PERFORM*), less volatile (*OCFVOL*), and more international (*LSUB; FOREIGN*), compared to MNEs without component auditors. Further, on average, a significantly higher percentage of observations of MNEs with component auditors are audited by Big 4 auditors (*BIG4*)[33] and industry leaders (*INDLEADER*). MNEs without component auditors, on average, engage a higher percentage of second-tier audit firms (*LARGENONBIGN*).

In Panel B of Table 2, we show descriptives of the key variables and dependent variables pre and post ISA 600 for the MNEs and MNEs with component auditors. We find a significant decrease in *COMPONENT%* from the pre- to post-ISA-600 period for MNEs and MNEs with component auditors (p-value<0.1, one-tailed) and in *UNAFFILIATED%* for the MNEs (p-value<0.1; one-tailed), which provides some univariate indication that the involvement of component auditors declined in the period after the revision of ISA 600.

We further show the industry and year composition of our subsamples in Table 2, Panel C and D. As is characteristic in Australia, the largest portion of companies are from the

[32] For over 93 percent (83 percent) of these observations, the proportion of the total audit fee paid to component auditors exceeds 5 (10) percent. For 345 observations (15 percent), the audit fees paid to the principal auditor are below 50 percent, indicating that, for 85 percent of observations, the principal auditor conducts a substantial part of the work. For the majority of the observations, component work is thus material to the overall group audit.
[33] The Big 4 market share of 51.9 percent for MNEs is in line with other Australian studies (Ferguson et al. [2018]).

materials industry (GICS two-digit code=15), which includes mining companies. In Table 2, Panel E, we further show the country of incorporation (or regions, where there are less than 100 observations) of subsidiaries and the number and proportion of MNEs with at least one subsidiary in that location. We use this table to code subsidiary country fixed effects.

To investigate our research questions and hypotheses, we mainly rely on the sample of MNEs with component auditors but also run our tests using the full MNE sample (i.e., those MNEs with and without component auditors), which are briefly discussed in footnote 43. Due to the significant differences in company and auditor characteristics between the MNEs with and without component auditors and the highly skewed variables of interest in the MNE sample (see histograms of *COMPONENT%*, *UNAFFILIATED%*, and *NETWORK%* in Graph 1, Panels A–C, in Appendix 2C), we test our hypotheses on the relatively homogenous subsample of MNEs with component auditors. In this way, we also avoid imposing a functional form on the association between the variables of interest and audit quality and fees.[34] As described in more detail in section 6.4, we further identify control groups for testing H2a.

[34] The high skewness of the variables in the MNE sample suggests a nonlinear relationship with audit outcomes.

TABLE 2

Descriptive Statistics

Panel A: Sample Descriptives

	MNEs (1) (N=4,869)			MNEs with Component Auditors (2) (N=2,349; 48.2%)			MNEs without Component Auditors (3) (N=2,520; 51.8%)			Comparison (2)-(3)
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	t-statistic[a]
Variables of interest and dependent variables										
COMPONENT	0.482	0.000	0.500	1.000	1.000	0.000	0.000	0.000	0.000	
COMPONENT%	0.134	0.000	0.191	0.278	0.244	0.188	0.000	0.000	0.000	
COMPONENT25%	0.235	0.000	0.424	0.487	0.000	0.500	0.000	0.000	0.000	
NETWORK%	0.065	0.000	0.146	0.134	0.000	0.187	0.000	0.000	0.000	
NETWORK25%	0.110	0.000	0.313	0.228	0.000	0.419	0.000	0.000	0.000	
UNAFFILIATED%	0.069	0.000	0.145	0.144	0.064	0.182	0.000	0.000	0.000	
UNAFFILIATED25%	0.116	0.000	0.321	0.241	0.000	0.428	0.000	0.000	0.000	
ISA600	0.565	1.000	0.496	0.560	1.000	0.496	0.569	1.000	0.495	-0.009
|TA|	0.162	0.073	0.255	0.131	0.060	0.211	0.191	0.091	0.286	-0.060***
|ΔAR|	0.008	0.000	0.028	0.008	0.000	0.025	0.009	0.000	0.030	-0.001
LAFEE	4.823	4.616	1.279	5.318	5.150	1.265	4.361	4.121	1.108	0.957***
Controls										
ADTCHANGE	0.101	0.000	0.301	0.104	0.000	0.305	0.098	0.000	0.297	0.006
ANNUAL	0.079	-0.106	0.857	0.083	-0.061	0.788	0.075	-0.155	0.917	0.008
BIG4	0.519	1.000	0.500	0.585	1.000	0.493	0.458	0.000	0.498	0.126***
BUSY	0.852	1.000	0.355	0.817	1.000	0.386	0.885	1.000	0.320	-0.067***
CATA	0.436	0.403	0.266	0.438	0.419	0.246	0.434	0.378	0.283	0.004
FOREIGN	0.764	1.000	0.424	0.814	1.000	0.390	0.719	1.000	0.450	0.095***
GROWTH	1.358	1.051	1.378	1.298	1.050	1.190	1.415	1.051	1.530	-0.118***
HIGHSUBDIST	0.250	0.000	0.433	0.270	0.000	0.444	0.232	0.000	0.422	0.038*
INDGROWTH	1.114	1.080	0.126	1.110	1.080	0.128	1.117	1.081	0.125	-0.006*
INDLEADER	0.159	0.000	0.366	0.179	0.000	0.384	0.140	0.000	0.347	0.039**
LARGENONBIGN	0.367	0.000	0.482	0.332	0.000	0.471	0.398	0.000	0.490	-0.066***
LEVERAGE	0.373	0.315	0.416	0.387	0.376	0.322	0.359	0.244	0.488	0.027[†]
LOCATIONCOV	0.823	1.000	0.257	0.834	1.000	0.252	0.812	1.000	0.261	0.023*
LOSS	0.568	1.000	0.495	0.467	0.000	0.499	0.662	1.000	0.473	-0.195***
LOWIFRS	0.493	0.000	0.500	0.412	0.000	0.492	0.569	1.000	0.495	-0.157***
LOWRULE	0.250	0.000	0.433	0.282	0.000	0.450	0.220	0.000	0.414	0.062**
LOWSUBSENGLISH	0.246	0.000	0.431	0.269	0.000	0.444	0.225	0.000	0.418	0.044*

LSUB	2.171	2.079	1.189	2.509	2.303	1.268	1.856	1.792	1.013	0.653***
LSUBGDP	10.499	10.737	0.651	10.453	10.692	0.663	10.541	10.772	0.638	-0.089***
LTA	4.102	3.766	2.207	4.705	4.462	2.224	3.540	3.256	2.037	1.165***
MB	2.531	1.506	3.826	2.408	1.505	3.214	2.646	1.508	4.317	-0.239†
MINING	0.318	0.000	0.466	0.296	0.000	0.457	0.338	0.000	0.473	-0.043*
MNESPEC	0.266	0.000	0.442	0.266	0.000	0.442	0.266	0.000	0.442	0.000
MOPINION	0.231	0.000	0.422	0.193	0.000	0.395	0.267	0.000	0.443	-0.074***
OCFVOL	0.093	0.052	0.122	0.079	0.045	0.101	0.105	0.059	0.138	-0.026***
PAYTOVER_L	3.048	0.000	5.851	3.471	0.226	5.788	2.653	0.000	5.884	0.817**
PERFORM	-0.118	-0.016	0.441	-0.051	0.031	0.329	-0.180	-0.048	0.516	0.128***
PPEGROWTH	1.717	0.039	9.657	1.517	0.047	8.808	1.903	0.032	10.384	-0.387†
PTCHANGE	0.226	0.000	0.418	0.230	0.000	0.421	0.223	0.000	0.416	0.007
QUICK	5.241	1.608	10.434	4.427	1.438	9.664	5.999	1.943	11.051	-1.573***
RECTOVER_L	8.728	4.686	20.159	8.009	5.232	16.217	9.398	3.968	23.221	-1.389†
SALESGROWTH	0.877	0.000	5.315	0.916	0.008	5.460	0.841	0.000	5.177	0.076
SALESVOL	0.154	0.060	0.244	0.159	0.080	0.225	0.149	0.038	0.260	0.010
|TA|_L	0.377	0.073	12.288	0.151	0.061	0.444	0.588	0.088	17.074	-0.438†

[a] t-statistic clustered at the company level; *** two-tailed p<0.01, **two-tailed p<0.05, * two-tailed p<0.1, † p<0.2 (one-tailed significance)

Panel B: Descriptives pre-ISA 600 and post-ISA 600

	MNEs pre-ISA 600 (N=2,119)		MNEs post-ISA 600 (N=2,750)			MNEs with Component Auditors pre-ISA 600 (N=1,033)		MNEs with Component Auditors post-ISA 600 (N=1,316)		
Variables	mean	p50	mean	p50	t-statistic[a]	mean	p50	mean	p50	t-statistic[a]
COMPONENT%	0.139	0.000	0.130	0.000	-0.009†	0.286	0.239	0.272	0.247	-0.013†
NETWORK%	0.066	0.000	0.064	0.000	-0.003	0.136	0.007	0.133	0.000	-0.003
UNAFFILIATED%	0.073	0.000	0.067	0.000	-0.006†	0.150	0.063	0.139	0.066	-0.011
|TA|	0.160	0.075	0.164	0.072	0.004	0.133	0.062	0.129	0.059	-0.003
|ΔAR|	0.009	0.000	0.008	0.000	-0.002†	0.008	0.000	0.008	0.000	0.000

[a] t-statistic clustered at the company level; *** two-tailed p<0.01, **two-tailed p<0.05, * two-tailed p<0.1, † p<0.2 (one-tailed significance)

TABLE 2

Descriptive Statistics (continued)

Panel C: Industry composition

GICS industry classification	GICS two-digit code	MNEs		MNEs with Component Auditors		MNEs without Component Auditors	
		N	%	N	%	N.	%
Energy	10	748	15.36	306	13.03	442	17.54
Materials	15	1,548	31.79	695	29.59	853	33.85
Industrial	20	757	15.55	434	18.48	323	12.82
Consumer Discretionary	25	579	11.89	332	14.13	247	9.8
Consumer Staples	30	133	2.73	88	3.75	45	1.79
Health Care	35	469	9.63	209	8.9	260	10.32
Information Technology	45	470	9.65	233	9.92	237	9.4
Telecommunication Services	50	76	1.56	28	1.19	48	1.9
Utilities	55	89	1.83	24	1.02	65	2.58
Total		4,869	100	2,349	100	2,520	100

Panel D: Year composition

	MNEs		MNEs with Component Auditors		MNEs without Component Auditors	
Year	N	%	N	%	N	%
2006	446	9.16	218	9.28	228	9.05
2007	535	10.99	272	11.58	263	10.44
2008	598	12.28	287	12.22	311	12.34
2009	605	12.43	292	12.43	313	12.42
2010	670	13.76	340	14.47	330	13.1
2011	662	13.6	318	13.54	344	13.65
2012	658	13.51	315	13.41	343	13.61
2013	695	14.27	307	13.07	388	15.4
Total	4,869	100	2,349	100	2,520	100

TABLE 2

Descriptive Statistics (continued)

Panel E: Subsidiary composition				
	MNEs with Component Auditors		MNEs	
Subsidiary location	N with at least one subsidiary	Proportion with at least one subsidiary	N with at least one subsidiary	Proportion with at least one subsidiary
USA	963	41.00%	1849	37.97%
United Kingdom[35]	935	39.80%	1420	29.16%
New Zealand	819	34.87%	1281	26.31%
Singapore	662	28.18%	934	19.18%
Hong Kong	580	24.69%	777	15.96%
Europe - Other[36]	411	17.50%	599	12.30%
China	381	16.22%	528	10.84%
Malaysia	361	15.37%	462	9.49%
Canada	336	14.30%	470	9.65%
Indonesia	284	12.09%	392	8.05%
South Africa	268	11.41%	374	7.68%
Africa - Other[37]	262	11.15%	489	10.04%
Central America - Other[38]	239	10.17%	381	7.83%
Asia - Other[39]	233	9.92%	336	6.90%
Germany	223	9.49%	318	6.53%
India	205	8.73%	285	5.85%
Thailand	193	8.22%	238	4.89%
Papua New Guinea	189	8.05%	273	5.61%
Netherlands	186	7.92%	254	5.22%
British Virgin	174	7.41%	351	7.21%
South America - Other[40]	171	7.28%	249	5.11%
Central Asia - Other[41]	170	7.24%	235	4.83%
Mauritius	152	6.47%	205	4.21%
Brazil	149	6.34%	225	4.62%
Chile	144	6.13%	201	4.13%
Pacific-Other[42]	142	6.05%	214	4.40%
Spain	135	5.75%	172	3.53%
France	128	5.45%	170	3.49%
Philippines	128	5.45%	166	3.41%
Sweden	107	4.56%	144	2.96%
Japan	100	4.26%	136	2.79%
Ghana	98	4.17%	136	2.79%
Namibia	65	2.77%	138	2.83%

[35] Includes Channel Islands, England, Guernsey, Ireland, Isle of Man, Jersey, Northern Ireland, Scotland and United Kingdom.
[36] Includes Albania, Austria, Belgium, Bosnia, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Georgia, Gibraltar, Greece, Hungary, Italy, Lithuania, Luxembourg, Macedonia, Malta, Montenegro, Norway, Poland, Portugal, Romania, Russia, Siberia, Slovakia, Slovak Republic, Slovenia, Serbia, Switzerland, Turkey and Ukraine.
[37] Includes Algeria, Angola, Botswana, Burkina Faso, Burundi, Cameroon, Congo, Ethiopia, Gabon, Gambia, Guinea, Kenya, Ivory Coast, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, Tanzania, Uganda, Zambia and Zimbabwe.
[38] Includes Antigua, Bahamas, Barbados, Belize, Bermuda, British Anguilla, Cayman Islands, Costa Rica, Dominican Republic, El Salvador, Honduras, Jamaica, Mexico, Netherlands Antilles, Panama, Puerto Rico, Trinidad and Turks and Caicos Islands.
[39] Includes Bangladesh, Brunei, Cambodia, East Timor, Korea, Kyrgyz Republic, Laos, Macau, Mongolia, Pakistan, Sri Lanka, Taiwan, and Vietnam.
[40] Includes Argentina, Bolivia, Colombia, Ecuador, Guatemala, Guyana, Netherland Antilles, Paraguay, Peru, Uruguay, and Venezuela.
[41] Includes Afghanistan, Bahrain, Egypt, Iran, Iraq, Israel, Jebel Ali Free Zone, Kazakhstan, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates and Uzbekistan.
[42] Includes American Samoa, Cook Islands, Fiji, New Caledonia, Samoa, Solomon Islands, Tonga, Western Samoa and Vanuatu.

2.6.2 DETERMINANTS OF COMPONENT AUDITOR INVOLVEMENT

In Table 3, Columns (1)–(5), we present our main analyses on the determinants of likelihood and extent of component involvement. We first analyze which determinants are associated with the likelihood of involving a component auditor (Column 1; Pseudo R^2 of 16.5 percent) in the MNEs sample. We find that component auditors are more likely to be involved when client firms are complex, measured as company size (*LTA*) and higher levels of current-to-total assets (*CATA*). We also find that the degree of internationalization, measured as the number of subsidiaries (*LSUB*) and high percentage of foreign subsidiaries (*FOREIGN*), significantly increases the likelihood of involving a component auditor. The likelihood of involving component auditors is also higher when the average distance to subsidiary countries is high (*HIGHSUBDIST*), making location visits for the principal auditor more time consuming and costly. We also find that, when average subsidiary rule of law is low (*LOWRULE*), the likelihood of component involvement is higher. This could indicate that principal auditors prefer to engage local component auditors when audit work is conducted in very different institutional settings, compared to Australia which has a high rule of law score. In terms of auditor characteristics, we find that MNE specialist auditors (*MNESPEC*) with more expertise in auditing international groups are less likely to involve component auditors. An auditor change (*ADTCHANGE*) significantly increases the likelihood of involving a component auditor. This result could be attributed to higher workload in first-year audits, which might lead principal auditors to rely on components, or subsidiaries might prefer to retain their legacy auditors (Sunderland and Trompeter 2017). For transparency reasons, we examine the cross-sectional association between determinants and the extent of component auditor involvement in the MNE sample in Column 2 (R^2 of 23.9 percent). In Column 3, we examine the determinants of the extent of component auditor involvement for the more homogenous MNEs with component auditor sample (R^2 of 28.1 percent). We find that client size (*LTA*) is positively associated with the extent of component involvement (*COMPONENT%*), while liquidity (*QUICK*) is negatively associated. We further find that those clients with a high percentage of foreign subsidiaries (*FOREIGN*), a low percentage of foreign subsidiary countries that mandate IFRS (*LOWIFRS*), and a high average distance from parent to subsidiary countries (*HIGHSUBDIST*) are associated with greater component involvement. The number of subsidiaries (*LSUB*) is insignificant, which shows that the extent of component involvement is not determined by the mere number of subsidiaries but rather their characteristics and location. Specifically, communication and coordination is likely to be more challenging in foreign

subsidiaries, subsidiaries that are located farther away from the parent, and those that might apply different accounting standards. We also find that Big 4 auditors that act as principal auditors involve a lower percentage of component auditors in their audits. These auditors likely have more resources, allowing them to complete more of the group audit themselves. Further, we find that the extent of involvement of component auditors increases after a principal auditor switch (*ADTCHANGE*) and is higher if the audit firm network covers a higher percentage of subsidiary countries (*LOCATIONCOV*).

When dividing the extent of component involvement into the extent of network auditor involvement (Column 4; R^2 of 39.1 percent) and extent of unaffiliated auditor involvement (Column 5; R^2 of 34.4 percent) for the sample of MNEs with component auditors, important differences in determinants for these two subgroups emerge. Specifically, we find that Big 4 and large non-Big 4 auditors (*BIG4* and *LARGENONBIG4*), i.e., those auditors with access to a worldwide network, involve a significantly higher percentage of network auditors and that Big 4 auditors are significantly negatively associated with *UNAFFILIATED%*. The network coverage of subsidiary countries (*LOCATIONCOV*) is also significantly positively associated with *NETWORK%*. We further find that those auditors with expertise in auditing MNEs (*MNESPEC*) involve a significantly higher percentage of network auditors but a significantly lower percentage of unaffiliated auditors. Further, after a principal auditor change (*ADTCHANGE*), the extent of network involvement is lower, while the extent of unaffiliated involvement is higher. This might indicate that legacy auditors are retained by subsidiaries (Sunderland and Trompeter 2017). In terms of client internationalization, we find that *NETWORK%* is positively associated with clients with high percentage of foreign subsidiaries (*FOREIGN*), those with a low percentage of English-speaking subsidiaries (*LOWSUBSENGLISH*), and those with a low percentage of foreign subsidiaries located in countries with mandatory IFRS adoption (*LOWIFRS*). *UNAFFILIATED%* is positively associated with average distance to subsidiary locations (*HIGHSUBSDIST*) but negatively associated with difference in accounting standards (*LOWIFRS*). These differences could be explained by the fact that network auditors might be preferred in situations requiring more coordination and communication.

In Table 3, Columns (6)–(10), we show the same analyses as before but include the variable *ISA600* rather than year fixed effects to investigate whether the likelihood and extent of component involvement changes after the revision of ISA 600. Note that the significance and signs of all other determinants do not change in these models, compared to the models that contain year fixed effects. We do not find a change in the likelihood of involving a component

auditor (*COMPONENT*) after ISA 600 (Column 1). However, for the sample of MNEs with component auditors, we find evidence that the extent of component involvement (*COMPONENT%*, Column 8) significantly decreases in the post-ISA 600 period. As was described in section 2.1, revised ISA 600 expanded the principal auditor's responsibility for the work of component auditors. The significant reduction in extent of component auditor involvement post-ISA 600 could be a reaction of principal auditors to these new requirements. We also find that this reduction can be attributed to a significant decrease in the extent of involvement of unaffiliated auditors (Column 10), while there is no significant decrease in the extent of involvement of network auditors (Column 9). However, revised ISA 600 explicitly points out that principal auditors cannot rely on the work of component auditors without adequate supervision, review and testing, regardless of whether they are from the same network.

TABLE 3

Determinants of use of component auditors and extent of component auditor involvement

	YEAR FE					ISA 600				
	MNEs		MNEs with Component Auditors			MNEs		MNEs with Component Auditors		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	*COMPONENT*	*COMPONENT%*	*COMPONENT%*	*NETWORK%*	*UNAFFILIATED%*	*COMPONENT*	*COMPONENT%*	*COMPONENT%*	*NETWORK%*	*UNAFFILIATED%*
ISA600						-0.0174	-0.0049	-0.0291***	-0.0015	-0.0276***
						(0.048)	(0.020)	(0.008)	(0.007)	(0.008)
LTA	0.1021***	0.0157***	0.0125**	0.0094**	0.0030	0.1016***	0.0157***	0.0123**	0.0098**	0.0026
	(0.028)	(0.004)	(0.006)	(0.005)	(0.005)	(0.028)	(0.004)	(0.006)	(0.005)	(0.005)
CATA	0.3789***	0.0244	-0.0292	-0.0103	-0.0190	0.3863***	0.0244	-0.0295	-0.0105	-0.0190
	(0.131)	(0.017)	(0.027)	(0.026)	(0.022)	(0.130)	(0.017)	(0.027)	(0.026)	(0.022)
QUICK	-0.0039	-0.0008**	-0.0009*	-0.0005	-0.0004	-0.0038	-0.0008**	-0.0009*	-0.0006	-0.0004
	(0.003)	(0.000)	(0.001)	(0.000)	(0.000)	(0.003)	(0.000)	(0.001)	(0.000)	(0.000)
LEVERAGE	-0.0260	0.0112	0.0173	0.0106	0.0067	-0.0270	0.0113	0.0177	0.0098	0.0079
	(0.086)	(0.009)	(0.016)	(0.013)	(0.016)	(0.086)	(0.009)	(0.016)	(0.013)	(0.016)
PERFORM	0.1313*	0.0164**	0.0111	0.0002	0.0109	0.1390*	0.0165**	0.0118	-0.0014	0.0131
	(0.077)	(0.008)	(0.017)	(0.013)	(0.016)	(0.077)	(0.008)	(0.017)	(0.013)	(0.016)
LOSS	-0.0910	-0.0061	0.0020	-0.0080	0.0099	-0.0913	-0.0061	0.0027	-0.0077	0.0104
	(0.079)	(0.010)	(0.013)	(0.012)	(0.012)	(0.079)	(0.010)	(0.013)	(0.012)	(0.012)
PPEGROWTH	-0.0009	-0.0000	-0.0000	-0.0000	-0.0000	-0.0006	-0.0000	0.0000	-0.0000	0.0000
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
SALESGROWTH	0.0063*	0.0008	0.0008	0.0000	0.0008	0.0064*	0.0008	0.0008	0.0000	0.0008
	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)
MINING	0.0709	-0.0079	-0.0370	-0.0185	-0.0185	0.0678	-0.0079	-0.0375	-0.0183	-0.0192
	(0.102)	(0.015)	(0.024)	(0.020)	(0.022)	(0.102)	(0.015)	(0.024)	(0.020)	(0.022)
ADTCHANGE	0.2595***	0.0465***	0.0507***	-0.0430***	0.0937***	0.2592***	0.0465***	0.0499***	-0.0435***	0.0934***
	(0.067)	(0.010)	(0.013)	(0.010)	(0.013)	(0.067)	(0.010)	(0.013)	(0.010)	(0.013)
PTCHANGE	0.0466	0.0039	0.0024	-0.0045	0.0069	0.0468	0.0039	0.0028	-0.0049	0.0077
	(0.041)	(0.005)	(0.007)	(0.007)	(0.006)	(0.040)	(0.005)	(0.007)	(0.007)	(0.006)
BIG4	0.0930	-0.0271	-0.0699***	0.0833***	-0.1533***	0.0936	-0.0271	-0.0704***	0.0828***	-0.1532***
	(0.149)	(0.019)	(0.026)	(0.021)	(0.027)	(0.149)	(0.019)	(0.026)	(0.021)	(0.027)
LARGENONBIGN	0.1187	0.0090	0.0088	0.0339**	-0.0251	0.1167	0.0091	0.0082	0.0339**	-0.0257
	(0.120)	(0.015)	(0.022)	(0.013)	(0.023)	(0.120)	(0.015)	(0.022)	(0.013)	(0.023)
MNESPEC	-0.2192***	-0.0239**	-0.0227	0.0359**	-0.0586***	-0.2175***	-0.0239**	-0.0208	0.0312**	-0.0521***
	(0.085)	(0.010)	(0.014)	(0.014)	(0.010)	(0.078)	(0.010)	(0.013)	(0.013)	(0.010)
INDLEADER	-0.0123	-0.0006	0.0099	0.0027	0.0072	-0.0150	-0.0006	0.0096	0.0037	0.0060
	(0.103)	(0.013)	(0.017)	(0.019)	(0.010)	(0.103)	(0.013)	(0.017)	(0.019)	(0.010)
BUSY	-0.1542	-0.0197	-0.0148	0.0069	-0.0217	-0.1549	-0.0202	-0.0168	0.0063	-0.0232

	(0.102)	(0.014)	(0.017)	(0.016)	(0.017)	(0.102)	(0.014)	(0.018)	(0.016)	(0.017)
LOCATIONCOV	0.0485	0.0260	0.0528**	0.0712***	-0.0185	0.0441	0.0260	0.0516**	0.0745***	-0.0228
	(0.169)	(0.022)	(0.026)	(0.022)	(0.029)	(0.168)	(0.022)	(0.026)	(0.023)	(0.028)
LSUB	0.1638***	0.0110	-0.0035	-0.0017	-0.0018	0.1605***	0.0110	-0.0035	-0.0018	-0.0017
	(0.054)	(0.007)	(0.010)	(0.010)	(0.008)	(0.054)	(0.007)	(0.010)	(0.010)	(0.008)
FOREIGN	0.5393***	0.0729***	0.0793***	0.0742***	0.0051	0.5352***	0.0730***	0.0790***	0.0748***	0.0043
	(0.101)	(0.011)	(0.017)	(0.014)	(0.014)	(0.101)	(0.011)	(0.017)	(0.014)	(0.014)
LOWSUBSENGLISH	-0.0701	-0.0027	0.0235	0.0331**	-0.0096	-0.0722	-0.0027	0.0238	0.0328**	-0.0090
	(0.106)	(0.014)	(0.017)	(0.016)	(0.015)	(0.106)	(0.014)	(0.017)	(0.016)	(0.015)
LOWIFRS	-0.0298	0.0214**	0.0305**	0.0584***	-0.0278**	-0.0324	0.0215**	0.0304**	0.0585***	-0.0281**
	(0.092)	(0.011)	(0.014)	(0.012)	(0.013)	(0.091)	(0.011)	(0.014)	(0.012)	(0.013)
HIGHSUBDIST	0.2458***	0.0472***	0.0550***	-0.0019	0.0569***	0.2438***	0.0472***	0.0550***	-0.0016	0.0566***
	(0.089)	(0.013)	(0.017)	(0.017)	(0.015)	(0.088)	(0.013)	(0.017)	(0.017)	(0.015)
LOWRULE	0.4226***	0.0434***	-0.0004	-0.0018	0.0014	0.4215***	0.0434***	-0.0005	-0.0015	0.0010
	(0.103)	(0.014)	(0.017)	(0.016)	(0.016)	(0.103)	(0.014)	(0.017)	(0.016)	(0.016)
Constant	-1.6907***	-0.0578*	0.1737***	-0.1589***	0.3326***	-1.6589***	-0.0574	0.1804***	-0.1496***	0.3300***
	(0.272)	(0.035)	(0.050)	(0.043)	(0.048)	(0.268)	(0.035)	(0.050)	(0.044)	(0.047)
Observations	4,869	4,869	2,349	2,349	2,349	4,869	4,869	2,349	2,349	2,349
(Pseudo) R-squared	0.170	0.244	0.281	0.391	0.344	0.169	0.244	0.280	0.389	0.340
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	Yes	Yes	Yes	Yes	Yes	NO	NO	NO	NO	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

2.6.3 COMPONENT AUDITOR INVOLVEMENT AND AUDIT OUTCOMES

To analyze H1a and b, we show cross-sectional associations between extent of auditor involvement (by auditor type) and audit quality and audit fees for the sample of MNEs with component auditors.[43]

Table 4, Panel A, shows the analysis for H1a on the association between component auditor involvement and audit quality and audit fees. In Column 1, we find that a higher extent of component auditor involvement (*COMPONENT%*) is associated with a significantly lower level of audit quality, as measured by total accruals (|*TA*|). We also find a significant one-tailed effect for revenue management *(|ΔAR|*). In terms of the economic effect, a one standard deviation increase in *COMPONENT%* results in an increase of 9.2% in average absolute total accruals (|*TA*|).[44] We find similar results when using high percentages of component auditor involvement (*COMPONENT25%*). We further find that audit fees are higher for those companies with high component auditor involvement. In economic terms, MNEs with high component auditor involvement have 13.2 percent higher audit fees on average, compared to those without. Overall, this provides support for H1a, and thus also for the audit quality concerns surrounding group audits involving component auditors voiced by audit standard-setters and regulators.

We present the results for H1b on the difference in audit quality and fees based on the type of component auditor in Panel B of Table 4 for the sample of MNEs with component auditors. We find evidence that the extent of involvement of both network and unaffiliated auditors (*NETWORK%* and *UNAFFILIATED%*) are significantly associated with decreased audit quality, measured as a positive association with |*TA*| (p-value<0.05, two-tailed).

[43] We do not identify a control group for this analysis, since the extent of component involvement is only observable if MNEs choose to involve a component. However, we also run our regressions on the full MNE sample (untabulated). In this table, we analyze in the MNE sample the association between 1) *COMPONENT* only and audit outcomes; 2) *COMPONENT25%* only and audit outcomes; and 3) *COMPONENT* and *COMPONENT25%* and audit outcomes. We do not find significant associations between our measures of audit quality and *COMPONENT* when included separately or *COMPONENT25%* when included separately. However, when we include both *COMPONENT* and *COMPONENT25%* jointly in the regression, we find positive and significant coefficients for *COMPONENT25%* for all audit outcomes, in line with our expectations. In these analyses, the coefficients for *COMPONENT* are significantly negative indicating that, on average, the MNEs with component auditors have higher audit quality, indicating that the MNEs with and without components are very different groups of companies. We view this result as an additional reason for analyzing the effect of component auditor involvement in the more homogenous group of MNEs with component auditors only.

[44] 0.188 (one standard deviation increase in *COMPONENT%*)*0.0646 (coefficient of *COMPONENT%*) = 0.012. This is an increase of 9.2 percent in average total accruals (0.012/0.131=0.092).

TABLE 4

Extent and type of component auditor involvement and audit outcomes

Panel A: Extent of component auditor involvement for MNEs with Component Auditors					
	(1)	(2)	(3)	(4)	(5)
Variables	|TA|	|TA|	|*ΔAR*|	|*ΔAR*|	*LAFEE*
COMPONENT%	0.0646**		0.0069†		
	(0.027)		(0.005)		
COMPONENT25%		0.0168*		0.0022†	0.1319***
		(0.009)		(0.001)	(0.028)
CATA	-0.0118	-0.0121	-0.0016	-0.0016	0.2077***
	(0.024)	(0.024)	(0.003)	(0.003)	(0.072)
QUICK	-0.0001	-0.0001	0.0000	0.0000	-0.0069***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
PERFORM	0.0974***	0.0968***	0.0020	0.0020	-0.1418***
	(0.025)	(0.025)	(0.002)	(0.002)	(0.048)
LTA	-0.0131***	-0.0125***	-0.0001	-0.0000	0.3576***
	(0.004)	(0.004)	(0.001)	(0.001)	(0.014)
LEVERAGE	0.0701**	0.0705**	0.0047	0.0047	0.1600***
	(0.031)	(0.032)	(0.003)	(0.003)	(0.057)
PPEGROWTH	0.0003	0.0003	0.0001	0.0001	-0.0026**
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
SALESGROWTH	0.0025*	0.0025*	0.0002	0.0002	-0.0032
	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)
SALESVOL	-0.0191	-0.0182	0.0018	0.0019	0.2115***
	(0.023)	(0.023)	(0.002)	(0.002)	(0.053)
OCFVOL	0.2481**	0.2476**	-0.0050	-0.0049	0.0016
	(0.098)	(0.097)	(0.006)	(0.006)	(0.150)
|TA|_L	0.0779**	0.0784**	-0.0014	-0.0014	
	(0.032)	(0.032)	(0.002)	(0.002)	
MB	0.0052***	0.0050**	0.0001	0.0001	-0.0074*
	(0.002)	(0.002)	(0.000)	(0.000)	(0.004)
ANNUAL	0.0080	0.0082	0.0006	0.0006	-0.0120
	(0.009)	(0.009)	(0.001)	(0.001)	(0.013)
RECTOVER_L	0.0000	0.0000	-0.0000	-0.0000	-0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
PAYTOVER_L	0.0005	0.0005	-0.0000	-0.0000	0.0007
	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)
MINING	-0.0215	-0.0236	0.0018	0.0016	0.0048
	(0.024)	(0.024)	(0.002)	(0.003)	(0.053)
ADTCHANGE	-0.0191	-0.0180	0.0014	0.0015	-0.1289***
	(0.017)	(0.018)	(0.002)	(0.002)	(0.030)
BIG4	-0.0259	-0.0267	0.0010	0.0010	0.2826***
	(0.025)	(0.025)	(0.003)	(0.003)	(0.056)
LARGENONBIGN	-0.0356	-0.0348	0.0049*	0.0049*	0.0163
	(0.024)	(0.024)	(0.003)	(0.003)	(0.048)
MNESPEC	-0.0003	-0.0013	-0.0014	-0.0015	0.0328
	(0.010)	(0.010)	(0.002)	(0.002)	(0.031)
INDLEADER	0.0064	0.0065	0.0028*	0.0028*	0.0987**
	(0.009)	(0.009)	(0.002)	(0.002)	(0.040)
BUSY	-0.0055	-0.0056	0.0002	0.0002	0.0259
	(0.008)	(0.008)	(0.002)	(0.002)	(0.038)
FOREIGN	-0.0056	-0.0042	-0.0019	-0.0019	0.0087
	(0.009)	(0.009)	(0.002)	(0.002)	(0.042)
LOWRULE	-0.0047	-0.0042	0.0022	0.0023	-0.0694
	(0.012)	(0.012)	(0.002)	(0.002)	(0.043)
|TA|					0.1630**
					(0.063)
INDGROWTH					-0.0547

					(0.065)
GROWTH					-0.0287***
					(0.010)
MOPINION					0.1504***
					(0.032)
LSUB					0.1234***
					(0.026)
LSUBGDP					-0.0511*
					(0.028)
HIGHSUBDIST					0.0634
					(0.039)
Constant	0.1122***	0.1194***	0.0044	0.0052	3.0987***
	(0.041)	(0.042)	(0.005)	(0.005)	(0.326)
Observations	2,349	2,349	2,349	2,349	2,349
R-squared	0.508	0.507	0.124	0.123	0.904
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Interactions with first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

We further find evidence that *NETWORK25%* is significantly positively associated with |*TA*| and |*ΔAR*| (p-value<0.1, two-tailed). *UNAFFILIATED25%* is significantly positively associated with |TA| (p-value<0.1, one-tailed). Overall, this suggests that audit quality problems exist when involving component auditors to a greater extent, regardless of their type. We further find that both *NETWORK25%* and *UNAFFILIATED25%* are significantly positively associated with audit fees (p-value<0.01, two-tailed). This provides evidence that audit fees are higher for MNEs with greater involvement of any type of component auditor, which reflects significant costs related to coordination and supervision of both types of component auditors. However, we find that the coefficient of *NETWORK25%* is significantly larger than the coefficient of *UNAFFILIATED25%*, indicating that audits involving network component auditors are costlier than those involving unaffiliated auditors (F-value=0.0231).

TABLE 4

Extent of type of auditor involvement and audit quality

Panel B: Extent of use of network auditors for MNEs with Component Auditors					
	(1)	(2)	(3)	(4)	(5)
Variables	|TA|	|TA|	|*ΔAR*|	|*ΔAR*|	*LAFEE*
NETWORK%	0.0745**		0.0068		
	(0.033)		(0.006)		
UNAFFILIATED%	0.0547*		0.0070		
	(0.030)		(0.005)		
NETWORK25%		0.0181*		0.0034*	0.1883***
		(0.011)		(0.002)	(0.039)
UNAFFILIATED25%		0.0167		0.0012	0.0884***
		(0.012)		(0.002)	(0.032)
Observations	2,349	2,349	2,349	2,349	2,349
R-squared	0.508	0.507	0.124	0.124	0.904
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Interactions first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

2.6.4 THE EFFECT OF ISA600 ON COMPONENT AUDITOR INVOLVEMENT AND AUDIT OUTCOMES

For our analyses of H2a, we first test cross-sectionally the impact of ISA 600 on the association between extent of component involvement and audit quality for MNEs with component auditors. We then analyze the impact of ISA 600 on this association, by studying the differential effect of ISA 600 on the treatment group (MNE with component auditors), compared to a control group, effectively implementing a difference-in-differences design with a continuous treatment. ISA 600 applies to all group audits but deals with the special considerations that apply where one or more component auditors are involved (ISA 600.1). We identify the sample of MNEs that do not involve component auditors (MNEs without component auditors sample) as our primary control group.[45] Further, we identify national (nongroup) companies that do not involve component auditors as an additional control group that is least affected by ISA 600.[46]

[45] We acknowledge that ISA 600 still applies to the sample of MNEs without component auditors to the extent that these are group audits.

