The use and characteristics of component auditors: Implications from U.S. Form AP filings

Jenna J. Burke
Assistant Professor
University of Colorado Denver
Email: jenna.j.burke@ucdenver.edu

Rani Hoitash
John E. Rhodes Professor of Accountancy
Bentley University
Email: rhoitash@bentley.edu

Udi Hoitash
Lilian L. and Harry A. Cowan Research Professor
Northeastern University
Email: u.hoitash@northeastern.edu

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ABSTRACT

This paper investigates the common, yet previously opaque, practice of using non-U.S. audit firms (commonly referred to as component auditors) to conduct portions of audit work for U.S. public companies. Since the U.S. lead auditor ultimately accepts full responsibility for the resulting audit opinion, regulators have expressed concern for the transparency and quality of audits using component auditors. Employing data disclosed in the newly-mandated PCAOB Form AP, we answer several questions that could not previously be examined. We find that component auditor use is most common amongst large clients with complex international operations. Unexpectedly, we do not find the mere use of component auditors is detrimental to audit outcomes, rather, the *amount* of work conducted by component auditors is associated with lower audit quality (i.e., higher likelihood of restatement), longer audit delay, and higher audit fees. Further, using hand-collected data, we find that not all component auditors are created equal and that only work performed by less competent component auditors and by those facing greater coordination and communication challenges is associated with adverse audit outcomes. However, we find that competent component auditors can alleviate coordination and communication challenges. Overall, these findings suggest that work performed by component auditors is not uniformly detrimental and that PCAOB Form AP disclosures achieve their objective of increased transparency, as they are useful for assessing the potential for adverse audit outcomes.

Keywords: PCAOB, Form AP, component auditor, group audit, audit quality, audit fees, audit delay

JEL Classification Codes: M42, G18, G28, F0

INTRODUCTION

This paper explores the use of non-U.S. audit firms, commonly referred to as component auditors, on the audits of U.S. public companies.[1] Lead U.S. auditors, who ultimately accept full responsibility for the resulting audit opinion, often utilize component auditors to conduct audit work in countries where clients have significant operations (e.g., Hanes 2013). The Public Company Accounting Oversight Board (PCAOB), which is tasked with monitoring auditors of U.S. listed companies, now requires details of this common practice to be disclosed in Form AP for each public company audit report issued after June 30, 2017. Combined, our data suggest that component auditors are responsible for auditing approximately six trillion dollars of U.S. public company assets.[2] Before this disclosure requirement, investors and other interested parties were largely unaware of the involvement of component auditors in U.S. audits, nor their identity or the extent of work they conduct. This information is indicative of potential coordination and communication challenges faced in the audit process (e.g., Downey and Bedard 2018a; Hanes 2013; Sunderland and Trompeter 2017), which may adversely impact audit outcomes.

Amidst the globalization of U.S. public companies, component auditor use by U.S. lead auditors is increasingly prevalent in countries where clients have significant operations. For example, Monsanto, an agricultural biotechnology company that sells its products in over 100 countries, is audited by Deloitte's St. Louis, Missouri office. To gather sufficient evidence to support the audit opinion, Deloitte employs five component auditors, including, amongst others,

[1] PCAOB standards use the term "other accounting firm" to refer to public accounting firms that participate in the audit other than the firm signing the audit report. To maintain consistency with prior literature (e.g., Carson et al. 2018; Czerney, Schmidt, and Thompson 2014; Downey and Bedard 2018a) and for expositional reasons, we refer to these firms as "component auditors" throughout this paper.

[2] The total assets audited by component auditors is an approximation based on the percentage of total audit hours conducted by component auditors. When reporting this percentage in Form AP, the lead auditor can report either an exact percentage or a predefined range (e.g., "5 percent to less than 10 percent of total audit hours, "10 percent to less than 20 percent of total audit hours," etc.). Nearly 97 percent of Form AP filings report this information as a range.

its affiliates in Argentina, Brazil, and Mexico to conduct 20 to 45 percent of the total audit hours. While these affiliates operate under the Deloitte global brand, they have varied professional standards, familiarity with U.S. audits and the client's industry, and are located in countries with vastly different characteristics than the U.S., including cultural, language, and time zone differences. Motivated by examples like this and using Form AP disclosures for a broad sample of U.S. public companies, we examine factors associated with component auditor use and investigate whether the use, extent of use, and characteristics of these component auditors and their locations are associated with variations in audit outcomes.

In our sample of 3,675 unique U.S. public companies, 37.6 percent use at least one component auditor. This suggests that component auditor use is a prevalent phenomenon in the U.S., which prior literature has been unable to explore.[3] Therefore, we first examine factors associated with the use of component auditors. We find that client size, foreign operations, foreign subsidiaries, geographic and business segments, and accounting reporting complexity are positively associated with the likelihood of component auditor use. Interestingly, we do not find company performance or auditor type (i.e., Big 4 vs. non-Big 4) to be significant. These results illustrate that the use of component auditors is often unavoidable for clients with complex international operations.

Next, we investigate the impact of U.S. component auditor use on audit outcomes. When proposing Form AP, the PCAOB cited inspection findings that highlight the coordination and communication challenges associated with managing diverse teams of auditors in multiple

[3] Before this mandatory disclosure requirement, prior literature was not able to focus on U.S. component auditor use. Instead, a concurrent paper by Carson et al. (2018) uses data from Australia and Dee et al. (2015) focus on *disclosure* of component auditor use in the U.S. We note that the Australian audit market and associated component auditor disclosure has several important differences from the U.S. and that reliance on past U.S. disclosure requirements could have resulted in as much as 95 percent of engagements using component auditors not being identified. Therefore, it is important to examine U.S. component auditor use and its implications in the Form AP era.

countries (PCAOB 2017; Doty 2016). While there are also advantages to using component auditors (e.g., overcoming jurisdictional hindrances, reducing labor costs, leveraging local expertise, etc.), we predict that component auditor use is associated with adverse audit outcomes. Surprisingly, when comparing engagements that use and do not use component auditors, we only find a significant difference in audit fees (i.e., significantly higher for engagements using component auditors). Audit quality and audit delay do not significantly differ based solely on this dichotomous distinction. This contrasts with limited sample findings that the disclosure of component auditor use is associated with lower audit quality (Dee et al. 2015). One plausible explanation for this contrast is that component auditors examined in Dee et al. (2015) were small firms with limited experience on U.S. audits.[4]

We next investigate whether the extent of component auditor use, which was previously not available in the U.S. and proxies for the materiality of their work to the resulting audit, is associated with adverse audit outcomes. Within a sample of 1,381 engagements that use component auditors, an average audit engagement employs 3.7 different component auditors who conduct 18.3 percent of total audit hours. Using this information, we are able to distinguish, for example, Monsanto's use of five component auditors conducting 20 to 45 percent of audit hours from Chipotle's use of only one component auditor (i.e., different number), and from Microsoft's use of five component auditors that together conduct less than 10 percent of the audit (i.e., different percentage). Consistent with the component auditor use indicator, we generally do not find significant associations between the number of component auditors and audit outcomes. In

[4] Specifically, the Dee et al. (2015) sample of 149 issuers disclosing component auditor use are identified using a requirement that PCOAB registered audit firms who do not serve as lead auditors on an SEC issuer, list the audits in which they substantially (i.e., responsible for more than 20 percent of the audit) participate in their Form 2 annual report. Any component auditor who also serves as a lead auditor or conducts less than 20 percent of the work, both of which are common, would either not appear in their sample or could be misclassified in the no disclosure group.

contrast, we find that the percentage of audit hours conducted by component auditors is associated with a higher likelihood of restatements, higher audit fees, and longer audit delays.[5] Taken together, these results highlight that the expected adverse outcomes are generally driven by the *amount* of work conducted by component auditors, rather than the number of component auditors used.

Since U.S. Form AP, unlike disclosures in other countries, requires identification of component auditors conducting significant audit work, we are uniquely able to explore whether certain characteristics of component auditors used exacerbate or mitigate the adverse audit outcomes observed.[6] For instance, the U.S. lead auditor and component auditors often operate in environments with different business practices, languages, cultural norms, and professional training and certifications (e.g., Hanes 2013; Franzel 2016; Sunderland and Trompeter 2017). Working with component auditors in certain locations can generate undue coordination and communication challenges, which may exacerbate the potential for adverse audit outcomes. Conversely, when managing these engagements, the lead auditor is expected to ensure that component auditors possess the appropriate independence, competence, and capabilities to serve on the engagement (PCAOB 2010). This suggests that work performed by competent component auditors may not result in adverse audit outcomes.

We identify 293 unique component auditors that operate in 69 different countries and conduct component audit work for an average of five U.S. clients each. We proxy for coordination and communication challenges associated with the country of operation as well as the competence

[5] Although we recognize that the predicted audit outcomes are jointly impacted by innate client characteristics and the audit process, PCAOB inspections strongly suggest that audit quality issues on component auditor engagements are incremental to the financial reporting issues at these companies. For example, in several instances the PCAOB reported that component auditors failed to perform appropriate audit procedures and misrepresented their work to the lead engagement partner (PCAOB 2018).

[6] Specifically, any component auditor individually contributing five percent or more of total audit hours must be separately listed and identified by name.

of these component auditors and find significant variation. For example, 39.2 percent experience an almost eight-hour time zone difference from the U.S. lead auditor and 22.2 percent have relevant industry experience. In multivariate analyses, we utilize this information to construct two distinct measures of coordination and communication challenges, the country's English language proficiency and time zone difference from the lead auditor. We find that adverse audit outcomes are limited to work conducted by component auditors located in countries with low English language proficiency and large time zone differences. We also employ two distinct measures of competence using hand-collected data on the number of CPAs employed by component auditors and component auditor experience in the client's industry. Across both competence proxies, we find that significant associations with adverse audit outcomes are mostly attributed to work conducted by less competent component auditors. These results demonstrate that characteristics of component auditors and their location, which have not been examined in other settings, are important for predicting variations in audit outcomes.

Since the need to use component auditors appears structural, it is unlikely that lead auditors can avoid engaging component auditors in countries with the aforementioned coordination and communication challenges. In additional analyses, we identify a potential alleviating factor whereby employing competent component auditors in countries with these challenges can mitigate adverse audit implications. Combined, our results suggest that lead auditors can overcome challenges associated with these environments by ensuring component auditor teams are sufficiently competent.

We address alternative explanations for our results in several ways. First, we employ propensity score matched samples to further control for observable client characteristics that determine the likelihood and extent of component auditor use, and find consistent results. Another

alternative explanation is that management in certain countries, captured by our coordination and communication proxies, are more likely to engage in earnings management irrespective of audit quality (e.g., Dyreng, Hanlon, and Maydew 2012). The aforementioned additional analysis shows that the competence of component auditors continues to matter even within these countries, suggesting that our results can be attributed to component auditor influence on audit quality. To reduce the concern that client complexity drives our results, we control for multiple measures of firm complexity throughout our analysis. We also examine whether our auditor competence results are driven by complexity (i.e., that more competent component auditors are assigned to less complex clients with a lower likelihood to experience financial reporting issues). We do not find this to be the case, which again demonstrates that the competence results are due to component auditor characteristics and not innate client characteristics.

Our study contributes to auditing research in several ways. This is the first study to use new Form AP data to comprehensively examine the use, extent of use (i.e., number used and percentage of work conducted), and characteristics of component auditors by U.S. lead auditors. This new data importantly allows insight into the audit team's judgment of the materiality of foreign operations to the financial statements and resulting audit, which other measures, such as the existence of foreign operations or the number of foreign subsidiaries, are unable to capture.

We find that structural characteristics of the client such as size, complexity, and foreign operations, rather than client performance or auditor type, explain most of the variation in the use of component auditors. We find that a dichotomous variable capturing the use of component auditors is not significantly associated with audit outcomes, which differs from prior literature that examines U.S. component auditor disclosure (Dee et al. 2015). Rather, we observe that within firms that use component auditors, the *amount* of work conducted by component auditors is

associated with several adverse audit outcomes. These contrasting findings underscore the importance of understanding component auditor use in the new Form AP information environment. Finally, since the identity of component auditors that are involved in U.S audits is now disclosed in the new Form AP, we are also able to manually collect other information on component auditors, including their competence and coordination and communication challenges faced. As a result, our study is the first to show that the use of component auditors is not uniformly detrimental to the resulting audit and that work performed by competent component auditors can alleviate coordination and communication challenges.

Overall, we conclude that component auditor information provided in new Form AP disclosures is informative and can help interested parties better assess the potential for adverse audit outcomes. This supports the PCAOB's objective to increase transparency as to who is conducting U.S. audits and extends a recent literature stream which explores the efficacy of PCAOB oversight and standard setting (e.g., Aobdia and Shroff 2017; Burke, Hoitash and Hoitash 2018; Cunningham, Li, Stein, and Wright 2018; DeFond and Lennox 2017; Krishnan, Krishnan, and Song 2017).

The remainder of the paper is organized as follows. Section 2 reviews related PCAOB standards and prior literature and proposes testable hypotheses. Section 3 describes the Form AP data and our empirical methodology. Section 4 presents our results, and Section 5 is devoted to a discussion of our findings and their implications for research and practice.

BACKGROUND AND HYPOTHESES DEVELOPMENT

Use of Component Auditors on U.S. Audit Engagements

Recent reports suggest that 43.2 percent of S&P 500 sales revenue comes from outside of the U.S. (S&P Dow Jones Indices 2017). This globalization of U.S. public companies has led to

geographically distributed audit work and the expanded use of non-U.S. auditors in public company audits. When auditing a multinational company, the lead auditor, who ultimately bears responsibility for the entire audit (PCAOB 2010), must engage other auditors to gather evidence and perform work on material foreign operations (Hanes 2013).[7] With the exception of six countries, U.S. auditors are not allowed to perform audit work within foreign jurisdictions.[8] In addition to these auditors' proximity to foreign operations, most countries require accounting firms to have separate local licenses and professionals in order to practice (Carson 2009). For example, the audit of a company such as Monsanto, which sells its products in over 100 countries, demands the use of several auditors in countries with significant operations. These other auditors are commonly referred to as "component auditors" in the extant literature.

The type and extent of work conducted by component auditors can vary considerably and may include testing an inventory listing or specified account balance in that location, performing high-level review procedures, or conducting a full scope audit of a foreign subsidiary that prepares standalone financial statements (Barrett, Cooper, and Jamal 2005; Gunn and Michas 2018). In aggregate, the work performed by component auditors can represent a significant portion of the audit (Hanes 2013). Regardless of the extent of work performed by component auditors, the lead auditor is responsible for directing and supervising all work pertaining to the financial statement audit opinion (AICPA 2017). However, the lead auditor's review is often legally restricted to

[7] We conduct informal interviews with senior managers involved on audits of multinational corporations, which reveal that lead auditors use both quantitative (e.g., revenue by country) and qualitative (e.g., potential to impact risk of material misstatement) materiality assessments to determine whether foreign operations should be scoped into the overall audit, and thus whether a component auditor should be engaged. Importantly, anecdotes suggest the U.S. lead auditor cannot perform remote audit work on foreign transactions, which implies that component auditor use is unavoidable for multinational entities with significant foreign operations.