[46] This control group has the drawback that our proxies for audit quality in this sample might be influenced by factors that differ from factors influencing audit quality for MNEs, which might call into question the parallel trends assumption underlying the difference-in-differences design. For example, our measures of audit quality of MNEs could be influenced by the exposure to shocks from other economies that do not impact national companies. By using both control groups, each with its limitations, one can gain confidence that we can better isolate the effect of ISA 600, if any, for MNEs with component involvement. Table 1, Panel A, of the Appendix 2D of this

Table 5 presents our analyses on whether the revision of ISA 600 affected the association between the extent of component (network or unaffiliated) auditor involvement and audit quality. Table 5, Panel A, shows the analysis for the MNE component auditor sample where we find that, while the extent of involvement of component auditors (*COMPONENT%*) is positively associated with |*TA*| (p-value<0.05, one-tailed), we do not find evidence that this association is affected by ISA 600. Similarly, we find that *COMPONENT25%* is positively associated with |*TA*| and audit fees while the interaction with *ISA600* is insignificant. The main effect of *ISA600* is insignificant in the audit quality model and negatively significant in the audit fee model, indicating that audit fees decreased over the sample period. Overall, our evidence cannot reject the null hypothesis formulated in H2a.[47]

In Table 5, Panel B, we rerun the analysis on the MNEs, including MNEs without component auditors as a control group. In this model, the main effect of *ISA600* reflects the general time trend in audit quality for the treatment and control group. We also include an indicator variable, *COMPONENT,* that equals one if the audit involves a component auditor and zero otherwise, to control for the choice to involve a component auditor. We include the interaction *COMPONENT*ISA600* to control for the choice to involve a component auditor and the potential effect of ISA 600 on the choice to involve a component auditor. We do not have an expectation about the sign of the coefficients for *COMPONENT* and *COMPONENT*ISA600*. This is because the treatment (*COMPONENT*=1) and control groups (*COMPONENT*=0) might have an overall different level of audit quality. In Panel B of Table 6, we continue to find insignificant results for the interactions of extent of component involvement and ISA 600 (*COMPONENT%*ISA600*) in the audit quality and fee models. Further, we continue to find evidence of a negative cross-sectional association between *COMPONENT%* and *COMPONENT25%* and our measures of audit quality and fees.

chapter shows descriptive statistics for the sample of national companies that do not involve component auditors, and in Panel B, we show the analysis of the effect of *ISA600* on the association between *COMPONENT%* (*COMPONENT25%*) and audit outcomes. In this analysis, we fail to find a significant effect of *ISA600* on the association.

[47] We follow the approach of Chung and Kallapur [2003] to check whether the insignificance of the effect of ISA 600 on the association between *COMPONENT%* and audit outcomes is due to a lack of a real effect of ISA 600 or due to low power of our tests (e.g., because we measure audit quality and audit effort with noise). For the pre-ISA-600 period, we find that the difference in total accruals between clients that fall in the first and third quartiles of *COMPONENT%* at the upper 95 percent confidence interval is 3.59 percent. For the post-ISA-600 period we find that the difference is 4.09 percent, which is even higher than in the pre-ISA-600 period. This indicates that, even at the upper 95 percent confidence limit, ISA 600 did not have an effect. This is similar for the other audit outcomes. We calculate the upper 95 percent confidence limit for the coefficient as (coefficient+standard error*1.96) and multiply this number with the interquartile range of *COMPONENT%* to estimate the difference in audit outcomes at the 95% confidence limit.

TABLE 5

ISA 600 and audit outcomes

Panel A: MNEs with Component Auditors

Variables	(1) |TA|	(2) |TA|	(3) |*ΔAR*|	(4) |*ΔAR*|	(5) *LAFEE*
COMPONENT%	0.0633**		0.0080		
	(0.031)		(0.005)		
*COMPONENT%*ISA600*	0.0047		-0.0021		
	(0.037)		(0.006)		
COMPONENT25%		0.0234**		0.0019	0.1470***
		(0.011)		(0.002)	(0.036)
*COMPONENT25%*ISA600*		-0.0108		0.0005	-0.0278
		(0.014)		(0.002)	(0.038)
ISA600	-0.0022	0.0028	0.0005	-0.0005	-0.0716**
	(0.015)	(0.014)	(0.002)	(0.001)	(0.029)
Observations	2,349	2,349	2,349	2,349	2,349
R-squared	0.505	0.504	0.122	0.121	0.903
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO
Interactions first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

Panel B: MNEs

Variables	(1) |TA|	(2) |TA|	(3) |*ΔAR*|	(4) |*ΔAR*|	(5) *LAFEE*
COMPONENT%	0.0593*		0.0096*		
	(0.032)		(0.005)		
*COMPONENT%*ISA600*	0.0012		-0.0028		
	(0.039)		(0.007)		
COMPONENT25%		0.0244**		0.0026	0.1719***
		(0.012)		(0.002)	(0.036)
*COMPONENT25%*ISA600*		-0.0118		0.0001	-0.0320
		(0.015)		(0.002)	(0.038)
COMPONENT	-0.0193	-0.0145	-0.0046**	-0.0031*	0.2029***
	(0.012)	(0.010)	(0.002)	(0.002)	(0.033)
*COMPONENT*ISA600*	-0.0035	0.0014	0.0034	0.0025	-0.0137
	(0.016)	(0.013)	(0.002)	(0.002)	(0.034)
ISA600	0.0042	0.0040	-0.0029**	-0.0030**	0.1226**
	(0.011)	(0.011)	(0.001)	(0.001)	(0.057)
Observations	4,869	4,869	4,869	4,869	4,869
R-squared	0.441	0.441	0.076	0.076	0.890
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO
Interactions first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

We find that the main effect of ISA 600 is significantly negative for |*ΔAR*| and audit fees, indicating that audit quality increased in the post-ISA-600 period in the MNE sample. The main effect of ISA 600 is positive in the audit fee model, indicating that, for MNEs, audit fees increased during our period of interest.

In untabulated analyses, we do not find any evidence of an effect of ISA 600 on the association between extent of network or unaffiliated auditors and audit quality in any of our samples. Hence our evidence fails to reject H2b. Overall, our finding that the revisions to ISA 600 do not appear to have improved audit quality might be due to a number of reasons, including that ISA 600 did not significantly change the responsibility of the principal auditor and that component auditors continued to exercise significant discretion, even after the revision of the standard.

2.6.5 ADDITIONAL ANALYSES

2.6.5.1 Subsidiary country characteristics

The literature finds that companies with foreign operations manage earnings through subsidiaries, especially those in weak institutional environments (e.g., Dyreng et al. [2012], Beuselinck et al., [forthcoming]). We thus further test whether the association between *COMPONENT%* (and *NETWORK%* and *UNAFFILIATED%*) and our measures of audit quality is more pronounced if the average rule of law of the MNEs' subsidiaries is lower. In Table 6, Panel A, we interact *COMPONENT%* with an indicator variable for low average rule of law (*LOWRULE*) for the client's subsidiary countries. We continue to find a significant main effect for *COMPONENT%* and no significant interaction effect with *LOWRULE* for audit quality measured as |*TA*|. However, we find a positive significant interaction effect for audit quality measured as |*ΔAR*|, indicating that the extent of component involvement is positively associated with revenue management if the component auditor work is conducted in weak institutional environments. In untabulated analyses, we further find that this significant result only holds in the period prior to the revision of ISA 600 (*ISA600*=0) but not afterward (*ISA600*=1), indicating that audit quality increased for those MNEs with subsidiaries in, on average, weak rule of law countries after the revision of ISA 600.[48] In Table 6, Panel B, we also find that the interaction term between *NETWORK%* and *UNAFFILIATED%* and *LOWRULE* is positive and significant for audit quality measured as |*ΔAR*|. We again find that

[48] We do not find a similar result when regressing *COMPONENT%* or *COMPONENT25%* without the interaction with *LOWRULE* on our measures of audit quality in the pre- and post-ISA-600 period of our sample. We find that the coefficients for *COMPONENT%* and *COMPONENT25%* remain significant for measure |*TA*| in both periods and that the coefficients remain insignificant for measure |*ΔAR*| in both periods.

these associations are only significant in the pre-ISA 600 period but not in the post-period (untabulated).

TABLE 6

Interaction between component auditor involvement and rule of law

Panel A: Extent of component auditor involvement and average subsidiary Rule of Law					
	(1)	(2)	(3)	(4)	(5)
Variables	*|TA|*	*|TA|*	*|ΔAR|*	*|ΔAR|*	*LAFEE*
COMPONENT%	0.0612*		-0.0007		
	(0.032)		(0.004)		
*COMPONENT%*LOWRULE*	0.0111		0.0263**		
	(0.053)		(0.012)		
COMPONENT25		0.0144			0.1455***
		(0.010)			(0.035)
*COMPONENT25%*LOWRULE*		0.0073		0.0064*	-0.0440
		(0.020)		(0.003)	(0.052)
LOWRULE	-0.0081	-0.0083	-0.0056	-0.0013	-0.0462
	(0.020)	(0.016)	(0.004)	(0.003)	(0.052)
Observations	2,349	2,349	2,349	2,349	2,349
R-squared	0.508	0.507	0.130	0.126	0.904
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Interactions first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

TABLE 6

Interaction between component auditor involvement and rule of law (continued)

Panel B: Extent of network and unaffiliated auditor involvement and average subsidiary Rule of Law					
Variables	(1) |TA|	(2) |TA|	(3) |*ΔAR*|	(4) |*ΔAR*|	(5) *LAFEE*
NETWORK%	0.0773**		-0.0004		
	(0.039)		(0.004)		
*NETWORK%*LOWRULE*	-0.0085		0.0278**		
	(0.059)		(0.014)		
UNAFFILIATED%	0.0410		-0.0011		
	(0.034)		(0.005)		
*UNAFFILIATED%*LOWRULE*	0.0376		0.0253**		
	(0.059)		(0.013)		
NETWORK25%		0.0203		0.0011	0.1936***
		(0.013)		(0.002)	(0.049)
*NETWORK25%*LOWRULE*		-0.0062		0.0082*	-0.0227
		(0.022)		(0.005)	(0.075)
UNAFFILIATED25%		0.0098		-0.0016	0.1104**
		(0.014)		(0.002)	(0.044)
*UNAFFILIATED25%*LOWRULE*		0.0167		0.0074*	-0.0593
		(0.025)		(0.004)	(0.062)
LOWRULE	-0.0103	-0.0084	-0.0056	-0.0020	-0.0521
	(0.019)	(0.016)	(0.004)	(0.003)	(0.052)
Observations	2,349	2,349	2,349	2,349	2,349
R-squared	0.508	0.507	0.130	0.128	0.904
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Interactions first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

2.6.5.2 Big 4 and non-Big 4 auditors

To check whether our results are driven by certain principal auditors, we rerun our main analyses for the subsample of Big 4 auditors and the subsample of non-Big 4 auditors. Group audit engagements with a non-Big 4 principal auditor have a significantly higher extent of component involvement (average *COMPONENT%*=30 percent), compared to those with a Big 4 principal auditor (average *COMPONENT%*=27 percent). As would be expected, the extent of involvement of unaffiliated component auditors (network component auditors) is lower (higher) in the Big 4 sample, compared to the non-Big 4 sample (Big 4 sample: average *UNAFFILIATED%*=8 percent and average *NETWORK%*=19 percent; non-Big 4 sample: average *UNAFFILIATED%*=25 percent and average *NETWORK%*=5 percent). When splitting the sample into MNEs with component auditors that are audited by a Big 4 auditor versus a non-Big 4 auditor, we only find that *COMPONENT%* is significantly positive for the audit

quality measure |*TA*| in the non-Big 4 subsample only.[49] We find that audit fees are positively associated with *COMPONENT%* in both subsamples. We tabulate these analyses in Table 7. This provides some evidence that the type of principal auditor (Big 4 or non-Big 4) drives the audit quality results we document in Table 5. We continue to find no effect of ISA 600 on the association between extent of auditor involvement and audit quality for either subsample.

[49] We further find that this result is driven by unaffiliated component auditors (*UNAFFILIATED%*) in the non-Big 4 subsample. However, given the low percentage of network auditor involvement for this subsample, the lack of a significant association between *NETWORK%* and our measures of audit quality might be due to low power.

TABLE 7

Audit outcomes by Big 4/Non-Big4

	Big 4					Non-Big 4				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	*|TA|*	*|TA|*	*|ΔAR|*	*|ΔAR|*	*LAFEE*	*|TA|*	*|TA|*	*|ΔAR|*	*|ΔAR|*	*LAFEE*
COMPONENT%	0.0439		0.0029			0.1317**		0.0080		
	(0.037)		(0.004)			(0.051)		(0.008)		
COMPONENT25%		0.0141		0.0014	0.1439***		0.0449***		0.0028	0.1269***
		(0.010)		(0.001)	(0.043)		(0.017)		(0.003)	(0.032)
Observations	1,373	1,373	1,373	1,373	1,372	976	976	976	976	975
R-squared	0.621	0.620	0.228	0.228	0.890	0.627	0.626	0.225	0.226	0.790
Client FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Interactions with first-stage reg	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

2.6.5.3 Changes in Component percentage

To provide further evidence on the effect of component auditor involvement on audit quality, we also analyze whether changes in component auditor involvement have an effect on audit quality. Specifically, we separately analyze whether a decrease in component percentage (*Component%*) or an increase in component percentage (*Component%*) affects audit quality for the sample of MNEs with component auditors (Table 8).[50] In line with our hypotheses, we expect an increase (decrease) in component percentage to be associated with lower (higher) audit quality. Consistent with these expectations, we find that a year-to-year decrease (increase) in component percentage is associated with higher (lower) audit quality, measured as |*ΔAR*| (p-value <0.1, two-tailed).

TABLE 8

Changes in component auditor involvement

	Decrease			Increase		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	|*TA*|	|*ΔAR*|	*LAFEE*	|*TA*|	|*ΔAR*|	*LAFEE*
ΔCOMPONENT%	-0.0073	-0.0021*	-0.0063	0.0077	0.0020*	0.0104
	(0.008)	(0.001)	(0.017)	(0.008)	(0.001)	(0.017)
Observations	2,349	2,349	2,349	2,349	2,349	2,349
R-squared	0.506	0.123	0.901	0.506	0.123	0.901
Controls	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Interactions with first-stage regressors	YES	YES	NO	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

2.6.5.4 National audits involving component auditors

The involvement of component auditors is not restricted to multinational audits but can also occur in national group audits. We observe 152 of these audits that involve a component auditor, with average *COMPONENT%* of 26% and median *COMPONENT%* of 21%. Analyzing this subsample (untabulated), we do not find a significant association between *COMPONENT%* or *UNAFFILIATED%* and our measures of audit quality. We do, however, find a significantly negative coefficient for *NETWORK%* for audit quality measured as |*TA*|, indicating that audit quality is significantly higher when network auditors are involved in national audits. We further find that audit fees are significantly higher when the extent of

[50] Note that rather than taking first differences and analyzing the magnitudes of changes over time, which are relatively small, we code increases (decreases) as an indicator variable equal to one if we observe a year-to-year increase (decrease) and zero otherwise. Hence, we separately analyze increases (decreases).

component auditor involvement is high (*COMPONENT25%*) and that this is driven by the involvement of network auditors (*NETWORK25%*). We also do not find that ISA 600 has a significant impact on the association between audit quality and extent of component involvement for national group audits. This indicates that audit quality problems from involving component auditors in group audits are mainly centered around multinational audits, i.e., those group audits for which communication and coordination problems are likely most prevalent.

2.6.5.5 Selection bias

We only observe our variable of interest (*COMPONENT%*) for a subset of the full sample of MNEs, i.e., those that choose to involve a component auditor. Hence, we restrict our main analyses to the sample of MNEs with component auditors. However, our estimates of the effect of extent of component auditor involvement on audit quality might be biased if sample selection bias is present and unobservable factors that affect component auditor choice also affect audit quality. To address this potential problem, we rely on a Heckman-type selection model.[51] As our exclusion restriction, we choose a dummy variable indicating high weighted-average distance between parent company location and subsidiary countries *(HIGHSUBDIST)*. The exclusion restriction (instrument) should be relevant, i.e., correlated with *COMPONENT*, and valid, i.e., uncorrelated with audit quality. We argue that high average subsidiary distance should be correlated with the likelihood of component auditor involvement as principal auditors that are time and resource constrained should be more likely to engage component auditors to conduct work in distant locations. We show, in our first-stage probit model (Table 4, Column 1), that *HIGHSUBDIST* is correlated with *COMPONENT*. We further test for relevance of the exclusion restriction with the Kleibergen-Paap-LM statistic and the Stock and Yogo (2005) test and find support for the relevance assumption and thus a correlation between *HIGHSUBDIST* and *COMPONENT*.[52] Regarding validity of the exclusion restriction, we do not expect the high weighted average distance between parent company location and subsidiary countries to be correlated with our measures of audit quality. While research has shown that audit quality differs around the world (e.g., Francis and Wang 2010), it should not be

[51] Because we observe the dependent variable, audit quality, for the full MNE sample, rather than only for those MNEs that choose to involve component auditors, we manually run the first-stage probit model to estimate the likelihood of involving a component and include the estimated inverse mills ratio in the second-stage OLS regressions on the MNEs with component auditors sample. To correct for inconsistency of the variance-covariance matrix in the second-stage regressions, we bootstrap standard errors, using 500 samples. Due to the number of observations being limited, we only include the first-stage regressors without their interactions with industry-year.
[52] The Kleibergen-Paap-LM statistic is highly significant (p-value<0.01, two-tailed), indicating that the null hypothesis of underidentification of the model can be rejected. Further, the Cragg-Donald-Wald F-statistic is larger than the Stock-Yogo critical value at 10% relative bias.

systematically higher or lower for clients for which the weighted average distance to subsidiary countries is large. When applying the Heckman correction to our model (Table 9), we draw the same inferences for the audit quality outcome |*TA*| and LAFEE. We further find a significant result for *COMPONENT%* for the audit quality outcome |*ΔAR*|.

TABLE 9
Selection Bias: Heckman model

VARIABLES	(1) |*TA*|	(2) |*TA*|	(3) |*ΔAR*|	(4) |*ΔAR*|	(5) *LAFEE*
COMPONENT%	0.0597**		0.0060†		
	(0.024)		(0.004)		
COMPONENT25%		0.0214**		0.021*	0.1315***
		(0.009)		(0.001)	(0.018)
Observations	12,788	12,788	12,788	12,788	2,349
R-squared	0.335	0.270	0.077	0.077	0.904
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Interactions with first-stage regressors	NO	NO	NO	NO	NO

Bootstrapped standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance); All variables are defined in Appendix 2B

2.6.6 SENSITIVITY ANALYSES

2.6.6.1 Low principal auditor involvement

To check whether the results are driven by those observations with a high extent of component involvement, we exclude the 30 observations for which the component auditors are paid more than 75 percent of the total fees. These are cases where concerns about the lack of principal auditor involvement and oversight are most prevalent. When excluding these observations, our inferences for our main analyses remain the same (untabulated).

2.6.6.2 Client firm fixed effects

We rerun our main analyses using client firm fixed effects to account for time-invariant unobservable client-specific factors that can influence our audit quality proxies (untabulated). We continue to find significant results for *COMPONENT%* for |*TA*| as the audit quality measure. We find a one-tailed significant effect for *COMPONENT%* for |*ΔAR*| as the measure of audit quality. We further find that audit fees are higher for high extent of component involvement (*COMPONENT25%*). We fail to find support for a significant effect of ISA 600 on the association between *COMPONENT%* and *COMPONENT25%* and audit quality.

2.6.6.3 Tobit

We rerun our main audit quality analyses using tobit, rather than OLS, as our accrual and revenue management proxies are unsigned and thus truncated at zero. Our inferences remain the same (untabulated).

2.7. Conclusions and Limitations

Regulators have raised concerns about the quality of the audits of multinational groups, especially those involving component auditors. These concerns are based on inspection findings relating to relatively small and risk-based samples. Large-scale empirical research on how MNE group audits are conducted and whether this affects audit quality is scant, primarily due to data constraints. As a first step in advancing knowledge of MNE group audits using large-scale data, we make use of unique, long-standing Australian disclosures, which allow identification of the extent of involvement of principal and component auditors in group audits based on audit fees.

We find that component auditors are more likely to be involved and to a larger extent when MNE client firms are more complex and have a higher degree of internationalization. Extent of component auditor involvement is higher when the client has more foreign subsidiaries that are located farther away from the parent and apply different accounting standards. In situations requiring more coordination and communication, principal auditors are more likely to engage network component auditors. In terms of auditor characteristics, we find that Big 4 principal auditors involve a lower percentage of component auditors in their audits. We further find that Big 4 and large non-Big 4 principal auditors involve a higher percentage of their network member firms as component auditors and that Big 4 principal auditors in particular are negatively associated with the use of unaffiliated auditors as component auditors. The overlap between subsidiary locations and the countries in which global audit firm networks have coverage is also associated with the use of network auditors, while principal auditors with expertise in auditing MNEs involve a higher percentage of network auditors but a lower percentage of unaffiliated auditors in undertaking MNE group audits.

In line with the concerns of regulators and standard-setters, our findings suggest that there are persistent audit quality issues for group audits involving component auditors, regardless of whether those auditors are part of an international network or unaffiliated. While the revision of ISA 600 reduced the involvement of unaffiliated (but not network) auditors, quality problems remain. Our research thus supports the view that further work is needed to address audit quality concerns for MNE group audits and identifies areas to which standard-setters and regulators might wish to direct future efforts.

Our study is subject to several limitations. Our audit quality measures only capture some aspects of audit quality (DeFond and Zhang [2014]). However, other commonly employed measures (such as Accounting and Auditing Enforcement Releases (AAERs) or restatements) are not available for Australian firms and the propensity to issue going concern opinions changed over the sample period, due to the impact of the global financial crisis (e.g., Xu et al. [2013]), making this an unreliable measure of audit quality for our sample period. We recognize that our results show cross-sectional associations only, and we cannot make any claims about causality. However, we attempt to address this by also investigating changes in component auditor involvement and address selection bias using a Heckman model. Further, while we control for the jurisdictions in which the subsidiaries are incorporated, we cannot observe in which jurisdictions component auditors are conducting their work and the identity of the other (unaffiliated) component auditors involved (e.g., whether unaffiliated component auditors are Big 4 or non-Big 4 auditors). We are also restricted in observing potentially important determinants that explain component involvement and the extent of that involvement, such as ownership of subsidiaries.

As more data on group audits in different jurisdictions become available, for example, under the new PCAOB disclosure rules, future research might be able to address these types of questions. More generally, as time proceeds, it will be interesting to investigate how public disclosure of group audit arrangements affects both audit quality and user perceptions of audit quality across the globe.

Appendices Chapter 2

Appendix 2A: Audit Fee Disclosures

The requirements of Australian companies to disclose audit fees paid to the principal and component network and component unaffiliated auditors are included in AASB 101 "AASB 101 - Presentation of Financial Statements - October 2006" as Australian specific requirements (as designated by the AUS paragraphs to show differences from the IAASB paragraph):

> Aus126.1 An entity, other than a group, shall disclose in the financial report, the amounts paid or payable to:
> (a) the auditor of the entity for an audit or a review of the financial reports of the entity;
> (b) the auditor of the entity for non-audit services in relation to the entity, disclosing separately the nature and amount of each of the non-audit services provided by the auditor; and
> (c) a *related practice* of the auditor for non-audit services in relation to the entity, disclosing separately the nature and amount of each category of non-audit service.
>
> Aus126.2 The following information shall be disclosed in the financial report of a group, the amounts paid or payable to:
> (a) the auditor of the parent of the group, for an audit or a review of the financial report of any entity in the group;
> (b) the auditor of the parent of the group, for non-audit services in relation to any entity in the group, disclosing separately the nature and amount of each of the non-audit services provided by the auditor;
> (c) a related practice of the auditor of the parent of the group, for non-audit services in relation to any entity in the group, disclosing separately the nature and amount of each of the non-audit services provided by the auditor;
> (d) the auditors of the subsidiaries in the group, other than those disclosed in accordance with paragraph Aus126.2(a), for an audit or a review of the financial reports of those subsidiaries;
> (e) the auditors of the subsidiaries in the group, other than those disclosed in accordance with paragraphs Aus126.2(b) and (c), for non-audit services in relation to any entity in the group, disclosing separately the nature and amount of each of the non-audit services provided by the auditor; and
> (f) a related practice of the auditors of the subsidiaries in the group, other than those disclosed in accordance with paragraphs Aus126.2(b) and (c), for non-audit services in relation to any entity in the group, disclosing separately the nature and amount of each of the non-audit services provided by the auditor.

In practice the disclosures are observed as follows:[53]

- The fee paid to the principal auditor (i.e. lead auditor)
- The fee paid to audit firms related to the principal auditor (i.e., affiliated firms that are members of the principal auditor's network).
- The fee paid to other auditors (i.e., unaffiliated firms that are not members of the principal auditor's network).

An example of these disclosures from Note 9 of the 2012 annual report of Amcor Limited is provided below in Figure 1.

[53] Audit fees paid to each category of auditor are required. The disclosure does not require identification of the specific network members or the name of the unaffiliated audit firm/firms involved in the group audit.

Figure 1: Audit Fee Disclosures from Amcor Limited's Annual Report

Note 9. Auditors' Remuneration

$ thousand	2012	2011
Auditors of the Company – PwC Australia		
Audit and other assurance services		
Audit and review of financial reports	**3,220**	3,179
Other regulatory audit services	**–**	95
Other services		
Taxation services, transaction related taxation advice and due diligence	**3,482**	3,786
Other advisory services	**786**	45
	7,488	7,105
Network firms of PwC Australia		
Audit and other assurance services		
Audit and review of financial reports	**837**	855
Other regulatory audit services	**3,629**	4,136
Other services		
Taxation services, transaction related taxation advice and due diligence	**2,202**	1,549
Other advisory services	**122**	106
	6,790	6,646
Non-PwC Audit Firms		
Audit and other assurance services		
Audit and review of financial reports	**217**	222
Other services		
Taxation services and transaction related taxation advice	**346**	305
	563	527
Total auditors' remuneration	**14,841**	14,278

These disclosure standards were later relocated into AASB 1054, Australian Additional Disclosures [2011], to reflect the harmonization of disclosure requirements between Australia and New Zealand.

Appendix 2B: Variable Descriptions

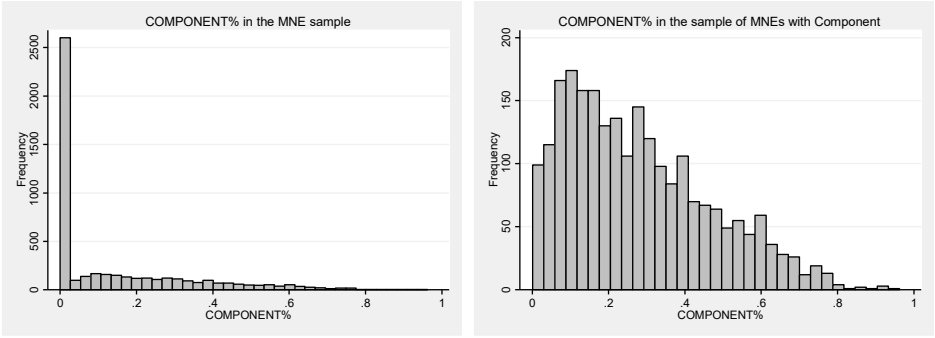
	Variable Definitions
COMPONENT	an indicator variable, 1 if audit fees are paid to an auditor other than the principal auditor, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
COMPONENT%	a continuous variable based on the percentage of audit fees paid to an auditor other than the principal auditor (Source: UNSW Audit Fee and Audit Reporting Database).
COMPONENT25%	an indicator variable, 1 if audit fees paid to a component auditor are 25 percent of total fees or higher, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
NETWORK%	the percentage of total group audit fees paid to the network (Source: UNSW Audit Fee and Audit Reporting Database)
NETWORK25%	an indicator variable, 1 if audit fees paid to a network component auditor are 25 percent of total fees or higher, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
UNAFFILIATED%	the percentage of total group audit fees paid to unaffiliated auditors (Source: UNSW Audit Fee and Audit Reporting Database).
UNAFFILIATED25%	an indicator variable, 1 if audit fees paid to an unaffiliated auditor are 25 percent of total fees or higher, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
ISA600	an indicator variable, 1 if client year-end is on or after 15 December 2010, otherwise 0.
$\|TA\|$	the absolute value of total accruals scaled by lagged total assets (Source: Morningstar Aspect Huntley Financial database).
$\|\Delta AR\|$	the absolute value of the change in accounts receivables scaled by lagged total assets (Source: Morningstar Aspect Huntley Financial database).
LAFEE	the natural log of the sum of total audit fees paid to the principal auditor, network auditor and unaffiliated auditors ($ thousands), Consumer Price Index adjusted (Source: Morningstar Aspect Huntley Financial database).
ADTCHANGE	an indicator variable, 1 if there is an audit firm change in year t, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
ANNUAL	the annualized market-adjusted return (Source: SPPR database).
BIG4	an indicator variable, 1 if the principal audit firm is a Big 4 auditor, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
BUSY	an indicator variable, 1 if the client firm has a June 30 fiscal year-end, 0 otherwise (Source: Morningstar Aspect Huntley Financial database).
CATA	the ratio of current assets to total assets (Source: Morningstar Aspect Huntley Financial database).
FOREIGN	an indicator variable if the proportion of foreign subsidiaries is greater than 25%, 0 otherwise (Source: hand-collected from annual reports).
GROWTH	Total $Assets_t$/Total $Assets_{t-1}$ (Source: Morningstar Aspect Huntley Financial database);
HIGHSUBDIST	an indicator variable, 1 if the natural logarithm of the weighted average geographic distance between the largest city of Australia and largest city of each subsidiary country is in the upper quartile of the distribution, 0 otherwise (Source: hand-collected from annual reports; Mayer and Zignago [2011]).
INDGROWTH	$\sum$ Total $Assets_{i,t}$/$\sum$ Total $Assets_{i,t-1}$ by two-digit GICS code (Source: Morningstar Aspect Huntley Financial database).
INDLEADER	an indicator variable, 1 if the audit firm is a national industry leader (based on client assets) in the client's industry (two-digit GICS code) in a particular year, 0 otherwise. (Source: Morningstar Aspect Huntley Financial database; UNSW Audit Fee and Audit Reporting Database).
LARGENONBIG4	an indicator variable, 1 if the principal audit firm is BDO or Grant Thornton, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
LEVERAGE	the ratio of total liabilities to total assets (Source: Morningstar Aspect Huntley Financial database).
LOCATIONCOV	the percentage of subsidiary countries in which the principal audit firm has a network member (Source: subsidiary information hand-collected from annual reports; audit firm network information hand-collected from audit firm websites).
LOSS	an indicator variable, 1 if the client firm incurs a loss in the current year, 0 otherwise (Source: Morningstar Aspect Huntley Financial database).
LOWIFRS	an indicator variable, 1 if the percentage of foreign subsidiaries that are located in countries with substantial adoption of IFRS as their accounting standards is below the median, 0 otherwise (Source: subsidiary information hand-collected from annual reports; information on IFRS adoption from https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/; Trimble [2018]).
LOWSUBSENGLISH	an indicator variable, 1 if the percentage of total subsidiaries incorporated in an English-speaking country (official or de jure) is in the lowest quartile of the distribution, 0 otherwise (Source: subsidiary information hand-collected from annual reports; Mayer and Zignago [2011]).

LOWRULE	An indicator variable, 1 if the weighted average rule of law of the client's subsidiary countries is in the lowest quartile of the distribution (Source: subsidiary information hand-collected from annual reports; Rule of Law from Kaufmann et al., [2010]).
LSUB	the natural log of the number of subsidiaries (Source: hand-collected from annual reports);
LSUBGDP	the natural log of the weighted average per-capita GDP of the client firm's subsidiary countries, averaged over the years 2006-2013 (Source: hand-collected from annual reports; Kaufmann et al. [2010]).
LTA	the natural log of Consumer Price Index adjusted total assets at year-end (Source: Morningstar Aspect Huntley Financial database).
MB	the market to book ratio at year-end (Source: Morningstar Aspect Huntley Financial database);
MINING	an indicator variable, 1 if the client firm is in the mining industry, 0 otherwise (Source: Morningstar Aspect Huntley Financial database).
MNESPEC	an indicator variable, 1 if the audit firm is an MNE specialist in a particular year, defined as an audit firm whose market share of auditing international clients (defined as the ratio of foreign to total subsidiaries) is in the upper quartile of the distribution, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database, Morningstar Aspect Huntley Financial database).[54]
MOPINION	an indicator variable, 1 if the client receives a qualified, modified or emphasis of matter opinion, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
OCFVOL	the volatility of cash flow from operations over the last three years (Source: Morningstar Aspect Huntley Financial database).
PAYTOVER_L	cost of goods sold in year t-1 scaled by total accounts payable in year t-1 (Payable Turnover ratio) (Source: Morningstar Aspect Huntley Financial database).
PERFORM	operating cash flow scaled by total assets (Source: Morningstar Aspect Huntley Financial database).
PPEGROWTH	the year-to-year percentage change in gross property plant and equipment (Source: Morningstar Aspect Huntley Financial database).
PTCHANGE	an indicator variable, 1 if there is an audit partner change, but not audit firm change, in year t, 0 otherwise (Source: UNSW Audit Fee and Audit Reporting Database).
QUICK	the ratio of current assets less inventories to current liabilities (Source: Morningstar Aspect Huntley Financial database).
RECTOVER_L	total revenue in year t-1 scaled by total accounts receivable in year t-1(Receivables Turnover ratio) (Source: Morningstar Aspect Huntley Financial database).
SALESGROWTH	sales in current year less sales in previous year divided by previous year's sales (Source: Morningstar Aspect Huntley Financial database).
SALESVOL	the volatility of sales calculated over the last three years (Source: Morningstar Aspect Huntley Financial database).
|TA|_L	the lagged absolute value of total accruals in year (t-1) (Source: Morningstar Aspect Huntley Financial database).

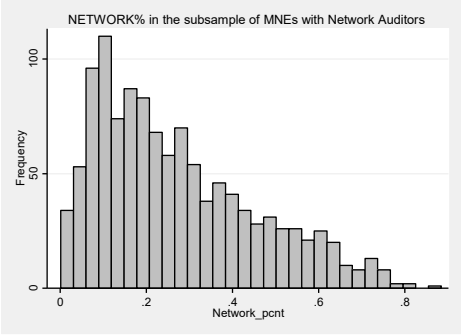
[54] Unlike Gunn and Michas [2018], we do not know foreign assets, and therefore calculate this measure using the percentage of foreign to total subsidiaries.

Appendix 2C: Histograms of *COMPONENT%*, *NETWORK%* and *UNAFFILIATED%*

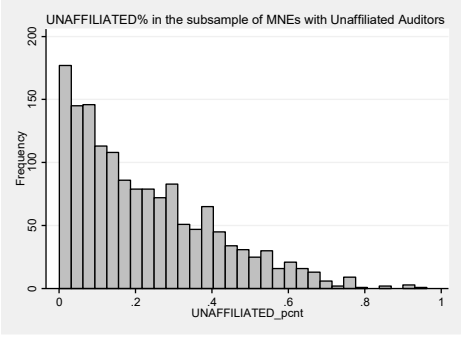
Graph 1, Panel A: Histograms *COMPONENT%*



Graph 1, Panel B: Histogram *NETWORK%*



Graph 1, Panel C: Histogram *UNAFFILIATED%*



Appendix 2D: National Groups without Component Auditors

Panel A: Descriptive Statistics

	MNEs with Component Auditors (1) (N=2,349; 45.9%)			National Groups without Component Auditors (2) (N=2,774; 54.1%)			Comparison (1)-(2)
	Mean	Median	SD	Mean	Median	SD	t-statistic[a]
Variables of interest and dependent variables							
COMPONENT	1.000	1.000	0.000	0.000	0.000	0.000	
COMPONENT%	0.278	0.244	0.188	0.000	0.000	0.000	
COMPONENT25%	0.487	0.000	0.500	0.000	0.000	0.000	
NETWORK%	0.134	0.000	0.187	0.000	0.000	0.000	
NETWORK25%	0.228	0.000	0.419	0.000	0.000	0.000	
UNAFFILIATED%	0.144	0.064	0.182	0.000	0.000	0.000	
UNAFFILIATED25%	0.241	0.000	0.428	0.000	0.000	0.000	
ISA600	0.560	1.000	0.496	0.527	1.000	0.499	0.033**
|TA|	0.131	0.060	0.211	0.172	0.081	0.259	-0.041***
|ΔAR|	0.008	0.000	0.025	0.010	0.000	0.033	-0.002**
LAFEE	5.318	5.150	1.265	4.004	3.855	0.871	1.314***
Controls							
ADTCHANGE	0.104	0.000	0.305	0.096	0.000	0.294	0.008
ANNUAL	0.083	-0.061	0.788	0.112	-0.130	0.932	-0.029
BIG4	0.585	1.000	0.493	0.383	0.000	0.486	0.202***
BUSY	0.817	1.000	0.386	0.898	1.000	0.303	-0.080***
CATA	0.438	0.419	0.246	0.411	0.362	0.271	0.027**
FOREIGN	0.814	1.000	0.390	0.000	0.000	0.000	0.814***
GROWTH	1.298	1.050	1.190	1.373	1.067	1.286	-0.076**
HIGHSUBDIST	0.270	0.000	0.444	0.000	0.000	0.000	0.270***
INDGROWTH	1.110	1.080	0.128	1.125	1.089	0.129	-0.014***
INDLEADER	0.179	0.000	0.384	0.092	0.000	0.289	0.087***
LARGENONBIGN	0.332	0.000	0.471	0.453	0.000	0.498	-0.121***
LEVERAGE	0.387	0.376	0.322	0.309	0.196	0.405	0.077***
LOCATIONCOV	0.834	1.000	0.252	1.000	1.000	0.000	-0.166***
LOSS	0.467	0.000	0.499	0.672	1.000	0.470	-0.205***
LOWIFRS	0.412	0.000	0.492	0.000	0.000	0.000	0.411***
LOWRULE	0.282	0.000	0.450	0.000	0.000	0.000	0.282***
LOWSUBSENGLISH	0.269	0.000	0.444	0.000	0.000	0.000	0.269***
LSUB	2.509	2.303	1.268	1.234	1.099	0.941	1.275***
LSUBGDP	10.453	10.692	0.663	10.867	10.867	0.000	-0.414***
LTA	4.705	4.462	2.224	3.267	3.112	1.801	1.438***
MB	2.408	1.505	3.214	2.281	1.377	3.495	0.127
MINING	0.296	0.000	0.457	0.479	0.000	0.500	-0.183***
MNESPEC	0.266	0.000	0.442	0.270	0.000	0.444	-0.004
MOPINION	0.193	0.000	0.395	0.254	0.000	0.435	-0.061***
OCFVOL	0.079	0.045	0.101	0.101	0.054	0.137	-0.022***
PAYTOVER_L	3.471	0.226	5.788	-2.803	0.000	6.484	6.274***
PERFORM	-0.051	0.031	0.329	-0.133	-0.046	0.423	0.082***
PPEGROWTH	1.517	0.047	8.808	1.884	0.050	10.239	-0.368
PTCHANGE	0.230	0.000	0.421	0.210	0.000	0.407	0.020**
QUICK	4.427	1.438	9.664	7.214	2.479	12.882	-2.788***
RECTOVER_L	8.009	5.232	16.217	15.802	4.805	42.194	-7.794***
SALESGROWTH	0.916	0.008	5.460	0.143	0.027	0.249	0.016
SALESVOL	0.159	0.080	0.225	1.129	0.000	6.393	-0.213
|TA|_L	0.151	0.061	0.444	0.193	0.084	0.354	-0.052***

[a] t-statistic clustered at the company level; *** two-tailed p<0.01, **two-tailed p<0.05, * two-tailed p<0.1, † p<0.2 (one-tailed significance)

Appendix 2D: National Groups without Component Auditors (continued)

Panel B: ISA 600 and audit outcomes for MNEs with Component Auditors and National Groups without Component Auditors

Variables	(1) *|TA|*	(2) *|TA|*	(3) *|ΔAR|*	(4) *|ΔAR|*	(5) *LAFEE*
COMPONENT%	0.0714**		0.0082		
	(0.031)		(0.006)		
*COMPONENT%*ISA600*	-0.018		-0.018		
	(0.037)		(0.007)		
COMPONENT25%		0.0300**		0.0020	0.1609***
		(0.012)		(0.002)	(0.036)
*COMPONENT25%*ISA600*		-0.0162		0.0006	-0.0318
		(0.015)		(0.002)	(0.038)
COMPONENT	0.0014	0.0054	-0.0014	-0.0003	0.2540***
	(0.014)	(0.013)	(0.002)	(0.002)	(0.050)
*COMPONENT*ISA600*	0.0011	0.0073	0.0008	-0.0001	-0.0393
	(0.015)	(0.012)	(0.002)	(0.002)	(0.033)
ISA600	-0.0656***	-0.0652***	-0.0048*	-0.0048*	-0.0215
	(0.019)	(0.019)	(0.003)	(0.003)	(0.065)
Observations	5,123	5,123	5,123	5,123	5,123
R-squared	0.395	0.395	0.061	0.060	0.895
Controls	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Subsidiary country FE	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO
Interactions first-stage regressors	YES	YES	YES	YES	NO

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1, † p<0.2 (one-tailed significance)

Chapter 3 – The Effect of National Inspection Regimes on Audit Quality[55][56]

Abstract: An international key reform aimed at improving audit quality has been the introduction of public oversight over the auditing profession by the various national public oversight bodies (POBs). The foundation of their strategy is inspections of audit firms. However, little is known about the impact of inspections on audit quality internationally. We examine the effect of POB inspections on audit quality, and explore the association of inspection characteristics and audit quality. Applying a difference-in-differences design exploiting the staggered inspection commencement for a large international sample over the period 2003-2012, we find that audit quality of listed clients increases after inspections commence, and is sustained in future years. We find a stronger effect for clients of Big 4 audit firms. Further, we find some evidence of cross-sectional variation in audit quality for differences in inspection characteristics. Overall, our study contributes to our knowledge about the impact of inspections on audit quality.

[55] This chapter is based on a working paper with Elizabeth Carson, Roger Simnett and Ann Vanstraelen.

[56] We thank Anna Huggins, Ashna Prasad, Shirley Tsau, Yang Xu and Lei Zou for research assistance, and Martijn Duffels (The Netherlands Authority for Financial Markets), Janine van Diggelen, (then Chairman of IFIAR), and Gary Pflugrath, (Director of Public Policy and Regulation at the International Federation of Accountants) for helping us gain access to the public oversight bodies (POBs) of the respective countries, as well as the various national POB representatives who responded to our data requests. A previous version of this paper was presented HEC Lausanne, the University of Auckland, University College Dublin, the University of Mannheim, UNSW Sydney, the University of Groningen, the Conference on Auditing and Capital Markets (PCAOB/JAR conference), the Annual Congress of the European Accounting Association, the European Auditing Research Network Symposium, the International Symposium on Audit Research, the Midyear Auditing Meeting of the American Accounting Association, the Accounting and Finance Association of Australia and New Zealand Conference, and the UTS Sydney Conference. We appreciate the comments of Christian Leuz, Stephan Hollander, Mathieu Mulders and Jeff Cohen, our discussants Neil Fargher, Nemit Shroff, Cassandra Estep, Tobias Svanström and Lasse Niemi, and other participants at these conferences/workshops. We further acknowledge the financial support of the Australian Research Council and the Maastricht University Peter Thijssen Fund.

3.1 Introduction

In the last fifteen years, one of the key reforms directed at improving the quality of auditing has been the application of public oversight to the activities of the auditing profession. Internationally, several countries have developed independent national public oversight bodies (POBs) that oversee their national auditing profession, moving away from a non-public oversight system.[57] These POBs are independent of the auditing profession and became responsible for audit regulatory functions in the public interest (International Forum of Independent Audit Regulators (IFIAR) [2018]; Public Company Accounting Oversight Board (PCAOB) [2018]). The U.S. was one of the front-runners in introducing public oversight of the auditing profession, and the PCAOB model of independent public oversight has formed the basis for many other national POBs that were installed in the following years (Harris [2009]).

A key strategy and work effort of all national POBs is the implementation of a system of recurring inspections of audit firms that are undertaking audits of public interest entities (PIE) (IFIAR [2018]). While independent public oversight supported by a comprehensive audit firm inspection program is presented as a more effective way to ensure audit quality than other forms of regulation of the auditing profession, concerns have been raised about whether this is actually more effective at ensuring audit quality than other forms of regulation. These concerns include a trade-off between expertise and independence of public oversight, the incentives that POBs face, organization of inspections and the resulting effect on audit quality (e.g. DeFond [2010]). Given the significant amount of resources invested in public oversight, its effect on audit quality is an important empirical question.

We also consider that the commencement of national inspection programs may not have a similar impact on all types of audit firms (and their clients). On the one hand, inspections may have a greater impact on Big 4 audit firms due to these firms' heightened concerns over reputation and enforcement actions as well as the opportunities to transfer learning throughout their global networks, resulting in larger audit quality increases than for non-Big 4 firms. On

[57] A range of approaches were employed by countries prior to the installation of public oversight: self-regulation by the auditing profession as found in the U.S. (e.g. DeFond [2010]), Australia (Smith & Simnett [2005]), and EU countries including Denmark, France, Ireland, the Netherlands and the U.K. (Garcı´a Osma et al. [2017])); governmental oversight (e.g. in Finland (Garcı´a Osma et al. [2017])), and mixed systems, such as in Germany, Italy or Spain (Garcı´a Osma et al. [2017]). Certain countries did not have any type of oversight prior to the installation of public oversight (e.g. Austria, (Garcı´a Osma et al. [2017])). Depending on the oversight system, some countries had certain inspection systems in place, such as peer-reviews under a self-regulatory system. The existence of such prior systems of quality control, regardless of the type of system, would bias against us finding improvements in audit quality from such initiatives.

the other hand, inspections may not further increase audit quality for Big 4 firms due to their higher ex-ante audit quality if POBs strive for uniform standards of audit quality.

We further identify that, while inspection programs are the key foundation of all national POBs' strategies and work efforts, divergent approaches to the implementation of these inspection programs have developed. Specifically, we consider factors that are directly related to how inspections are conducted, whether and how results are disclosed and the potential consequences of deficient inspections. As these differences in inspection regimes may impact the effectiveness of inspections as a regulatory instrument, an analysis of the effect of inspections in an international setting and effect of different design choices on audit quality is warranted.

Overall, we examine the effect of the commencement[58] of national independent POB's inspection programs on audit quality. We further examine whether the effect of commencement of inspections on audit quality differs between Big 4 compared to non-Big 4 firms. Lastly, we explore whether and how differences in organization of inspection regimes impact audit quality.

As is common in international archival research, it is an empirical challenge to disentangle the effect of inspections on audit quality from other factors and events. To address this challenge, we use a generalized difference-in-differences specification that exploits the staggered commencement of inspections in various countries, and control for country and time fixed effects. In the absence of more direct measures of audit quality for a large international sample, we infer audit quality using common proxies of financial reporting quality for which data are available in an international setting, including the level of absolute abnormal and total accruals, working capital accruals, discretionary revenues, changes in accounts receivable, the incidence of small profits and timely loss recognition of audit firms' client companies. We view our proxies as indicative of audit quality since audited financial statements are a joint product of clients and auditors (Antle & Nalebuff [1991]) and the ultimate goal of the auditor is to increase the reliability of financial reporting (DeFond & Zhang [2014]). This view is consistent with recent empirical evidence showing that commonly used financial reporting quality measures are correlated with audit process quality (Aobdia [2019]).

Using this difference-in-differences specification, we investigate the effect of inspection commencement on audit quality for a sample of 157,370 listed clients from 50

[58] This study focuses on the commencement of inspections by POBs as opposed to the legal introduction of inspections.

countries for the period 2003-2012 (full sample), irrespective of whether they have commenced inspections prior to our sample period, commence inspections during our sample period or do not commence inspections, and for the subsample of 90,364 listed clients from 27 countries that commence inspections between 2004-2011 (inspection commencement sample). We find that, for both the full sample and the inspection commencement sample, measures of earnings management (absolute abnormal, total and working capital accruals) and revenue management (discretionary revenues, changes in accounts receivables) significantly decrease for clients whose audit firms are subject to national inspection programs compared to clients of audit firms that are not subject to inspections. For both samples, we also find that clients of audit firms which are subject to inspections by national POBs are associated with more timely loss recognition, compared to clients of audit firms which are not, while we do not find an effect of inspection commencement on earnings management around the zero earnings threshold. We also find that the effect of inspection commencement on audit quality, for our measures of accruals and revenue management and small profits, is more pronounced for clients of Big 4 audit firms compared to clients of non-Big 4 audit firms. Further, we find little evidence of an anticipatory effect of inspections and show that the positive effect of inspections on audit quality is sustained over time. We also find some support for a differential effect of inspections on audit quality, conditional on inspection regime choices by the POB for the inspection commencement sample, in particular with regard to inspection disclosure. Our overall results are largely consistent across a number of additional and sensitivity analyses and controlling for concurrent events that may affect our measures of audit quality.

Overall, our findings contribute to the emerging literature on the benefits of public oversight of the auditing profession and audit firm inspection programs by providing evidence on the audit quality effects of inspections conducted by national POBs and the characteristics of inspections associated with audit quality improvements. We thus extend the literature on the audit quality effects of PCAOB inspections and other national inspection regimes to a larger international setting. Our analyses also shed light on audit quality and reputation incentives for audit firms arising from public oversight, in settings other than the U.S. Our insights may also prove useful for POBs and regulators across the world in their ongoing discussions and decisions regarding mutual recognition of public oversight across countries.

The remainder of this paper is organized as follows. In Section 3.2, we provide the relevant background for the study and formulate the hypotheses that we test. In Section 3.3, we describe the data, descriptive statistics and research design. In Section 3.4, we present the results of the study and we conclude in Section 3.5.

3.2 Background and hypotheses development

In the last fifteen years we have witnessed a significant shift in audit regulation and institutions, through the introduction of public oversight and the commencement of inspections of audit firms. In many countries, POBs were newly created, or existing institutions were given additional responsibility, to replace self-regulation by the audit profession or other existing forms of oversight, as discussed in footnote 57. The commonality of these POBs is that they are (1) independent of the auditing profession, and (2) engaged in audit regulatory functions in the public interest (as defined by IFIAR [2018]). Inspections of audit firms are the main approach employed by POBs for identifying and improving deficiencies in audit quality and driving improvements in the audit process. Although considerable resources go into these national inspection regimes, very little is known about their effect on audit quality, except for studies on the impact of PCAOB inspections in the U.S. and PCAOB inspections internationally, which we outline further below.

From a theoretical view, regulatory oversight through mechanisms such as inspections by POBs can provide investors with confidence that audits meet a minimum level of quality standards and independence requirements (Landes & Posner [1975]; Polinsky [1980]; Coates [2007]; Aobdia & Shroff [2017]), thereby mitigating agency conflicts inherent in auditing (Watts & Zimmerman [1980]). Studies on POBs, in particular the PCAOB, have further argued that an independent inspection process may be superior to a peer review system by way of greater independence, objectivity, and availability of resources (e.g., Carcello et al. [2011]; Gunny & Zhang [2013]). Further, stricter standards and larger penalties could be expected to provide stronger incentives to improve audit quality (DeFond [2010]). However, a public regulator may not be effective in fulfilling its task of ensuring that audits are of quality if it is not competent to undertake such inspections, has the wrong incentives or acts under regulatory capture (Stigler [1971]; Mahoney [2001]). The PCAOB was criticized early in its existence for using staff with limited expertise, inadequate transparency of procedures and inspection outcomes, slow feedback (e.g., Glover et al. [2009]), and the use of risk-based inspection sampling which may result in inspection findings that are not representative for the entire client portfolio of an audit firm (e.g., Church & Shefchik [2012]; Peecher et al. [2013]). Thus, the benefits of public oversight and its effect on audit quality are not uncontested.

Empirical research on PCAOB inspections in the U.S. shows that inspection results can discriminate between various levels of audit quality (e.g., Gunny & Zhang [2013]) and there is support for a positive effect of inspections on audit quality (e.g., Carcello et al. [2011], DeFond

& Lennox [2017]). PCAOB inspections also increase the reporting credibility and trust investors place in the financial reporting of clients of inspected audit firms (Gipper et al. [2017]). Research has also been conducted on the informational value of PCAOB inspection reports or sanctions (e.g., Dee et al. [2011]) and the impact of inspection reports on hiring and firing of audit firms (e.g., Lennox & Pittman [2010]; Abbott et al. [2013]).

With regard to international considerations, the impact of the international reach and inspections of non-U.S. audit firms by the PCAOB on audit quality, including spillover effects to domestic clients of these non-U.S. audit firms, has recently become a topic of research (e.g. Lamoreaux [2016]; Fung et al. [2017]; Krishnan et al. [2017]; Aobdia & Shroff [2017]; Shroff [2017]). This research consistently finds that international access by the PCAOB and international inspections conducted by the PCAOB are positively associated with audit quality, and also appear to lead to real economic effects for audit firms and their clients (Aobdia & Shroff [2017], Shroff [2017]). Research on other POBs is limited but finds some support for the ability of inspections to discriminate audit quality in the Netherlands (van Opijnen et al. [2016]) and in Spain (Fuentes et al. [2015]). Florou & Shuai [2017] also find some evidence of audit quality varying with inspection regime characteristics in Europe. However, inferences from these studies may not be generalizable to other POB inspections and settings (Aobdia & Shroff [2017]) or to international settings in general, which is the aim of this study. In particular, we investigate in an international setting the impact of commencement of inspections on audit quality and whether this effect differs between Big 4 compared to non-Big 4 audit firms, and also explore the association of inspection characteristics and audit quality.

The differences in the timing of the commencement of inspections across the various countries (see Table 2) provides a setting to address our research questions. Even though there is a debate around whether inspections by POBs are effective at improving audit quality, we expect that the commencement of regular inspections by independent POBs affects audit quality in these countries for the following reasons.[59] First, the inspection process can provide important incentives to audit firms for improving their engagement quality and firm-wide quality control systems in order to avoid reputational losses if audit quality deficiencies are detected. Reputational concerns may play a significant role in incentivizing audit firms to provide quality audits, especially in countries with low legal liability for auditors (e.g. Weber et al. [2008]; Skinner & Srinivasan [2012]). Second, audit firms may have concerns about

[59] We argue that it is the commencement of the inspection regime per se, not only the execution of inspections at specific audit firms, that is of importance in improving audit quality, as it is from this time that there will be interactions between the POB and audit firms.

enforcement actions and sanctions, and the consequences thereof, should audit quality deficiencies be detected, and may therefore improve audit quality (e.g. Dee et al. [2011]). Third, regular inspections are designed to detect deficiencies in audit quality, and the communication of these deficiencies to audit firms can lead to a learning and feedback effect, ultimately resulting in better audit quality. Fourth, as discussed above, there is evidence, mainly relating to the U.S. and the international reach of the PCAOB, that public oversight and inspections impact audit quality. Hence, while we acknowledge the criticisms of independent inspection regimes, we expect that audit quality increases for clients of audit firms that become subject to independent inspections by national POBs. We therefore hypothesize that:

H1: Audit quality increases for clients of audit firms that become subject to inspections by national POBs.

We further examine whether inspection commencement has a differential effect on Big 4 audit firms. On the one hand, it can be argued that Big 4 audit firms that deliver higher audit quality ex-ante may be affected less by or react less to the commencement of inspections than non-Big 4 firms with lower ex-ante audit quality (DeAngelo [1981]). In this regard, POBs may focus their resources more on those audit firms for which they expect low ex-ante audit quality when conducting their inspections, resulting in a larger effect on audit quality for non-Big 4 firms. Overall, it can be expected that POBs strive to achieve uniformly high audit quality across all audit firms that fall under their responsibility, regardless of their size.

On the other hand, Big 4 audit firms and their clients may respond more to the commencement of inspections through POBs than non-Big 4 firms. Public oversight and inspections focus on areas of risk, which are more likely to occur in larger and more complex clients, of which Big 4 audit firms typically audit a larger market share. Big 4 audit firms and their clients may also be more concerned about potential consequences from inspections, including adverse reputational effects, and any resulting regulatory actions and legal penalties. Further, individual Big 4 audit firms communicate the findings of inspection processes into their network-wide quality review processes (IFIAR [2018]), leading to greater feedback and learning effects from the inspection process for Big 4 audit firms compared to non-Big 4 audit firms. This may result in Big 4 audit firms demonstrating a larger reaction to the commencement of inspections in terms of audit quality changes.

Given these competing arguments, we formulate the following null hypothesis:

H2: There is no difference in the increase in audit quality for the clients of Big 4 versus non-Big 4 audit firms that become subject to inspections by national POBs.

In addition to the two main hypotheses, we examine whether there is an association between choices made by national POBs in the design of inspection processes and audit quality. In this regard, we consider factors that are directly related to how inspections are conducted, whether and how results are disclosed and the potential consequences of deficient inspections. Specifically, we analyze the association of (1) the characteristics of the inspection regime, including the type of oversight (direct oversight, through oversight of the professional body or a combination) and the frequency of inspection; (2) the disclosure decisions made by POBs, including whether inspection results are disclosed and the type of disclosure of inspection results (individual inspection reports per audit firm or an aggregate report); and (3) the ability of the POB to impose sanctions on audit firms based on inspection results (enforcement ability) with our measures of audit quality. Arguments can be made as to how each inspection characteristic can be positively or negatively associated with, or unrelated to, audit quality. Further, it is difficult to determine ex-ante the relative influence of individual inspection characteristics. We therefore do not formally hypothesize the relationship between these inspection characteristics and audit quality and provide this as exploratory analyses.

3.3 Data, descriptive statistics, and research design

3.3.1 SAMPLE SELECTION AND DESCRIPTION

Our sample period relates to the period 2003-2012. We choose 2003 as the starting year of our sample since this was the year when the PCAOB started conducting inspections following the adoption of the Sarbanes-Oxley Act in 2002. It was also the commencement of a period of extensive discussion on the benefits and costs of audit firm oversight both in the U.S. and internationally. To examine the effect of audit firm inspections by POBs, we consider a 10-year period from this starting year until 2012 during which many countries installed POBs. Further, this sample period includes observations in years before and after most countries that chose to adopt a public oversight system during the sample period 2003-2012 initiated inspections.[60]

We use the Worldscope database to collect financial data for the listed companies of the countries in our sample. We started with all countries available in Worldscope and checked

[60] The year 2012 is an appropriate final year as those countries that had not installed a POB that conducts independent inspections by the end of our sample period had not done so by the end of 2017, except for Pakistan that installed a POB during 2016.

the number of observations for which four key data items (total assets, sales, net income and operating income) were available in 2012, the last year of our sample period. Countries with more than 50 listed company observations for these 4 items in 2012 were retained in the initial sample, which resulted in a sample of 53 countries.

As outlined in Table 1, from our initial sample of listed companies in these 53 countries, we next exclude all financial institutions and utilities, consistent with prior literature (Francis & Michas 2013). We further eliminate observations with insufficient financial data for the independent variables required for our models (as described in the next section and in Appendix 3A of this chapter). To calculate the dependent variables for our models, we eliminate observations from countries with less than 100 observations and then eliminate observations with insufficient data to enable the calculation of abnormal accruals and discretionary revenues (Appendix 3A of this chapter)[61]. Finally, the 26 observations pertaining to clients of Arthur Andersen in 2003 are eliminated. The final dataset contains listed companies from 50 countries, of which 36 are conducting inspections by the end of 2012. Of these 36 countries, 27 commenced inspections between 2004-2011 (inspection commencement sample) which allows us to observe a change in the inspection variable within these countries. The final full sample is an unbalanced panel with 24,913 unique clients over the years 2003-2012, a total of 157,370 client-year observations.[62] The sample of firms commencing inspections between 2004-2011 results in a total of 90,364 client-year observations.

TABLE 1

Sample selection

	Number of Observations
Client-year observations in Worldscope 2003-2012 (53 countries)	281,833
Less:	
Clients with SIC Codes between 6000-6999 and 4400-4999	(33,737)
Missing financial variables	(74,598)
Countries with less than 100 observations	(80)
Observations lost due to calculation of independent variables and countries with less than 100 observations (3 countries)	(16,102)
Observations audited by Arthur Andersen in 2003	(26)
Full sample (50 countries)	157,370
Inspection commencement sample (27 countries)	90,364

[61] We lose observations due to the truncation of variables for the models in Appendix 3A of this chapter at the 1st and 99th percentile for each country-year, following Francis & Michas [2013]. This eliminates extreme observations in our diverse dataset of international firms.

[62] While our sample period is 2003-2012, we also collect data for 2002 and 2001 for the calculation of some variables (see Appendix 3A of this chapter)

To gather information on the inspection commencement dates and other characteristics of each of the POBs in our sample, we consult the country profile documentation available on the IFAC website, the IFIAR website, the World Bank website, and the official websites of the POBs. For the 50 countries in the final sample, we did not identify POBs[63] from publicly available sources for 14 countries. For the 36 countries for which we identified a POB, we collected information on the commencement of inspections and other inspection characteristics from publicly available data from the above-mentioned websites (as indicated under column titled Sources in Table 2 or the related footnotes). To corroborate the information from publicly available sources, we surveyed[64] most POBs in the sample[65], to confirm the commencement date of inspections and the information on inspection characteristics. We received responses from all countries that were successfully contacted.

By examining the responses from these sources, we can establish the date of inspection commencement, the frequency and type of inspection system, as well as information on inspection disclosure and enforcement ability of the POBs in each country. This information is documented in Table 2 which provides an overview of the year in which inspections by independent POBs commenced, details of the inspection characteristics and year of mandatory IFRS adoption.[66]

3.3.2 EMPIRICAL MODELS

3.3.2.1 Measures of audit quality

To test our hypotheses, we infer audit quality using common proxies of financial reporting quality for which we have data consistently available for all countries in our international sample. Our proxies are 1) absolute (abnormal) accruals, 2) absolute working capital accruals, 3) absolute discretionary revenues, 4) changes in accounts receivable, 5) the incidence of small profits and 6) timely loss recognition.[67] We recognize that these measures are measures of financial reporting quality and may not be direct proxies for audit quality since pre-audited financial statements are not observable. Nevertheless, audited financial statements are a joint product of clients and auditors (Antle & Nalebuff [1991]) and the ultimate goal of

[63] Note that we adopt IFIAR's definition of POBs, outlined in Section 3.2 of this study.
[64] The initial survey was sent out in the summer of 2015, and a follow-up survey was carried out in spring of 2016.
[65] We were unable to successfully contact the POBs of the Philippines, Romania and Russia and as a result, rely on publicly available sources to identify the inspection start date and other inspection characteristics. Because certain POB characteristics could not be identified for these countries based on publicly available sources, we exclude observations from these countries in the analyses of the POB and inspection characteristics.
[66] In our analyses, we control for mandatory IFRS adoption which is a concurrent event that may affect audit quality
[67] For details on data definitions and models, see Appendix 3A of this chapter.

the auditor is to increase the reliability of financial reporting (DeFond & Zhang [2014]). Further, Aobdia [2019] shows that commonly used financial reporting quality measures are correlated with audit process quality, measured as PCAOB inspection findings, in the U.S. setting. Hence, given the lack of availability of more direct measures of audit quality for a large international sample[68], we view our proxies as indicative of audit quality.

First, and as a benchmark for findings in prior literature, we consider reduced managerial discretion resulting in lower absolute abnormal accruals, all other things being equal. We measure absolute abnormal accruals ($|ATA|$) as the absolute values of the residuals of the performance-adjusted cross-sectional modified Jones model (Jones [1991]; Dechow et al. [1995]; Kothari et al. [2005]) which we estimate for each industry-year including country fixed effects. This model has also been widely used in the international auditing literature to infer audit quality (e.g., Kwon et al. [2007]; Francis et al. [2013]). Chen et al. [2018] show that when using a two-step model and explanatory variables are correlated, coefficients and standard errors may be biased. In line with the suggestion in Chen et al. [2018], and as implemented in Gipper et al. [2017] and Godsell et al. [2017], we therefore estimate a model that regresses the absolute value of total accruals ($|TA|$) on all regressors of the performance-adjusted Jones model (in Appendix 3A of this chapter) and all regressors of our model of interest (equation [1] below), include a set of interaction variables between the Jones model regressors and industry and year fixed effects, and include country fixed effects.

As an alternative measure for absolute (abnormal) accruals, we use abnormal working capital accruals based on the expectation model in DeFond & Park [2001]. A common argument in the literature is that working capital accruals are more susceptible to manipulation than non-working capital accruals (e.g., DeFond & Jiambalvo [1994]; Teoh et al. [1998]). Further, this measure is less sensitive to estimation issues that arise due to data limitations in the international setting when modelling normal accruals. We calculate abnormal working capital accruals ($|AWCA|$) as realized working capital minus expected working capital, where expected working capital is assumed to be a fixed proportion of sales (Dechow et al. [1998]; DeFond & Park [2001]).

We further supplement the accrual-based measures of audit quality with a measure of revenue manipulation based on McNichols & Stubben [2008] and Stubben [2010]. This

[68] More direct measures of audit fees and auditor reporting are not readily discernable in Worldscope or are subject to large measurement error. For example, audit fees might be reported excluding or including non-audit fees and the type of modified audit opinion cannot be readily identified. Further, Worldscope only indicates whether the auditor's opinion is qualified or unqualified (which groups together all types of modifications and does not allow for the separate identification of going concern opinions, see Fan & Wong [2004]).

measure of discretionary revenues has been used in an international setting (Chen et al. [2011]) and as a proxy for audit quality (Minutti-Meza [2013]), and has been found to be less prone to measurement bias and more powerful at detecting earnings management than accruals models (Stubben [2010]). We calculate discretionary revenues ($|DR|$) as the absolute value of the residuals from regressing the change in accounts receivables on the change in revenues for each industry-year and include country fixed effects. Since the calculation of discretionary revenues relies on a two-step procedure which can result in biased coefficients and standard errors (Chen et al. [2018]), we also estimate a model that regresses the absolute value of the change in accounts receivables ($|\Delta AR|$) on the change in revenue and all regressors of our model of interest (equation [1] below) and include a set of interaction variables between the change in revenue and industry and year fixed effects, and include country fixed effects.

As an additional audit quality measure, we use the incidence of small profits. Prior literature looking at earnings distributions around benchmarks has interpreted the incidence of small profits as evidence of income-increasing earnings management to meet or beat the zero-earnings benchmark and avoid losses (e.g. Burgstahler & Dichev [1997]). We suggest that auditors' incentives to constrain earnings management to meet or beat the zero-earnings benchmark is higher when audit firms are inspected by POBs. We define small profits as profits that fall between 0 and 1% of ROA, consistent with Gul et al. [2013].[69]

Lastly, we test our hypotheses with a model of timely loss recognition (TLR). The speed with which economic losses are recognized is a function of managerial and auditor incentives, as well as institutional factors (e.g. Ball et al. [2003]). We thus test whether auditor's incentives to require clients to report more conditionally conservatively increases when audit firms are inspected by POBs. We rely on a model which recognizes the asymmetric relationship between accruals and client performance for economic gains and losses (Ball & Shivakumar [2005]). It is expected that economic losses are captured by accruals in a more timely manner than gains. We choose this measure as a measure of TLR for our international study, since the Basu [1997] measure which regresses earnings on stock returns might induce measurement bias in cross-country studies (Holthausen [2003]).

[69] Prior literature uses various cutoff values of ROA to define small profits. Gul et al. [2013] define small profits as ROA between 0 and 1%. Frankel et al. [2002], Ashbaugh et al. [2003] and Carey & Simnett [2006] define small profits as ROA between 0 and 2%. Francis & Yu [2009] define small profits as ROA between 0 and 5%. We choose a conservative cutoff value of 1% as in Gul et al. [2013], but also report results with a higher cutoff value of 2%.

3.3.2.2 Empirical models for testing the hypotheses

Our empirical design uses a difference-in-differences methodology which exploits the fact that there are differences in the timing of the commencement of inspections by national POBs. Every untreated client at a point in time acts as a control for a treated client in the same time period. That is, we compare the difference in audit quality before and after the commencement of inspections for clients in countries that commence inspections to the same difference for clients in countries that do not commence inspections. Since our full sample also includes clients in countries that had commenced inspections prior to the start of our sample period, we also show results for the subsample of countries for which we can observe audit quality pre and post inspection commencement (i.e. those countries commencing inspections between 2004 and 2011).

In our main specification, we use inspections as treatments and include country and year fixed effects, in addition to various client-level control variables.[70] We expect audit firms which become subject to inspections by POBs to improve the quality of their audits. The identification of the effect of inspection commencement on audit quality hinges on the assumptions underlying the difference-in-differences methodology, including exogeneity of the treatment and parallel trends in audit quality of the control and treatment group absent inspection commencement.[71] We implement a test for the parallel trends assumption by including a contemporaneous treatment plus lags and leads of the treatment in our models (Autor [2003]; Atanasov & Black [2016]).

To test our hypotheses, we use the following model, where standard errors are clustered at audit client level[72] and we use OLS for the accrual quality and discretionary revenue analyses[73], and probit for the small profit analyses:

[70] We do not include various country-level factors that have been shown to explain variation in financial reporting quality (e.g. Rule of Law, Financial Development, as in Francis et al. [2013]) since including country fixed effects subsumes these variables, which have little variation across time.

[71] As discussed in the limitations section, we acknowledge that the commencement of inspections may not be exogenous, since the introduction of POBs and inspections may be a result of low audit quality, inducing a simultaneity bias. Further, the assignment of the treatment to countries is likely not random.

[72] We cluster standard errors by audit client to adjust for correlation of observations for one client across years. Whilst the variable of interest is at the country level and clients within a country are jointly assigned to the treatment, we argue that not all clients in a country may be treated equally by the commencement of inspections (for example, the treatment effect may differ by audit firm type). Further, as not all audit firms may be inspected directly upon commencement of inspections, the use of clustering at country level may not be appropriate in this setting. Nevertheless, we discuss results when clustering standard errors at the country level in sensitivity analyses.

[73] In sensitivity analyses (not tabulated), we use tobit analyses instead of OLS for the discretionary accruals, total accruals, working capital accruals and discretionary revenue analyses, since these proxies are measured in absolute values and are thus left-censored. Inferences from equation [1] remain the same when using tobit, instead of OLS for these audit quality proxies.

$$|ATA_{i,t}|, |TA_{i,t}|, |AWCA_{i,t}|, |DR_{i,t}|, |\Delta AR_{i,t}|, or\ SmallProfit_{i,t} = \beta_0 + \beta_1 Inspection_{i,t} + \beta_2 Big4_{i,t} + \beta_j \sum Controls_{i,t} + Country/Industry/Year\ Fixed\ Effects + \varepsilon \quad [1]$$

Where $|ATA_{i,t}|$ is the absolute value of performance-adjusted abnormal total accruals measured by the modified Jones model; $|TA_{i,t}|$ is the absolute value of total accruals in year t[74]; $|AWCA_{i,t}|$ is the absolute value of abnormal working capital accruals; $|DR_{i,t}|$ is the absolute value of discretionary revenues; $|\Delta AR_{i,t}|$ is the absolute value of the change in accounts receivable; $SmallProfit_{i,t}$ is an indicator variable if ROA is between 0 and 1% (or 0 and 2%). The dependent variables are defined in Appendix 3A of this chapter.

The variable of interest for testing Hypothesis 1 is $Inspection_{i,t}$, which is an indicator variable taking the value of 1 when the observation relates to a country and year where independent inspections are taking place.[75] We hypothesize that inspections improve audit quality and thus expect a negative coefficient for β_1. $Big4_{i,t}$ is an indicator variable equal to one when the client-year observation is audited by a Big 4 audit firm.[76] We expect that Big 4 audit firms provide higher audit quality and thus predict a negative coefficient for β_2. To investigate Hypothesis 2, we add interaction terms between all variables in the model and $Big4_{i,t.}$. The interaction between $Inspection_{i,t}$ and $Big4_{i,t}$ is our variable of interest for Hypothesis 2 and allows us to test whether inspections have a differential impact on the audit quality of clients of Big 4 compared to non-Big 4 audit firms.

We include the following control variables in equation (1). We add the variable $IFRS_{i,t}$ which is an indicator variable taking the value of 1 if the client-year observation is subject to mandatory IFRS accounting standards[77], to control for the potential confounding event of the

[74] As discussed above, in line with Chen et al. [2017] we regress total accruals on all regressors of equation [1] and all regressors of the performance-adjusted Jones model (Appendix 3A of this chapter) and include a set of interaction variables between the Jones model regressors and industry, year and country fixed effects.

[75] We are aware that the unit of analysis is the inspection regime level, while equation [1] is conducted at the firm-level, which may overweight large countries in the sample. We address this concern in sensitivity analyses using hierarchical linear modelling and checking for robustness when excluding the largest countries from the sample.

[76] Note that the Worldscope database reports the auditor name as a current variable, thus overwriting historical auditor data. To address this limitation, we also collect historical auditor data for the fiscal year 2003 from the Orbis database by Bureau van Dijk. If the auditor is the same in the 2003 Orbis database and the 2012 Worldscope database, it is assumed that no auditor change has taken place. For those firms with changes in auditors, we identify when the auditor switch has taken place using the historical files of the Orbis database. In total, we are able to confirm 53% of the *Big 4*/non-*Big 4* observations (83,548 client-year observations) using the Orbis database, of which 93.3% are coded the same as in the Worldscope database. Results based on the Orbis-based auditor variable are consistent with the main results except for the main effect of *Inspection* becoming insignificant in the interaction model with *Big4* for the measures $|ATA|$ and $|TA|$.

[77] We expect a positive coefficient β_3. Ahmed et al. [2013] and Capkun et al. [2016] argue that IFRS provides substantially greater flexibility and discretion in accounting to companies compared to local GAAPs, leading to an increase in earnings management after its mandatory adoption.

adoption of international financial reporting standards (IFRS). As client-level controls, we include the following covariates: $Size_{i,t}$ is the natural logarithm of total assets; $CFO_{i,t}$ is the operating cash flow scaled by total assets; $Growth_{i,t}$ is the percentage of year-to-year growth in sales; $Loss_{i,t}$ is an indicator variable for a loss in the current year; $MB_{i,t}$ is a company's market value of equity scaled by book value of equity; *PPE* $Growth_{i,t}$ is a company's one year growth in gross property, plant and equipment from year *t-1* to year *t*; $Leverage_{i,t}$ is the ratio of long-term debt to total assets; *Sales* $Vol_{i,t}$ is the standard deviation of a company's sales from year *t-2* through year *t*; *CFO* $Vol_{i,t}$ is the standard deviation of cash flow from operations from year *t-2* through year *t*; *Lagged* $TA_{i,t}$ is total accruals lagged by one year; $GDP_annualgrowth_{i,t}$ is the national GDP growth as a percentage; *Country* is a vector of country indicator variables; *Industry* (2-digit SIC code) is a vector of industry indicator variables and *Year* is a vector of year indicator variables[78].

To investigate the effect of inspections on timely loss recognition, we adopt the following model (equation [2]) used in Francis et al. [2013] which is based on Ball & Shivakumar [2005] and Bushman & Piotroski [2006]:

$$\begin{aligned} TA_{i,t} = {} & \beta_0 + \beta_1 NegCFO_{i,t} + \beta_2 CFO_{i,t} + \beta_3 NegCFO_{i,t} * CFO_{i,t} + \beta_4 Inspection_{i,t} \\ & + \beta_5 NegCFO_{i,t} * Inspection_{i,t} + \beta_6 CFO * Inspection_{i,t} \\ & + \beta_7 NegCFO_{i,t} * CFO_{i,t} * Inspection_{i,t} \\ & + \sum \beta_m \, Controls_{i,t} \\ & + \sum \beta_n \, Controls_{i,t} * (NegCFO_{i,t}/CFO_{i,t}) \\ & + \sum \beta_o \, Controls_{i,t} * NegCFO_{i,t} * CFO_{i,t} \\ & + Country/Industry/Year\ Fixed\ Effects + \varepsilon \end{aligned} \qquad [2]$$

Where $TA_{i,t}$ are total accruals calculated as net income before extraordinary items less cash flow from operations, scaled by lagged total assets; $NegCFO_{i,t}$ is an indicator variable equal to 1 if cash flow from operations is negative and zero otherwise; $CFO_{i,t}$ is cash flow from operations scaled by lagged total assets. The main variable of interest is $Inspection_{i,t}$, which is an indicator variable taking the value of 1 when the observation relates to a country and year where independent inspections are taking place. As client-level controls, we include $Sales_{i,t}$, $MB_{i,t}$ and $Leverage_{i,t}$, (Francis et al. [2013]) where $MB_{i,t}$ and $Leverage_{i,t}$ are defined above and $Sales_{i,t}$ is the natural logarithm of sales in year *t*. We further include $IFRS_{i,t}$ if a client-year

[78] All continuous dependent and independent variables are winsorized at the 1st and 99th percentile.

observation is subject to mandatory IFRS reporting. Consistent with Francis et al. [2013], *Rule of Law*$_{i,t}$ is sourced from the World Bank database and included in this analysis to allow timely loss recognition to differ between countries with different governance quality.[79] We include two-way interactions between *IFRS*$_{i,t}$, *Sales*$_{i,t}$, *MB*$_{i,t}$, *Leverage*$_{i,t}$ and *Rule of Law*$_{i,t}$ and *NegCFO*$_{i,t}$ (*CFO*$_{i,t}$) respectively and three-way interactions between *IFRS*$_{i,t}$, *Sales*$_{i,t}$, *MB*$_{i,t}$, *Leverage*$_{i,t}$ and *Rule of Law*$_{i,t}$ and *NegCFO*$_{i,t}$ and *CFO*$_{i,t}$. We further include country, industry and year fixed effects and cluster standard errors at client level.