[8] Even within these six countries (Australia, Canada, Hong Kong, Ireland, Mexico, and New Zealand) there are significant certifications and training requirements which often prevent U.S. auditors from participating in the audit (NASBA 2018).

summary documentation of the work performed and conclusions reached (AICPA 2017; Downey and Bedard 2018a; Sunderland and Trompeter 2017).

In 2016, the PCAOB and SEC passed Rule 3211, which requires disclosure of information on the use of component auditors in Form AP for audit reports issued on or after June 30, 2017. This disclosure was motivated by a desire for increased transparency regarding who is conducting audits. Before this disclosure requirement, investors were largely unaware of the extent to which component auditors were involved in an audit.[9] For example, in Monsanto's Form AP Deloitte reports that between 20 and 45 percent of the audit is conducted by five different component auditors, with a majority conducted by their affiliates in Argentina, Brazil, and Mexico. Despite the magnitude of audit work conducted by these affiliates, Deloitte's Missouri office ultimately bears full responsibility for the audit opinion and was previously the only firm name disclosed.

Before the Form AP disclosure requirement mandated component auditor disclosure for all U.S. public company audits, three studies used various methods to identify subsets of audits involving component auditors. First, in a concurrent paper using a sample of Australian listed companies, Carson et al. (2018) examine different work arrangements for multinational engagements (e.g., lead auditor conducts all audit work, uses affiliated component auditors, or uses unaffiliated component auditors). Component auditor use and disclosure in Australia differs from the U.S. in several ways, including differences in audit market concentration (e.g., Ferguson 2003) and component auditor disclosure requirements (i.e., component auditor identity is not disclosed and extent of use is determined from fees the lead auditor pays to components, rather than their actual share of hours worked as in the U.S.). Second, within a sample of U.S. audits where

[9] Recent experimental research suggests this new information may impact investor behavior. Specifically, Hux (2018) finds that non-professional investors invest less in companies when component auditors are involved in an audit versus not involved, and that this is more apparent when misstatement risk is higher.

component auditor use is disclosed, Mao, Ettredge, and Stone (2018) examine both when the lead auditor accepts and divides responsibility. In our study, we focus on engagements where the lead auditor accepts responsibility for the entire audit opinion (PCAOB 2010). Lastly, Dee et al. (2015) compare engagements where U.S. lead auditors accept and disclose responsibility for the work of other auditors to similar engagements where component auditors are not disclosed. Specifically, Dee et al. (2015) identify a sample of 149 issuers that disclose the use of component auditors using the requirement that PCAOB registered audit firms who *do not serve as lead auditors on an SEC issuer* list the audits in which they substantially participate in their Form 2 annual report.[10] Any component auditor who also serves as a lead auditor either would not appear in the sample or could even be misclassified in the no disclosure group. This is significant because according to the new Form AP data, nearly half of component auditors also serve as a lead auditor of an SEC issuer. For instance, major audit firms in Canada, China, and Israel often conduct component work and serve as lead auditors for SEC issuers such as IMAX, Lululemon, and Stantec.[11]

Now that Form AP requires disclosure of component auditor use for all U.S. issuers, we can accurately identify engagements that do and do not use component auditors. We thus can focus on the underlying use, and not merely the disclosure, of these component auditors, which was not previously possible. Using this data, we first examine factors associated with the use of component auditors. For instance, inherent client characteristics such as the existence and extent of foreign operations are expected to prompt the lead auditor to engage component auditors. In addition,

[10] Specifically, when audit firms that are PCAOB registered but are not lead auditors on a SEC issuer file Form 2, they are required to list audit reports for which they played a substantial role in Item 4.2. A substantial role is defined as 20 percent or more of the issuer's total audit hours or fees. This data, in addition to this information for those that do serve as a lead auditor and for those performing any percentage of the audit, is now directly supplied by the lead auditor in Form AP.

[11] This limitation is not expected to impact the results of market reaction to the disclosure of information as examined by Dee et al. (2015) and for conducting certain analyses within the disclosure group (e.g., Mao et al. 2018). However, using this data to compare firms that use component auditors with those that do not is not possible and would result in biased samples.

client size, performance, and overall complexity may impact component auditor use (e.g., Downey and Bedard 2018a). While some of these factors have been discussed in practitioner and regulator statements, they were not empirically investigated due to data limitations.

Use of Component Auditors and Audit Outcomes

Recent PCAOB oversight activities have identified significant audit deficiencies related to component auditor work and the lead auditor's oversight of this work (PCAOB 2016; Doty 2016). For instance, PCAOB inspections have attributed restatements to component auditors not performing procedures requested by the lead auditor or required under PCAOB standards, as well as failing to communicate significant issues to the lead auditor (Harris 2016; PCAOB 2018). These inspection findings suggest that there are quality concerns for audits using component auditors. In 2017, the PCAOB also proposed amendments to strengthen auditing standards that govern the planning and supervision of audits that involve component auditors (PCAOB 2017).[12] The need for this standard is evidence that the PCAOB believes there is varied audit quality, beyond financial reporting quality issues that may be inherent to these companies, when lead auditors engage component auditors.

Advantages of component auditor use include overcoming jurisdictional hindrances inherent to multinational companies, as well as reduction of labor costs and knowledge sharing via access to personnel who have specific expertise and familiarity with the company's operating environment in that country (e.g., Hanes 2013). Former PCAOB member Lewis Ferguson summarized these benefits:

> *The use by the lead auditor of such other auditors in an audit, often located in a different country, and at times in several different countries, can provide a number of benefits, including competitive and efficiency benefits, by allowing lead auditors to leverage the use of locally-licensed auditors.*

[12] The referenced proposed standards are expected to improve audit quality across all audit firms and component auditors, which biases against finding a cross-sectional association between component auditor use and adverse audit outcomes.

> *The locally licensed auditors may have language skills and knowledge of local culture and business practices that can be a great benefit to the lead auditor if properly used and supervised. The use of other auditors in a multinational environment, however, also introduces a number of challenges that can lead to inadequate audit performance* (Ferguson 2016).

This quote also highlights the significant challenges a lead auditor can face when using component auditors. While the component auditors' local presence is an advantage, it also results in differences between the U.S. lead audit firm and various component auditors, which can cause coordination and communication problems (e.g., Hanes 2013; Franzel 2016; Sunderland and Trompeter 2017). These differences are compounded by legal restrictions on work sharing and the inherent risks of a geographically dispersed work design, which make it difficult for audit teams to observe cues, informally interact, and ultimately understand the interdependence of their work (Downey and Bedard 2018a; Hanes 2013). Further, constrained resources during audit busy season limit the lead auditors' ability to provide timely feedback to component auditors, as well as travel for in-person visits to conduct supervision and coaching. Lastly, component auditors also face constrained resources as they are often tasked both with completing component work and serving local clients (Sunderland and Trompeter 2017).

The aforementioned related studies, which use Australian and limited U.S. data in the pre-Form AP era, find firms that disclose component auditor use have lower audit quality, as measured by discretionary accruals (Dee et al. 2015; Carson et al. 2018).[13] Audit fee findings are mixed, with Dee et al. (2015) finding no difference between firms that disclose and do not disclose component auditor use and Carson et al. (2018) finding higher audit fees for component auditor engagements in Australia.

[13] Importantly, we expect component audit firms that do not serve as lead auditors for SEC issuers (i.e., the Dee et al. 2015 sample) to be fundamentally different from those that do. Specifically, these component auditors are small non-U.S. firms with limited experience on U.S. audits (Dee et al. 2015), which may explain the finding that the disclosure of component auditors is associated with adverse audit outcomes.

Since disclosing the use of component auditors was not previously required in the U.S., it is not known whether and in what direction it influences audit outcomes across a broad sample. If component auditors are properly used and supervised, the advantages of their use could result in competitive and efficiency benefits for the lead audit firm (i.e., increased audit quality and decreased audit delay and audit fees). Conversely, without adequate supervision or perhaps even with a diligent effort by the lead auditor, deficiencies in the work of component auditors arising from coordination and communication challenges can result in deficient audits. Prior literature, as well as regulator comments, inspection findings, and proposed standards, have supported this prediction. Specifically, the challenges associated with component auditor use are thought to decrease audit quality and efficiencies (i.e., increase audit delay and audit fees). We therefore predict the following in our first hypothesis:

> **Hypothesis 1:** The use of component auditors is negatively associated with audit quality and positively associated with audit delay and audit fees.

Characteristics of Component Auditors Used

Since component auditor identities are now known, we next consider whether component auditors operating in locations with varying coordination and communication challenges and possessing varying levels of competence differentially impact audit outcomes.

Component Auditor Coordination and Communication Challenges

Component auditors operate in many different countries, from the Cayman Islands to Belgium, China, Egypt, Greece, Italy, Switzerland, Vietnam, and many more. As mentioned previously, differences between the U.S. lead audit firm and component auditors operating in these various countries can result in coordination and communication challenges. This was highlighted in a recent PCAOB speech:

> *When a lead auditor engages other auditors in (sometimes many) different countries, new challenges are injected into the audit. These challenges can be associated with different languages,*

> *business practices, cultural norms, and market conditions in different countries, as well as different quality control systems and professional training of staff in different audit firms. Meanwhile, the evolution of auditing standards and auditing practices that address the auditor's performance requirements and expectations under such circumstances has varied, increasing the risk of variability in audit quality* (Franzel 2016).

While operating in diverse and remote environments, it can be difficult for the lead and component auditor teams to overcome challenges and establish norms and a shared understanding (e.g., Barrett et al. 2005; Hanes 2013).

For instance, the effectiveness of audit work using component auditors depends crucially on communication between the lead and component auditors (e.g., Barrett et al. 2005; Hanes 2013; Sunderland and Trompeter 2017). The lead auditor may often work with component auditors in countries with different native languages and varied levels of English proficiency. Component auditor teams with low English proficiency may have difficulty following the lead auditor's direction and miss information and salience cues, causing information relevant to the audit opinion not to be conveyed to the lead auditor (Downey and Bedard 2018a; Hanes 2013). PCAOB oversight activities have found lead auditor failures in supervising component auditor work when there were language barriers (PCAOB 2013). Further, the lead auditor and component auditor teams may experience vast time differences. Timely communication amongst these teams is important for effective resolution of issues that arise throughout the audit process (AICPA 2017), and significant time differences may hinder this communication.

Of course, coordination and communication problems may not heterogeneously arise across all countries in which component auditors are used. For example, certain countries such as the United Kingdom are more similar to the U.S. in communication preferences. We therefore expect that work performed by component auditors facing greater coordination and

communication challenges will drive the negative association with audit quality and positive association with audit fees and audit delay predicted in Hypothesis 1.[14]

> **Hypothesis 2**: The predicted association with adverse audit outcomes is more pronounced when there are more, relative to less, coordination and communication challenges.

Component Auditor Competence

In addition to coordination and communication challenges, the competence of component auditors employed may vary. When selecting and retaining component auditors, the lead auditor must ensure that component auditors are independent and possess the appropriate competence and capabilities. Specifically, the lead auditor is permitted to express an opinion on the financial statements as a whole if they can satisfy themselves as to the ethics, independence, and professional reputation (including knowledge of the professional standards, skill, and ability) of component auditors used (PCAOB 2010; PCAOB 2016).

PCAOB standards suggest the lead auditor confirm component auditor familiarity with U.S. GAAP, generally accepted auditing standards (GAAS), and relevant SEC requirements in their evaluation of competence.[15] Familiarity may be indicated, for example, by their relevant professional certifications, such as a CPA or equivalent (Dee et al. 2015; Nagy, Sherwood, and Zimmerman 2018).[16] Relatedly, prior research documents that auditing standards differ by country, and can alter audit outcomes (Carcello, Vanstraelen, and Willenborg 2009). Regulators

[14] For expositional reasons, in Hypotheses 2 and 3, we refer to these associations as "adverse audit outcomes." While higher audit fees can be indicative of greater effort, which may have a positive impact on the audit, we predict that higher audit fees are an inefficient and adverse audit outcome in combination with our prediction of lower audit quality. Higher audit fees may also arise from a risk premium related to the management of component auditor work.

[15] This is consistent with responses to the Downey and Bedard (2018a) questionnaire, where component auditor knowledge, measured using their understanding of GAAP, GAAS, the regulatory environment, and the client's industry, is thought to reduce coordination and communication challenges on multinational audits.

[16] While Dee et al. (2015) do not find this to be a significant characteristic in their subset of firms that disclose component auditor use, recent studies find local education levels and professional certifications of relevant individuals to be informative characteristics (e.g., Beck, Francis, and Gunn 2017; Hoitash, Hoitash, and Kurt 2016; Ge, Matsumoto, and Zhang 2011; Prawitt, Smith, and Wood 2009). Nagy et al. (2018) find that the number of CPAs in U.S. audit firm offices is positively associated with audit quality, measured by the likelihood of restatements and discretionary accruals.

have also expressed concern over component auditors lacking the industry experience necessary to perform work requested by the lead auditor (AICPA 2017; PCAOB 2016) since industry experience and specialization is known to improve audit quality (Minutti-Meza 2013; Reichelt and Wang 2010). In sum, the competence of component auditors is an important factor when managing a complex multinational audit, a notion confirmed by respondents to the Downey and Bedard (2018a) questionnaire. We therefore predict the following:

> **Hypothesis 3:** The predicted association with adverse audit outcomes is more pronounced when less, relative to more, competent component auditors are used.

RESEARCH DESIGN

Sample Selection

We begin our data collection by identifying a sample of U.S. public companies subject to the Form AP component auditor disclosure requirement. Specifically, we identify Form AP filings for audit reports of U.S. issuers issued after June 30, 2017, which includes fiscal year ends between April 2017 and March 2018.[17] We remove observations where the lead auditor divides responsibility for component auditor work or is a non-U.S. auditor. We also remove observations where U.S. component auditors are used and those without necessary data in Compustat and Audit Analytics. The resulting sample is 3,675 U.S. issuers.

The lead auditors of all companies in this initial sample are required to report information on component auditor use (if any) in Items 4.1 and 4.2 of engagement-specific Form AP filings. Specifically, in Item 4.1 lead auditors report the legal name, extent of participation[18], city, state,

[17] Form AP filings are collected from the AuditorSearch database made available by the PCAOB (https://pcaobus.org/Pages/AuditorSearch.aspx).

[18] Lead auditors have the option to report the extent of participation as either an exact percentage or a range of the percentage of audit hours (e.g., "5 percent to less than 10 percent of total audit hours," "10 percent to less than 20 percent of total audit hours," etc.). When the range is reported, we use the midpoint in our calculations. For example, "10 percent to less than 20 percent of total audit hours" becomes 15 percent.

and country for each component auditor that individually contributes five percent or more of total audit hours. In Item 4.2 lead auditors report the number and aggregate percentage of component auditors that individually contribute less than five percent of total audit hours.[19] These filings indicate that 1,381 (37.6 percent) of the 3,675 engagements use at least one component auditor and 881 use at least one component auditor that contributes five percent or more of total audit hours. Since the latter sample identifies component auditors by name, it is used in our characteristics analyses (H2 and H3). The derivations of our samples are reported in Table 1.

Component Auditor Variables

We use three test variables in analysis for H1. *COMPONENT-USE* is an indicator variable equal to one if at least one component auditor participated in the engagement, and zero otherwise. For engagements where component auditors are used, we create two additional variables. *COMPONENT-NUMBER* is a count variable for the total number of component auditors that participated in the audit. *COMPONENT-PCT* is the total percentage of audit hours conducted by component auditors.