A positive coefficient for the interaction between *NegCFO*$_{i,t}$ and *CFO*$_{i,t}$ (β_3) indicates timely loss recognition. The coefficient of interest for testing Hypothesis 1 is the three-way interaction between *NegCFO*$_{i,t}$, *CFO*$_{i,t}$ and *Inspection*$_{i,t}$, since we predict that economic losses are recognized faster in accruals than economic gains. We therefore expect that the coefficient β_7 is incrementally significant to β_3 and positive. To investigate Hypothesis 2 on the interaction effect between *Inspection*$_{i,t}$ and *Big4*$_{i,t}$, we include a four-way interaction term between these variables and *NegCFO*$_{i,t}$ and *CFO*$_{i,t}$. A signficiantly positive (negative) coefficient for this four-way interaction would indicate higher (lower) timely loss recognition for clients of Big 4 audit firms after inspection commencement, compared to clients of non-Big4 firms after inspection commencement.

3.4 Results

3.4.1 DESCRIPTIVE STATISTICS

Table 2 presents the 50 countries included in the sample and the public oversight features. At the end of the sample period (2012), 36 of the 50 countries in our sample (85.81% of all observations) had commenced inspections and 27 countries have observations pre- and post-inspection commencement (inspection commencement sample). Table 2[80] further demonstrates that within the group of countries with a public oversight system in place, there is considerable variation in the organization of public oversight. There is variation in the type of inspection system that is in place, where inspections can be directly performed by a POB (20 countries), through oversight of the national professional accountancy body (7 countries), or through a combination of these systems (3 countries) where audit firms are inspected by both a POB and by the national professional accountancy body with oversight of the POB. Five

[79] Note that including interaction effects between *NegCFO, CFO* and country indicators is infeasible for estimation purposes.

[80] We are unable to confirm certain information on inspection characteristics for Romania, Russia and the Philippines. We therefore exclude these countries from the analyses of public oversight and inspection characteristics. Hence, the number of countries mentioned in this paragraph on POBs and inspection characteristics may not add to 36.

countries switch from through oversight (of the national professional accountancy body) to direct inspections and 1 country switches from combination to direct during the sample period. The frequency of inspections varies from no set period ("on demand" (Brazil) or "no provision" (Indonesia)), to 3 years for PIE audit firms (which is the minimum requirement for EU countries) up to annually for large audit firms (Canada, France, Germany, Switzerland, Thailand, U.K. and U.S.). Sixteen POBs conduct more frequent inspections for large audit firms than for small audit firms.[81] POBs also differ in terms of whether and how inspection results are disclosed. Thirty POBs publicly disclose the inspection results, of which 5 POBs (Norway, Russia, Sweden, U.K., U.S.) disclose inspection results for each audit firm individually, while 25 POBs disclose an aggregate report of the findings across audit firms. Lastly, POBs differ in their enforcement ability, where 24 POBs can impose sanctions directly, while 3 hold oversight over the enforcement process of the national professional accountancy body, 3 POBs have a combination of direct enforcement and enforcement through oversight, and 5 do not hold responsibility for enforcement over the audit function.[82] Overall, POBs vary substantially in their organization of the inspection process, disclosure of inspection results and in their enforcement rights.

[81] The definition of large and small audit firms depends on the jurisdiction, where certain jurisdictions define large audit firms as those with more than a certain number of issuers under audit (e.g. U.S., Germany), and others make the distinction based on audit firm's size (e.g. Big 4 in Australia, Big 6 in France).

[82] In cases where the POB is not involved in or does not oversee enforcement over the audit function, the responsibility often resides with the legislative system of a country which may act based on findings or recommendations of the POB or the profession.

TABLE 2[83]

Observations per Country and Details of Inspection Regimes

Country	Name of oversight board	Year of inspection commencement	Type of oversight system [3=direct; 2=combination; 1=through oversight; 0=no POB]	Frequency of inspections [2=Inspection for large audit firms less than 2 years; 1=otherwise; 0=no POB]	Disclosure of inspection results [2=Inspection reports publicly available; 1=inspection reports not public; 0=no POB]	Disclosure type [2=individual level for large or all audit firms; 1=aggregated level; 0=no POB]	Enforcement ability (of sanctions) [3=Direct enforcement; 2=through oversight; 1=No enforcement right; 0=no POB]	Date of mandatory IFRS adoption (effective date)	Source[84]
ARGENTINA	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/ 2012	IFAC; Decision 2011/30/EU; FRC (2014, p.9); IFRS
AUSTRALIA	Australian Securities and Investments Commission (ASIC), Financial Reporting and Audit	2005	Direct [3]	B4: 1.5 years; 2nd tier: 2-3 years; small: 12 years [2]	Public [2]	Aggregated report (every 18 months) [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; IFRS
AUSTRIA	Austrian Auditors Supervisory Authority (ASA)	2006	Through oversight [1]	3 years [1]	Non-public [1]	N/A [0]	No [1]	1/1/ 2005	IFIAR; Response to survey; IFRS

[83] The information in Table 2 refers to the years under investigation, 2003-2012 only.

[84] Unless otherwise indicated, we abbreviate the sources in the following manner (abbreviations in bold with explanations and reference to source documents):
IFIAR refers to the IFIAR member profiles, available from IFIAR's website at https://www.ifiar.org/Members.aspx.
IFAC refers to Compliance Responses and Action Plans available on International Federation of Accountants' (IFAC) website: http://www.ifac.org/about-ifac/membership/compliance-program/compliance-responses.
Decision 2011/30/EU refers to the EU Commission decision available at http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32011D0030.
FRC (2014) refers to Inspections of Third Country Auditors Annual Report 2013/14 published by the Financial Reporting Council (FRC), which is available at https://www.frc.org.uk/Third-country-auditors.
Worldbank refers to Report on the Observance on Standards and Codes (ROSC) – Accounting and Auditing available from the World Bank's website: http://documents.worldbank.org/curated/en/docsearch/document-type/904555.
IFRS refers to the IFRS jurisdiction profiles, available at http://www.ifrs.org/Use-around-the-world/Pages/Jurisdiction-profiles.aspx.[85] http://www.cvm.gov.br/subportal_ingles/index.html

	[Qualitätskontrollbehörde für Abschlussprüfer und Prüfungsgesellschaften (QKB)]		to direct [3] in 2010						
BELGIUM	CRME/KVI (Chambre de renvoi et de mise en état/Kamer van verwijzing en instaatstelling)	2007	Through oversight [1]	3 years [1]	Public [2]	Aggregated annual report [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; IFRS
BRAZIL	Comissão de Valores Mobiliários (CVM) / Securities and Exchange Commission of Brazil	1978	Through oversight [1] to direct [3] in 2011	prior to 2011: on demand; from 2011: 2 years [1]	Non-public [1]	N/A [0]	No [1]	12/31/ 2010	IFIAR; POB's website[85]; Response to survey; IFRS
BULGARIA	Commission for Public Oversight of Statutory Auditors (CPOSA)	2008	Direct [3]	PIE: 3 years; Non-PIE: 6 years [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	12/31/ 2003	IFIAR; POB's website[86]; Response to survey; IFRS
CANADA	Canadian Public Accountability Board (CPAB) / Conseil Canadien sur la Reddition de Comptes	2004	Direct [3]	B4: 1 year; NB4: 2-3 years [2]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	1/1/ 2011	IFIAR; Response to survey; IFRS
CHILE	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	12/31/ 2010	Decision 2011/30/EU; FRC (2014, p.9); IFRS
CHINA	CSRC (China Securities Regulatory Commission) (as part of), MOF (Ministry of Finance), CICPA (The Chinese Institute of Certified Public Accountants)	1992	Through oversight [1] to Combination [2] in 2004[87]	every 3 years by each authority (but coordinated; thus, audit firms not inspected more than once a year) [1]	Public [2]	Aggregated reports (frequency depends on the organization) [1]	Direct enforcement [3]	N/A	IFAC; Response to survey; World Bank; Du & Stevens (2013)[88], CICPA, MOF and CSRC websites; IFRS
DENMARK	Danish Business Authority (DBA)	2003	Through oversight [1]	3 years [1]	Public [2]	Aggregated annual reports (PIE and non-	Through oversight [2]	1/1/ 2005	IFIAR; World Bank; Response to Survey; IFRS

[85] http://www.cvm.gov.br/subportal_ingles/index.html
[86] http://www.cposa.bg/en/
[87] In sensitivity analyses we code 2004 as the start date of inspections through the Chinese MOF.
[88] Du N., and K. Stevens. "Big Four Audit Independence and Oversight in China. (international viewpoint)." *The CPA Journal*, no. 7 (2013): p. 6-9.

			to Direct [3] in 2013			PIE distinction) [1]			
EGYPT	Auditors Oversight Board Egyptian Financial Supervisory Authority (EFSA)	2009	Direct [3]	On-site: 3 years; Off-site: 1 year [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	N/A	IFIAR; Response to Survey; IFRS
FINLAND	Finnish Patent and Registration Office Auditor Oversight Unit (PRH)	2009[89]	Direct [3]	3 years [1]	Public [2]	Aggregated annual report [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; IFRS
FRANCE	Haut Conseil du Commissariat aux Comptes (H3C) / High Council for Statutory Audit	2003	Direct [3]	B6: 1 year; NB6: 3 years [2]	Public [2]	Aggregated annual report [1]	No sanctions can be imposed [1]	1/1/ 2005	IFIAR; POB's website[90]; Response to survey; IFRS
GERMANY	Abschlussprueferaufsichtskommission (APAK) / Auditor Oversight Commission (AOC)	2007	Through oversight [1] to Direct [3] in 2012	>26 relevant audits: 1 year; others: 3 years [2]	Public [2]	Aggregated annual reports [1]	Through oversight of the professional body [2]	1/1/ 2005	IFIAR; Wordbank; POB's annual reports[91]; Response to survey; IFRS
GREECE	Hellenic Accounting and Auditing Standards Oversight Board (HAASOB)	2009	Direct [3]	3 years [1]	Non-public [1]	N/A [0]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; IFRS
HONG KONG	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/ 2005	IFAC; Deloitte and FRC (2013)[92]; FRC (2014, p.9); IFRS
INDIA	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A	IFAC; FRC (2014, p.9); IFRS
INDONESIA	Pusat Pembinaan Profesi Keuangan (Finance Professions Supervisory Center, hereinafter PPPK), the Ministry of Finance (MOF)	2002	Direct [3]	No provision [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	N/A	IFIAR; IFAC; Response to survey; IFRS
ISRAEL	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/ 2008	IFAC; FRC (2014; P. 9); IFRS
ITALY	Commissione Nazionale per le Società e la Borsa (CONSOB)	2007	Direct [3]	3 years [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; POB's website[93]; Response to survey; IFRS

[89] In sensitivity analyses we code 2007 as the start date of inspections since preparatory work and/or small-scale inspections had been performed since 2007.
[90] http://www.h3c.org/accueil.htm
[91] http://www.apak-aoc.de/en/publications/annual-reports.html
[92] Refers to the "Report on independent audit oversight" issued by Deloitte and FRC in September 2013. Available at <http://www.frc.org.hk/Report%20on%20Independent%20Audit%20Oversight.pdf>.
[93] http://www.consob.it/mainen/documenti/english/revisione/index.html

JAPAN	Certified Public Accountants & Auditing Oversight Board (CPAAOB) as part of the Financial Services Agency (FSA)	2004	Through oversight [1]	B4: 2 years; 2nd tier: 3 years; small/mid: risk-dependent [1]	Public [2]	Aggregated annual reports [1]	No enforcement actions (but recommendations) [1]	N/A	IFIAR; POB's website[94]; Response to survey; IFRS
JORDAN	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/ 1997	FRC (2014, p. 9); IFRS
KOREA (SOUTH)	Financial Services Commission (FSC) Financial Supervisory Service (FSS)	2007	Combination [2]	B4: 2 years; other: 3-5 years [1]	Non-public [1]	N/A [0]	Direct enforcement [3]	1/1/ 2011	IFIAR; POB's website[95]; Response to survey; IFRS
KUWAIT	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1990	FRC (2014, p.9); IFRS
MALAYSIA	Audit Oversight Board Securities Commission Malaysia	2010	Direct [3]	1 year, and ad-hoc basis [2]	Public [2]	Aggregated annual report 1[	Direct enforcement [3]	1/1/ 2012	IFIAR; POB's annual reports[96]; Response to survey; IFRS
MEXICO	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/2012	Decision 2011/30/EU; IFAC; IFRS
NETHER-LANDS	Autoriteit Financiële Markten (AFM) (Netherlands Authority for financial markets)	2007	Direct [3]	PIE: 3 years; Non-PIE: 6 years [1]	Public [2]	Aggregated report (individual report by Big 4 as of 2014) [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; POB's website[97]; Response to survey; IFRS
NEW ZEALAND	Financial Markets Authority (FMA)	2012	Through oversight [1]	By law: 4 years; Goal: 3 years [1]	Public [2]	Aggregated annual report [1]	Direct enforcement [3]	1/1/ 2007	POB's website[98]; FMA (2013, p.11)[99]; IFRS
NORWAY	Finanstilsynet / Financial Supervisory Authority of Norway (FSA)	1992	Direct [3]	PIE: 3 years; Non-PIE: 6 years [1]	Public [2]	Individual inspection reports [2]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; IFRS
OMAN	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1998	FRC (2014, p.9); IFRS
PAKISTAN	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A	IFAC; Decision 2011/30/EU; IFRS
PERU	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/	IFAC; IFRS

[94] http://www.fsa.go.jp/en/index.html

[95] http://www.fsc.go.kr/eng/

[96] Available at https://www.sc.com.my/general-section/audit-overboard/about-us-2/aob-annual-report/

[97] http://www.afm.nl/en/professionals/doelgroepen/accountantsorganisaties

[98] https://fma.govt.nz/

[99] Refers to Auditor Regulation and Oversight Plan for the Three Years Ending 30 June 2016 published on FMA's website: http://www.fma.govt.nz/assets/Reports/_versions/3334/130601-auditor-regulation-and-oversight-plan-2013-2016.1.pdf.

								2012	
PHILIPPINES [100]	The Board of Accountancy (BOA) under the Philippine Regulation Commission	2004	Through oversight [1]	No info	No info	No info	No info	1/1/ 2005	IFAC; POB's website [101]; IFRS
POLAND	Komisja Nadzoru Audytowego /Audit Oversight Commission (AOC)	2010	Through oversight [1]	PIE: 3 years; Non-PIE: 6 years [1]	Public [2]	Aggregated annual reports [1]	Through oversight [2]	1/1/ 2005	IFIAR; Response to survey; IFRS
ROMANIA [102]	Since 2012: Council for the Public Interest Oversight of the Accountancy Profession (CSIPPC) Prior 2012: CONSILIUL PENTRU SUPRAVEGHEREA PUBLICĂ A ACTIVITĂŢII DE AUDIT STATUTAR (CSPAS)	2008	Through oversight [1]	PIE: 3 years; Non-PIE: 7 years [1]	Non-public [1]	No info	Direct enforcement and through oversight [2]	1/1/ 2005	World Bank; IFRAC; POB's annual reports [103]; IFRS; IAS Plus [104]
RUSSIA [105]	Ministry of Finance of the Russian Federation	2009	Through oversight [1] since 2009 to Direct [3] since 2013	At least every 5 years [1]	No info	No info	Direct enforcement and through oversight [2]	1/1/ 2012	POB's website (MOF) [106]; gaap-ifrs.com; Decision 2011/30/EU; IFRS
SAUDI ARABIA	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A	IFAC; FRC (2014; P. 9) PwC [107]
SINGAPORE	Accounting and Corporate Regulatory Authority (ACRA)	2004	Combination [2]	B4: 2 years; others PIE: 2-3 years; Non-PIE: 4-5 years [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement and through oversight [2]	N/A	IFIAR; Response to survey; IFRS
SOUTH AFRICA	Independent Regulatory Board for Auditors (IRBA)	2006	Direct [3]	3 years [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	1/1/ 2003	IFIAR; POB's website [108]; Response to survey; IFRS

[100] We were unable to contact the POB of the Philippines and can therefore not provide information on some inspection characteristics.
[101] http://boa.com.ph/about-the-boa/republic-act-9298/
[102] We were unable to contact the POB of Romania and can therefore not provide information for some of the inspection characteristics.
[103] See http://csippc.ro/rapoarte-2/ and http://www.cafr.ro/sectiune.php?id=491
[104] IAS Plus jurisdiction profile Romania, available at https://www.iasplus.com/en/jurisdictions/europe/romania
[105] We were unable to contact the POB of Russia and can therefore not provide information for some of the inspection characteristics.
[106] http://old.minfin.ru/en/accandaudit/index.php
[107] PwC publication IFRS adoption by country, available at https://www.pwc.com/us/en/cfodirect/assets/pdf/pwc-ifrs-by-country-2016.pdf
[108] www.paab.co.za

SPAIN	Accounting and Auditing Institute (ICAC)	2006	Through oversight [1] from 2006 to Direct [3] in 2011	3 years; Goal for B4: 1 year [1]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; POB's website[109]; Response to survey; IFRS
SRI LANKA	Sri Lanka Accounting and Auditing Standards Monitoring Board (SLAASMB)	2000	Direct [3]	Annual sampling [1]	Public [2]	Aggregated annual reports [1]	No [1]	1/1/ 2012	IFIAR; POB's website[110]; Response to survey; IFRS
SWEDEN	Revisorsnämnden (RN) / Supervisory Board of Public Accountants	2006[111]	Direct [3]	3 years [1]	Public [2]	Individual inspection reports [2]	Direct enforcement [3]	1/1/ 2005	IFIAR; POB's inspection reports[112]; Response to survey; IFRS
SWITZERLAND	Federal Audit Oversight Authority FAOA	2008	Direct [3]	B3: 1 year; other PIE: 3 years [2]	Public [2]	Aggregated annual reports [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; Armstrong et al. (2010)[113]
TAIWAN	Accounting and Auditing Supervision Division Securities and Futures Bureau (SFB) Financial Supervisory Commission (FSC Taiwan)	2009	Direct [3]	Large audit firms: 3 years; others: 6 years [1]]	Public [2]	Aggregated annual report [1]	Direct enforcement [3]	N/A	IFIAR; POB's website[114]; Response to survey; IFRS
THAILAND	Securities and Exchange Commission Thailand	2010	Direct [3]	B4: 1 year; others: 3 years [2]	Public [2]	Aggregated annual report [1]	Direct enforcement [3]	N/A	IFIAR; Response to survey; IFRS
TURKEY	Capital Markets Board of Turkey (CMB) Public Oversight, Accounting and Auditing Standards Authority (POA)	2007	Direct [3]	Large audit firms: 2 years; others: 3 years [1]	Public [2]	Aggregated annual report [1]	Direct enforcement [3]	1/1/ 2005	IFIAR; POB's website (CMB and POA)[115]; Response to survey; IFRS
UKRAINE	None identified	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	1/1/ 2012	Decision 2011/30/EU; IFRS

[109] http://www.icac.meh.es/Temp/20160408092849.PDF

[110] http://slaasmb.gov.lk/

[111] In sensitivity analyses we code 1995 as start date of inspections since the Swedish RN had been conducting audit firm inspections since then, but not in the sense of independent inspections as defined in this paper.

[112] Available at http://www.revisorsnamnden.se/rn/tillsyn/kvalitetskontrollrapporter.html

[113] Armstrong, C. S., M. E. Barth, A. D. Jagolinzer & E. J. Riedl. (2010). Market reaction to the adoption of IFRS in Europe. *The Accounting Review* 85 (1), 31-61.

[114] http://www.sfb.gov.tw/en/home.jsp?id=97&parentpath=0,6

[115] See http://www.kgk.gov.tr/eng/contents/files/Pdf/Public_Oversight_Authority.pdf

UNITED KINGDOM	Financial Reporting Council (FRC)	2004	Combination [2]	B6: 1 year; others: 3 years [2]	Public [2]	Individual inspection reports for annually inspected; aggregated report for others [2]	Direct enforcement [3]	1/1/ 2005	IFIAR; Response to survey; IFRS
UNITED STATES	Public Company Accounting Oversight Board (PCAOB)	2003	Direct [3]	>100 SEC registrants: 1 year; <=100 SEC registrants [2]	Public [2]	Individual inspection reports (restricted to inspection findings; not quality control findings) [2]	Direct enforcement [3]	N/A	IFIAR; Response to survey; IFRS
VIETNAM	None identified[116]	N/A	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A [0]	N/A	IFAC; FRC (2014, p.9); IFRS

[116] Prior to 2007, quality assurance and quality control were the responsibility of the State, specifically the Ministry of Finance, which would organize the checking and inspection processes and directly control accounting and auditing operations. In 2007, the Accounting Practice Management Unit was established directly under the Central Office of Vietnam Association of Accountants and Auditors (VAA) and was made responsible for inspections of audit firms (https://www.ifac.org/system/files/compliance-assessment/part_3/201211VietnamVAA.pdf). In our main analyses we code Vietnam as not having an independent POB throughout the sample period. In sensitivity analyses we address that the Vietnam MOF conduced inspections prior to 2007 and thus code *Inspection* = 1 for 2003-2007.

Table 3 presents, for our full sample, the descriptive statistics of the dependent and control variables, the variables of interest, the distribution across industries and years, and the dependent variables and inspection percentage by country. Table 3, Panel A, shows that the mean (median) absolute value of abnormal total accruals is 0.059 (0.039). For the absolute value of abnormal working capital accruals, the mean (median) absolute value is 0.066 (0.036). The mean (median) absolute value of discretionary revenues is 0.037 (0.023) and the mean (median) value of total accruals scaled by lagged total assets is -0.046 (-0.036). These values are close to those reported in prior literature (Chen et al. [2011]; Ahmed et al. [2013]; Francis et al. [2013]).

Table 3, Panel B shows, for observations in countries that commence inspections between 2004 and 2011, descriptive statistics for client-year observations subject to inspections (*Inspection*=1) and not subject to inspections (*Inspection*=0) and a t-test of the mean difference. As expected, the mean of all dependent variables is significantly lower for those observations subject to inspections, compared to those not subject to inspections. We also find significant differences for most control variables, showing that client-year observations subject to inspections are larger in size (total assets), have higher market to book value, but lower cash flow performance and score higher on rule of law, compared to client-year observations not subject to inspections.

Table 3, Panel C, shows that the majority of the observations (58.04%) relate to the manufacturing industry (SIC 2-3), followed by 15.83% in the services industry (SIC 7-8), and 12.01% in the mining industry (SIC 1). It also shows that there has been an increase in the number of observations per year (except for 2012) with the sample composition ranging from 6.67% in 2003 to 12.50% in 2011.

Table 3, Panel D, outlines the number of observations, dependent variables and inspection percentage per country for each of the 50 countries included in the full sample (in total, 157,370 client-year observations). The most highly represented countries in the sample in terms of number of observations are Japan (24,241 15.40% of sample) and the U.S. (24,759 15.73% of sample). All other countries individually represent less than 10% of the total sample.[117] Besides the number of observations and percentage of observations per country, Table 3, Panel D, shows the mean dependent variables for the models in equations [1] and [2] for each country. This gives a better understanding of the size of the average dependent

[117] In sensitivity analyses we address the unequal number of observations across countries by running our analyses excluding the two largest countries in terms of observations, U.S. and Japan.

variables per country and allows for comparisons of the average dependent variables with averages in single-country studies.

TABLE 3

Descriptive Statistics

Panel A: Descriptive statistics for dependent and control variables for the total sample in the period 2003-2012 (n=157,370)[118]

Continuous variables

Variables	N	Mean	Median	Std. Dev.	Min	25th percentile	75th percentile	Max
|ATA|	157,370	0.059	0.039	0.062	0.000	0.016	0.079	0.304
|TA|	157,370	0.075	0.052	0.080	0.000	0.024	0.097	0.533
|AWCA|	157,370	0.066	0.036	0.096	0.000	0.015	0.076	0.707
|DR|	157,370	0.037	0.023	0.041	0.000	0.009	0.050	0.211
|ΔAR|	157,370	0.048	0.027	0.065	0.000	0.010	0.060	0.756
TA	157,370	-0.046	-0.036	0.144	-1.093	-0.084	0.010	0.445
Size	157,370	11.981	11.939	1.922	7.177	10.732	13.209	16.669
CFO	157,370	0.045	0.060	0.155	-0.734	0.001	0.120	0.390
Growth	157,370	0.150	0.073	0.468	-0.680	-0.037	0.219	3.196
MB	157,370	2.017	1.310	2.742	-5.420	0.720	2.410	17.650
PPE Growth	157,370	0.126	0.051	0.340	-0.620	0.002	0.160	2.140
Leverage	157,370	0.118	0.054	0.158	0.000	0.000	0.179	0.798
Sales Vol	157,370	0.123	0.079	0.136	0.003	0.039	0.153	0.810
CFO Vol	157,370	0.057	0.036	0.070	0.003	0.020	0.066	0.484
Lagged TA	157,370	-0.046	-0.035	0.152	-0.874	-0.084	0.011	0.415
Sales	157,370	11.680	11.794	2.296	4.382	10.454	13.141	16.642
GDP annual growth	157,370	3.869	3.068	4.073	-14.800	1.607	6.465	15.240
Rule of Law	157,370	0.984	1.312	0.797	-0.970	0.456	1.616	2.014

Indicator variables (main analyses)

Variables	N	Mean
SmallProfit1	157,370	0.074
SmallProfit2	157,370	0.150
Inspection	157,370	0.717
IFRS	157,370	0.265
Big4	157,370	0.574
Loss	157,370	0.258
NegCFO	157,370	0.246

Inspection characteristics (% of inspection commencement sample where Inspection=1)

Variables	N[119]	0	1	2	3
InspDisc	67,131	10.77%	89.23%		
InspDiscType	67,131	10.77%	78.18%	11.05%	
Enforcement	67,131	33.31%	8.57%	58.11%	
InspFreq	67,131	67.42%	32.58%		
TypeOversight	67,131		37.68%	22.29%	40.03%

[118] Table 3 reports *Size* and *Sales* as natural logarithms of total assets and net sales or revenues, respectively. To give a better picture of the size and sales of the companies in our sample we report values for total assets and net sales in USD below:

Variables (USD)	**N**	**Mean**	**Median**	**Std. Dev.**
Total Assets	157,370	1,062,307	153,181	3,964,624
Net Sales or Revenues	157,370	1,029,193	132,410	4,107,797

[119] Inspection characteristics are reported for all country-year observations with an inspection regime in place for the inspection commencement sample, and excluding all country-year observations from the Philippines, Romania and Russia for which we were unable to confirm the inspection characteristic variables.

TABLE 3

Descriptive Statistics (continued)

Panel B: Descriptive statistics for client-year observations for which Inspections have been commenced (Inspection=1) and have not been commenced (Inspection=0) and t-test for the mean difference for the sample of countries that commence inspections between 2004-2011.

	Inspection=1 (N=68503)			*Inspection=0 (N=21861)*			*T-test of mean difference*	
Variables	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	T-statistic	p-value
|ATA|	0.053	0.035	0.056	0.056	0.039	0.056	7.438	0.000
|TA|	0.067	0.048	0.070	0.072	0.054	0.068	9.359	0.000
|AWCA|	0.057	0.032	0.085	0.061	0.037	0.078	4.719	0.000
|DR|	0.034	0.021	0.038	0.037	0.024	0.040	9.828	0.000
|ΔAR|	0.043	0.024	0.057	0.049	0.028	0.062	12.533	0.000
TA	-0.046	-0.037	0.120	-0.032	-0.034	0.103	14.901	0.000
Size	12.002	11.940	1.878	11.757	11.609	1.638	-17.262	0.000
CFO	0.042	0.056	0.144	0.067	0.067	0.115	22.769	0.000
Growth	0.129	0.047	0.493	0.123	0.070	0.370	-1.645	0.100
MB	1.714	1.120	2.257	1.576	1.100	1.811	-8.279	0.000
PPE Growth	0.111	0.035	0.348	0.107	0.044	0.302	-1.568	0.117
Leverage	0.099	0.045	0.133	0.100	0.053	0.126	0.292	0.770
Sales Vol	0.114	0.073	0.128	0.122	0.080	0.130	7.658	0.000
CFO Vol	0.052	0.034	0.063	0.049	0.036	0.050	-5.052	0.000
Lagged TA	-0.047	-0.036	0.135	-0.031	-0.031	0.118	16.384	0.000
Sales	11.671	11.882	2.433	11.580	11.521	1.910	-5.053	0.000
GDP ann. growth	2.489	2.205	3.684	5.698	4.900	4.248	107.906	0.000
Rule of Law	1.267	1.326	0.537	0.877	0.871	0.597	-91.033	0.000
SmallProfit1	0.082	0	0.274	0.080	0	0.271	-0.710	0.478
SmallProfit2	0.170	0	0.376	0.155	0	0.362	-5.076	0.000
Inspection	0.394	0	0.489	0.142	0	0.349	-70.551	0.000
IFRS	0.663	1	0.473	0.673	1	0.469	2.654	0.008
Big4	0.275	0	0.447	0.214	0	0.410	-18.157	0.000
Loss	0.241	0	0.428	0.199	0	0.399	-12.823	0.000

Panel C: Descriptive statistics for industry and year composition for the total sample in the period 2003-2012 (n=157,370)

1-digit SIC code	N	Percent
0	1,761	1.12
1	18,893	12.01
2	35,449	22.53
3	55,881	35.51
4	2,261	1.44
5	18,216	11.58
7	18,286	11.62
8	6,623	4.21
Total	157,379	100

Year	N	Percent
2003	10,494	6.67
2004	11,545	7.34
2005	12,476	7.93
2006	13,417	8.53
2007	15,815	10.05
2008	17,430	11.08
2009	18,022	11.45
2010	19,029	12.09
2011	19,672	12.50
2012	19,470	12.37
Total	157,370	100

TABLE 3

Descriptive Statistics (continued)

Panel D: Descriptive statistics for country composition, mean dependent variables and inspection percentage by country for the total sample in the period 2003-2012 (n=157,370)

Country	N	%N	|ATA|	|TA|	|AWCA|	|DR|	Small Profit	TA	Inspection
ARGENTINA	199	0.13	0.037	0.078	0.056	0.026	0.040	-0.016	0.000
AUSTRALIA	7,262	4.61	0.076	0.087	0.096	0.036	0.019	-0.099	0.876
AUSTRIA	280	0.18	0.027	0.062	0.038	0.017	0.061	-0.042	0.779
BELGIUM	457	0.29	0.039	0.075	0.047	0.025	0.053	-0.045	0.696
BRAZIL	861	0.55	0.050	0.075	0.064	0.031	0.059	-0.032	1.000
BULGARIA	499	0.32	0.062	0.085	0.106	0.042	0.138	-0.011	0.790
CANADA	5,055	3.21	0.075	0.101	0.085	0.038	0.028	-0.111	0.955
CHILE	743	0.47	0.042	0.065	0.052	0.026	0.051	-0.022	0.000
CHINA	11,828	7.52	0.070	0.079	0.073	0.041	0.134	-0.011	1.000
DENMARK	670	0.43	0.047	0.078	0.054	0.029	0.064	-0.056	1.000
EGYPT	486	0.31	0.050	0.071	0.071	0.030	0.047	-0.018	0.673
FINLAND	797	0.51	0.041	0.071	0.047	0.028	0.049	-0.045	0.442
FRANCE	3,053	1.94	0.047	0.064	0.042	0.038	0.066	-0.039	1.000
GERMANY	3,177	2.02	0.060	0.080	0.060	0.038	0.063	-0.045	0.633
GREECE	917	0.58	0.042	0.067	0.057	0.032	0.128	-0.037	0.613
HONG KONG	5,741	3.65	0.080	0.092	0.087	0.054	0.048	-0.027	0.000
INDIA	8,798	5.59	0.074	0.084	0.078	0.056	0.076	0.008	0.000
INDONESIA	1,840	1.17	0.062	0.080	0.069	0.036	0.113	-0.019	1.000
ISRAEL	1,347	0.86	0.054	0.068	0.060	0.034	0.064	-0.027	0.000
ITALY	1,037	0.66	0.032	0.059	0.040	0.027	0.101	-0.043	0.690
JAPAN	24,241	15.40	0.034	0.046	0.033	0.025	0.141	-0.037	0.914
JORDAN	414	0.26	0.045	0.073	0.074	0.028	0.070	-0.019	0.000
KOREA (SOUTH)	8,462	5.38	0.061	0.068	0.059	0.042	0.078	-0.025	0.762
KUWAIT	362	0.23	0.040	0.074	0.062	0.029	0.055	-0.031	0.000
MALAYSIA	4,819	3.06	0.057	0.067	0.068	0.039	0.083	-0.023	0.347
MEXICO	592	0.38	0.037	0.062	0.042	0.023	0.059	-0.023	0.000
NETHERLANDS	655	0.42	0.039	0.069	0.046	0.032	0.058	-0.053	0.608
NEW ZEALAND	410	0.26	0.032	0.074	0.061	0.019	0.039	-0.046	0.127
NORWAY	693	0.44	0.055	0.084	0.062	0.038	0.043	-0.057	1.000
OMAN	302	0.19	0.044	0.076	0.062	0.027	0.020	-0.005	0.000
PAKISTAN	1,083	0.69	0.064	0.081	0.079	0.032	0.063	-0.009	0.000
PERU	469	0.30	0.051	0.086	0.067	0.029	0.051	-0.021	0.000
PHILIPPINES	675	0.43	0.064	0.084	0.079	0.035	0.090	-0.019	0.914
POLAND	1,345	0.85	0.071	0.092	0.076	0.054	0.068	-0.008	0.517
ROMANIA	326	0.21	0.061	0.082	0.091	0.040	0.193	-0.023	0.801
RUSSIA	798	0.51	0.070	0.088	0.081	0.059	0.091	-0.001	0.619
SAUDI ARABIA	450	0.29	0.032	0.060	0.051	0.015	0.031	-0.014	0.000
SINGAPORE	3,279	2.08	0.071	0.085	0.076	0.049	0.064	-0.017	0.929
SOUTH AFRICA	1,327	0.84	0.053	0.074	0.054	0.036	0.021	-0.029	0.787
SPAIN	452	0.29	0.037	0.065	0.047	0.026	0.088	-0.040	0.998
SRI LANKA	651	0.41	0.044	0.063	0.058	0.028	0.055	-0.007	1.000
SWEDEN	1,946	1.24	0.057	0.076	0.062	0.039	0.031	-0.043	1.000
SWITZERLAND	1,086	0.69	0.033	0.057	0.040	0.022	0.037	-0.046	0.538
TAIWAN	11,144	7.08	0.058	0.070	0.060	0.038	0.075	-0.027	0.459
THAILAND	2,760	1.75	0.059	0.077	0.061	0.035	0.045	-0.024	0.341
TURKEY	1,189	0.76	0.061	0.082	0.076	0.043	0.061	-0.014	0.907

UKRAINE	105	0.07	0.097	0.154	0.140	0.071	0.086	-0.001	0.000
UK	5,893	3.74	0.058	0.074	0.058	0.037	0.043	-0.055	0.928
US	24,759	15.73	0.067	0.092	0.082	0.035	0.031	-0.115	1.000
VIETNAM	1,636	1.04	0.090	0.109	0.102	0.061	0.087	0.025	0.000
Total	157,370	100	0.059	0.075	0.066	0.037	0.074	-0.046	0.717

3.4.2 MULTIVARIATE ANALYSIS

3.4.2.1 Effect of inspections on audit quality

Table 4, Panel A, presents for the full sample of countries, the results for the test of Hypothesis 1 on the association between inspections and audit quality, measured by the absolute value of abnormal and total accruals (Columns (1) and (2)), and the absolute value of abnormal working capital accruals (Column (3)). The results of audit quality measured as the absolute value of discretionary revenues are reported in Column (4), and the results of the absolute value of change in accounts receivable as the dependent variable are reported in Column (5). Columns (6) and (7) report the results of the small profit or loss analysis, where small profit is defined as ROA between 0 and 1% and ROA between 0 and 2%, respectively. All models are significant at $p<0.01$ with R^2 between 18.2% and 34.7%. Using OLS regression[120], the results show a significant negative coefficient for *Inspection* for all but the small profit analyses (Columns (6) and (7)). This implies that companies domiciled in country-years with an inspection regime have significantly lower levels of abnormal total accruals ($p<0.01$), total accruals ($p<0.01$) and working capital accruals ($p<0.01$), than companies in country-years not subject to inspections. In terms of economic significance, the commencement of inspections decreases the absolute value of abnormal total accruals by 4.7% on average, the absolute value of total accruals by 4.5% on average, and the absolute value of working capital accruals by 4.9% on average, when scaling the coefficient by the mean value of the respective accruals for the full sample, holding all other values constant.

We confirm these results with the revenue management analyses in Columns (4) and (5). *Inspection* is associated with significantly less absolute discretionary revenues ($p<0.01$) (Column (4)), and significantly less absolute change in accounts receivables ($p<0.01$) (Column (5)). This implies that there is a decrease in revenue management for clients of audit firms domiciled in countries and years that are subject to inspections, compared to clients of audit firms domiciled in countries and years that are not subject to inspections.