To test H2, we use two proxies for coordination and communication challenges. Language barriers are measured by the English language proficiency[20] of the component auditor's country of operation and additional communication issues by the time zone difference between the lead and component auditor offices.[21] To capture the amount of work done by component auditors with more or fewer challenges, we split the percentage of audit hours conducted by separately listed component auditors into two mutually exclusive variables capturing the percentage of audit hours

[19] Appendix A provides an example of Items 4.1 and 4.2 from Monsanto's 2017 Form AP filing.
[20] We measure English language proficiency by collecting data on the percentage of the country's population that speaks English from several sources (e.g., EF 2017).
[21] Time zone data is obtained from a flight and airport location database available at https://openflights.org. While we consider an above average time zone difference to represent a coordination and communication challenge, it is conversely possible that a large time difference increases productivity because work is being conducted continuously.

performed by component auditors scoring high and low based on these two proxies.[22] We consider component auditors with coordination and communication challenges to be those with below average English language proficiency (*LOW-ENGLISH*) and above average time zone differences (*HIGH-TIMEDIFF*). The counterparts to these variables are *HIGH-ENGLISH* and *LOW-TIMEDIFF*. Since one engagement could use several different component auditors, these sets of measures allow us to split the percentage of work conducted by component auditors with and without each characteristic. For example, if 40 percent of audit hours are conducted by component auditors, 15 percent could be classified as low (e.g., *LOW-TIMEDIFF*) and 25 percent as high (e.g., *HIGH-TIMEDIFF*).

To test H3, we similarly create variables capturing the percentage of audit hours performed by component auditors scoring high and low on two proxies for competence. Motivated by PCAOB standards, which suggest the lead auditor confirm component auditor professional reputation and familiarity with U.S. GAAP and GAAS, we measure competence using the number of personnel with a CPA or comparable license[23] and experience conducting PCAOB regulated audit work in the client's industry (i.e., either a lead or component auditor on at least one additional client). For each measure, we consider less competent (more competent) component auditors to be those with below (above) average values within the sample and refer to these variables as *LOW-CPAS (HIGH-CPAS)* and *NO-INDEXPERIENCE (IND-EXPERIENCE)*, respectively.

Dependent Variables

[22] Since component auditors that individually conduct less than five percent of the audit are reported in aggregate in Item 4.2 of Form AP, we cannot identify their characteristics and therefore cannot incorporate them in these cross-sectional analyses.

[23] We hand-collect this data for each component auditor registered with the PCAOB from their annual Form 2 filing (Item 6.1). Since this data is not available for component auditors that are not registered with the PCAOB, we classify them in the below average number of CPAs group. Our results remain consistent if we instead remove engagements requiring this assumption from analysis.

We employ three dependent variables throughout our analyses. The first measure is an indicator variable equal to one for firms that have subsequently restated their filings, and zero otherwise (*RESTATEMENT*). Recent studies suggest restatements are a strong and direct measure of audit quality (e.g., Aobdia 2018; DeFond and Zhang 2014). Second, *AUDIT-DELAY* is the number of days between the fiscal year end and the audit report date minus the SEC's filing deadline (60, 75, and 90 days for large accelerated, accelerated, and non-accelerated, respectively). Lower *AUDIT-DELAY* is often indicative of a more efficient audit. Lastly, *AUDIT-FEES* is the natural log of audit fees, which serves as a proxy for audit cost and audit effort.

Control Variables

We employ a common set of control variables across all models, which includes controls for size, complexity, financial performance, and several other common variables (e.g., Hay, Knechel, and Wong 2006; Hoitash and Hoitash 2018). We control for company size (*SIZE*) and firm complexity with several variables, including the number of business segments (*BUS-SEG*), the number of geographic segments (*GEO-SEG*)[24], an indicator for foreign operations (*FOREIGN-OPERATIONS*), the natural log of the number of foreign subsidiaries (*FOREIGN-SUBSIDIARIES*), and the natural log of the number of U.S. subsidiaries (*US-SUBSIDIARIES*).[25] We also control for accounting reporting complexity (*ARC*) which captures the amount of accounting disclosures in annual filings. Additional control variables and their definitions are

[24] It is not possible to fully map geographic segments to component auditor data. Specifically, data on geographic segments is often presented in aggregate. For example, one company can list Asia as one of its geographic segments, while another can separately report information on Japan and China. Our component auditor data is unique as it reveals the auditors perception of the materiality and risk of certain geographic locations. In fact, within a sample of firms that use at least one component auditor, the number of geographic segments do not exhibit significant and consistent associations with audit outcomes. This suggests component auditor work better captures the materiality of foreign operations to the audit.

[25] We collect subsidiary information using SeekEdgar. While companies are required to report the number of foreign subsidiaries and this is important to control for in our context, they do not report the extent of operations in these countries. Because many firms report more than 20 foreign subsidiaries, it is unlikely that all are materially significant.

provided in Appendix B. All continuous variables are winsorized at the 1st and 99th percentiles and all models also include two-digit SIC industry fixed effects.

RESULTS

Descriptive Statistics

Our sample includes 3,675 companies, of which 37.6 percent use component auditors. Table 2, Panel A presents descriptive statistics within the sample of 1,381 engagements that use at least one component auditor. We observe that the mean (median) number of components used in an audit engagement is 3.7 (2.0) and ranges from one to 23. The mean (median) percentage of audit hours conducted by component auditors is 18.3 (15.0), ranging from one to 70 percent. To proxy for the materiality of audit hours conducted by these component auditors, we multiply the percentage each component auditor is responsible for on a given engagement by total assets of that engagement. Combined, component auditors are responsible for auditing approximately six trillion dollars of assets in our sample, which is economically meaningful.

881 engagements, or 63.8 percent of those using component auditors, have at least one separately disclosed component auditor (i.e., individually responsible for more than five percent of the audit). Within this sample, an average of 1.73 separately listed component auditors are used to conduct 21.67 percent of audit hours. Descriptives for variables used to test H2 and H3, which disaggregate the percentage of audit hours into those conducted by component auditors with more or less coordination and communication challenges and by more and less competent component auditors are also presented in Panel A. Of the 293 unique component auditors identified, 93.2 percent are part of an affiliate network, 64.2 percent are affiliates of a Big 4 auditor, and 46.8 percent also serve as a lead auditors on at least one U.S. issuer (untabulated). The latter group did

not previously disclose their component auditor work and would be excluded from the Dee et al. (2015) treatment sample.[26]

Lastly, Table 2, Panel B presents the descriptives of our dependent and control variables. Of the 3,675 companies in our sample, 5.6 percent restate their financials. According to sample means, companies report their financials seven days before their deadline, and audit fees are 2.5 million dollars. Descriptives for control variables are also displayed and are consistent with prior literature.[27]

Multivariate Results

Factors Associated with Component Auditor Use

Our first set of models examine factors associated with the use of component auditors. Column 1 of Table 3 shows results of a logistic regression model where the dependent variable is an indicator for *COMPONENT-USE*. Results show that the likelihood of using a component auditor increases with *SIZE, LOSS, LEVERAGE, INV-REC, BIG4*, and *AGE*, and decreases with *EXTERNAL-FINANCING* and *CAP-INTENSITY*.