[120] Using tobit models, for the models that are censored at 0 (due to the use of absolute values), does not change the inferences of the results of our analyses.

We fail to find evidence of a decrease in the likelihood of small profit occurrence (Columns (6) and (7)), with an insignificant coefficient of *Inspection* for both small profit defined as ROA between 0 and 1% and when defined as ROA between 0 and 2%.

Table 4, Panel B, we present the results for the subsample of countries for which we observe a change in the treatment, i.e. which commence inspections between 2004 and 2011 (N=90,364). The results reflect the inferences from the full sample, and additionally the coefficient for small profit 0-1% (Column (6)) becomes significant in the predicted direction. Collectively, this provides evidence that audit quality increases in those countries that commence inspections, with inspected audit firms appearing to act as a stronger constraint on accrual and revenue management when being subject to inspections by POBs. There is, however, a lack of evidence that inspected audit firms act as a significant constraint for earnings management around the zero earnings threshold. Most control variables are significant with signs in the expected direction.

Table 4
Effect of Inspections

Panel A: Accrual Management, Revenue Management and Earnings Management around the zero earnings threshold for the full sample (N=157,370)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	|ATA|	|TA|	|AWCA|	|DR|	|ΔAR|	Small Profit 0-1%	Small Profit 0-2%
Inspection	-0.0028***	-0.0030***	-0.0032***	-0.0010**	-0.0030***	-0.0310	-0.0047
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.023)	(0.020)
Big4	-0.0026***	-0.0023***	-0.0040***	-0.0013***	-0.0018***	-0.1535***	-0.1762***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.018)	(0.016)
IFRS	0.0029***	0.0007	0.0024**	0.0019***	0.0023***	-0.0107	-0.0037
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.028)	(0.023)
Size	-0.0033***	-0.0023***	-0.0055***	-0.0022***	-0.0021***	-0.0478***	-0.0339***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.005)
CFO	-0.0244***	0.0255***	-0.0479***	-0.0069***	-0.0465***	-2.7510***	-3.1389***
	(0.002)	(0.004)	(0.003)	(0.001)	(0.002)	(0.071)	(0.066)
Growth	0.0071***	0.0037***	0.0623***	0.0060***	-0.0026***	-0.3988***	-0.3952***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.032)	(0.025)
Loss	-0.0006	0.0100***	0.0105***	-0.0018***	-0.0030***	-2.5707***	-2.9549***
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.090)	(0.080)
MB	0.0006***	0.0002	-0.0017***	0.0002***	0.0005***	-0.0584***	-0.0739***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.004)
PPE Growth	0.0108***	0.0133***	-0.0213***	0.0060***	0.0142***	-0.3723***	-0.4248***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.028)	(0.023)
Leverage	0.0152***	0.0200***	-0.0014	-0.0001	0.0021	0.7963***	0.8656***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.047)	(0.044)
SalesVol	0.0461***	0.0583***	0.0828***	0.0594***	0.0659***	-0.2822***	-0.3462***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.062)	(0.053)
CFOVol	0.1819***	0.2323***	0.3753***	0.0513***	0.0367***	-1.6975***	-1.7184***
	(0.004)	(0.007)	(0.009)	(0.003)	(0.004)	(0.179)	(0.153)
Lagged TA	-0.0023	-0.0094***	-0.0269***	0.0160***	0.0249***	-0.3873***	-0.3856***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.056)	(0.049)
GDP annual growth	0.0001	-0.0002	0.0001	-0.0000	-0.0003***	-0.0055*	-0.0071***

	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)
Constant	0.0468***	0.0794***	0.0743***	0.0307***	0.0562***	-0.3145	0.3165
	(0.006)	(0.012)	(0.006)	(0.004)	(0.008)	(0.216)	(0.194)
Observations	157,370	157,370	157,370	157,370	157,370	157,347[121]	157,347
[Pseudo] R-squared	0.205	0.249	0.347	0.182	0.254	0.185	0.235
Industry/Year/Country FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

[121] 23 observations are dropped from the estimation because their industry indicators determine failure perfectly in the probit models for Small Profit 0-1% and Small Profit 0-2%.

Table 4

Effect of Inspections (continued)

Panel B: Accrual Management, Revenue Management and Earnings Management around the zero earnings threshold for the sample of countries that install inspections between 2004-2011 (N=90,364)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	|ATA|	|TA|	|AWCA|	|DR|	|ΔAR|	Small Profit 0-1%	Small Profit 0-2%
Inspection	-0.0035***	-0.0035***	-0.0042***	-0.0016***	-0.0042***	-0.0636**	-0.0289
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.029)	(0.025)
Big4	-0.0008	-0.0004	-0.0033***	-0.0004	-0.0005	-0.1380***	-0.1770***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.022)	(0.020)
IFRS	0.0030***	0.0007	0.0011	0.0023***	0.0029***	0.0241	0.0156
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.034)	(0.029)
Size	-0.0025***	-0.0016***	-0.0038***	-0.0021***	-0.0022***	-0.0370***	-0.0196***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.006)
CFO	-0.0156***	0.0737***	-0.0319***	-0.0074***	-0.0368***	-3.4361***	-3.8481***
	(0.003)	(0.005)	(0.004)	(0.002)	(0.003)	(0.111)	(0.102)
Growth	0.0069***	0.0047***	0.0606***	0.0053***	-0.0022***	-0.4633***	-0.4621***
	(0.001)	(0.001)	(0.002)	(0.000)	(0.001)	(0.048)	(0.038)
Loss	-0.0000	0.0105***	0.0098***	-0.0016***	-0.0012**	-2.8404***	-3.2151***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.143)	(0.124)
MB	0.0005***	0.0002	-0.0007***	0.0001	0.0001	-0.1176***	-0.1526***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.011)	(0.010)
PPE Growth	0.0101***	0.0127***	-0.0186***	0.0054***	0.0113***	-0.2698***	-0.3379***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.037)	(0.032)
Leverage	0.0150***	0.0179***	-0.0030	0.0016	0.0038*	1.0492***	1.1292***
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.071)	(0.068)
SalesVol	0.0418***	0.0482***	0.0718***	0.0550***	0.0668***	-0.2175**	-0.2375***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.087)	(0.075)
CFOVol	0.1761***	0.2321***	0.3399***	0.0588***	0.0523***	-1.5036***	-1.4619***
	(0.006)	(0.009)	(0.011)	(0.004)	(0.005)	(0.255)	(0.227)
Lagged TA	-0.0013	-0.0107***	-0.0052	0.0153***	0.0157***	-0.3122***	-0.3573***
	(0.002)	(0.003)	(0.004)	(0.001)	(0.002)	(0.084)	(0.074)

GDP annual growth	-0.0000	-0.0001	-0.0000	-0.0000	-0.0001	-0.0112**	-0.0120***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)
Constant	0.0609***	0.0680***	0.0633***	0.0325***	0.0328***	-0.4339***	0.0350
	(0.003)	(0.012)	(0.004)	(0.002)	(0.004)	(0.126)	(0.110)
Observations	90,364	90,364	90,364	90,364	90,364	90,349	90,349
[Pseudo] R-squared	0.186	0.231	0.307	0.172	0.265	0.204	0.265
Industry FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		
Standard Errors	Cluster CLIENT	Cluster CLIENT	Cluster CLIENT	Cluster CLIENT	Cluster CLIENT	Cluster CLIENT	Cluster CLIENT

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

Table 4, Panel C, shows the results of the association between inspections and timely loss recognition, our final measure of audit quality. We use OLS regression to analyze the timely loss recognition model. The baseline and main models are significant ($p<0.01$) with R^2 of 17.7% and 32.3%, respectively. Column (1) shows the results for the baseline model with only *NegCFO* and *CFO*, and fixed effects, as predictors of total accruals. The significantly positive coefficient of the interaction term between *NegCFO* and *CFO* ($p<0.01$) in Column (1) provides evidence of timely loss recognition in this large international sample, which is also reported in prior literature (see Francis et al. [2013]). Column (2) presents the results for the full sample where the interaction between *NegCFO* and *CFO* is significant ($p<0.01$), providing evidence of timely loss recognition. The coefficient of the interaction term between *NegCFO*, *CFO* and *Inspection* is highly significant ($p<0.01$) and positive. This indicates that negative cash flows are recognized faster in total accruals for clients whose audit firms are subject to inspections, compared to clients whose audit firms are not subject to inspections. Column (3) shows the results for the subsample of countries that commence inspections between 2004 and 2011. While the interaction term between *NegCFO* and *CFO* is significantly negative, indicating absence of timely loss recognition in the sample, the interaction term of *NegCFO*, *CFO* and *Inspection* is significantly positive, indicating that clients of audit firms domiciled in countries that commence inspections have significantly more timely loss recognition after commencement than clients in countries that have not (yet) commenced inspections. In terms of control variables, the positive and significant interaction term between *NegCFO*, *CFO* and *Rule of Law* confirms results from prior literature (e.g. Francis et al. [2013]) that timely loss recognition is higher in countries with higher rule of law. Contrary to expectations, we find that clients of Big 4 audit firms have significantly less timely loss recognition (interaction term *NegCFO*CFO*Big4;* $p<0.01$) compared to clients of non-Big 4 audit firms in the full sample. We do not find a difference in timely loss recognition for clients of Big 4 versus non-Big 4 audit firms for the sample of countries that commence inspections between 2004 and 2011 (Column (3)).

Overall, the results in Table 4 confirm our expectation that inspections increase audit quality when measured as timely loss recognition for clients of audit firms that are subject to inspection, compared to clients of audit firms not subject to inspection.

Table 4
Effect of Inspections (continued)

Panel C: Timely Loss Recognition for the full sample and the inspection commencement sample			
	(1)	(2)	(3)
	Full Sample	*Full Sample*	*Inspection Commencement Sample*
VARIABLES	TA (baseline)	TA	TA
NegCFO	0.0380***	-0.0847***	-0.0747***
	(0.002)	(0.009)	(0.011)
CFO	-0.4002***	-0.6177***	-0.2866***
	(0.007)	(0.053)	(0.054)
*NegCFO*CFO*	0.7158***	0.6473***	-0.2198**
	(0.017)	(0.087)	(0.106)
Inspection		0.0040**	0.0028
		(0.002)	(0.002)
*NegCFO*Inspection*		0.0068**	0.0063*
		(0.003)	(0.004)
*CFO*Inspection*		-0.0131	0.0001
		(0.012)	(0.013)
*NegCFO*CFO*Inspection*		0.3568***	0.2085***
		(0.032)	(0.046)
Big4		0.0003	0.0021
		(0.001)	(0.002)
*NegCFO*Big4*		-0.0068**	0.0010
		(0.003)	(0.004)
*CFO*Big4*		0.0316**	0.0222
		(0.014)	(0.017)
*NegCFO*CFO*Big4*		-0.2351***	-0.0472
		(0.029)	(0.038)
Constant	-0.0195*	-0.0471***	-0.1406***
	(0.011)	(0.013)	(0.011)
Observations	157,370	157,370	90,364
Control Variables and their interactions with NegCFO and CFO	YES	YES	YES
R-squared	0.177	0.323	0.259
Industry/Year/Country FE	YES	YES	YES

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

3.4.2.2 Impact of Inspections on Audit Quality of Big 4 vs Non-Big 4 Audit Firms

Table 5, Panel A, shows analyses that examine whether inspections have a differential effect on clients audited by the Big 4 audit firms compared to those audited by non-Big 4 audit firms for the accrual, discretionary revenue and small profit analyses for the full sample. The models are all significant (p<0.01) with R^2 ranging between 18.2% and 35.3%. The main effects for the variables *Big4* and *Inspection* are significant and negative as expected for all

accrual measures (Columns (1)-(3)) and the absolute change in accounts receivable model (Column (5)). The coefficient for *Inspection* is insignificant for the discretionary revenue model (Column (4)), while the coefficient for *Big4* remains significant. This indicates that accrual management and revenue management are lower for clients of Big 4 audit firms, which is consistent with prior literature (e.g. Becker et al. [1998]). [122] Further, accrual and revenue management (except for discretionary revenue) is lower for clients of audit firms domiciled in country-years that are subject to inspections compared to clients of audit firms domiciled in country-years that are not subject to inspections. The coefficient of the interaction term between *Inspection* and *Big4* is highly significant ($p<0.01$) and negative for all accrual management measures (Column (1) – (3)) and revenue management measures (Column (4) – (5)), indicating that the effect of inspections on accrual and revenue management is incrementally more pronounced for clients of Big 4 audit firms than for clients of non-Big 4 audit firms. We do not find evidence of an effect of inspection commencement or differential effect of inspection commencement for clients of Big 4 vs non-Big 4 audit firms on earnings management around the zero earnings threshold. Most control variables (unreported) are significant with signs in the expected direction.

We confirm the inferences from the full sample for the sample of countries that install inspections between 2004 and 2011. In addition, we find significant negative coefficients for *Inspection* and the interaction effect of *Inspection* with *Big4* for the small profit analysis where small profit is defined as ROA between 0 and 1%. Thus, there is some evidence of an effect of inspections on earnings management around the zero earnings threshold for this subsample.

[122] We acknowledge that there is discussion in the literature on the sensitivity of the Big 4 effect to research design choices (Lawrence et al. [2011]; DeFond et al. [2016]; Lawrence et al. [2016]).

Table 5

Effect of Inspections and Big 4

Panel A: Accrual Management, Revenue Management and Earnings Management around the zero earnings threshold for the full sample (N=157,370)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	|ATA|	|TA|	|AWCA|	|DR|	|ΔAR|	Small Profit 0-1%	Small Profit 0-2%
Inspection	-0.0021**	-0.0034***	-0.0029**	-0.0008	-0.0039***	-0.0090	-0.0029
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.030)	(0.027)
Big4	-0.0216***	-0.0182***	-0.0660***	-0.0086***	-0.0098***	-0.1882	-0.3151***
	(0.003)	(0.004)	(0.005)	(0.002)	(0.003)	(0.131)	(0.117)
*Inspection*Big4*	-0.0030***	-0.0025***	-0.0037***	-0.0010**	-0.0025***	-0.0386	-0.0010
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.026)	(0.023)
	(0.003)	(0.005)	(0.006)	(0.002)	(0.003)	(0.117)	(0.101)
Constant	0.0565***	0.0870***	0.1135***	0.0341***	0.0598***	-0.2913	0.4108*
	(0.006)	(0.013)	(0.007)	(0.005)	(0.008)	(0.231)	(0.211)
Observations	157,370	157,370	157,370	157,370	157,370	157,347	157,347
Control Variables and their interaction with Big4	YES	YES	YES	YES	YES	YES	YES
[Pseudo] R-squared	0.206	0.253	0.353	0.182	0.255	0.190	0.240
Industry/Year/Country FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

Table 5

Effect of Inspections and Big 4 (continued)

Panel B: Accrual Management, Revenue Management and Earnings Management around the zero earnings threshold for the sample of countries that install inspections between 2004-2011 (N=90,364)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	**|ATA|**	**|TA|**	**|AWCA|**	**|DR|**	**|ΔAR|**	**Small Profit 0-1%**	**Small Profit 0-2%**
Inspection	-0.0028***	-0.0031**	-0.0032**	-0.0007	-0.0031***	-0.0663*	-0.0484
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.037)	(0.033)
Big4	-0.0186***	-0.0091	-0.0449***	-0.0070**	-0.0022	-0.0788	-0.2024
	(0.005)	(0.006)	(0.007)	(0.003)	(0.004)	(0.188)	(0.170)
*Inspection*Big4*	-0.0038***	-0.0035***	-0.0045***	-0.0020***	-0.0048***	-0.0588*	-0.0136
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.033)	(0.028)
Constant	0.0715***	0.0714***	0.0928***	0.0357***	0.0329***	-0.4241**	0.1201
	(0.004)	(0.013)	(0.007)	(0.003)	(0.005)	(0.183)	(0.162)
Observations	90,364	90,364	90,364	90,364	90,364	90,349	90,349
Control Variables and their interaction with Big4	YES	YES	YES	YES	YES	YES	YES
[Pseudo] R-squared	0.188	0.235	0.309	0.173	0.266	0.141	0.191
Industry/Year/Country FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

Table 5, Panel C, shows the results for the association between the interaction term of *Big4* and *Inspection* in the timely loss recognition model. The interaction term *NegCFO*CFO* is positive and significant, indicating timely loss recognition in the full sample (Column (1)), like in Table 4, Panel C, while it is negative and significant in the subsample of countries that introduce inspections between 2004-2011 (Column (2)). We do not find evidence of more timely loss recognition for *Big4* audit firms (insignificant coefficient for *NegCFO*CFO*Big4*) for either sample, but find evidence consistent with more timely loss recognition for clients of audit firms subject to inspections, compared to those not subject to inspections (significant positive coefficient for *NegCFO*CFO*Inspection)* in both samples, like in Table 4, Panel C. The coefficient of the four-way interaction term between *NegCFO*, *CFO*, *Inspection* and *Big4* which tests for a differential effect of inspections on timely loss recognition for Big 4 versus non-Big 4 firms is negative and significant ($p<0.1$) in the full sample (Column (1)), indicating that there is a differential impact of inspections on Big 4 versus non-Big 4 firms, but not in the expected direction. That is, in the full sample we find that timely loss recognition is lower for clients of Big 4 firms subject to inspections, than for clients of non-Big 4 firms subject to inspections. However, this coefficient is insignificant in the sample of countries that commence inspections between 2004 and 2011.

Overall, the results of the accrual and revenue management and small profit analysis provide support for the fact that inspections have a greater impact on clients of Big 4 firms, while the timely loss recognition results do not.

Table 5
Effect of Inspections and Big 4 (continued)

Panel C: Timely Loss Recognition for the full sample and the inspection commencement sample		
	(1)	(2)
	Full Sample	*Inspection Commencement Sample*
VARIABLES	TA	TA
NegCFO	-0.0737***	-0.0637***
	(0.014)	(0.018)
CFO	-0.7008***	-0.2458*
	(0.102)	-0.0637***
*NegCFO*CFO*	0.6749***	-0.4404**
	(0.138)	(0.180)
Inspection	0.0054**	0.0017
	(0.003)	(0.003)
*NegCFO*Inspection*	0.0143***	-0.4404**
	(0.004)	(0.180)
*CFO*Inspection*	-0.0201	0.0028
	(0.024)	(0.027)
*NegCFO*CFO*Inspection*	0.4481***	0.1954***
	(0.043)	(0.070)
Big4	0.0621***	0.0706***
	(0.011)	(0.014)
*NegCFO*Big4*	-0.0126	-0.0058
	(0.019)	(0.023)
*CFO*Big4*	0.0994	-0.0665
	(0.117)	(0.143)
*NegCFO*CFO*Big4*	-0.2338	0.3500
	(0.180)	(0.232)
*Inspection*Big4*	-0.0023	0.0010
	(0.003)	(0.003)
*NegCFO*Inspection*Big4*	-0.0209***	-0.0012
	(0.006)	(0.007)
*CFO*Inspection*Big4*	0.0132	-0.0036
	(0.028)	(0.030)
*NegCFO*CFO*Inspection*Big4*	-0.2567***	0.0331
	(0.065)	(0.091)
Constant	-0.0749***	-0.1875***
	(0.009)	(0.015)
Observations	159,150	90,364
Control Variables and their interactions with NegCFO and CFO	YES	YES
R-squared	0.280	0.263
Industry/Year/Country FE	YES	YES
Standard Errors	Cluster CLIENT	Cluster CLIENT

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

3.4.2.3 Pre- and Post-treatment effects

A major assumption of the difference-in-differences model is the parallel trends assumption which we test by including a contemporaneous inspection dummy (variable *InspTreatDum* coded as 1 in the year in which inspections commence) and its leads (following convention, we call the years after the inspection commencement year leads (Autor [2003]) and lags (the years before the inspection commencement year), instead of our *Inspection* variable as defined previously (Autor [2003]; Atanasov & Black [2016]). In Panel A of Table 6, we present the results when regressing the contemporaneous inspection dummy and its leads and lags on our proxies of audit quality, following Autor [2003]. We find that, except for the regressions on audit quality measures $|ATA|$ and $|\Delta AR|$, there are not significant anticipatory effects of inspections (the lag variables are insignificant), which provides some confidence that the parallel trends assumption holds. For the regressions on $|ATA|$ and $|\Delta AR|$, we find a significant coefficient for the year prior to inspection commencement (*InspTreatLag1*). We further find a contemporaneous effect of inspection commencement only for $|ATA|$ and $|\Delta AR|$. For the other measures ($|TA|$, $|AWCA|$, $|DR|$), we do find an effect of inspections only as of the first year after commencement. This could be the case because audit firms need time to incorporate the feedback of the initial inspection year in their audits. The significant lead dummies show that the effect of inspection commencement is maintained over the years, indicating a sustained benefit from inspections. For the small profit analyses, we find significant positive coefficients for all inspection dummies in the model, which is consistent with the absence of an effect of inspection on audit quality in the main models.

Table 6, Panel B, shows the lead lag analysis with Big 4 interactions. In this analysis, we do not find any significant pre-treatment effects for either the main lagged effect or the interaction of the lagged effect and *Big4*. We find a significant effect of the interaction of Big 4 and the contemporaneous inspection dummy in the first year after inspection commencement, but not for the main effect of the inspection dummy. This may indicate that in the first years of inspection commencement, especially Big 4 audit firms were affected or significantly reacted to the new regime. For some audit quality measures ($|ATA|$ and $|DR|$), we find a consistent sustained effect in this model while the effect is less consistent for the other audit quality measures. As mentioned before, we did not expect to find results for the small profit analyses.

Overall, we conclude from this section that there is little evidence of a significant anticipatory effect on inspection, and that especially the Big 4 audit firms were affected or reacted to the commencement of inspection directly after commencement. For the full sample,

Table 6
Lead Lag Model

Panel A: Lead-Lag Regression for Accrual Management, Revenue Management and Earnings Management around the zero earnings threshold (N=157,370)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	|ATA|	|TA|	|AWCA|	|DR|	|ΔAR|	Small Profit 0-1%	Small Profit 0-2%
InspTreatLead4+	-0.0075***	-0.0067***	-0.0035*	-0.0018*	-0.0045***	0.2433***	0.2554***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.058)	(0.050)
InspTreatLead3	-0.0069***	-0.0070***	-0.0050***	-0.0027***	-0.0054***	0.2049***	0.1898***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.052)	(0.044)
InspTreatLead2	-0.0055***	-0.0051***	-0.0035**	-0.0011	-0.0053***	0.1338***	0.1338***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.048)	(0.041)
InspTreatLead1	-0.0044***	-0.0053***	-0.0036**	-0.0013*	-0.0058***	0.1587***	0.1647***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.045)	(0.038)
InspTreatDum	-0.0035***	-0.0021	-0.0011	-0.0009	-0.0035***	0.1657***	0.2002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.043)	(0.036)
InspTreatLag1	-0.0021**	-0.0011	0.0001	-0.0002	-0.0022**	0.2627***	0.2289***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.042)	(0.035)
InspTreatLag2	-0.0010	-0.0026*	0.0010	0.0004	-0.0012	0.1226***	0.1597***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.046)	(0.038)
InspTreatLag3	0.0003	0.0014	0.0002	-0.0008	-0.0025**	0.1118**	0.1015***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.045)	(0.037)
Constant	0.0528***	0.0854***	0.0774***	0.0322***	0.0604***	-0.5152**	0.1142
	(0.006)	(0.012)	(0.006)	(0.005)	(0.008)	(0.220)	(0.197)
Observations	157,370	157,370	157,370	157,370	157,370	157,347	157,347
R-squared	0.205	0.250	0.347	0.182	0.254	0.186	0.235
Controls	YES	YES	YES	YES	YES	YES	YES
Industry/Year/Country FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

Table 6

Lead Lag Model (continued)

Panel B: Big4 interaction of the Lead-Lag Regression for Accrual Management, Revenue Management and Earnings Management around the zero earnings threshold (N=157,370)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	|ATA|	|TA|	|AWCA|	|DR|	|ΔAR|	Small Profit 0-1%	Small Profit 0-2%
Big4	-0.0176***	-0.0138***	-0.0629***	-0.0065***	-0.0064*	-0.3043**	-0.4098***
	(0.004)	(0.005)	(0.005)	(0.002)	(0.004)	(0.140)	(0.124)
InspTreatLead4+	-0.0032*	-0.0021	0.0006	0.0002	-0.0024	0.1732**	0.1698***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.073)	(0.064)
*InspTreatLead4+*Big4*	-0.0059***	-0.0066***	-0.0075***	-0.0029**	-0.0030*	0.0930	0.1099*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.066)	(0.058)
InspTreatLead3	-0.0039**	-0.0049**	-0.0060**	-0.0006	-0.0036*	0.1662**	0.1392**
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.071)	(0.062)
*InspTreatLead3*Bg4*	-0.0038**	-0.0025	0.0006	-0.0029**	-0.0024	0.0502	0.0684
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.073)	(0.063)
InspTreatLead2	-0.0018	-0.0019	-0.0031	0.0006	-0.0039**	0.0542	0.0660
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.067)	(0.059)
*InspTreatLead2*Big4*	-0.0052***	-0.0043*	-0.0013	-0.0023*	-0.0019	0.1160	0.0956
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.074)	(0.064)
InspTreatLead1	-0.0007	-0.0009	-0.0012	0.0007	-0.0026	0.1044	0.0798
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.064)	(0.056)
*InspTreatLead1*Big4*	-0.0052***	-0.0061***	-0.0043*	-0.0028**	-0.0047**	0.0820	0.1259**
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.072)	(0.062)
InspTreatDum	0.0016	0.0016	0.0036	0.0016	0.0003	0.0263	0.0944*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.063)	(0.055)
*InspTreatDum*Big4*	-0.0075***	-0.0055**	-0.0079***	-0.0035***	-0.0056***	0.2209***	0.1679***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.072)	(0.062)
InspTreatLag1	-0.0003	-0.0004	0.0002	0.0003	-0.0015	0.1279**	0.1221**
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.065)	(0.056)
InspTreatLag1*Big4	-0.0025	-0.0008	-0.0006	-0.0006	-0.0010	0.1986***	0.1558**
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.075)	(0.064)

InspTreatLag2	0.0014	-0.0006	-0.0003	0.0017	0.0009	0.0246	0.0571
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.073)	(0.061)
*InspTreatLag2*Big4*	-0.0034	-0.0024	0.0021	-0.0019	-0.0029	0.1516*	0.1614**
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.088)	(0.073)
InspTreatLag3	0.0041*	0.0036	0.0036	-0.0005	-0.0028	-0.0287	0.0602
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.077)	(0.062)
*InspTreatLag3*Big4*	-0.0056**	-0.0033	-0.0046	-0.0004	0.0003	0.2139**	0.0616
	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.092)	(0.076)
Constant	0.0528***	0.0854***	0.0774***	0.0322***	0.0604***	-0.5152**	0.1142
	(0.006)	(0.012)	(0.006)	(0.005)	(0.008)	(0.220)	(0.197)
Observations	157,370	157,370	157,370	157,370	157,370	157,347	157,347
R-squared	0.205	0.250	0.347	0.182	0.254	0.186	0.235
Controls	YES	YES	YES	YES	YES	YES	YES
Industry/Year/Country FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

we find evidence of a sustained effect of inspections after the commencement date, indicating a continuing benefit of inspections for improving audit quality.

3.4.2.4 The effect of inspection regime characteristics on audit quality

We analyze the inspection characteristics by interacting the characteristics with the *Inspection* variable for the 24 countries that commence inspections during the sample period and for which we have reliable information on inspection characteristics.[123] The inspection characteristics are defined in Appendix 3B of this chapter and descriptive statistics are shown in Table 3, Panel A, for the client-year observations when inspections are in place (*Inspection*=1). Inspection reports are publicly disclosed for the majority of the sample (89.23% of observations; 21 of 24 countries), and most of the observations are from countries that disclose inspection reports on an aggregate level (78.18% of observations; 19 of the 21 countries disclosing inspections publicly), as opposed to disclosing inspection reports at an individual audit firm basis (11.05% of observations; 2 of the 21 countries). 32.58% of all observations relate to 17 countries with inspection regimes where large audit firms are inspected in a cycle of less than 2 years and 67.42% of all observations relate to 7 countries with inspection regimes where the cycle of inspections is 2 years or more. Most commonly, observations relate to countries whose POBs have direct enforcement powers (58.11% of the observations; 19 countries), while few observations relate to countries whose POBs oversee the accounting profession's enforcement powers (8.57%; 3 countries) and the remaining observations (33.31%) relate to 2 countries whose POBs do not have enforcement powers. Lastly, regarding type of oversight, 40.03% (18 countries at the end of the sample period) of observations are inspected directly by their respective POB, 37.68% (3 countries at the end of the sample period) are inspected by the accounting profession through oversight by the POB, and 22.292% (3 countries at the end of the sample period) are inspected by a mixed system. The *TypeOversight* variable is non-static because several POBs switch their type of oversight during our sample period.[124]

We analyze whether the effect of *Inspection* varies with different inspection characteristics for the sample of countries that commenced inspections between 2004-2011. The results are shown in Table 7. In Table 7, Panel A, we find evidence that the effect of

[123] As discussed in footnote 65, from the inspection commencement sample with 27 countries, we exclude the Philippines, Romania and Russia for this analysis, due to uncertainty regarding the inspection characteristics.
[124] For this reason, *TypeOversight* is coded differently from the other inspection characteristics. *TypeOversight* is coded 0 for firm-year observations for which no inspections are in place, and 1, 2 or 3 for the firm-year observations for which inspections of a certain type of oversight are in place. All other inspection characteristics are coded as static variables since there is no variation over time and are coded at the country-level rather than client-year level.

inspection commencement on audit quality is higher for those countries whose POB publicly discloses inspection reports. The coefficient *Inspection*InspDisc* in Panel A of Table 7 is significant and negative for all measures of audit quality. The coefficient on *Inspection* turns insignificant or positively significant for all measures indicating that the effect of inspection commencement is driven by those countries that publicly disclose inspection results which may have important reputation effects for audit firms.[125]

In Table 7, Panel B, we further show that the inspection disclosure effect is more pronounced for countries whose POBs disclose results at an aggregate level (*Inspection*InspDiscType=1*) for the inspection commencement sample.[126] Further, we find that those countries that disclose inspection results individually per audit firm (*InspDiscType=2*) have consistently higher audit quality.

Table 7, Panel C, shows that audit quality increases after inspection commencement (*Inspection*) regardless of inspection frequency for all measures of audit quality, except small profit 0-2%, but there is no evidence that this increase is driven by the inspection frequency (*Inspection*InspFreq*). However, we find that countries whose POBs choose for a higher inspection frequency have higher audit quality, compared to countries whose POBs choose a lower inspection frequency (negative coefficients for *InspFreq*), except in the abnormal total accrual analysis (Column (1)).

Table 7, Panel D, shows that audit quality increases after inspection commencement (Inspection), except for the revenue measures (Columns (4) and (5)), but there is no consistent evidence that the effect of inspection commencement depends on enforcement ability of the POB (*Inspection*Enforcement*). The main effects for enforcement are positive and significant, indicating that measures of accrual and revenue management are higher in those countries where enforcement is through oversight of the accounting profession (*Enforcement*=1), and in those countries where POBs hold enforcement power (*Enforcement*=2), compared to countries where enforcement is not in the hands of the POBs.

Table 7, Panel E, shows that compared to no inspections, audit quality is significantly higher after inspections are introduced when inspections are either conducted by POBs that oversee the inspection process of a national professional accountancy body

[125] We note, however, that only three countries (Austria, Greece and South Korea) choose not to disclose inspection results publicly in the inspection commencement sample, which may help explain the strong results for this analysis.

[126] We note, however, that only Sweden and the U.K. choose to disclose inspection results individually by audit firm in the inspection commencement sample, and a lack of observations for individual inspection disclosure may drive this result.

(*TypeOversight*=1), for all measures of audit quality except discretionary revenues, or by POBs with a direct inspection regime (*TypeOversight*=3), for all measures of audit quality except for both small profit meaures. The evidence from our analysis of the effect of inspections in a combined system (*TypeOversight*=2) on audit quality is limited[127], with some evidence of a positive association with the likelihood of earnings management around the zero earnings threshold and the absolute value of abnormal working capital.

Panel F of Table 7 shows the effect of inspection characteristics on timely loss recognition. Only *TypeOversight* significantly impacts the association between *Inspection* and timely loss recognition, and we find that timely loss recognition increases for inspection commencement when inspections are direct or organized under a combined system.

We acknowledge that these analyses are cross-sectional in nature and potentially suffer from endogeneity concerns, since the choice of the inspection characteristics may be related to country-specific factors, such as the quality of institutions. Furthermore, we only analyze one inspection characteristic at a time instead of considering all inspection characteristics of a POB simultaneously due to multicollinearity of the inspection characteristic variables and the inclusion of country fixed effects in the model.[128]

[127] We note that only three countries (South Korea, Singapore and the U.K.) choose a combined system in the inspection commencement sample, with both Singapore and the U.K. commencing inspections in 2004. The absence of a significant effect may thus be explained by the lack of observations for a combined system.

[128] We abstain from combining inspection characteristics in an additive manner due to high subjectivity involved in making judgments about the importance of each characteristic and different numbers of nominal levels for each characteristic, or applying factor-type analyses (multiple correspondence analyses for nominal variables) since it simply partitions inspection regimes into clusters with similar characteristics but does not unveil whether regimes with similar characteristics should be better than others.

Table 7

Inspection Characteristics[129]

Panels A-E: Accrual Quality, Discretionary Revenue and Small Profit Analyses							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables	|**ATA**|	|TA|	|AWCA|	|DR|	|ΔAR|	Small Profit 0-1%	Small Profit 0-2%
Panel A: Inspection Disclosure							
Inspection	0.0013	0.0007	0.0020	0.0043***	0.0017	0.1085*	0.1288***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.059)	(0.049)
InspDisc	0.0038**	0.0098***	0.0346***	0.0038***	0.0033*	-0.2651***	-0.3484***
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.082)	(0.073)
*Inspection*InspDisc*	-0.0056***	-0.0064***	-0.0060***	-0.0069***	-0.0078***	-0.2030***	-0.1835***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.060)	(0.051)
(Pseudo) R-squared	0.188	0.182	0.089	0.102	0.220	0.205	0.267
Panel B: Inspection Disclosure Type							
Inspection	0.0013	0.0005	-0.0038***	0.0028***	0.0011	0.1130*	0.1337***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.059)	(0.049)
InspDiscType=1	0.0039**	0.0050**	0.0004	-0.0037***	-0.0061***	-0.2531***	-0.3351***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.082)	(0.073)
InspDiscType=2	-0.0065**	0.0009	-0.0144***	-0.0073***	-0.0081***	-0.1980	-0.3250***
	0.0013	0.0005	-0.0038***	0.0028***	0.0011	0.1130*	0.1337***
Inspection	-0.0056***	-0.0048***	-0.0006	-0.0051***	-0.0063***	-0.2088***	-0.1901***
**InspDiscType=1*	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.060)	(0.051)
Inspection	-0.0048*	-0.0082**	0.0028	-0.0034*	-0.0042	-0.0080	0.0290
**InspDiscType=2*	(0.003)	(0.004)	(0.004)	(0.002)	(0.003)	(0.142)	(0.118)
(Pseudo) R-squared	0.188	0.237	0.308	0.172	0.265	0.205	0.267
Panel C: Inspection Frequency							
Inspection	-0.0031***	-0.0027***	-0.0039***	-0.0016***	-0.0046***	-0.0546*	0.0020
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.032)	(0.027)
InspFreq	0.0029	-0.0079**	-0.0068*	-0.0085***	-0.0239***	-0.2567***	-0.1865**
	(0.003)	(0.003)	(0.004)	(0.002)	(0.003)	(0.099)	(0.088)
*Inspection*InspFreq*	-0.0011	-0.0025*	-0.0012	0.0004	0.0012	-0.0123	-0.0790*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.047)	(0.041)
(Pseudo) R-squared	0.187	0.237	0.308	0.171	0.265	0.205	0.267
Panel D: Enforcement							
Inspection	-0.0053***	-0.0048***	-0.0046***	-0.0014	-0.0006	-0.3508***	-0.2559***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.053)	(0.045)
Enforcement=1	0.0262***	0.0334***	0.0203***	0.0150***	0.0201***	-0.5379***	-0.6001***
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.093)	(0.079)
Enforcement=2	0.0122***	0.0109***	0.0055**	0.0002	-0.0015	-0.9655***	-1.0737***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.077)	(0.069)
Inspection	-0.0017	-0.0070***	-0.0013	-0.0005	-0.0051**	0.2086***	0.0899
**Enforcement=1*	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.079)	(0.067)
Inspection	0.0026**	0.0027*	0.0005	-0.0001	-0.0037***	0.3462***	0.2878***
**Enforcement=2*	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.054)	(0.046)
(Pseudo) R-squared	0.188	0.237	0.308	0.171	0.265	0.206	0.267
Panel E: Type Oversight							
TypeOversight=1	-0.0061***	-0.0087***	-0.0063***	-0.0005	-0.0021*	-0.2549***	-0.1749***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.044)	(0.037)
TypeOversight=2	0.0001	-0.0008	-0.0028*	0.0016*	-0.0000	0.0501	0.0790*
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.057)	(0.047)
TypeOversight=3	-0.0035***	-0.0025***	-0.0041***	-0.0025***	-0.0059***	-0.0169	0.0057
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.033)	(0.029)
(Pseudo) R-squared	0.188	0.237	0.308	0.172	0.265	0.206	0.267
For all							
Observations	88,565	88,565	88,565	88,565	88,565	88,550	88,550
Control variables	YES	YES	YES	YES	YES	YES	YES

[129] The inspection characteristics analysis is conducted on the subsample of countries that have an inspection system in place by the end of our sample period in 2012. Therefore, the number of observations decreases to 134,797 in this analysis.

Industry/Country /Year FE	YES	YES	YES	YES	YES	YES	YES
Interaction first stage regressors and FE		YES			YES		

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

Table 7
Inspection Characteristics (continued)

Panel F: Timely Loss Recognition

	TA				
Inspection Characteristics:	(1) InspDisc	(2) InspDisc Type	(3) InspFreq	(4) Enforce-ment	(5) Type Oversight
*NegCFO*CFO*	-0.3592***	-0.3916**	-0.5837***	-0.1600	-0.3504***
	(0.164)	(0.166)	(0.123)	(0.172)	(0.112)
*NegCFO*CFO*Inspection*	0.1002	0.0996	0.2464***	-0.1713	
	(0.116)	(0.117)	(0.050)	(0.113)	
*NegCFO*CFO*InspectionCharacteristic=1*	-0.0043	-0.0076	0.2922***	-0.1810	
	(0.121)	(0.122)	(0.068)	(0.145)	
*NegCFO*CFO*InspectionCharacteristic=2*		-0.0443		-0.2119*	
		(0.209)		(0.121)	
*NegCFO*CFO*InspectionCharacteristic=3*					
*NegCFO*CFO*Inspection*InspectionCharacteristic=1*	0.1295	0.1387	-0.0698	0.0001	0.0782
	(0.125)	(0.126)	(0.074)	(0.153)	(0.059)
*NegCFO*CFO*Inspection*InspectionCharacteristic=2*		0.1220		0.3889***	0.1391**
		(0.210)		(0.124)	(0.054)
*NegCFO*CFO*Inspection*InspectionCharacteristic=3*					0.1937***
					(0.049)
Observations	88,565	88,565	88,565	88,565	88,565
R-squared	0.257	0.258	0.261	0.261	0.259
Control variables	YES	YES	YES	YES	YES
Industry/Country/Year FE	YES	YES	YES	YES	YES

Robust standard errors clustered at the client firm level in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 3B

3.4.3 ADDITIONAL ANALYSES

3.4.3.1 U.S. cross-listed clients, PCAOB access to foreign audit firms, joint PCAOB inspection

In additional analyses, we first consider the role of the U.S., and specifically the role of U.S. cross-listed observations and the international PCAOB reach. Prior literature shows that non-U.S. clients listed in the U.S. systematically differ from other non-U.S. clients, and these cross-listed firms are generally seen as having higher accounting quality (e.g. Lang et al. [2003]). To ensure that results are not driven by U.S. cross-listed clients, especially since the auditors of these clients are also subject to PCAOB registration and inspections (further discussed below), we control for U.S. cross-listed firms in our models. Our inferences remain unchanged for our main analysis and the interaction analysis.

Prior literature also shows that audit quality of non-U.S. PCAOB-registered audit firms is positively affected by PCAOB inspection access (Lamoreaux [2016]), for both U.S. cross-listed and through spill-over effects for national clients. To ensure that our findings of the effect of national POB inspections on audit quality are not driven by the PCAOB's inspection access to non-U.S. audit firms, we code PCAOB access according to Fung et al. [2017]. We include the variable *PCAOB_Access* in our main analysis (while excluding the U.S. from the sample) and find results consistent with the results reported for the full sample, except that, for the absolute value of change in receivables, only the interaction between *Inspection* and *Big4* is significant in the interaction model, but not the main effect of *Inspection*. We also interact *PCAOB_Access* with *Big4* since larger audit firms are more likely to audit U.S. cross-listed companies and are therefore more likely to be inspected by the PCAOB. The inferences for the effect of local *Inspection* on audit quality remains unchanged for all audit quality proxies. We also interact *PCAOB_Access* with an indicator of clients' U.S. cross-listing since those clients are those most directly affected by PCAOB access. We find that our inferences remain, except that for the absolute value of change in receivables the main effect of *Inspection* is insignificant in the interaction model.

We further analyze whether the effect of inspections of POBs that conduct joint inspections with the PCAOB is larger than for other POBs. The PCAOB relies on the work of local inspectors if it deems these POBs to be of high quality (Krishnan et al. [2017]). When including the variable *PCAOB_Joint* (an indicator variable that is equal to 1 for Australia, Canada, South Korea, Norway, Singapore, and the U.K.), all inferences for the main effect of local *Inspection* remain unchanged for both the main analysis and the interaction analysis.

3.4.3.2 Cross-country differences in the effect of inspection commencement

We also investigate whether the effect of *Inspection* depends on the regulatory quality of a country. We split the countries of the inspection commencement sample into quartiles[130] of the ten-year average score for *Regulatory Quality,* which is a proxy for a country's general ability to implement sound policies and regulations that promote private sector development (Kaufmann et al. [2010]).[131] We fail to find an effect of *Inspection* for the lowest quartile of *Regulatory Quality*[132], but find a significant effect of *Inspection* when combining the upper three quartiles of *Regulatory quality* for all measures of audit quality. Thus, while we find an average positive effect of *Inspection* on audit quality, it does not hold for countries with low ex-ante regulatory quality.

3.4.3.3 Other concurrent events

In our main analysis, we control for the mandatory adoption of IFRS as a major concurrent event. Other concurrent changes are major reporting enforcement changes (such as public disclosure of errors and retrospectively restating financial statements) implemented around the same time as mandatory IFRS adoption that were aimed at improving financial market regulation (Christensen et al. [2013]). Christensen et al. [2013] show that these enforcement changes explain capital market effects around IFRS adoption but could also influence the extent of accrual and revenue management and conservative reporting. When controlling for these enforcement changes, in line with Christensen et al. [2013], our inferences for *Inspection* and *Inspection*Big4* remain unchanged for all measures of audit quality, except that the main effect of Inspection in the Big 4 interaction model turns insignificant in the |*ATA*| and |*DR*| analysis.

3.4.4 SENSITIVITY ANALYSES

3.4.4.1 Addressing concerns about dominant countries, and the hierarchical data structure

In sensitivity analyses, we first address concerns that the number of observations per country largely differs and the unit of analysis is the inspection regime level, while the analysis is at the client level, which may overweight large countries in the analysis. We therefore first check whether the results are influenced by certain countries in our sample. Specifically, and as is common in international auditing research, certain countries represent a large portion of

[130] We do not find an effect for a median split of *Regulatory Quality.*
[131] We find the same results when using *Rule of Law* as a proxy for enforcement quality.
[132] This quartile includes the following countries: Bulgaria, Egypt, Greece, South Korea, Malaysia, the Philippines, Poland, Romania, Russia, South Africa, Thailand and Turkey.

the sample. The U.S. and Japan jointly make up 31.1% of client-year observations for our full sample. The inferences from the main results when excluding the observations from the U.S. are consistent for all tests of Hypothesis 1 and for all tests of Hypothesis 2. We also find a significant main effect of *Inspection* for the discretionary revenue analysis for the test of Hypothesis 2. The inferences from the main results when excluding Japan are consistent for the accrual and revenue management models, except for the discretionary revenue model where the coefficient for *Inspection* is insignificant. The results for the timely loss recognition models are consistent with the results reported for the full model (for both the main effect of *Inspection* and the interaction effect between *Inspection* and *Big 4*). The coefficient of the main effect of *Inspection*, however, is positive and significant in the small profit models, indicating that inspections increase the incidence of small profits. When excluding Japan from the full sample our inferences are consistent with our main analyses, except that the interaction term between *Big4* and *Inspection* is insignificant for the revenue management measures.

As an additional approach to address the concern that the unit of analysis is the inspection regime level, while the analysis is at the client level, we use hierarchical linear modeling to take into account the hierarchical structure of the data. That is, observations are grouped, and the error terms may be correlated within countries. Using random intercepts, we find results that are fully consistent with the main models and find significant coefficients for *Inspection* in all but the small profit analyses.[133] We also find significant interaction effects of *Inspection* and *Big4* for all models, except for the small profit analyses and the main effect of *Inspection* for all models except the discretionary revenue model and the small profit analyses. We continue to find less timely loss recognition for clients of Big 4 audit firms that are subject to inspections compared to clients of non-Big 4 audit firms.

3.4.4.2 Balanced panel analysis

In the main analyses, we show that our results hold for the full sample and the sample of countries that commence inspections between 2004-2011. In this sensitivity analysis, we use a balanced panel (42.1% of all observations)[134] to ensure that results are not driven by differences in sample composition throughout the years and to ensure that the same companies are included pre- and post-inspection commencement.[135] We find significant negative coefficients for all accrual and revenue management measures, and a significant positive

[133] Due to computational issues we implement the total accrual model without the interaction terms between year and industry and the first-stage regressors.
[134] This includes all companies for which we have observations over all ten years in our sample.
[135] We note that the number of observations increases over the sample period (see Table 3, Panel B).

coefficient for the *NegCFO*CFO*Inspection* coefficient in the TLR regression, consistent with our expectations and the findings for the full and inspection commencement sample. Additionally, we find significant negative coefficients for both small profit analyses. The inferences for the test of Hypothesis 2 (the interaction between *Big4* and *Inspection*) remain the same, and additionally we find significant negative coefficients for the interaction effect for both small profit analyses. In the TLR analysis, we find significantly more timely loss recognition for clients of audit firms that are subject to inspections, but we fail to find a significant difference for clients of Big 4 compared to non-Big 4 audit firms. The inferences from the analyses of the balanced sample are consistent with the inferences from the inspection commencement sample.

3.4.4.3 Audit firm networks (Big 6 instead of Big 4)

We further investigate whether the effect of inspections on audit quality holds for the Big 6 compared to the non-Big 6 audit firms.[136] The Big 6 are considered global audit firm networks with significant shared knowledge and resources (e.g. Carson [2009]), which may thus benefit from inspections in a similar way as the Big 4. The inferences from the Big 6 analyses are consistent with the inferences from the Big 4 analyses in the main model. In the interaction model, all interactions *Big6*Inspection* are significant, but the main effect for inspection turns insignificant for the abnormal total accrual and abnormal working capital accrual model.

3.4.4.4 Coding of inspection start dates

As explained in Section III, we collect the information on inspection commencement from public sources and we survey the POBs to confirm this information. We note that our coding of inspection commencement dates differs from the legislative inspection beginning date used by Lamoreaux [2016] in 18 cases. We code inspection start as the year in which the first inspections were undertaken after which inspections may impact audit quality. While we believe that our coding is more appropriate for the purpose of our study, investigating the effect of inspection commencement, we check the sensitivity of our results to Lamoreaux's definition of inspection start, legislative inspection beginning date. We create a new variable, *Inspection_Lamoreaux,* where we replace all those inspection start dates that differ from our coding with the coding in Lamoreaux. All inferences remain unchanged in the main analysis, but the main effect of *Inspection* is insignificant in the interaction model, for all measures of

[136] The Big 6 are the Big 4 audit firms, plus Grant Thornton and BDO.

audit quality except for |*ΔAR*|. This indicates that the effect of *Inspection* is driven by Big 4 firms when coding according to legislative inspection beginning dates.

We further identified cases where the coding of inspection commencement is ambiguous because some POBs conducted preparatory inspections before the commencement of the full inspection regime, and where a form of inspection regime had been in place, but not in the sense of inspections by POBs as defined in this study.[137] All inferences remain unchanged for the main analyses, except that the main effect of *Inspection* turns insignificant in the interaction analysis (*Inspection*Big4*) for all measures of audit quality except for |*ΔAR*|.

3.4.4.5Client fixed effects

We further analyze equations [1] and [2] using client and year fixed effects, as opposed to country, industry and year fixed effects, to control for client-specific time-invariant factors, following Daske et al. [2008] and Hail & Leuz [2009]. The main results for *Inspection* are consistent for the client fixed effects specification in all models, except that for the *Big 4* interaction model the main effect of *Inspection* becomes insignificant when using the revenue management measures of audit quality, while the interaction term *Big 4*Inspection* remains significant for all measures of audit quality.[138]

3.4.4.6 Clustering standard errors at country level

We cluster standard errors at client level in the main analyses. Since the variable of interest is at the country level and observations within a country should be simultaneously affected by the treatment, it can be argued that standard errors should be clustered at the country level affected (e.g. Bertrand, Duflo & Mullainathan, 2004). We discuss in footnote 72 our choice of clustering standard errors at the client level. Despite the justification in this footnote, we also run the analyses with standard errors clustered at country level and find, for both the full sample and the sample of inspection commencers, a significant effect of *Inspection* in the expected direction for all accrual management and TLR models, but not for the revenue management models. When interacting *Inspection* with *Big4*, we only find a significant result of the interaction effect for the accrual management measures in the full sample, and audit quality measures |*ATA*|, |*DR*| and *Small Profit*, as well as a significant main effect for |*TA*| in the inspection commencement sample. However, we caution that if the treatment of inspection

[137] Footnotes in Table 2 describe these coding differences.
[138] We do not apply client fixed effects for the small profit analyses due to the nonlinear estimation procedure of the probit model. The results hold for cases where we include either year fixed effects or industry-year fixed effects in addition to client fixed effects.

is not homogenous for all clients in one country, clustering at the country level may not be appropriate.

3.5. Conclusions and Limitations

One of the most profound recent international initiatives in audit regulation has been the move to independent public oversight of the auditing profession, replacing previous models of regulation. As the potential merits of public oversight are not uncontested, research on its effect on audit quality at the international level is warranted. To date, the literature on public oversight has mainly focused on the U.S., since it is one of the few countries where the public oversight body publicly discloses detailed inspection findings. The issue, however, is much broader than the U.S., and, except for a small number of studies examining individual countries other than the U.S., there is no comprehensive international study on the effect of commencing independent inspections through public oversight on audit quality.

To this end, we use a large sample of non-financial companies located in 50 countries over the period 2003-2012, of which 27 countries commence inspections between 2004-2011. We observe that the level of accrual and revenue management significantly decreases and that there is more timely loss recognition for clients of audit firms that become or are subject to inspections, for both the full sample and the sample of inspection commencers. In addition, there is evidence that the effect of inspections is stronger for Big 4 audit firms than for non-Big 4 audit firms for all audit quality measures, except for timely loss recognition We find little evidence of an anticipatory effect for these inspections and show that especially Big 4 firms were affected or responded in the initial years of inspection commencement, while the overall effect of inspection commencement is sustained over future years.

Further, we provide evidence that the effect of inspection commencement on audit quality varies with different inspection characteristics, mainly with whether inspection results are disclosed publicly. Collectively, our results contribute to the emerging literature and debate on public oversight by providing insights from an international setting. This is important since results from studies on (international) PCAOB inspections may not be generalizable to an international setting, especially since the implementation of inspections and their characteristics vary by POBs. Our findings may prove useful for regulators in the further development, design and mutual recognition of public oversight systems. We caution, however, that we do not provide insights into the costs created by the commencement of public oversight internationally and therefore do not make policy recommendations based on our results.

One of the potential limitations of our study are endogeneity concerns. POBs and inspections were installed because of concerns about audit quality, and the timing and treatment of countries is likely not random. One of the major assumptions underlying our difference-in-differences analysis is exogeneity and we acknowledge this as a potential limitation of our study. We also acknowledge that the estimated treatment effect may not be homogenous across countries since the quality of inspection regimes and POBs can differ and may depend on institutional features of a country (e.g. La Porta et al. [2006]). The other major assumption of the difference-in-differences method is parallel trends in dependent variables of treated and untreated firms. We attempt to address this using the lead lag regressions and show that there is little evidence of a pre-treatment trend. Relatedly, although inspections by POBs are the key strategy for audit quality improvements, we also cannot rule out that other common factors associated with the countries that have instigated active inspection regimes have contributed to audit quality. To deal with these concerns we have attempted to identify and control for other events that are likely to affect our proxies of audit quality, including IFRS adoption, PCAOB access and enforcement changes.

A further limitation is that, although we undertake an analysis of a comprehensive portfolio of audit quality metrics, we are restricted to financial reporting quality metrics which are indirect measures of audit quality, specifically discretionary and working capital accruals, discretionary revenues, changes in accounts receivable, incidence of small profits and timely loss recognition. Other measures of audit quality are limited to certain companies (such as the appropriate use of going concern opinions, which are specific to loss-making companies) or are not available, or comparable, for an international study (such as financial statement restatements which are a common measure of audit quality for U.S. studies).

Despite these inherent limitations, our study is a first major attempt at examining the impact of public oversight of the auditing profession in a large international setting. Future research may benefit from investigating the effect of public oversight on audit quality for specific national settings for which alternative and potentially more detailed and private data (e.g., audit adjustments) can be used, by further exploiting the different features of the organization and characteristics of public oversight as data become available, and by further extending the period of study.

Appendices Chapter 3

Appendix 3A – Empirical models to calculate dependent variables

$\|ATA\|$	We estimate absolute abnormal accruals as the absolute value of residuals from the following regression: $$TA_{i,t} = \beta_0 + \beta_1\left(\frac{1}{Assets_{i,t-1}}\right) + \beta_2(\Delta REV_{i,t} - \Delta AR_{i,t}) + \beta_3 PPE_{i,t} + \beta_4 ROA_{i,t} + Country\ Fixed\ Effects + \varepsilon$$ Where $TA_{i,t}$ is total accruals in year t (defined as the change in non-cash current assets minus change in current liabilities excluding current portion of long-term debt, minus depreciation and amortization) scaled by lagged total assets; $ASSETS_{i,t-1}$ is a client's total assets in year t-1; $\Delta REV_{i,t}$ is sales in year t less sales in year t-1, scaled by lagged total assets; $\Delta AR_{i,t}$ is accounts receivable in year t less accounts receivable in year t-1, scaled by lagged total assets; $PPE_{i,t}$ is net property, plant and equipment in year t, scaled by lagged total assets; and $ROA_{i,t}$ is net income before extraordinary items in year t, scaled by lagged total assets. It is standard practice to run this equation for each industry year in studies that investigate issues in a single country. However, using a sample of international data, we face data limitations regarding the number of observations within each country-industry-year. We therefore estimate this equation for each industry-year and include country fixed effects. To mitigate the impact of extreme observations for the calculation of expected accruals in this dataset, we exclude all observations for which any value of the variables in above equation are below the 1st or above the 99th percentile (Francis & Michas [2013]), for each country-year.
$\|AWCA\|$	In line with (Dechow et al. [1998]; DeFond & Park [2001]). $$AWCA_{i,t} = WC_{i,t} - ((WC_{i,t-1}/S_{i,t-1}) * S_{i,t})$$ Where $AWCA$ is abnormal working capital accruals in year t; $WC_{i,t-1}$ and $WC_{i,t}$ are non-cash working capital in year *t-1* and *t*, respectively where non-cash working capital is computed as the difference between (current assets minus cash and short-term investments) and (current liabilities minus short-term debt); and $S_{i,t-1}$ and $S_{i,t}$ are sales in year *t-1* and *t*, respectively.
$\|DR\|$	We estimate discretionary revenues as the absolute value of residuals from the following regression $$\Delta AR_{i,t} = \beta_0 + \beta_1 \Delta REV_{i,t} + Country\ Fixed\ Effects + \varepsilon \quad [3]$$ Where $\Delta AR_{i,t}$ is accounts receivable in year *t* less accounts receivable in year *t-1* scaled by lagged total assets and $\Delta REV_{i,t}$ is sales in year *t* less sales in year *t-1* scaled by lagged total assets. Given the limited number of observations for each country-industry-year, we estimate this equation for each industry-year and include country fixed effects. For each country-year, we truncate the data at the 1st and 99th percentile.

Appendix 3B– Variable definitions[139]

Dependent variables

$\|ATA\|$	Absolute value of abnormal accruals (absolute value of the residuals from the performance-adjusted modified Jones model measured as in Francis et al. [2013], see Appendix 3A).
$\|TA\|$	The absolute value of total accruals, calculated as net income before extraordinary items less cash flow from operations, scaled by lagged total assets.
$\|AWCA\|$	Absolute value of abnormal working capital accruals (DeFond & Park [2001], see Appendix3 A).
$\|DR\|$	Absolute value of discretionary revenues (residuals from a regression of changes in accounts receivables on changes in revenue based on McNichols & Stubben [2008], see Appendix 3A).
$\|\Delta AR\|$	Absolute value of the change in accounts receivable, scaled by lagged total assets (dependent variable in the discretionary revenue model, see Appendix 3A)
SmallProfit	Indicator variable taking the value of 1 if a client reports small positive earnings (where small earnings are defined as ROA between 0 and 0.01 or 0 and 0.02), else 0.
TA	Total Accruals, calculated as net income before extraordinary items less cash flow from operations, scaled by lagged total assets.

Variables of Interest

Inspection	Indicator variable taking the value of 1 when a company is domiciled in a country-year where audit firms are subject to inspections by independent POBs, else 0.
InspTreatDum	Indicator variable taking the value of 1 in the year a country commences inspections of audit firms by a POB, else 0.
InspTreatLead i	Indicator variable taking the value of 1 in the i^{th} year after a country commenced inspections of audit firms by a POB, else 0.
InspTreatLag i	Indicator variable taking the value of 1 in the i^{th} year before a country commenced inspections of audit firms by a POB, else 0.
InspDisc	Nominal static variable classifying whether inspection results are disclosed or not. It takes the value of 1 for countries in which the inspection reports are made publicly available, and 0 for countries in which the inspection reports are not publicly available.
InspDiscType	Nominal static variable classifying the type of inspection disclosure. It takes the value of 2 for countries in which reports are disclosed individually per audit firm, 1 for countries in which reports are disclosed in aggregate, and 0 for countries in which reports are not disclosed publicly.
InspFreq	Nominal static variable classifying the inspection frequency. It takes the value of 1 for countries in which large audit firms are inspected in a cycle of less than 2 years, and 0 for countries using less frequent inspection cycles.
Enforcement	Nominal static variable classifying the type of enforcement ability. It takes the value of 2 for countries in which the POB has direct enforcement abilities, 1for countries in which enforcement is through oversight of the accounting profession, and 0 for countries in which the POB has no enforcement powers.
TypeOversight	Nominal non-static variable classifying the type of oversight system. It takes the value of 3 for client-year observations for which inspections are conducted by POBs with direct or primarily direct oversight, 2 for client-year observations for which inspections fall under a combination of a direct inspection regime and inspections through oversight, and 1 for client-year observations for which inspections are conducted by POBs through oversight of the profession, and 0 for client-year observations for which no inspections are in place. This variable is non-static since some POBs switch their oversight type over the sample years.

[139] For financial variables that are ratios, or calculated from ratios, both numerator and denominator are in local currency (consistent with Michas [2011]). Financial variables with natural logarithmic transformation (*Size* and *Sales*) are reported in US Dollars, for comparability purposes.

Control variables	
Big4	Indicator variable taking the value of 1 when a company is audited by a Big 4 audit firm, else 0.
IFRS	Indicator variable taking the value of 1 when a company is domiciled in a country and year with mandatory use of IFRS.
Size	Natural logarithm of total assets (in thousands of USD).
CFO	Cash flow from operating activities scaled by lagged total assets.
Growth	Percentage change in sales.
Loss	Indicator variable taking the value of 1 when a company has a negative income before extraordinary items, else 0.
MB	Market value of equity to book value of equity.
PPE Growth	Percentage change in gross property plant and equipment.
Leverage	Ratio of long-term debt to lagged total assets.
Sales Vol	The standard deviation of a company's sales from year t-2 through year t.
CFO Vol	The standard deviation of cash flow from operations from year t-2 through year t.
Lagged TA	Total Accruals in t-1, calculated as net income before extraordinary items less cash flow from operations, scaled by total assets in t-2.
GDP annual growth	Annual growth in GDP per country, retrieved from the World Bank.
NegCFO	Indicator variable taking the value of 1 when a client's cash flow from operations is negative, else 0.
Sales	The natural logarithm of net sales.
Rule of Law	Is an annual country-level measure of the "the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al. [2010], P. 4), retrieved from the World Bank.
Regulatory Quality	Is an annual country-level measure "capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development." (Kaufmann et al. [2010], P. 4), retrieved form the World Bank

Chapter 4 – The effect of the interaction between litigation and regulatory risk on audit outcomes[140]

Abstract: The purpose of this study is to investigate how auditor conservative reporting and audit fees are affected by litigation risk and how this litigation risk interacts with regulatory forces. While prior literature has explored the association between either litigation or regulatory risk and audit outcomes, it is unclear whether and how these risks jointly influence audit outcomes. To examine this research question, I investigate whether and how the effect of regulatory risk stemming from PCAOB inspections on audit quality varies with the legal and litigation environment in which the auditor operates, by exploiting differences in auditors' liability exposure across U.S. state liability regimes. While both audit fees and the likelihood of a going concern opinion are higher for engagements for which the auditor faces higher litigation risk, I find that regulatory risk reinforces the impact of litigation on audit fees and auditor conservative reporting.

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4.1 Introduction

Auditor behavior is influenced by various incentives of which litigation and regulatory risks are generally considered to be instrumental (e.g. DeFond & Zhang [2014]; Knechel et al. [2013]). Litigation risk incentivizes auditors to provide high quality audits to avoid lawsuits and other financial penalties associated with audit failures. The litigation costs for auditors in involved in negligent audits can be substantial and even result in auditors being forced out of the market (Shu [2000]), which in turn can result in large losses in consumer surplus (Gerakos & Syverson [2015]). It has been estimated that even over ten years ago lawsuits cost audit firms about ten to fifteen percent of total revenue annually (CAQ [2008]). Litigation risk is thus an important consideration for audit firms, client firms and capital markets in general. Risks from regulation, such as from intervention of public oversight boards or securities enforcement agencies, pose a threat to auditors in terms of financial or criminal penalties and enforcement actions (e.g. the loss of the auditor's license to practice). Both litigation and regulatory risk stem from the institutional environment in which auditors operate and provide a downside risk (Peecher et al. [2013]). Further, reputational losses stemming from litigation and regulatory risks can impair the auditors' ability to attract and retain clients (DeFond & Zhang [2014]).

Despite the importance of litigation and regulatory risk for audit firms, it is largely unclear how the various institutional factors that drive litigation and regulatory risk interact with each other to influence audit quality and audit fees (Francis [2011]).[141] Therefore, this study explores how audit quality and audit fees are affected by the interaction between litigation risk stemming from third-party auditor liability based on common law and damage apportionment standards and regulatory risk stemming from PCAOB inspections. In the U.S., third-party auditor liability based on common law and damage apportionment standards vary considerably between states. Further, the introduction of regular PCAOB inspections of audit firms arguably increases audit firms' regulatory risk by increasing the likelihood of detecting low audit quality and subsequent enforcement actions and sanctions (e.g. Gunny & Zhang [2013]; Aobdia [2019]). In this regard, prior research has documented an association between PCAOB inspections and outcomes and audit quality and audit fees (e.g. Carcello et al. [2011];

[141] For example, Francis ([2011], P. 142) states that "we have barely scratched the surface in our *understanding of the role of institutions* […] for audit quality. For example, in the United States is the main institutional driver of audit quality the *SEC, the PCAOB, or is it a legal system* in which it is far easier to sue auditors than any other country in the world? Alternatively, are *all of these institutions equally important*?". Further, DeFond and Zhang ([2014], P. 279) mention that "[…] a major challenge [in understanding the effect of auditor incentives] is *disentangling regulatory intervention from litigation* and reputation risk." Lastly, Minutti-Meza ([2014], P. 354) questions whether auditors are "more likely to increase fees in response to litigation, reputation, or regulatory costs?"

DeFond & Lennox [2017]; Gramling et al. [2011]; Acito et al. [2018]; Vanstraelen & Zou [2017]).

Therefore, I exploit the variation in auditor litigation risk between U.S. states and investigate whether and how audit quality and audit fees vary across U.S. state liability regimes. I further examine whether the association between state liability regimes and audit quality and audit fees is affected by the introduction of PCAOB inspections and PCAOB inspection outcomes.

Using a sample of U.S. client firms over the years 2001-2009, I find that the likelihood of a going concern opinion as a measure of audit quality and audit fees are higher for client engagements for which the auditor faces higher litigation risk. Further, I find that audit fees are higher after the publication of the first PCAOB inspection report and that the effect is larger for clients for which the auditor faces higher litigation risk from third parties and higher losses from damage apportionment standards. While I do not find evidence of a complementary effect of regulatory risk and litigation risk on the likelihood to issue going concern opinions, I do find evidence that these risks jointly affect conservative reporting of auditors for damage apportionment standards. Collectively, my findings suggest that litigation and regulatory risks are complements.

Since it is difficult to disentangle the different risks that affect auditors (DeFond & Zhang [2014]), it is largely unclear what the main institutional drivers of audit quality and audit fees are (e.g. Francis [2011]; Minutti-Meza [2014]). Studying the relation between litigation and regulatory forces that affect audit firm behavior is therefore an important issue. By identifying a setting that allows me to explicitly consider how regulatory and litigation risk jointly affect auditor behavior, I contribute to the literature by showing that these risks jointly increase audit fees and conservative auditor reporting, measured as the likelihood of a Type I going concern reporting error. Further, I find a significant joint effect of regulatory and litigation risk only for damage apportionment litigation risk measures which measure the size of potential damages for audit firms, and for non-global audit firm networks (GAFN) that have less resources to cover potentially large litigation costs.

The paper proceeds as follows: In section 4.2, I describe the background of the study and develop the hypotheses. Next, section 4.3 outlines the research design and sample selection. In section 4.4, I present and discuss the results of this study. I conclude and discuss limitations in section 4.5.

4.2 Background and hypotheses development

Theory suggests that auditors can respond to litigation risk in several ways, including the provision of higher audit quality in order to increase the likelihood of detecting a material misstatement (Palmrose [1988]; Venkataraman et al. [2008]) or reporting more conservatively and thus avoiding litigation (e.g. Carcello & Palmrose [1994]; Kaplan & Williams [2013]; Lys & Watts [1994]), increasing audit fees by spending higher audit effort or by charging a risk premium and thus compensating for additional work or larger risk (e.g. Palmrose [1986]; Simunic & Stein [1996]; Bell et al. [2001]; Venkataraman et al. [2008]), or by not accepting or retaining clients with high litigation risk and therefore avoiding litigation (e.g. Pratt & Stice [1994]; Krishnan & Krishnan [1997]; Shu [2000]).

Most prior empirical literature on auditor litigation risk assesses whether the litigation environment in which auditors operate affects audit quality, auditor reporting or audit fees by comparing these audit outcomes across different legal regimes at the country level, analyzes the impact of changes to litigation risk over time, or investigating differences in litigation risk at the client level.[142] First, the international literature on litigation risk generally finds that audit quality is higher in countries with stronger legal systems and better investor protection, and that this effect is stronger for large auditors who face higher penalties from litigation (e.g. Choi & Wong [2007]; Francis, Khurana & Pereira [2003]; Francis & Wang [2008]; Guedhami & Pittman [2006]; Hwang & Chang [2010]). Further, in their studies on cross-country differences in litigation risk and audit pricing, Seetharaman et al. [2002] and Choi et al. [2009] document that audit fees are higher in countries with higher litigation risk, reflecting a risk premium. These studies, however, cannot easily disentangle whether these effects are due to differences in litigation risk or institutional environments across jurisdictions.

Second, the literature on shifts in legal liability in the U.S. investigates changes in federal securities law.[143] For example, Lee and Mande [2003] and Francis and Krishnan [2002] find that audit quality decreased after the Private Securities Litigation Reform Act of 1995 (PSLRA), which eliminated joint and several liability of auditors under federal securities law and thus significantly reduced litigation risk for auditors. Similarly, Geiger and Raghunandan [2001] and Geiger et al. [2006] find that the likelihood of the issuance of a going concern

[142] While I focus on auditor conservative reporting and audit fees in this study, I also briefly summarize studies on audit quality in this literature review, since going concern opinions can be seen as and are associated with measures of audit quality (e.g. DeFond & Zhang [2014]; Berglund [2019]).
[143] Federal securities law is based on the Securities Exchange Acts of 1933 (for IPOs) and 1934 (for secondary markets) and applies to buyers and sellers of securities and other third parties in case of gross negligence or fraud (Chung et al. [2010]). Federal securities law does not cover litigation under ordinary negligence.

opinion decreased after the PSLRA, indicating less conservative auditor reporting as federal litigation risk for auditors decreased. In line with this, Basu [1997] provides evidence that changes in conservatism of audited financial statements correspond to changes in statutory auditor liability regimes over time. Furthermore, a large amount of literature has investigated the consequences of the Sarbanes-Oxley Act (SOX) for audit quality and audit fees which increased auditor liability to third parties at the federal level.[144] However, it is unclear whether it is the increase in auditor liability or other concurrent changes that SOX brought about, which affect audit quality (DeFond & Zhang [2014]).

Lastly, prior literature investigates and finds that cross-sectional differences or changes in litigation risk at the client level affects audit quality, auditor reporting and audit fees. For example. a change in auditor litigation risk due to a client's IPO (Venkataraman et al. [2008]), or differences in litigation risk for private versus public audit clients (Badertscher et al. 2014), affect audit quality and audit fees. Kaplan and Williams [2013] show that auditors report more conservatively when auditor's client-specific litigation risk is higher. In line with expectations, the studies show that audit quality, auditor reporting conservatism, and audit fees are higher when auditors face higher litigation.

More recently, the auditing literature has started to investigate litigation risk from auditors' liability towards third parties that is based on tort law, which is part of common law. Auditor liability towards third-party non-clients for ordinary negligence is governed by common law, as opposed to gross negligence or fraud which is governed by federal securities law.[145] Further, state law cases, including those initiated by third-parties, have been identified as the greatest source of litigation risk faced by audit firms in terms of number and size of lawsuits (e.g. Cook et al. [1992]; Center for Audit Quality [2008]; Donelson [2013]).[146] Auditor litigation under federal securities law has been declining after the PSLRA of 1995 and after stricter application of the rules contained in the PSLRA in more recent years (Honigsberg et al. [2018]). This resulted in a more prominent role for litigation under common law (Donelson

[144] SOX increased auditor liability to third parties by expanding the definition of third parties and the scope of information that third parties can use when litigating against auditors (Chung et al. [2010]).
[145] Specifically, by Section 10(b) of the Securities Exchange Act of 1934 (including Rule 10b-5) and Section 11 of the Securities Act of 1933. There are important differences in lawsuits based on state vs. federa law. First, under state law, third parties must demonstrate reliance on financial statements or the audit report, while they do not have to demonstrate this under federal law. Second, under federal law, auditors can face large claims since individual lawsuits can be combined into class action lawsuits which is not possible under state law. (Kaplan & Williams [2013]).
[146] It should be noted that availability of data regarding actual number and size of lawsuits is limited and that many of these state liability cases are settled before they make it to the courts (Center for Audit Quality [2008]; Donelson [2013]). Nevertheless, it is estimated that number and size of these settlements and litigation cases are large and that these pose a real risk for the survival of audit firms (Donelson [2013]).

[2013]). There are substantial cross-sectional differences in liability regimes across U.S. states in terms of who constitutes a third-party that can hold the auditor liable for ordinary negligence,[147] and in terms of apportionment of liability in case of multiple defendants[148] (Anantharman et al. [2016]). This allows the investigating of how cross-sectional differences in auditor litigation risk affect audit outcomes.

Gaver et al. [2012] provide the first evidence that conservative financial reporting varies with auditor's state-level legal liability to third parties in the property-casualty insurance industry. Specifically, in states with third-party liability based on restatement of torts or reasonable foreseeability (i.e. high liability regimes), understating of insurers' loss reserves occurs less than in states with third-party liability based on privity (i.e. low liability regimes). Anantharaman et al. [2016] expand on Gaver et al. [2012] by examining whether the propensity of auditors to issue a going concern opinion to financially distressed clients in a broad sample of industries varies by different liability regimes. The authors consider both third-party liability regimes and liability apportionment rules. Anantharaman et al. [2016] find evidence that the likelihood of a going concern opinion is higher in high liability regimes than in low liability regimes. They further exploit changes to state liability standards and, using a difference-in-differences approach, provide evidence that a decrease in liability in two states decreased the propensity of auditors to issue a going concern opinion in these treated compared to non-treated states. In summary, there is some evidence that litigation risk at the federal level and at the state level affects audit quality and reporting.

As a first step and benchmark for this study, validating the findings in Anantharaman et al. [2016], I investigate whether and how auditor reporting differs across state liability regimes in the U.S. I also test for cross-sectional differences in audit fees across different liability regimes and expect that auditors charge higher fees to audit clients for which they face higher litigation risk, compared to audit clients for which they face lower litigation risk. This

[147] As described in Pacini et al. [2000a; 2000b], Gaver et al. [2012] and Anantharaman et al. [2016], four major approaches to determine third parties to whom the auditor is liable exist (in increasing order of strictness). First, the privity standard is most restrictive and requires a contractual relationship to exist between the auditor and the third-party. Second, the near-privity standard holds auditors liable towards a third-party who relied on its report. Third, the restatement of torts standard holds the audit firm liable to third parties belonging to a limited group for whom the auditor supplies information and suffers a loss by relying on this information, if the auditor fails to exercise reasonable care. Fourth, the reasonable foreseeability standard holds the auditor liable to all third parties who the auditor can reasonably foresee to use the audited statements for proper business purposes.

[148] Anantharaman et al. [2016] develop an index that indicates how damages are apportioned among multiple defendants, based on ATRA [2014]. The major distinctions are joint and several liability and proportionate liability, with other apportionment rules lying on a continuum. Joint and several liability means that the party suffering a loss can recover full damages from any defendant in case of multiple defendants. Proportionate liability means that third parties can only recover the proportionate share of damages from a defendant for which the defendant was responsible.

is based on the premise that auditors can adjust audit pricing for litigation risk to compensate for higher risk or for adjustments to audit effort to improve audit quality (e.g. Palmrose [1986]; Simunic & Stein [1994]).[149]

Further, third parties can accuse auditors of negligent misreporting if they fail to issue a going concern opinion for financially distressed clients that subsequently go bankrupt (Carcello & Palmrose [1994]; Geiger & Rama [2006]; Mutchler [1984]; Thoman [1996]). To avoid litigation for failing to issue going concern opinions, auditors can report more conservatively as indicated by a higher likelihood of a going concern opinion, or a Type I error (the issuance of a going concern opinion to a client that does subsequently not go bankrupt). However, conservative auditor reporting is costly since an audit firm can lose clients and thus future quasi-rents after issuing an unwarranted going concern opinion (DeAngelo [1981]). Auditor behavior should thus depend on the ratio between expected litigation costs related to negligent misreporting and costs related to Type I errors (Carson et al. [2013]). Overall, I expect auditor reporting conservatism to be higher for audit clients for which auditors are exposed to higher litigation risk, compared to audit clients for which auditors are exposed to lower litigation risk.