In Column 2 we add six different measures of firm complexity to the model and find that each is significantly associated with the likelihood of using a component auditor. Specifically, we find that *BUS-SEG*, *GEO-SEG*, *FOREIGN-OPERATIONS*, *FOREIGN-SUBSIDIARIES*, and *ARC* are each associated with an increased likelihood that a component auditor is involved ($p<0.05$ or less). The number of *US-SUBSIDIARIES* is inversely associated with the use of component auditors, likely because it captures firms with more operations in the U.S. Interestingly, all variables from Column 1 other than *SIZE* and *INV-REC* are no longer significant when the

[26] We also recognize that the PCAOB is not allowed to inspect audit firms in certain countries. Our results are robust to controlling for engagements where significant work is conducted by component auditors located in these countries.
[27] The variance inflation factors (VIFs) are below 10 in all of our models, with the highest VIF being 5.03. We therefore conclude that mulicollinearity does not substantially impact the interpretation of our results (Cohen et al. 2003).

complexity variables are included in Column 2.[28] This suggests that the structure of firms, rather than their financial performance or auditor choice, is the primary determinant of component auditor use.[29] This is consistent with practitioner statements that component auditor use is unavoidable for companies with significant foreign operations.

Component Auditor Use and Audit Outcomes

Our first hypothesis predicts that the use of component auditors will be associated with lower audit quality, longer audit delays, and higher audit fees. We first test this hypothesis using an indicator for component auditor use (*COMPONENT-USE*) in Table 4. Results in Column 1 and 2 of Panel A show that *COMPONENT-USE* is not significantly associated with the likelihood of *RESTATEMENT* nor *AUDIT-DELAY*.[30] This contrasts with Dee et al. (2015), which employs a limited sample of U.S. component auditor disclosure and finds lower audit quality. However, we do find that *COMPONENT-USE* is positively associated with higher *AUDIT-FEES* ($p<0.01$). Results are also economically significant. Audit fees for engagements using component auditors are, on average, $132,162, higher relative to the sample mean. The audit fee result is similar to Downey and Bedard (2018b), which finds higher audit fees for engagements using component auditors, but in contrast to Dee et al. (2015) which finds that firms disclosing the use of component auditors had no difference in audit fees when compared to those that did not disclose. Overall, this

[28] It is not surprising that *SIZE* remains significant because it also captures firm and audit complexity. Further, the positive sign on *INV-REC* is likely attributed to the fact that many component auditors are responsible for performing audits of inventory listings in their location (e.g., Barrett et al. 2005; Gunn and Michas 2018).

[29] The explanatory power of the model in Column 2 is 42.4 percent and 83.75 percent of observations are correctly classified, which is not trivial. We also estimate the two models without industry fixed effects (not tabled) and observe that the explanatory power in columns 1 and 2 are 11.52 and 38.76 percent respectively, further underscoring that the likelihood of component auditor use is mostly explained by the six complexity variables and not by company performance or by industry.

[30] The number of observations differ across the restatement logit models because observations are automatically dropped when any independent variable perfectly predicts (success or failure) the dependent variable. As sensitivity for Tables 4-6, to avoid the loss of observations due to perfect prediction, we substitute two-digit SIC industry fixed effects for one-digit SIC fixed effects and find consistent results.

analysis illustrates that audit firms that were previously required to disclose their work as component auditors (i.e., small non-U.S. firms with limited experience on U.S. audits) are fundamentally different from the broader sample of component auditors.

Although our model includes controls for firm size and complexity, it is possible that the observed results are nonetheless attributed to the client's innate characteristics (e.g., complexity, foreign operations, financial reporting quality) and not to the use of component auditors. This is of particular concern since the determinants analysis in Table 3 suggests that component auditor use is structural. To further explore whether component auditor use has an impact on these audit outcomes incremental to observable client characteristics, we employ a propensity score matched sample. To create the matched sample, we identify engagements with a similar likelihood to use a component auditor based on all of the covariates from Table 4 Column 1 (as recommended in Armstrong, Core, and Guay 2014), resulting in 594 treatment and 594 control engagements.[31] Results using this sample are reported in Table 4, Panel B and are consistent with Panel A.

Number of component auditors used. Table 5 presents results examining the association between *COMPONENT-NUMBER* and audit outcomes. In Columns 1-3 we estimate these models within the full sample, which includes observations where *COMPONENT-NUMBER* equals zero. We continue to only observe significant associations for audit fees, where *COMPONENT-NUMBER* is associated with higher audit fees ($p<0.01$). Columns 4-6 confirm this result within a more homogenous sample of firms that use at least one component auditor. The lack of audit quality and delay findings are unexpected given that respondents to the Downey and Bedard

[31] We use a caliper distance of 0.01 without replacement to identify matches. The covariance balance affirms the success of the matching procedures, indicating that none of the control variables are statistically different between the treatment and control engagements. To retain a balanced sample throughout propensity score analyses, we do not include industry fixed effects in the logit restatement models (Columns 1). Results are consistent if industry fixed effects are included.

(2018a) experiential questionnaire perceived that a greater number of component auditors increased coordination and communication issues.

In Table 5, Panel B we use a second propensity score matched sample. Specifically, we create a matched sample of firms with high and low number of component auditors used (i.e., *COMPONENT-NUMBER* above and below the median, respectively). The matching procedure, which uses the same criteria as described earlier is performed within the sample of firms that use at least one component auditor. The matched sample includes 266 treatment and 266 control engagements. None of the control variables are significantly different across the treatment and control samples. Results using this propensity score matched sample are consistent with Panel A.

Percentage of audit hours conducted by component auditors. In Table 6 we investigate the association between the percentage of audit hours conducted by component auditors, which proxies for the materiality of their work to the resulting audit, and audit outcomes. This table indicates support for Hypothesis 1, with Panel A showing that *COMPONENT-PCT* is significant and positively associated with *RESTATEMENT*, *AUDIT-DELAY*, and *AUDIT-FEES* both within the full sample ($p<0.05$; $p<0.01$; $p<0.01$, respectively) and the more homogenous sample of firms that use at least one component auditor ($p<0.01$; $p<0.01$; $p<0.01$, respectively).[32] These results are also economically significant. For Column 4 we calculate economic significance as the change in the likelihood of *RESTATEMENT* when *COMPONENT-PCT* moves from the 25th percentile to the 75th percentile. Holding all other variables at their sample mean, we observe a 54.25 percent increase in the likelihood of *RESTATEMENT*. Further, audit delay (Column 5) is 18.03 percent longer and audit fees (Column 6) are 8.95 percent higher when moving from the 25th to 75th percentile of *COMPONENT-PCT*.

[32] In the full sample regressions reported in Columns 1-3, we set *COMPONENT-PCT* to zero for companies that do not use component auditors.

In Table 6, Panel B we use a third propensity score matched sample to further control for client characteristics. Specifically, we utilize the sample of firms with at least one component auditor and create a matched sample of firms with high and low percentages of work conducted by component auditors (i.e., *COMPONENT-PCT* above and below the median, respectively). The matching procedure, which uses the same criteria as described earlier, results in a sample of 376 treatment and 376 control engagements. None of the control variables are significantly different across the treatment and control sample. Results in Panel B show that *RESTATEMENT*, *AUDIT-DELAY*, and *AUDIT-FEES* all increase with *COMPONENT-PCT* ($p<0.10$; $p<0.1$-; $p<0.01$, respectively). This analysis provides further assurance that even within a sample of engagements that are equally likely to require significant component auditor work, the percentage of audit hours conducted by component auditors impacts audit outcomes.

Overall, we conclude that results for the *amount* of work conducted by component auditors show support for H1. Taken together, results in Tables 5 and 6 document that while the number of components is only informative for audit pricing, the percentage of audit hours conducted by component auditors better captures the extent of challenges faced in audits that involve diverse teams of auditors.

Component Auditor Coordination and Communication Challenges

In H2, we predict that not all component auditors are created equal and that those facing greater coordination and communication challenges can result in more pronounced adverse audit outcomes. This analysis is conducted within the sample of 881 engagements where at least one component auditor is separately listed on Form AP, and thus its identity is publicly available.[33]

[33] We confirm that the *COMPONENT-PCT* associations observed in Table 6 hold within this more homogenous sample of firms that use at least one component auditor that is separately listed on Form AP.

Results in Table 7, Panel A show that *LOW-ENGLISH* is positively associated with *RESTATEMENT* and *AUDIT-DELAY* ($p<0.10$; $p<0.01$, respectively), while *HIGH-ENGLISH* is not significant in any of the models. These results suggest that communication with component auditors operating in countries with low English proficiency generates adverse audit implications while employing component auditors in countries with high English proficiency is not significantly different from the work performed by the lead auditor. Findings of this analysis support predictions that language differences can cause communication difficulties (e.g., Barrett et al. 2005; Hanes 2013; Sunderland and Trompeter 2017) and are in contrast to responses to the Downey and Bedard (2018a) experiential questionnaire, where language barriers were not perceived to be influential in engagements.[34]

In Panel B, we find consistent results, showing that *HIGH-TIMEDIFF* is again positively associated with *RESTATEMENT* and *AUDIT-DELAY* ($p<0.05$; $p<0.01$, respectively). This suggests that challenges arising from delayed communication (e.g., delayed phone and email response time, difficulty coordinating live conference calls, etc.) ultimately prevent the resolution of audit issues.

Component Auditor Competence

In Table 8 we focus on variations in component auditor competence. Results in Panel A show that *LOW-CPAS* is associated with a greater propensity for *RESTATEMENT* and longer *AUDIT-DELAY* ($p<0.05$; $p<0.01$, respectively). *HIGH-CPAS* is not significantly associated with any of the dependent variables, which suggests that work conducted by appropriately staffed component

[34] There are several possible explanations for our different findings, including that the respondents in Downey and Bedard (2018a) are U.S. senior managers who likely only communicate with component auditor management and are less likely to notice language barriers. Further, we employ different samples (147 versus 881), dependent variables (communication and coordination issues versus audit outcomes), and research methods (experiential questionnaire versus archival).

auditors is not significantly different from work conducted by the U.S. lead auditor. Results for *NO-INDEXPERIENCE* and *INDEXPERIENCE* are displayed in Panel B and mimic Panel A, suggesting that a lack of requisite experience in the client's industry is associated with lower audit quality and longer audit delay. Interestingly, *INDEXPERIENCE* is also positively associated with *AUDIT-DELAY* ($p<0.01$), which may suggest that conducting both component and lead auditor work constrains resources.

Overall, using both measurements of competence, results suggest that work performed by more competent component auditors is not statistically different from work performed by the lead audit firm. In contrast, work performed by less competent component auditors is driving the association with adverse audit outcomes.

Additional Analysis

Employing Competent Component Auditors to Mitigate Challenges

Findings of Table 7 suggest that employing component auditors in countries with coordination and communication challenges generates adverse audit outcomes. However, as documented in Table 3, component auditor use is determined by firm size, complexity, and the existence and diversity of foreign operations. Therefore, lead auditors may not have a choice of where to employ component auditors. In this additional analysis, we explore whether employing competent component auditors can remediate the challenges associated with operating in countries with low English language proficiency and large time differences from the lead auditor.

In Table 9, we disaggregate the percentage of work performed by component auditors with each challenge into the percentage conducted by competent component auditors and conducted by less competent component auditors. We determine this split based on whether the component auditor meets both of the competence criteria used to test H3 (i.e., employs above average number

of CPAs and has experience as either a lead or component auditor on at least one additional client in the same industry). We validate this competence measure in Panel A, where results show that the percentage of work conducted by more competent component auditors (*COMPETENT*) is not significantly different from the baseline, and therefore does not generate adverse audit outcomes.

We find that work performed by less competent component auditors in countries with low English language proficiency and large time differences (Panels A and B, respectively) is generally associated with adverse audit outcomes. Importantly, adverse outcomes are generally not observed in challenging locations when the auditor is more competent. The one exception is positive associations with *AUDIT-FEES*, which may suggest that more effort is exerted and audit quality issues are mitigated when a competent component auditor is employed in challenging locations.

Therefore, we conclude that using more competent component auditors can help overcome certain country-specific challenges, which may be unavoidable once operations in challenging countries are deemed material. These results alleviate the concern that financial reporting issues inherent to complex multinational engagements, and specifically to those with operations in countries with low English proficiency and high time difference, drive our main results. If that were the case, we would not find that competent component auditors alleviate challenges in these countries.

Further Controlling for Client Complexity

In H3, we conclude that work performed by less competent component auditors is driving the association with adverse audit outcomes. An alternative explanation for this result is that these component auditors are more likely to work on complex firms, which are also more likely to experience adverse audit outcomes. To explore this potential correlated omitted variable, we correlate the aggregate competence measure with six firm complexity measures (i.e., *BUS-SEG,*

GEO-SEG, FOREIGN-OPERATIONS, FOREIGN-SUBSIDIARIES, US-SUBSIDIARIES, ARC). We observe that the percentage of work performed by competent (less competent) component auditors is positively (negatively) associated with five out of six (all six) complexity measures. Since complexity is associated with adverse audit outcomes, this biases against our competence finding and further alleviates concern that results are driven by innate firm characteristics rather than auditor characteristics.

Alternative Component Auditor Characteristics

In untabulated analyses, we consider two additional component auditor characteristics. First, we consider an additional coordination and communication challenge by calculating the geographic distance in miles between the closest major airports to the lead and component auditor locations, which is a factor that may impact in-person supervision and coaching (PCAOB 2016). For brevity, we do not include this characteristic in main analyses as it shares similar predictions to time zone differences. However, time zone difference and geographic distance can differ significantly; for example, New York City and Rio De Janeiro have only a two hour time difference, but are ten hours apart in flying distance. We similarly find that adverse audit outcomes are driven by work performed by component auditors with above average geographic distance from the lead auditor.

Second, as an alternative competence measure, we consider the component auditor's experience conducting component auditor work. We define competent component auditors as those who audit an above average amount of total assets across their component auditor engagements. Untabulated results using this alternative competence measure are consistent, with less experienced component auditors driving the observed adverse associations.

CONCLUSION

In 2017, the PCAOB's Form AP requirement introduced new data to auditing research and the capital markets. Specifically, lead auditors on U.S. issuers are now required to disclose the use, extent of use, and identity of component auditors, which the PCAOB refers to as "other accounting firms." Recent PCAOB inspections identify significant audit deficiencies relating to component auditor work and the lead auditors' oversight of this work (PCAOB 2016; Doty 2016; Harris 2016). Therefore, these new disclosures could be informative when assessing audit outcomes.

Prompted by this regulator concern and the new Form AP disclosure requirements, we examine factors associated with component auditor use, and whether this use is associated with audit outcomes. At the outset, we find that the likelihood of using a component auditor is associated with company structural properties, such as size, complexity, and foreign operations. Audit engagements that involve significant component auditor work are associated with a higher likelihood of restatement, longer audit delays, and higher audit fees. This information was not available before the new disclosure requirement and can be informative to interested parties when assessing the audit.

To further explore this finding, we collect information on component auditors named in Form AP to explore whether all component auditors are created equal. We find that the percentage of audit hours conducted by less competent component auditors and those with significant coordination and communication challenges exhibit significant associations with adverse outcomes, while more competent component auditors and those without significant challenges do not. However, since our results show that component auditor use is structural and driven by client operations, lead auditors likely cannot control the countries in which they employ component auditors, and thus the coordination and communication challenges faced. Therefore, we conduct further analysis and find that hiring competent component auditors in locations that are more prone

to challenges can mitigate adverse outcomes. Overall, these findings can contribute to both future research and practitioners (e.g., lead and component auditors, client management, investors) using the new Form AP data to make decisions.