Audit fees and auditor reporting are two distinct ways of addressing litigation risk, since additional audit effort might not help relatively late during the audit process when the auditor makes his/her reporting decision, and is also unlikely to address litigation risk based on auditor reporting since the decision is based on assumptions about the future bankruptcy of a client (Kaplan & Williams [2013]). Hence, I look at both types of audit outcomes and formulate the first set of hypotheses as follows:[150]

H1a: Auditors report more conservatively for clients for which the auditor faces higher litigation risk from third-parties and higher damage apportionment than for clients for which the auditors face lower litigation risk from these sources.

H1b: Auditors charge higher fees to clients for which the auditor faces higher litigation risk from third-parties and higher damage apportionment than to clients for which the auditors face lower litigation risk from these sources.

[149] The prediction regarding the association between audit fees and litigation risk is the same for the effort and risk premium explanation. This paper does not intend to disentangle these explanations.

[150] Underlying these hypotheses is the assumption that auditors adjust their behavior based on the mere risk of litigation, not actual litigation.

As the focus of this study, I explore how litigation risk from third-party auditor liability and damage apportionment standards interact with regulatory risk from audit firms' exposure to PCAOB inspections.

As mentioned above, a major change in the institutional and regulatory environment of auditors was the introduction of SOX which increased federal litigation risk for auditors. With the establishment of the PCAOB, SOX also increased regulatory risk for auditors. The PCAOB's responsibilities include, among others, the inspection of auditors of public entities, the disclosure of inspection results, including non-remediated quality control issues (PCAOB [2016]; SOX 104), and the power to discipline audit firms that violate auditing standards, professional standards or are in non-compliance with SOX and securities laws[151] (PCAOB [2016]; SOX 105). The regular inspection process made regulatory intervention frequent and "represents a fundamental change in the risk dynamics of U.S. audit markets" (DeFond & Zhang [2014], P. 279), thus substantially increasing regulatory risk for audit firms. That is, the regular inspections of audit firms by the PCAOB increases the likelihood of detection of low audit quality and increases the likelihood of subsequent enforcement actions and sanctions. In general, PCAOB inspections are expected to provide auditors with an incentive to increase audit quality because of these regulatory concerns and potential subsequent reputational concerns (e.g. Gunny & Zhang [2013]; Aobdia [2019]). Prior literature finds evidence that PCAOB inspections positively impact auditor clients' financial reporting quality (e.g. Aobdia [2019]; Carcello et al. [2011]; Fung et al. [2017]; Lamoreaux [2016]), auditor reporting (e.g. DeFond & Lennox [2017]; Gramling et al. [2011]; Lamoreaux [2016]) and audit fees (Acito et al. [2018]; Vanstraelen & Zou [2017]).

While there is evidence that litigation risk at the federal and state level, and PCAOB inspections *separately* impact audit reporting conservatism and audit fees, it is not clear how these forces interact. In particular, there is limited evidence as to how third-party auditor liability, which varies across U.S. states, influences auditor conservative reporting and fees (Minutti-Meza [2014], and no evidence as to how these state liability regimes interact with forces that impose regulatory risk on auditors. However, the PCAOB does not operate independently, but acts within the general legal and litigation environment. In this regard, Kinney [2005] suggests that PCAOB inspection results could in theory expose firms to increased litigation risk. Furthermore, there is evidence that audit partners perceive PCAOB

[151] Examples of enforcement actions vary from less severe, such as censures and fines, to more severe, such as revocation of firm registration, or barring individual auditors from auditing public clients (PCAOB [2016]).

inspections to increase litigation risk (Houston & Stefaniak [2013]). Thus, changes in auditor exposure to regulatory intervention can arguably interact with the liability regimes in which the auditor operates. I propose that auditors take into account litigation risk when reacting to PCAOB inspections.

On the one hand, if regulatory oversight is an alternative disciplining mechanism to a strong liability regime, regulatory and litigation risks would be substitutes (Ye & Simunic [2017]). This is because once effort or audit quality meets auditing standards, auditors might not have an additional incentive to provide an even higher level of effort or audit quality, or report more conservatively due to the costs of Type I errors. Furthermore, if auditors charge a sufficiently high audit fee to compensate for effort or risk to meet auditing standards, an increase in regulatory risk might not increase audit fees for auditors in high liability regimes, but the contrary may hold true for auditors in low liability regimes. In this regard, Fung et al. [2017] find that the introduction of PCAOB inspection of foreign auditors increases audit quality more in jurisdictions with low auditor liability regimes, which would suggest that regulatory risk and litigation risk are substitutes in an international setting.

On the other hand, changes in audit quality or changes in audit fees after an increase in regulatory risk may be larger for auditors operating in high liability regimes. Regulatory oversight can improve auditors' effectiveness in detecting material misstatements and their reporting accuracy regardless of the liability regime the auditor operates in and can thus improve audit value even in strong legal regimes (Ye & Simunic [2017]). Furthermore, auditors facing high risks from both litigation and regulation have an incentive to increase audit quality or report more conservatively to avoid high penalties from both risks and can incorporate a risk premium for both risks in their audit fees. These arguments would suggest that litigation and regulatory risk are complementary.

I therefore formulate the following set of non-directional hypotheses to examine whether the effect of PCAOB inspections varies by state liability regimes:

H2a: The auditor's exposure to regulatory risk stemming from PCAOB inspections affects the association between litigation risk from third-parties and damage apportionment standards and auditor reporting.

H2b: The auditor's exposure to regulatory risk stemming from PCAOB inspections affects the association between litigation risk from third parties and damage apportionment standards and audit fees.

4.3 Research design and sample selection

4.3.1 PROXIES FOR LITIGATION RISK AND REGULATORY RISK

The main variables of interest are the various U.S. state liability regimes, as well as PCAOB inspections and their outcomes. As mentioned before, the proxies for state liability regimes are based on, and coded in line with Anantharaman et al. [2016]. State liability regimes are governed by third-party liability standards and damage apportionment standards, which measure different dimensions of litigation risk for auditors. First, third-party liability standards determine which parties can hold the auditor liable for ordinary negligence under common law and thus influence the likelihood of a lawsuit based on the number of parties that can sue an auditor. As described in Pacini et al. [2000a; 2000b], Gaver et al. [2012] and Anantharaman et al. [2016], these include the privity standard which requires a contractual relationship to exist between the auditor and the third-party; the near-privity standard which holds auditors liable towards a third-party that relied on their report; the restatement of torts standard which holds the audit firm liable to third parties belonging to a limited group to whom the auditor supplies information and that suffers a loss by relying on this information if the auditor fails to exercise reasonable care; and the reasonable foreseeability standard which holds the auditor liable to all third parties who the auditor can reasonably foresee will use the audited statements for proper business purposes. Based on who constitutes a third-party in case of a lawsuit, litigation risk for the auditor is lowest in states where privity standards prevail, is higher in states with near-privity and restatement of torts standards and is highest in cases where the reasonable foreseeability standard applies.

Second, damage apportionment standards determine the size of a potential payout for auditors if a lawsuit is successful. Damages can be apportioned among multiple defendants in the case of a lawsuit against an auditor in two main ways: first, third parties suffering a loss can only recover the proportionate share of damages from a defendant for which the defendant was responsible (proportionate liability); and second, third-parties can recover full damages from any defendant in case of multiple defendants (joint and several liability) (Anantharaman et al. [2016]; ATRA [2014]). Certain states also use a modified (less strict) joint and several liability standard. Since damage apportionment standards influence the size of a lawsuit against an auditor, they represent a different dimension of litigation risk for auditors compared to third-party liability standards. Hence the results of both proxies might not necessarily be aligned.

Appendix 4A of this chapter provides the description of the prevalent third-party liability and damage apportionment standards and their coding according to Anantharaman et

al. [2016] for each U.S. state until 2009.[152] Third-party liability standards are measured as a continuous variable ranging from 1 to 9 with higher values indicating higher third-party liability (*TPLIndex*), as well as a dummy variable indicating high (restatement of torts or reasonable foreseeability reflected in a coding of third-party liability standards of four or higher) versus low liability standards (privity or near-privity, coded less than four) (*TPLDummy*) (see footnote 147 for descriptions; Gaver et al. [2012]; Anantharaman et al. [2016]). Liability-sharing standards are coded on a nominal scale (as joint and several liability, modified joint and several liability, and proportionate liability) (*JSLIndex*), as well as a dummy variable indicating highest (joint and several liability reflected in a coding of damage apportionment standards of one) vs lower (all others, coded less than one) liability sharing regimes (*JSLDummy*) (see footnote 148 for descriptions; Anantharaman et al. [2016]; ATRA [2014]).

To match state liability regimes to a certain client-year observation, I follow the procedure in Anantharaman et al. [2016]. Specifically, I assign the state law with the most significant relationship relating to a lawsuit or the parties of a lawsuit to an observation (American Law Institute [1971]). The most significant relationship can be the place of incorporation or place of business, the place where the injury or conduct occurred or the place where the relationship between the parties is located. Following Anantharaman et al. [2016], the state law that would apply in a third-party lawsuit against the auditor is thus identified as the one with the highest score of either the client's state of incorporation or the state where the client's headquarters are located, or the audit firm's location (state of local office or head office). This approach cannot capture all state laws that might apply in the case of a lawsuit since, for example, the place where the relationship between parties is located (e.g. the plaintiff's location) is only known in the case of a lawsuit. However, the auditor does not know ex-ante where the third-party plaintiff may be located and therefore the proposed assignment of liability regimes to states likely reflects the expectation of the auditor regarding litigation risk from third parties and liability sharing. I retrieve the information on client's state of incorporation and state of headquarters from the Notre Dame Software Repository for Accounting and Finance[153], the state of the audit office in which the engagement auditor is

[152] The measures are only updated until 2009 in Anantharaman et al. [2016]. Hence, I choose 2009 as the end of my sample period.
[153] This repository provides information contained in the header section of all 10-K filings on SEC EDGAR, including information on client firm's state of incorporation and state of headquarter, see http://sraf.nd.edu (Loughran & McDonald [2016]).

located from Audit Analytics and the state of the audit firm's head office is manually collected from PCAOB inspection reports and audit firm's websites.

To proxy for regulatory risk, I identify first-time PCAOB inspection report release dates and PCAOB inspection outcomes from the PCAOB website for all audit firms in the sample. I assume that regulatory risk is affected when PCAOB inspections are disclosed since external stakeholders only know that an audit firm has been inspected once the report is made public.[154] The PCAOB started inspecting Big 4 audit firms with one-time limited inspections in 2003. In 2004, it started with full annual inspections for all annually inspected audit firms, i.e. firms with more than 100 issuer clients. Audit firms with less than 100 issuer clients are inspected triennially and these inspections were phased in over three years. Hence, PCAOB inspection report disclosure dates are staggered over time for different audit firms and can affect clients of different audit firms at different points in time, depending on their fiscal year end. I use this staggered introduction to identify changes in regulatory risk for different audit firms and clients. I thus code the variable *PostInsp* equal to 1 if the annual report of clients falls in the period after the first inspection report release date, and 0 otherwise.

4.3.2 EMPIRICAL MODELS

The general empirical model to investigate hypothesis 1 is the following:

$$Outcome_{i,t} = \beta_0 + \beta_1 LiabilityRegime_{i,t} + \beta_i CONTROLS_{i,t} + Year, Audit\ Firm\ and\ Industry\ fixed\ effects + \varepsilon \quad (1)$$

Where *Outcome* is either the likelihood of a first-time going concern opinion for financially-distressed clients (*GCFirst*) and the likelihood of a first-time Type I reporting error (*TypeI*) as a measure of auditor conservative reporting, or audit fees ($AUFees$).[155] As mentioned before, audit firms can respond to risks in multiple ways, two of which are increasing audit fees or reporting more conservatively. I therefore use audit fees as a dependent variable and choose the likelihood of a first-time going concern opinion and Type I error as a measure of conservative auditor reporting since a large number of third-party lawsuits are related to bankruptcy cases and auditor reporting measures directly reflect auditor behavior (Anantharaman et al. [2016]).

[154] An underlying assumption is that audit firms do not react to PCAOB inspections early by changing their behavior in terms of auditor reporting or charging different audit fees.

[155] Audit fees can be used as a proxy for audit quality (DeFond & Zhang [2014]). However, it is difficult to disentangle whether the association between litigation risk and audit fees reflects additional audit effort leading to higher audit quality or a risk premium and thus an audit pricing issue. Therefore, in this paper, I focus on audit quality and audit fees as separate issues.

LiabilityRegime is one of the four separate measures of liability regimes: *TPLIndex*, a continuous measure for third-party liability standards: *TPLDummy*, a dummy variable indicating high and low third-party liability standards; *JSLIndex*, a nominal measure for damage apportionment standards; and *JSLDummy*, a dummy variable indicating high and low third-party liability standards. In additional analyses, I further use the dummy variables $TPL_{High}\&JSL_{High}$, indicating combined high third-party liability and high damage apportionment standards, which I compare to all other combinations of TPL and JSL as the baseline. Following the first set of hypotheses, I expect a higher likelihood of a first-time going concern opinion for financially distressed clients and higher audit fees for clients in states with higher third-party liability and damage apportionment standards. I therefore expect a positive coefficient β_1.

To investigate hypothesis 2, I use the following model adapted from Carcello et al. [2011]:

$$\begin{aligned} Outcome_{i,t} = {} & \beta_0 + \beta_1 LiabilityRegime_{i,t} + \beta_2 PostInsp_{i,t} \\ & + \beta_3 LiabilityRegime_{i,t} * PostInsp_{i,t} + \beta_i CONTROLS_{i,t} \\ & + Year, Audit\ Firm\ and\ Industry\ fixed\ effects + \varepsilon \end{aligned} \quad (2)$$

Where *Outcome* and *LiabilityRegime* are described above. *PostInsp* is a dummy variable equal to 1 for client-year observations in the years after their auditor received a PCAOB inspection report, but before the next report is released. The coefficient β_3 of the interaction term between *LiabilityRegime* and *PostInsp* allows analyzing whether and how the effect of PCAOB inspections varies with state liability regimes. A positive coefficient would indicate that litigation and regulatory risk reinforce each other (i.e. a complementary effect), while a negative coefficient would indicate the opposite (i.e. a substitution effect).

In line with prior work, I restrict the going concern model to financially-distressed clients only, which are those clients with negative net income or negative cash flow. I include the following control variables in the going concern model, based on prior research (e.g. Anantharaman et al. [2016]; Reynolds & Franics [2000]). I control for the probability of bankruptcy using the Altman Z-Score (*Altman*); the incidence of losses in the current (*Loss*) and prior year (*LagLoss*); leverage of the client (*Leverage*) and change in leverage (*ChLeverage*) which are proxies for the closeness to violation of debt covenants; liquidity of the client (*CashRatio*); future equity issuance of the client (*FutEquityIssu*) and future debt issuance of the client (*FutDebtIssu*); the size of the client (*LnTA*); the type of the auditor (*Big4*);

the change in auditor by controlling for whether the audit is a first year audit (*FirstYrAudit*) and the length of the report lag between fiscal year end and auditor opinion date indicating complexity of the audit (*ReportLag*).

Based on prior research (Ashbaugh et al., 2003; Choi et al., 2010; and Ball et al., 2012), I include the following control variables in the audit fee model: client size measured as total assets (*LnTA*); the type of auditor (*Big4*); client firm leverage (*Leverage*), the incidence of losses in the current year (*Loss*), return on assets (*ROA*) and the current ratio (*CurrRatio*) as proxies for client-specific risk; the market to book ratio (*MtoB*) as a measure of the asset base; indicators of client restructuring (*Restructure*), client's involvement in an M&A transaction (*MandA*), the presence of special items (*SpecItem*), the payment of foreign taxes (*TaxForeign*), and a change in debt or equity financing (*Financing*) as measures of client complexity; an indicator of whether the fiscal year end is in December (*DecYearEnd*) as a measure for auditor's busyness; and lastly indicators of a going concern opinion (*GoingConcern*) and internal control material weakness (*ICMW*) opinion to account for the auditor's additional work related to these opinions.

I include industry (based on 2-digit SIC codes) and year fixed effects in all models and cluster the standard errors at client firm level.[156] In the audit fee analyses, I also include audit firm fixed effects .[157] All variables are defined in Appendix 4B of this chapter.

4.3.3 SAMPLE SELECTION AND DESCRIPTION

The sample selection process is shown in Table 1. The initial sample includes all client-year observations from the Compustat-Audit Analytics universe from 2001 until 2009. I only include client-year observations until the year 2009 since the indices for the third-party liability and damage apportionment standards, based on prior research (Anantharaman et al. [2016]), are available only until that year.

I delete all observations pertaining to the financial industries (SIC-codes 6000-6999), and all observations pertaining to foreign auditors and those engagements for which the liability regimes cannot be measured (i.e. those observations lacking information on client headquarter and state of incorporation and auditor headquarter and office). I drop observations with missing dependent variables and missing independent variables. This results in a sample for the audit

[156] In sensitivity analyses for the audit fee model, I include year and client firm fixed effects to control for unobserved time-invariant characteristics that might be associated with audit fees. This does not change the inferences of the results.

[157] Since I do not observe the issuance of going concern opinions for a large number of audit firms, as well as a large number of client firms in my dataset, I do not include audit firm or client firm fixed effects in the going concern analyses.

fee analysis of 33,563 client-year observations. In the going concern analysis, I restrict the sample to financially-distressed client firms, which are defined as firms with negative operating cash flow or negative net income in a specific year, and eliminate all observations pertaining to industries for which there are no first-time going concern opinion during the sample period resulting in 14,595 client-year observations. For the Type I error analysis, I further drop observations for which information on bankruptcy or liquidation in year t+1 is not available on Compustat, resulting in a sample of 13,252 observations.

TABLE 1

Sample selection

Initial sample from Compustat-Audit Analytics Merge (2001-2009)	68,384
Delete financial industries (SIC-code 6000-6999)	(18,104)
Delete observations if information for liability standard definition is missing and client-year observations pertaining to foreign auditors	(9,630)
	40,650
Delete observations for missing dependent variables	(347)
Delete observations for missing control variables	(6,740)
Sample for the audit fee analysis	33,563
Delete observations for missing control variables for the going concern model	(2,565)
Restrict to financially-distressed firms	(16,301)
Exclude industries without a first-time going concern opinion	(102)
Financially-distressed subsample for the going concern analysis	14,595
Exclude observations with missing information on bankruptcy or liquidation in year t+1	(1,343)
Financially-distressed subsample for the Type I error analysis	13,252

Table 2, Panel A, provides information on the composition of the audit fee sample by state for the variables which are used to assign the liability regimes: client incorporation, client headquarters, audit office and audit firm headquarters, respectively. Most commonly, client-year headquarters are in California and Texas. Most client-years are incorporated in Delaware, which is well-documented due to the favorable conditions that incorporation in Delaware provides to companies. Most audit firms that audit the client-years in the sample are headquartered in New York[158], followed by Illinois. Most frequently, audit offices that audit client-years in this sample are located in California, followed by New York and Texas. These

[158] All Big 4 audit firms are headquartered in New York which explains the composition of the sample in terms of auditor headquarter by client-year.

numbers correspond relatively well to the state of client firm headquarters, however, some companies choose out-of-headquarter-state auditors. Overall, there is variation in all state locations that determine assignment of a client engagement-year to a liability index.

4.4. Results

4.4.1 DESCRIPTIVE STATISTICS

Table 2, Panel B, shows the frequency distribution of client-year observations of the five proxies of liability regime (*TPLIndex*, *TPLDummy*, *JSLIndex*, *JSLDummy* and the combined

TABLE 2

Descriptive Statistics

Panel A: Sample composition by state (audit fee sample)							
State of client firm headquarter		State of client firm incorporation		State of auditor engagement office		State of auditor headquarter	
State	Frequency	State	Frequency	State	Frequency	State	Frequency
CA	18.69%	DE	62.86%	CA	18.32%	NY	73.54%
TX	10.03%	CA	3.50%	NY	9.74%	IL	8.19%
NY	8.01%	NV	2.93%	TX	9.56%	CA	3.03%
MA	5.60%	NY	2.89%	MA	6.08%	NJ	2.13%
NJ	4.71%	MN	2.20%	PA	4.54%	CO	1.91%
PA	4.36%	OH	1.98%	FL	4.50%	TX	1.87%
All others	48.6%		23.08%		48.56%		10.48%

measures) for the audit fee sample. Most observations (73.01%) fall under a restatement of torts third-party liability regime, followed by near privity (14.6%) and reasonable foreseeability (12.01%), while very few observations fall under a privity regime (0.39%). In terms of damage apportionment, most observations fall under a full joint and several liability regime (91.48%), and few observations (4.89%) fall under a modified version or a proportionate damage apportionment standard (3.63%). These descriptive statistics reflect the findings in Anantharaman et al. [2016]. The descriptives further show that 52.17 percent (44.33 percent) of client-year observations are in the post inspection period (i.e. in the period after the publication of the first PCAOB inspection report of their auditor (*PostInsp*=1)) in the audit fee sample (in the going concern sample).

TABLE 2

Descriptive Statistics (continued)

Panel B: Frequency distribution across liability regimes (audit fee sample)			
TPLIndex		*TPLDummy*	
Privity (1-2)	0.39%	TPLDummy=0	14.98%
Near Privity (2.5-3.5)	14.59%	TPLDummy=1	85.02%
Restatement of Torts (4-7)	73.01%		
Reasonable Foreseeability (7.5-9)	12.01%		
JSLIndex		*JSLDummy*	
Proportionate Liability	3.63%	JSLDummy=0	8.52%
Modified JSL	4.89%	JSLDummy=1	91.48%
Full JSL	91.48%		

All variables are defined in Appendix 4B

Table 2, Panel C, provides descriptive statistics for all dependent and independent variables for the going concern sample. Seven percent of client-year observations receive a first-time going concern opinion from their auditor. The client firms in the subsample are in financial distress as indicated by a high negative mean Altman Z-Score (*Altman*), a high percentage of loss firms (*Loss*) and previous year loss firms (*LagLoss*) and negative *ROA* and operating cash flow (*CFO*). Companies have average *Leverage* of 47%, and a large percentage issue equity (*FutEquityIssu*) or debt (*FutDebtIssu*) in year *t+1*. Furthermore, 54% of the observations are audited by a *Big4* audit firm, 14% are first-year audits (*FirstYrAudit*) and the report lag (*ReportLag*) is 73 days on average. This reflects the descriptives in Anantharaman et al. [2016].

TABLE 2

Descriptive Statistics (continued)

Panel C: Descriptive Statistics for the going concern analysis sample								
Variables	N	Mean	Median	Std. Dev	Min	25th percentile	75th percentile	Max
GCFirst	14,595	0.07	0	0.25	0	0	0	1
Altman	14,595	-8.71	1.21	55.42	-522.44	-2.64	3.37	57.96
Loss	14,595	0.92	1	0.28	0	1	1	1
LagLoss	14,595	0.73	1	0.44	0	0	1	1
ROA	14,595	-0.79	-0.17	2.45	-20.45	-0.52	-0.04	0.37
CFO	14,595	-0.30	-0.04	0.91	-6.96	-0.26	0.04	0.36
Leverage	14,595	0.47	0.17	1.21	0	0.01	0.44	10.19
ChLeverage	14,595	0.07	0	0.62	-2.28	-0.02	0.07	4.13
CashRatio	14,595	0.27	0.16	0.27	0	0.04	0.44	0.97
FutEquityIssu	14,595	0.76	1	0.43	0	1	1	1
FutDebtIssu	14,595	0.44	0	0.50	0	0	1	1
LnTA	14,595	4.00	4.06	2.39	-2.90	2.51	5.56	10.74
Big4	14,595	0.54	1	0.50	0	0	1	1
FirstYrAudit	14,595	0.14	0	0.35	0	0	0	1
ReportLag	14,595	73.49	73	33.39	20	56	87	244

All variables are defined in Appendix 4B

Table 2, Panel D, provides descriptive statistics for the audit fee subsample. The average audit fee is $1.19mn (average *lnAUFee* of 12.92). The proxies for client-specific risk indicate that 44% of firms are loss-making firms (*Loss*), have a negative average *ROA* of -0.34 and have *Leverage* of 33%. The average total assets are $2,073 mn (*lnTA* of 5.09). *Big4* firms audit 66% of the observations, while 11% of the observations relate to first-year audits (*FirstYrAudit*). The average market to book ratio (*MtoB*) is 2.53 and the average current ratio (*CurrRatio*) is 0.52. In terms of client complexity, almost all client-year observations incur restructuring expenses (*Restructure*), 35% of client-year observations are involved in a M&A transaction (*MandA*), 51% pay foreign taxes (*TaxForeign*), 43% increase their outstanding debt or shares significantly (*Financing*) and 63% of client-year observations report special items in their financial statements. December financial year end (*DecYearEnd*) comprise 65% of client-year observations, 11% receive a going concern opinion (*GoingConcern*) from their auditor and 34% receive an internal control material weakness opinion (*ICMW*) from their auditor.

TABLE 2

Descriptive Statistics (continued)

Panel D: Descriptive Statistics for the audit fee sample								
Variables	N	Mean	Median	Std. Dev	Min	25th percentile	75th percentile	Max
AUFee	33,563	12.92	12.91	1.47	9.28	11.84	13.96	16.46
Loss	33,563	0.44	0	0.50	0	0	1	1
ROA	33,563	-0.34	0.01	1.76	-20.45	-0.15	0.06	0.37
Leverage	33,563	0.33	0.17	0.87	0.00	0.01	0.36	10.19
LnTA	33,563	5.09	5.17	2.46	-2.90	3.49	6.77	10.74
Big4	33,563	0.66	1	0.47	0	0	1	1
FirstYrAudit	33,563	0.11	0	0.31	0	0	0	1
ReportLag	33,563	66.69	65	29.17	20	51	77	244
MtoB	33,563	2.53	1.84	8.54	-50.15	0.96	3.38	57.64
CurrRatio	33,563	0.52	0.52	0.26	0.03	0.32	0.73	1
Restructure	33,563	1.00	1	0.01	0	1	1	1
MandA	33,563	0.35	0	0.48	0	0	1	1
TaxForeign	33,563	0.51	1	0.50	0	0	1	1
Financing	33,563	0.43	0	0.50	0	0	1	1
SpecItem	33,563	0.63	1	0.48	0	0	1	1
DecYearEnd	33,563	0.65	1	0.48	0	0	1	1
GoingConcern	33,563	0.11	0	0.31	0	0	0	1
ICMW	33,563	0.34	0	0.47	0	0	1	1

All variables are defined in Appendix 4B

4.4.2 MULTIVARIATE ANALYSES

4.4.2.1 Auditor Conservative Reporting

In Table 3, Panels A and B, I report the results of equation (1) and (2) for the going concern model for all proxies of *LiabilityRegime* (*TPLIndex, TPLDummy, JSLIndex* and *JSLDummy*), the post-inspection (*PostInsp*) indicator as a measure of regulatory risk, and the

interaction between *LiabilityRegime* and *PostInsp*. In line with Anantharaman et al. [2016], I find that the likelihood of a first-time going concern opinion is higher for audit engagements for which the auditor faces higher litigation risk. Using probit analysis, I find that the likelihood of the auditor issuing a first-time going concern opinion is significantly higher when the auditor faces higher litigation risk for an audit engagement as measured by *TPLDummy* (Columns (4)) ($p<0.01$), *JSLIndex* (Columns (7)) (one-tailed $p<0.1$) and *JSLDummy* (Columns (10)) ($p<0.05$), which provides support for H1a. I do not find a significant difference in first-time going concern reporting likelihood after the publication of PCAOB inspection reports, compared to before the publication (*PostInsp*). When investigating the interaction between *PostInsp* and *LiabilityRegime* and its association with the likelihood of a first-time going concern opinion, I fail to find a significant effect as reported in Table 3. Most control variables are significant in the expected directions, with positive coefficients for variables indicating financial distress and negative coefficients for variables indicating positive operating performance.

In Table 3, Panel B, I find that auditors have a significantly higher likelihood of a Type I error ($p<0.05$) when auditing clients for which they face higher litigation risk for all measures of litigation risk, indicating that auditors report conservatively when facing high litigation risk, which further supports H1a. Further, the interaction effects between *JSLDummy* and *JSLIndex* and *PostInsp* (Columns (9) and (12)) are significantly positive (1% and 5%, respectively). Specifically, the Wald test indicates that the joint significance of the interaction term and the *PostInsp* main effect is significant at the 5% level ($\mathcal{X}^2$=9.09; p-value=0.0106) for *JSLIndex* and at the 5% level ($\mathcal{X}^2$=6.37; p-value=0.0414) for *JSLDummy*. This provides support for H2a.

This provides evidence that litigation risk and regulatory risk reinforce auditor conservative reporting as measured by an increased likelihood of a Type I error. This finding, however, holds only for the damage apportionment litigation risk measures which are a proxy of the potential size of the auditor payouts in case of litigation, rather than the mere risk of litigation based on the potential number of parties that could sue the auditor. Hence, these results indicate that auditors report more conservatively when there is high regulatory risk and high litigation risk in form of large potential payouts.

TABLE 3

Auditor reporting behavior

Panel A: First-time going concern opinions (GCFirst)

	TPLIndex			*TPLDummy*			*JSLIndex*			*JSLDummy*		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LiabilityRegime	0.0202	0.0203*	0.0202	0.1440***	0.1439***	0.1482**	0.1334*	0.1345*	0.0755	0.1259**	0.1268**	0.0843
	(0.012)	(0.012)	(0.015)	(0.050)	(0.050)	(0.060)	(0.074)	(0.074)	(0.087)	(0.056)	(0.056)	(0.066)
PostInsp		-0.0284	-0.0286		-0.0263	-0.0138		-0.0308	-0.1993		-0.0311	-0.1472
		(0.060)	(0.137)		(0.060)	(0.109)		(0.060)	(0.139)		(0.060)	(0.111)
PostInsp LiabilityRegime*			0.0000			-0.0144			0.1976			0.1442
			(0.025)			(0.105)			(0.146)			(0.114)
Altman	0.0021***	0.0021***	0.0021***	0.0021***	0.0020***	0.0021***	0.0021***	0.0021***	0.0021***	0.0021***	0.0021***	0.0021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Loss	0.4849***	0.4851***	0.4851***	0.4799***	0.4801***	0.4802***	0.4865***	0.4867***	0.4868***	0.4856***	0.4858***	0.4860***
	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)	(0.094)	(0.094)	(0.094)	(0.094)
LagLoss	0.3120***	0.3118***	0.3118***	0.3089***	0.3087***	0.3087***	0.3128***	0.3126***	0.3139***	0.3128***	0.3125***	0.3139***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)
ROA	0.0451***	0.0453***	0.0453***	0.0457***	0.0458***	0.0458***	0.0436***	0.0438***	0.0447***	0.0434***	0.0436***	0.0444***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
CFO	-0.2446***	-0.2447***	-0.2447***	-0.2454***	-0.2456***	-0.2456***	-0.2412***	-0.2414***	-0.2430***	-0.2405***	-0.2407***	-0.2422***
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.039)	(0.038)	(0.039)	(0.039)	(0.039)	(0.039)
Leverage	-0.1702***	-0.1704***	-0.1704***	-0.1701***	-0.1703***	-0.1703***	-0.1691***	-0.1693***	-0.1693***	-0.1686***	-0.1687***	-0.1691***
	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
ChLeverage	0.1915***	0.1919***	0.1919***	0.1906***	0.1909***	0.1909***	0.1896***	0.1901***	0.1908***	0.1898***	0.1903***	0.1911***
	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.054)	(0.054)	(0.055)	(0.054)	(0.054)	(0.055)
CashRatio	-0.6013***	-0.6006***	-0.6006***	-0.6097***	-0.6091***	-0.6092***	-0.6100***	-0.6093***	-0.6101***	-0.6141***	-0.6134***	-0.6139***
	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)	(0.088)	(0.087)	(0.087)	(0.088)
FutEquityIssu	-0.2489***	-0.2487***	-0.2487***	-0.2551***	-0.2549***	-0.2548***	-0.2496***	-0.2494***	-0.2510***	-0.2509***	-0.2507***	-0.2523***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.042)	(0.043)	(0.043)	(0.042)
FutDebtIssu	0.1466***	0.1468***	0.1468***	0.1481***	0.1482***	0.1482***	0.1488***	0.1490***	0.1489***	0.1497***	0.1499***	0.1502***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
LnTA	-0.0973***	-0.0970***	-0.0970***	-0.0994***	-0.0990***	-0.0990***	-0.1010***	-0.1007***	-0.1010***	-0.1021***	-0.1018***	-0.1021***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Big4	0.0737	0.0803*	0.0803*	0.0671	0.0733	0.0731	0.0605	0.0676	0.0627	0.0558	0.0630	0.0583
	(0.047)	(0.049)	(0.049)	(0.047)	(0.049)	(0.049)	(0.047)	(0.049)	(0.049)	(0.047)	(0.049)	(0.049)
FirstYrAudit	-0.0171	-0.0183	-0.0183	-0.0168	-0.0179	-0.0179	-0.0168	-0.0180	-0.0183	-0.0158	-0.0170	-0.0172
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
ReportLag	0.0052***	0.0052***	0.0052***	0.0052***	0.0052***	0.0052***	0.0051***	0.0051***	0.0052***	0.0051***	0.0051***	0.0051***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Constant	-1.8836***	-1.8897***	-1.8896***	-1.8850***	-1.8903***	-1.8940***	-1.8914***	-1.8984***	-1.8390***	-1.8666***	-1.8733***	-1.8306***
	(0.152)	(0.152)	(0.156)	(0.144)	(0.145)	(0.147)	(0.149)	(0.150)	(0.156)	(0.143)	(0.144)	(0.148)
Observations	14,595	14,595	14,595	14,595	14,595	14,595	14,595	14,595	14,595	14,595	14,595	14,595
Pseudo R^2	0.1178	0.1179	0.1179	0.1187	0.1187	0.1187	0.1180	0.1181	0.1184	0.1183	0.1183	0.1186
Industry /Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors clustered by client firm in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 4B

Panel B: Type I Error sample

	TPLIndex			*TPLDummy*			*JSLIndex*			*JSLDummy*		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LiabilityRegime	0.0354***	0.0354***	0.0389**	0.1883***	0.1883***	0.2037***	0.2282***	0.2290***	0.1066	0.1825***	0.1830***	0.1021
	(0.013)	(0.013)	(0.015)	(0.054)	(0.054)	(0.063)	(0.082)	(0.082)	(0.091)	(0.062)	(0.062)	(0.069)
PostInsp		-0.0053	0.0510		-0.0019	0.0467		-0.0136	-0.4999***		-0.0124	-0.3013**
		(0.064)	(0.149)		(0.064)	(0.121)		(0.064)	(0.179)		(0.064)	(0.136)
*PostInsp**			-0.0112			-0.0556			0.5520***			0.3461**
LiabilityRegime			(0.027)			(0.118)			(0.183)			(0.137)
Observations	13,252	13,252	13,252	13,252	13,252	13,252	13,252	13,252	13,252	13,252	13,252	13,252
Pseudo R^2	0.1081	0.1081	0.1082	0.1091	0.1091	0.1092	0.1086	0.1086	0.1104	0.1086	0.1086	0.1099
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry/Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors clustered by client firm in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 4B

TABLE 3

Auditor reporting behavior (continued)

Panel C: Type I Error non-GAFN sample

	TPLIndex			*TPLDummy*			*JSLIndex*			*JSLDummy*		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LiabilityRegime	0.0111	0.0118	0.0209	0.1268*	0.1249*	0.1663**	0.1466*	0.1440*	0.0362	0.1217*	0.1188*	0.0511
	(0.017)	(0.017)	(0.019)	(0.067)	(0.067)	(0.075)	(0.082)	(0.082)	(0.091)	(0.062)	(0.062)	(0.071)
PostInsp		-0.1037	0.0776		-0.0981	0.0696		-0.0973	-0.4768***		-0.0947	-0.2890**
		(0.088)	(0.215)		(0.088)	(0.158)		(0.088)	(0.176)		(0.088)	(0.136)
*PostInsp**			-0.0365			-0.2091			0.5005***			0.2945**
LiabilityRegime			(0.040)			(0.165)			(0.189)			(0.146)
Observations	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534
Pseudo R^2	0.0711	0.0717	0.0720	0.0723	0.0727	0.0733	0.0723	0.0728	0.0755	0.0724	0.0729	0.0745
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry/Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors clustered by client firm in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 4B

I then further explore what drives the above result, that litigation risk and regulatory risk reinforce each other, but only when litigation risk is measured using damage apportionment liability regimes. On the one hand, the size of potential payouts is likely to matter more for small audit firms than large audit firms that are generally regarded to have deeper pockets that can more easily cover litigation costs. In addition, small audit firms are more likely to be named as co-defendants in lawsuits that allege financial reporting failure than large audit firms, putting smaller audit firms at higher risk of litigation (Lennox & Li [2019]). On the other hand, large audit firms with deeper pockets can have large amounts of wealth at risk in any one engagement (Dye [1993]; Franis & Krishnan [1999]; Geiger et al. [2006]; Lennox [2003]; Raghunandan & Rama [1999]; Shu [2000]). Further, large audit firms are generally also subject to more regulatory scrutiny than their small counterparts (Myers, Schmidt & Wilkins [2014]). For example, they face more frequent inspections by the PCAOB, and larger reputation concerns when inspections are deficient (e.g. Gunny & Zhang [2013]; Aobdia [2019]). It is thus an empirical question as to whether the above finding holds for small and large audit firms. Descriptive statistics show that all client-year observations of large audit firms (Big 4) are subject to strict third-party liability (*TPLDummy*-1) and joint and several liability regimes (*JSLDummy*=1). Hence, I cannot test whether large and small audit firms respond differently to incentives from regulatory and litigation risks by reporting more conservatively, when splitting on Big 4. I thus analyze whether the association between Type I error rates and the interaction between litigation and regulatory risk holds in the subsamples of GAFN and non-GAFN (i.e. Big 6 and non-Big 6 auditors). For the non-GAFN subsample, I find results that are largely consistent with the Type I error results in the full sample. As shown in Table 3, Panel C, I find that the main effect of liability regime is significant for all measures of liability regime, except *TPLIndex*. I further find that the interaction effect between *PostInsp* and *JSLIndex* and *JSLDummy* is significantly positive and jointly significant with the main effect of *PostInsp*. In the GAFN sample, I do not find a significant interaction effect between *PostInsp* and measures of liability regimes (untabulated, for brevity).

Overall, these findings show that litigation risk and regulatory risk reinforce auditor conservative reporting as measured by an increased likelihood of a Type I error, but only for litigation risk measured as damage apportionment and for non-GAFN clients that have less resources to cover large litigation costs.

4.4.2.2 Audit Fees

Using OLS regressions, I analyze whether litigation risk, regulatory risk and the interaction of these risks are associated with audit fees. As shown in Table 4, I find that audit

fees are significantly higher ($p<0.05$) for stricter third-party liability standards when using *TPLIndex,* (Columns (1)-(3)) and *TPLDummy* (Columns (4)-(6)) as a measure for third-party litigation risk and for more expansive damage apportionment standards using *JSLIndex* (Columns (7)-(9)) and *JSLDummy* (Columns (10)-(12)). Overall, this provides evidence that there is variation in audit fees from third-party litigation risk, providing support for H1b, and shows that audit fees are one channel through which audit firms manage litigation risk (e.g. Palmrose [1986]; Simunic & Stein [1996]; Venkataraman et al. [2008]). As mentioned in footnote 149, I do not intend to disentangle whether this is due to higher auditor effort or a risk premium that is charged for engagements for which auditors face higher litigation risk. I further find a strong indication that audit fees increase after PCAOB inspections in most models, as reflected in the significant positive coefficient *PostInsp*. This reflects the findings in Acito et al. [2018] and Vanstraelen and Zou [2017].

I find significantly positive coefficients ($p<0.01$) for the interaction between *LiabilityRegime* and *PostInsp* for all models, except when measuring litigation risk using TPLIndex (Columns (1)-(2)). This is a strong indication that the reaction to regulatory risk measured as the introduction of PCAOB inspections is higher when the auditor faces higher litigations risk for an audit client. This provides support for H2b and specifically for the suggestion that the effects of litigation and regulation risks on audit fees are complementary. Most control variables are significant in the expected directions, with positive coefficients for variables measuring client-specific risk, for variables measuring client complexity and for variables indicating increased audit effort. As is expected in audit fee regressions, the R-square is high and between 83.3 and 84.9 percent for the different models.

Table 4

Audit fees

	TPLIndex			*TPLDummy*			*JSLIndex*			*JSLDummy*		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	AUFee											
LiabilityRegime	0.0367***	0.0368***	0.0348***	0.0453**	0.0466**	0.0845***	0.3610***	0.3441***	0.2595***	0.2824***	0.2711***	0.2097***
	(0.005)	(0.005)	(0.006)	(0.018)	(0.018)	(0.020)	(0.029)	(0.029)	(0.030)	(0.022)	(0.022)	(0.024)
PostInsp		0.2228***	0.2415***		0.2228***	0.1589***		0.1991***	-0.0294		0.2010***	0.0437
		(0.014)	(0.031)		(0.014)	(0.023)		(0.015)	(0.040)		(0.015)	(0.030)
*PostInsp*LiabilityRegime*			-0.0038			0.0760***			0.2605***			0.1889***
			(0.006)			(0.021)			(0.042)			(0.031)
LnTA	0.4537***	0.4548***	0.4548***	0.4534***	0.4545***	0.4547***	0.4619***	0.4614***	0.4618***	0.4615***	0.4609***	0.4614***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Big4	0.1091***	0.0499	0.0488	0.1047***	0.0456	0.0531	0.2616***	0.2129***	0.2066***	0.2557***	0.2065***	0.2002***
	(0.041)	(0.041)	(0.041)	(0.040)	(0.040)	(0.040)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Leverage	0.0494***	0.0493***	0.0493***	0.0489***	0.0489***	0.0486***	0.0427***	0.0428***	0.0432***	0.0432***	0.0433***	0.0436***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
LagLoss	0.1326***	0.1347***	0.1347***	0.1337***	0.1359***	0.1361***	0.1510***	0.1526***	0.1531***	0.1501***	0.1517***	0.1522***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
ROA	-0.0565***	-0.0570***	-0.0570***	-0.0563***	-0.0568***	-0.0569***	-0.0520***	-0.0526***	-0.0524***	-0.0517***	-0.0522***	-0.0521***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
MtoB	0.0007	0.0007*	0.0007*	0.0007	0.0008*	0.0008*	0.0006	0.0007	0.0007	0.0006	0.0007	0.0007
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Restructure	-0.4952***	-0.4530***	-0.4537***	-0.4861***	-0.4441***	-0.4396***	-0.4628***	-0.4284***	-0.4272***	-0.4617***	-0.4271***	-0.4257***
	(0.140)	(0.143)	(0.143)	(0.138)	(0.141)	(0.140)	(0.138)	(0.140)	(0.140)	(0.138)	(0.140)	(0.140)
MandA	0.0983***	0.0985***	0.0984***	0.0990***	0.0993***	0.0994***	0.1028***	0.1034***	0.1028***	0.1032***	0.1038***	0.1032***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
CurrRatio	0.2766***	0.2801***	0.2800***	0.2833***	0.2868***	0.2875***	0.3048***	0.3056***	0.3051***	0.3019***	0.3027***	0.3026***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
DecYearEnd	0.0616***	0.0567***	0.0568***	0.0596***	0.0547***	0.0544***	0.0589***	0.0557***	0.0558***	0.0593***	0.0560***	0.0559***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
TaxForeign	0.2403***	0.2402***	0.2401***	0.2416***	0.2415***	0.2414***	0.2302***	0.2309***	0.2298***	0.2299***	0.2306***	0.2297***
	(0.013)	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Financing	-0.0740***	-0.0735***	-0.0735***	-0.0744***	-0.0738***	-0.0739***	-0.0819***	-0.0816***	-0.0815***	-0.0818***	-0.0815***	-0.0814***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
SpecItem	0.1495***	0.1492***	0.1492***	0.1501***	0.1498***	0.1498***	0.1559***	0.1551***	0.1550***	0.1557***	0.1549***	0.1547***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
GoingConcern	0.3146***	0.3130***	0.3130***	0.3146***	0.3131***	0.3132***	0.2719***	0.2751***	0.2738***	0.2687***	0.2721***	0.2708***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
ICMW	0.2923***	0.2705***	0.2710***	0.2872***	0.2654***	0.2623***	0.3143***	0.2882***	0.2779***	0.3138***	0.2874***	0.2768***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)
Constant	9.8404***	9.8364***	9.8284***	9.6969***	9.6935***	9.7124***	8.9992***	9.0110***	9.0961***	9.0871***	9.0935***	9.1542***
	(0.231)	(0.232)	(0.233)	(0.229)	(0.231)	(0.231)	(0.223)	(0.224)	(0.225)	(0.222)	(0.224)	(0.224)

Observations	33,563	33,563	33,563	33,563	33,563	33,563	33,563	33,563	33,563	33,563	33,563	33,563
R-squared	0.848	0.849	0.849	0.847	0.848	0.848	0.833	0.834	0.835	0.833	0.835	0.835
Industry/Audit Firm/Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors clustered by client firm in parentheses; *** p<0.01, ** p<0.05, * p<0.1; All variables are defined in Appendix 4B

4.4.2 ADDITIONAL AND SENSITIVITY ANALYSES

4.4.2.1 Combined measure

As a comprehensive measure of litigation risk, I also construct a combined measure of third-party and damage apportionment standards. I create an indicator variable $TPL_{High}\&JSL_{High}$ which equals one if both *TPLDummy* and *JSLDummy* are equal to one, and zero otherwise. This indicator variable is included in the regression analyses and compared to the baseline of engagements subject to all other combinations of third-party liability and damage apportionment standards (untabulated for brevity).[159] Descriptive statistics show that 75.19 percent (78.17 percent) of client-year observations are subject to a strict third-party and damage apportionment regime ($TPL_{High}\&JSL_{High}$) in the going concern (audit fee) sample.

Using this combined measure, I find results consistent with the first-time going concern analysis. Only the liability regime measure ($TPL_{High}\&JSL_{High}$) is significantly positive ($p<0.05$), but not the interaction effect with *PostInsp*. In the Type I error analysis, I find that both the main effect of $TPL_{High}\&JSL_{High}$ ($p<0.01$) and the interaction effect with *PostInsp* ($p<0.1$) are significantly positive, indicating that litigation and regulatory risk jointly increase auditor reporting conservatism. I further find that audit fees are significantly higher ($p<0.01$) for engagements subject to strict third-party liability and damage apportionment standards ($TPL_{High}\&JSL_{High}$) compared to other engagements. I further find a significant positive interaction effect between *PostInsp* and $TPL_{High}\&JSL_{High}$ ($p<0.01$) in the audit fee analysis, indicating that regulatory risk and litigation risk jointly increase audit fees.

4.4.2.2 Weighting of observations

To account for differences in the number of observations between different liability regimes in my sample, I use weighted regression analyses by equally weighting liability regimes, rather than weighting client observations (Choi & Wong [2007]). Using weighted regression, where weights are defined as the inverse of the number of observations per legal regime (for each measure of legal regime *TPLIndex*, *TPLDummy*, *JSLIndex* and *JSLDummy*), my inferences in all samples remain the same.

[159] I choose to only code the high-high combination of TPL and JSL regimes. When coding other combinations (High TPL/Low JSL and LowTPL/High JSL), the baseline (LowTPL/Low JSL) only constitutes 1.66% of observations in the audit fee sample, and would thus not be a good comparison group.

4.5. Conclusions and Limitations

This study sheds light on whether and how litigation risk and the interaction between litigation and regulatory risk affects auditor conservative reporting and audit fees. Specifically, this study investigates the interplay between litigation risk stemming from third-party auditor liability which varies substantially across U.S. states, and regulatory risk stemming from PCAOB inspections.

Using a financially-distressed sample of client-year observations for which auditors' third-party liability and damage apportionment standards differ across U.S. states, I find evidence that auditors are more likely to issue going concern opinions for engagements for which they face higher litigation risk. While I do not find evidence of a significant interaction effect of litigation and regulatory risk on the likelihood of going concern opinions, I do find evidence that these risks jointly increase auditor conservatism reflected in a higher likelihood of a Type I error for damage apportionment litigation risk measures. This indicates that auditors only react to high joint regulatory and litigation risk when potential payouts are high in case of litigation. This result in turn is driven by non-GAFN which have less resources available to cover large litigation payouts. I also find that audit fees are higher when auditors face higher litigation risk from auditing a certain client. More importantly, I find a positive and significant coefficient for the interaction between regulatory and litigation risk in the audit fee analysis, which further supports their complementary nature

I contribute to the literature by investigating the relation between litigation and regulatory risks and how these risks jointly influence auditor behavior. This provides insights into how various institutional forces interact to influence auditor conservative reporting and audit fees. Collectively, I find evidence suggesting that the effect of litigation and regulatory risk are complementary in the U.S. setting.

This paper is subject to several limitations. First, I investigate only specific sources of litigation and regulatory risk that can affect audit firms which assumes that other risks that affect audit quality and audit fees remain constant. Second, I only provide cross-sectional evidence on the impact of litigation risk on audit quality and fees since there are no exogenous changes in liability regime in U.S. states during the time period under investigation (2001-2009). While a changes analysis could strengthen the identification of the analyses, the number of changes in assignment of a certain liability regime to an engagement based on changes in company locations and audit firm locations are very limited which makes analyzing changes in liability regime difficult. Third, I assume that regulatory risk affecting audit firms changes

once PCAOB inspection reports are released. This assumes that audit firms do not react to PCAOB inspections prior to the release of reports to the public.

This study can be extended in multiple ways. First, future research can investigate the association between audit outcomes and other sources of litigation and regulatory risks, thus adding to the limited knowledge about how different auditor incentives interact. This is of interest since this study finds that litigation and regulatory risk are complementary, while for example Fung et al. [2017] find that PCOAB inspections and the litigation environment in an international setting are substitutes. Future studies could for example consider changes in federal litigation risk (Honigsberg et al. 2018) and the interaction with regulatory risk. Further, this study can also be seen as exploring the contextual settings under which PCAOB inspections are more or less effective. While this study investigates the effect of PCOAB inspections in different litigation environments, future research could consider whether different audit firm offices or auditors of clients in certain geographical regions react differently to PCAOB inspection commencement.

Appendices Chapter 4

Appendix 4A: Description and coding of auditor liability regimes across U.S. states

State	Third-Party Liability Standard (1993-2004) (Gaver et al, 2012)	Third-Party Liability Index (Anantharaman et al., 2016; Gaver et al., 2012; Pacini et al., 2000b)	Joint-and-Several Liability Standard (2001-2009) (ATRA, 2014)	Joint-and-Several Liability Index (Anantharaman et al., 2016)
Alabama	Near Privity (1993) Restatement (typical view) (1994-2004)	3 (1993) 5 (1994-2004)	Full joint-and-several liability	1
Alaska	Restatement (restrictive view)	4	Proportionate Liability	0
Arizona	Restatement (typical view) (1993-2004)	5	Proportionate Liability	0
Arkansas	Near Privity (1993-1994) Privity (1995-2004)	3 (1993-1994) 1.5 (1995-2004)	Modified joint-and-several liability (2003-2009) Full joint-and-several liability (2001-2002)	0.5 (2003-2009) 1 (2001-2002)
California	Restatement (restrictive view)	4	Full joint-and-several liability	1
Colorado	Restatement (typical view)	5	Proportionate Liability	0
Connecticut	Near Privity (1993-1997) Near Privity (1998-2004)	2.5 (1993-1997) 3.5 (1998-2004)	Full joint-and-several liability	1
Delaware	Restatement (typical view)	5	Full joint-and-several liability	1
District of Columbia	Privity	2	Full joint-and-several liability	1
Florida	Restatement (typical view)	5	Proportionate Liability (2006-2009) Modified joint-and-several liability (2001-2005)	0 (2006-2009) 0.5 (2001-2005)
Georgia	Restatement (typical view)	5	Proportionate Liability (2005-2009) Modified joint-and-several liability (2001-2004)	0 (2005-2009) 0.5 (2001-2004)
Hawaii	Restatement (typical view)	5	Full joint-and-several liability	1
Idaho	Near Privity	2.5	Proportionate Liability	0
Illinois	Near Privity	3.5	Full joint-and-several liability	1
Indiana	Near Privity	2.5	Proportionate Liability	0

Iowa	Restatement (typical view)	5	Modified joint-and-several liability	0.5
Kansas	Near Privity	2.5	Proportionate Liability	0
Kentucky	Restatement (typical view)	5	Proportionate Liability	0
Louisiana	Restatement (typical view)	5	Proportionate Liability	0
Maine	Restatement (typical view)	5	Full joint-and-several liability	1
Maryland	Near Privity	2.5	Full joint-and-several liability	1
Massachusetts	Restatement (restrictive view)	4	Proportionate Liability	0
Michigan	Restatement (typical view) (1993-1995) Restatement (restrictive view) (1996-2004)	5 (1993-1995) 4 (1996-2004)	Proportionate Liability	0
Minnesota	Restatement (expansive view)	7	Modified joint-and-several liability	0.5
Mississippi	Reasonable Foreseeability	7.5	Proportionate Liability (2004-2009) Modified joint-and-several liability (2001-2003)	0 (2004-2009) 0.5(2001-2003)
Missouri	Restatement (typical view)	5	Modified joint-and-several liability	0.5
Montana	Near Privity	3	Modified joint-and-several liability	0.5
Nebraska	Privity	2	Full joint-and-several liability	1
Nevada	Restatement (typical view)	5	Proportionate Liability	0
New Hampshire	Restatement (typical view)	5	Modified joint-and-several liability	0.5
New Jersey	Reasonable Foreseeability (1993-1994) Near Privity (1995-2004)	9 (1993-1994) 2.5 (1995-2004)	Modified joint-and-several liability	0.5
New Mexico	Restatement (typical view)	5	Proportionate Liability	0
New York	Near Privity	2.5	Full joint-and-several liability	1
North Carolina	Restatement (typical view)	5	Full joint-and-several liability	1
North Dakota	Restatement (typical view)	5	Proportionate Liability	0
Ohio	Restatement (restrictive view)	4.5	Full joint-and-several liability (2001-2002) Modified joint-and-several liability (2003-2009)	1 (2001-2002) 0.5 (2003-2009)
Oklahoma	Restatement (typical view)	5	Modified joint-and-several liability	0.5

Oregon	Restatement (typical view)	5	Modified joint-and-several liability	0.5
Pennsylvania	Privity	1	Modified joint-and-several liability (2002-2004) Full joint-and-several liability (2001) (2005-2009)	0.5 (2002-2004) 1 (2001) (2005-2009)
Rhode Island	Restatement (typical view)	5	Proportionate Liability	0
South Carolina	Restatement (typical view)	5	Full joint-and-several liability (2001-2004) Modified joint-and-several liability (2005-2009)	1 (2001-2004) 0.5 (2005-2009)
South Dakota	Restatement (typical view)	5	Modified joint-and-several liability	0.5
Tennessee	Restatement (typical view)	5	Proportionate Liability	0
Texas	Reasonable Foreseeability	7.5	Modified joint-and-several liability	0.5
Utah	Near Privity	2.5	Proportionate Liability	0
Vermont	Restatement (typical view)	5	Proportionate Liability	0
Virginia	Privity	1	Full joint-and-several liability	1
Washington	Restatement (typical view) (1993-1997) Restatement (typical view) (1998-2004)	5 (1993-1997) 6 (1998-2004)	Full joint-and-several liability	1
West Virginia	Restatement (typical view)	5	Modified joint-and-several liability	0.5
Wisconsin	Reasonable Foreseeability	7.5	Modified joint-and-several liability	0.5
Wyoming	Restatement (typical view) (1993-1994) Near Privity (1995-2004)	5 (1993-1994) 3 (1995-2004)	Proportionate Liability	0

Appendix 4B: Variable Definitions and Data Sources

Variable	Definition	Data Source
Variables of Interest and dependent variables		
TPLIndex	Is an index measuring the extent to which auditors can be held liable for negligence by third-party non-clients, with scale form 1 (indicating the least strict standard) to 9 (indicating the strictest standard). The coding foreach state is shown in Appendix 4A.	Anantharaman et al. (2016); Gaver et al. (2012); Pacini et al. (2000b).
TPLDummy	Is an indicator variable equal to 1 if the third-party liability standards restatement or reasonable foreseeability applies (TPLIndex>=4), and 0 in case the standards of privity or near-privity apply.	
JSLIndex	Is an index measuring the damage apportionment rule in case of a lawsuits against the auditor and is set to 0 in case of proportionate liability, 0.5 in case of modified joint-and-several liability (JSL), and 1 in case of full JSL. The coding for each state is shown in Appendix 4A.	Anantharaman et al. (2016); ATRA (2014).
JSLDummy	Is an indicator variable equal to 1 if the damage apportionment rule is full JSL (JSLIndex=1), and 0 otherwise.	
$TPL_{High}\&JSL_{High}$,	Is a dummy variable equal to 1 if the third-party liability standards restatement or reasonable foreseeability apply (TPLIndex>=4) and the damage apportionment rule is full JSL (JSLIndex=1), 0 otherwise.	Anantharaman et al. (2016)
PostInsp	Is an indicator variable equal to 1 for client-year observations in the years after their auditor received a PCAOB inspection reports, but before the next report is released.	PCAOB
GCFirst	Is an indicator variable equal to 1 if the auditor issues a first-time going concern opinion to the client in year t, and 0 otherwise.	Audit Analytics
TypeI	Is an indicator variable equal to 1 if the auditor issues a first-time type I error to the client in year t, and 0 otherwise.	Audit Analytics; Compustat
AUFee	Is the natural logarithm of total audit fees.	Audit Analytics
Control variables – going concern model		
Altman	Altman's Z-Score representing the client's risk of bankruptcy in fiscal year t, calculated following Altman (1968) as: Altman = A x 3.3 + B x 0.99 + C x 0.6 + D x 1.2 + E x 1.4 Where, A=operating efficiency (EBIT/AT); B=total asset turnover (SALE/AT); C=leverage ratio (CSHO*PRCC_F/LT); D=asset liquidity (WCAP/AT); E=earnings power (RE/AT).	Compustat
Loss	An indicator variable equal to 1 if income before extraordinary items (IB) is negative in year *t*, and 0 otherwise.	Compustat
LagLoss	An indicator variable equal to 1 if income before extraordinary items (IB) is negative in year *t-1*, and 0 otherwise.	Compustat
ROA	Return on Assets, defined as income before extraordinary items (IB) in year *t*/total assets (AT).	Compustat
CFO	Is cash flow from operations in year *t* (OANCF), scaled by total assets (AT).	Compustat
Leverage	Is the leverage ratio calculated as long-term debt (DLC+DLTT) in year *t*, scaled by total assets (AT).	Compustat
ChLeverage	Is the change in leverage ratio (Leverage) from year *t-1* to *t*.	Compustat
CashRatio	Is the cash ratio calculated as cash and short-term equivalents (CHE) in year *t*, scaled by total assets (AT).	Compustat
FutEquityIssu	Is an indicator variable equal to 1 if the client issues equity (SSTK) in year *t+1*, and 0 otherwise.	Compustat
FutDebtIssu	Is an indicator variable equal to 1 if the client issues long-term debt (DLTIS) in *t+1*, and 0 otherwise.	Compustat

LnTA	Is the natural logarithm of total assets (AT) in year *t*.	Compustat
Big4	Is an indicator variable equal to 1 if the client is audited by a Big 4 audit firm in year *t*, and 0 otherwise.	Audit Analytics
FirstYrAudit	Is an indicator variable equal to 1 if the client is audited by a new audit firm in year *t*, and 0 otherwise.	Audit Analytics
ReportLag	Is the audit report lag, measured as the difference in the number of days between the client's fiscal year end-date in year *t* and the auditor's opinion date in year *t*.	Audit Analytics
Control variables – audit fee model (omitted if defined above)		
MtoB	Is the market to book value in year *t*, calculated as the market value (CSHO*PRCC_F), scaled by total common equity (CEQ).	Compustat
Restructure	Is an indicator variable equal to 1 if the client is restructuring in year *t*, identified as non-zero discontinued operations (DO) or restructuring expenses (RCP), and 0 otherwise.	Compustat
MandA	Is an indicator variable equal to 1 if the client is involved in an M&A transaction in year *t*, identified as positive acquisition cash flows (AQC), and 0 otherwise.	Compustat
CurrRatio	Is the current ratio in year *t*, calculated as current assets (ACT) scaled by total assets (AT).	Compustat
DecYearEnd	Is an indicator variable equal to 1 if the client's fiscal year ends in December (FYR=12) in year *t*, and 0 otherwise.	Compustat
TaxForeign	Is an indicator variable equal to 1 if the client pays foreign income taxes (TXFO) in year *t*, and 0 otherwise.	Compustat
Financing	Is an indicator variable equal to 1 if the percentage increase in long-term debt (DLTT) in year *t* is at least 20% or the number of common shares outstanding (CSHO) in year *t* increases by 10%, and 0 otherwise.	Compustat
SpecItem	Is an indicator variable equal to 1 if the client reports special items (SPI) in year *t*., and 0 otherwise.	Compustat
GoingConcern	Is an indicator variable equal to 1 if the client receives a going concern opinion from their auditor in year *t*, and 0 otherwise.	Audit Analytics
ICMW	Is an indicator variable equal to 1 if the client receives an internal control material weakness report from their auditor in year *t*, and 0 otherwise.	Audit Analytics

Chapter 5 – Conclusion

5.1 Summary of main findings

Multiple different engagement-specific, audit firm-specific and contextual factors, as well as incentives, affect auditors' supply of audit quality and other audit outcomes (IAASB [2014]). In this dissertation I focus on engagement-specific and contextual factors, including inputs to the audit, auditor incentives, and the institutional environment. In the three studies of this dissertation, I examine how audit outcomes are associated with the extent of component auditor involvement in group audits, the commencement of public oversight worldwide, as well as the interaction between regulatory and litigation risk.

In the first study (Chapter 2), I investigate the determinants of component (network and/or unaffiliated) auditor involvement in MNE group audits, and the association between the involvement and audit quality and fees. To explore this question, I make use of the Australian disclosures of audit fees paid to component (network and/or unaffiliated) and principal auditors in annual reports of listed companies. I find that principal auditor characteristics, and MNE complexity and internationalization are associated with likelihood and extent of involvement of component auditors. I further find that likelihood of network (unaffiliated) component auditors is positively (negatively) associated with Big 4 and large non-Big 4 principal auditors, and that size, and degree of internationalization of MNEs are only associated with network component auditors. I then find that component auditor involvement is negatively associated with audit quality and positively associated with audit fees, regardless of type of component auditor. Lastly, while I find that unaffiliated component auditor involvement decreased after the revision of the group audit standard ISA 600, audit quality or audit fees did not change in response.

In the second study (Chapter 3), I investigate the association between audit quality and the commencement of national inspections of public oversight bodies worldwide. To examine this question, I use a large international sample of publicly listed companies audited by audit firms that are subject to inspections of national public oversight boards of 50 countries. Using a difference-in-differences design exploiting the staggered adoption of inspections internationally, I find that audit quality increases after inspection commencement. I further find that the increase in audit quality after inspection commencement is higher for large (Big 4) auditors, compared to small (non-Big 4) auditors. Since different public oversight boards were designed with different working approaches to inspections, disclosure of inspection results and enforcement ability, I document these differences. Based on these descriptives, I find that the

effect of inspection commencement on audit quality is conditional on public oversight boards disclosing inspection results.

In the third study of this dissertation (Chapter 4), I investigate how two auditor incentives, litigation and regulatory risk, are jointly associated with auditor conservative reporting behavior and audit pricing. I measure differences in litigation risk for auditors across different U.S. states, and regulatory risk as the start of PCAOB inspections for the different audit firms. I exploit the U.S. setting which features variation in auditor litigation risk across different U.S. states, both in terms of third-party and damage apportionment standards which capture different dimensions of litigation risk. Further, regulatory risk increased during the sample period 2001-2009 with the introduction of public oversight over the audit profession, and specifically the introduction of inspections of audit firms at different time periods. Using these empirical proxies for litigation and regulatory risk, I find evidence these risks jointly increase audit fees, and conservative auditor reporting. Further, this effect is attributed to non-global audit firm networks (non-GAFN). This suggests that litigation and regulatory risks reinforce each other, rather than acting as substitutes.

5.2 Contribution and implications

Overall, the three chapters of this dissertation contribute to the body of knowledge about engagement-specific and contextual factors that influence audit outcomes. The research questions and settings that I examine in this dissertation are timely and of concern to the audit profession, regulators and standard-setters, and the public at large. The contribution of each study is discussed in the respective chapters in detail. I reiterate the important points here.

The first study (Chapter 2) is a very timely topic since regulators, standard-setters and practitioners worldwide are concerned with the level of audit quality of multinational group audits (e.g., IFIAR [2018], PCAOB [2016], [2017], IAASB [2015a], [2015b], [2019]). These audits are of particular concern when component auditors, especially foreign or unaffiliated, are involved. While this is clearly a topic of concern, there is to date only scant empirical research on group audits, primarily due to data constraints. This study is one of the first studies that documents audit quality and fee consequences of group audits. This is particularly interesting for regulators and standard-setters who are under pressure to address this issue. Our study shows that despite the IAASB's attempt to increase the work of the principal auditor with the revision of ISA 600, audit quality problems remain even though the involvement of unaffiliated (but not network) auditors decreased. These results can be informative for the PCAOB and IAASB as they aim to revise their group audit standards (see footnotes 11 and 12

of this dissertation for current initiatives of these standard-setting bodies). This study, based on public disclosures of component auditor involvement, also shows that users of group financial statements in settings outside Australia might benefit from more public disclosure on component auditor involvement.

Study two (Chapter 3), is the first comprehensive investigation into the effect of inspection commencement in settings outside the U.S., where PCAOB inspections have been investigated widely. I collect descriptives on the design of public oversight boards that show vast differences. Since public oversight boards have varying working approaches, inspection disclosure decisions and enforcement ability, it is unclear whether the U.S. findings can be extrapolated to other settings. This study generalizes the findings of the various U.S. studies that audit firm inspections by independent public oversight boards improve audit quality, however, it is contingent on inspection disclosure decisions of public oversight boards. These findings and descriptives can be useful for regulators that have ongoing discussions about mutual recognition of public oversight across countries, as well as for the (re)design of public oversight boards to increase their effectiveness in safeguarding the public interest. This study is also of interest to investors who can benefit from understanding the effectiveness of different public oversight designs.

In the third study (Chapter 4), I investigate the interaction between two auditor incentives (litigation and regulatory risk) and the association with audit outcomes. While the literature has investigated various different auditor incentives separately, there is little knowledge about how different risks interact, and which contextual factors or institutions determine auditor behavior and outcomes (Francis [2011]; Minutti-Meza [2014]). I find that litigation and regulatory risks reinforce each other and affect auditor reporting conservatism and audit fees jointly. However, increased conservatism, rather than improved audit quality, and higher audit fees, which are not necessarily reflective of higher audit effort, are not socially desirable. While more research is needed, this finding should be of interest to investors, regulators and society. Further, this study can be seen as exploring the settings (i.e. litigation environment) under which PCAOB inspections are more or less effective. This should further be of interest to regulators and investors.

5.3 Limitations and future research

As with any study, this dissertation is subject to certain limitations, which are also discussed in each of the separate studies. In this section, I briefly discuss the common limitations of each study, and how these limitations give rise to future research opportunities.

First, all three studies rely on empirical proxies for various theoretical constructs which are inherently difficult to measure or can be noisy. First and foremost, the measures of audit quality used in study one and two (earnings and revenue management and timely loss recognition), only capture certain aspects of audit quality (DeFond and Zhang [2014]). However, in the international settings in which these two studies are conducted, other measures are either not available or are not comparable across settings. Both studies use a number of different measures to account for the fact that there is likely some measurement error in each one of these measures. Furthermore, the measure of auditor conservatism in study three is restricted to financially distressed firms only.

Second, while the research design of each study has been carefully constructed, isolating the effect of the variables of interest on audit outcomes is challenging. In each study, I attempt to rule out confounding effects in different ways. In study one, I address this by investigating changes in component auditor involvement and address selection bias using a Heckman model. In study two, I apply a difference-in-differences analysis exploiting the staggered commencement of inspections. In study three, I identify changes in regulatory risk through the introduction of inspections. However, I can only identify cross-sectional differences in litigation risk which poses a research design challenge.

Third, for each study, I choose a specific setting that allows me to investigate the research question. For example, in study one, I focus on the Australian setting that allows me to observe component auditor disclosures. In study three, I focus on the US setting where differences in state liability regimes can be observed, while abstracting away from other litigation risks. For these two studies, generalizability of results to other settings and institutional environments can be questioned. In study two, I use the international setting to investigate the effect of commencement of inspections worldwide, including the effect of differences in inspection regimes. While I find an overall effect of inspection commencement on audit quality, the effect is subject to, for example, differences in inspection characteristics. Hence, the findings might not fully generalize to all settings.

Future research can address these different limitations as more data become available. For example, as data on group audits become available in other settings, such as is the case in the U.S. with component auditor identification available on the PCAOB's Form AP since 2017, more research can be conducted on the relationship between group audits and audit quality. These other settings might also allow the use of different audit quality measures when investigating the relation between group audits and audit quality. Further, while the second study generalizes the finding that inspections increase audit quality to a large international

sample, we only find that this holds for public oversight boards with certain characteristics. Future research can further investigate the effects of the different oversight regimes in different jurisdictions (country-by-country). In this way, the studies could also take into account the results of inspections, if this is public knowledge, rather than the effect of inspection commencement. Further, study three can be extended by considering the interaction between different auditor incentives, other than litigation and regulatory risk, or by considering other sources of litigation and regulatory risks and how these affect audit outcomes.

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Valorization Addendum

A functioning capital market is the basis of efficient allocation of resources, economic growth, and ultimately a prosperous society. High-quality and reliable financial information that investors have confidence in is the backbone of functioning capital markets. Auditing is vital for enhancing the quality and credibility of financial statements and for building confidence of users of financial information. Auditing is thus underlying the functioning of capital markets. However, the value of auditing is derived from its quality, since only a quality audit can enhance financial statement quality and build credibility in capital markets. Audit quality is thus vital for the functioning of capital markets. Audit quality is influenced by engagement-specific circumstances and the context in which audits take place.

This dissertation investigates whether and how different institutional and engagement-specific factors affect audit quality and audit outcomes. Broadly, investigating the effect of these factors on audit quality and other outcomes is of interest to users of audited financial statements, the audit profession, regulators, standard-setters and the public. All three studies of this dissertation address topics that are of current and continued interest to all stakeholders. The valorization opportunities for each chapter are addressed in the following paragraphs.

The first study of this dissertation (Chapter 2) investigates the audit quality of group audits of MNEs. Given the important role that MNEs play for the world economy and their worldwide reach, audit quality is of high importance for those companies and users of their financial information. Audit failures of group audits of MNEs have wide reaching consequences for investors and the audited companies. Examples of these major international failures are Parmalat, Royal Ahold, Satyam Corporation, and, more recently, BT. Furthermore, both regulators and standard-setters are concerned about the quality of group audits, based on inspection results of risk-based samples that have identified various shortcomings in group audits, particularly those involving component auditors and foreign component auditors (e.g., Doty [2011], [2017], IFIAR [2018]). The first chapter empirically documents audit quality and audit fee consequences for group audits of MNEs. The study shows that audit quality problems are prevalent in group audits involving component auditors, regardless of whether the component auditor is part of the network of the principal auditor or unaffiliated. The study further shows that even though standard-setters have revised the group auditing standard ISA 600, audit quality problems in group audits remain. The insights from this large-scale study are therefore of interest to standard-setters in their endeavor to improve audit quality. In particular, standard-setters that are currently revising the group audit standard (both the PCAOB and the

IAASB have current projects on their group audit standards) can benefit from the insights of this study. Users of group financial statements should be aware of audit quality problems prevalent in group audits. Further, if disclosure about involvement of component auditors is available (e.g. through Form AP in the U.S., or in annual reports of Australian listed companies), investors would be able to use this information to evaluate audit quality of group financial statements. Regulators can thus use the insights from this study when inspecting group audits and evaluating their quality, and for evaluating the need for disclosures about involvement of component auditors in group audits which users of group financial statements can benefit from. Audit practitioners can use the insights of this study to address group audit quality problems when component auditors are involved, regardless of the type of component auditor (network or unaffiliated).

The second study of this dissertation (Chapter 3) investigates one of the most profound changes in audit regulation in the last decades, the installment of public oversight of audit firms, replacing a system of self-regulation of the audit profession. Public oversight of audit firms, including regular inspection systems, was installed to counter the loss of confidence of investors in audit quality and capital markets following a number of high-profile scandals, e.g. Enron. While the US has been frontrunner in this development, public oversight boards were installed in many other jurisdictions worldwide. However, national public oversight boards have developed different characteristics in the design of inspection systems related to their work approach, disclosures of inspection results and enforcement ability. The second study describes these differences in inspection systems and evaluates changes in audit quality after commencement of inspections. The study finds evidence of audit quality improvements after commencement of inspections but shows that these improvements depend on disclosure of inspection results. These descriptives and results are of interest to public oversight boards and other regulators that have ongoing discussions about mutual recognition of public oversight across countries. Further, the results are interesting for the (re)design of public oversight boards to increase their effectiveness in safeguarding the public interest. For example, many EU countries have redesigned or established new public oversight boards recently. This study is also of interest to investors who can benefit from understanding the effectiveness of different public oversight designs for safeguarding audit quality.

The third study of this dissertation (Chapter 4) investigates the relation between litigation and regulatory risks and how these risks jointly influence auditor behavior. This provides insights into how various institutional forces interact to influence auditor conservative reporting and audit fees. This study finds evidence suggesting that the effect of litigation and

regulatory risk are complementary in the U.S. setting. This study is of interest to regulators who should be aware that any regulation, such as inspections, imposed on audit firms will not exist in isolation but might have different effects in different contexts such as in different litigation environments. Given the empirical setting, this study also explores the settings under which PCAOB inspections are more or less effective which is of further interest to regulators. This study should also be of interest to investors and the public who want to evaluate the potential effectiveness of audit regulation in different contexts and litigation environments. Investors and the public should be aware that joint risk from litigation and regulation can increase auditor reporting conservatism, rather than improve audit quality, and increase audit fees, which might not be reflective of higher audit effort. This result is not socially desirable.

Overall, the findings of this dissertation shed light on engagement-specific and contextual factors that influence audit outcomes. The different research questions in this dissertation are of concern to regulators, standard-setters, practitioners and the public at large and are timely topics that are under current or continued discussion.

Curriculum Vitae

Ulrike Thürheimer was born on May 22nd, 1989, in Oettingen i. Bay., Germany. She studied International Business with major in Accounting at Maastricht University and the Hong Kong University of Science and Technology and received her Bachelor of Science degree in 2013. She continued her Master studies at Maastricht University, completing her Master of Science degree in Business Research (cum laude) in 2015. In September 2015, she joined the PhD program of the department of Accounting and Information Management at Maastricht University. During her doctoral studies, she was a visiting PhD student at the University of New South Wales (Australia), in 2017, 2018 and 2019, and doctoral research fellow at the Tuck School of Business at Dartmouth College (U.S.) in 2018-2019. Her work was presented at various international conferences such as the PCAOB/JAR conference on Auditing and Capital Markets 2017 in Washington D.C., the UTS Australian Summer Accounting Conference 2018 in Sydney, the EAA Doctoral Colloqium 2018 in Varese during which she was selected as the EAA representative to the AFAANZ Doctoral Symposium 2018, the EAA Annual Congress 2019 in Paphos, and the International Symposium on Auditing Research (ISAR) 2019 in Boston. She is co-recipient of three grants from the Foundation for Auditing Research in 2016, 2017 and 2018. As of April 2020, she will continue her academic career as a Lecturer at the School of Accounting of the University of New South Wales (UNSW), in Sydney, Australia.