Although data made available by Form AP enhances the information environment, limitations remain. For instance, we are unable to determine the identity or individual percentage of audit hours conducted by component auditors who conduct less than five percent of the audit hours. Further, for those that do conduct more than five percent of audit hours, very little information is available other than their required reporting with the PCAOB, which we use to create competence measures. Since we largely do not have information on the identities of employees at these component auditors, we must assume that characteristics (e.g., experience in the industry and English language proficiency, etc.) of the firm and the country it operates in apply to the audit team.

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Appendix A: Example of Items 4.1 and 4.2 in Form AP

Italicized terms are defined in PCAOB Rule 1001, except for the definition of "other accounting firm" which appears in the general instructions to Form AP. The Firm must apply those definitions in completing the Form.

PART IV - RESPONSIBILITY FOR THE *AUDIT* IS NOT DIVIDED

In responding to Part IV, total *audit* hours in the most recent period's *audit* should be comprised of hours attributable to: (1) the financial statement *audit*; (2) reviews pursuant to AS 4105, *Reviews of Interim Financial Information*; and (3) the *audit* of internal control over financial reporting pursuant to AS 2201, *An Audit of Internal Control Over Financial Reporting That Is Integrated with An Audit of Financial Statements*. Excluded from disclosure and from total *audit* hours in the most recent period's *audit* are, respectively, the identity and hours incurred by: (1) the engagement quality reviewer; (2) the person who performed the review pursuant to SEC Practice Section 1000.45 Appendix K; (3) specialists engaged, not employed, by the Firm; (4) an accounting firm performing the audit of the entities in which the *issuer* has an investment that is accounted for using the equity method; (5) internal auditors, other company personnel, or third parties working under the direction of management or the audit committee who provided direct assistance in the *audit* of internal control over financial reporting; and (6) internal auditors who provided direct assistance in the *audit* of the financial statements. Hours incurred in the *audit* by entities other than *other accounting firms* are included in the calculation of total *audit* hours and should be allocated among the Firm and the *other accounting firms* participating in the *audit* on the basis of which accounting firm commissioned and directed the applicable work.

In responding to Part IV, if the financial statements for the most recent period and one or more other periods covered by the *audit report* identified in Item 3.1.a.4 were audited during a single *audit* engagement (for example, in a reaudit of a prior period(s)), the calculation should be based on the percentage of *audit* hours attributed to such firms in relation to the total *audit* hours for the periods identified in Item 3.1.c.

Actual audit hours should be used if available. If actual audit hours are unavailable, the Firm may use a reasonable method to estimate the components of this calculation. The Firm should document in its files the method used to estimate hours when actual audit hours are unavailable and the computation of total audit hours on a basis consistent with AS 1215, *Audit Documentation*. Under AS 1215, the documentation should be in sufficient detail to enable an experienced auditor, having no previous connection with the engagement, to understand the computation of total audit hours and the method used to estimate hours when actual hours were unavailable.

Indicate, by checking the box, if the percentage of total *audit* hours will be presented within ranges in Part IV.	☑

ITEM 4.1 - *OTHER ACCOUNTING FIRM*(S) INDIVIDUALLY 5% OR GREATER OF TOTAL *AUDIT* HOURS

Firm ID	01153	Check here if no Firm ID is available ☐	Percentage of participation	%	or range 5% to less than 10%
Legal name	Galaz, Yamazaki, Ruiz, Urquiza, S.C.				
Headquarters' office location:					
Country	Mexico				
City	Ciudad de México		State		

Firm ID	01088	Check here if no Firm ID is available ☐	Percentage of participation	%	or range 5% to less than 10%
Legal name	Deloitte & Co. S.A. (Deloitte & Co. Sociedad Anónima)				
Headquarters' office location:					
Country	Argentina				
City	Ciudad Autonoma de Buenos Aires		State		

Firm ID	01045	Check here if no Firm ID is available ☐	Percentage of participation	%	or range 10% to less than 20%
Legal name	Deloitte Touche Tohmatsu Auditores Independentes				
Headquarters' office location:					
Country	Brazil				
City	São Paulo		State		

Note 1: In responding to Items 4.1 and 4.2, the percentage of hours attributable to *other accounting firms* should be calculated individually for each firm. If the individual participation of one or more *other accounting firm(s)* is less than 5%, the Firm should complete Item 4.2.

Note 2: In responding to Item 4.1, the Firm ID represents a unique five-digit identifier for firms that have a publicly available PCAOB-assigned number.

ITEM 4.2 - *OTHER ACCOUNTING FIRM*(S) INDIVIDUALLY LESS THAN 5% OF TOTAL *AUDIT* HOURS

a. State the number of *other accounting firm(s)* individually representing less than 5% of total *audit* hours.

2

b. Indicate the aggregate percentage of participation of the *other accounting firm(s)* that individually represented less than 5% of total *audit* hours by filling in a single number or by selecting the appropriate range as follows:

Aggregate percentage of participation % or range Less than 5%

Appendix B: Variable definitions

Test Variables	**Variable Definition**
COMPONENT-USE	=1 if the lead auditor indicates in Form AP that at least one component auditor participated on the engagement, zero otherwise [Form AP]
COMPONENT-NUMBER	The number of component auditors that participated on the audit [Form AP]
COMPONENT-PCT	The percentage of audit hours conducted by component auditors [Form AP]
LOW-CPAS	The percentage of audit hours conducted by component auditors with number of CPAs below the sample mean [Item 6.1 of PCAOB Form 2]
HIGH-CPAS	The percentage of audit hours conducted by PCAOB registered component auditors with number of CPAs above the sample mean [Item 6.1 of PCAOB Form 2]
NO-INDEXPERIENCE	The percentage of audit hours conducted by component auditors with no other experience (as a lead or component auditor) in the client's industry
INDEXPERIENCE	The percentage of audit hours conducted by PCAOB registered component auditors with experience (as a lead or component auditor) in the client's industry
LOW-ENGLISH	The percentage of audit hours conducted by component auditors operating in countries with English proficiency below the sample mean [EF 2017]
HIGH-ENGLISH	The percentage of audit hours conducted by component auditors operating in countries with English proficiency above the sample mean [EF 2017]
HIGH-TIMEDIFF	The percentage of audit hours conducted by component auditors with time zone difference from the lead auditor's office above the sample mean
LOW-TIMEDIFF	The percentage of audit hours conducted by component auditors with time zone difference from the lead auditor's office below the sample mean
Dependent Variables	
RESTATEMENT	=1 for companies that misstated their financial reports, zero otherwise [Audit Analytics]
AUDIT-DELAY	The number of days between the fiscal year end date and the audit report date minus the SEC's filing deadline requirement (60, 75, and 90 days for large accelerated, accelerated, and non-accelerated, respectively) [Audit Analytics]
AUDIT-FEES	The natural log of audit fees [Audit Analytics]
Control Variables	
SIZE	Natural log of total assets [Compustat data]
BUS-SEG	The sum of reported business segments [Compustat Segment file]
GEO-SEG	The sum of reported geographic segments [Compustat Segment file]
FOREIGN-OPERATIONS	= 1 if the company has nonzero foreign pretax income, zero otherwise [Compustat]
FOREIGN-SUBSIDIARIES	Natural log of number of foreign subsidiaries [SeekEdgar]
US-SUBSIDIARIES	Natural log of number of U.S. subsidiaries [SeekEdgar]
ARC	The natural log of the total number of distinct monetary XBRL tags in Item 8 of the 10-K flings [http://www.xbrlresearch.com]]
LOSS	= 1 if the company reported a net loss in the current or prior year, zero otherwise [Compustat]
LEVERAGE	The ratio of total liabilities to total assets [Compustat]
EXTERNAL-FINANCING	An indicator variable that equals one if the year over year change in the number of shares outstanding is greater than 10%. [Compustat]
EXTREME-GROWTH	An indicator variable that equals one if the year-over-year industry adjusted sales growth falls in the top quintile, zero otherwise (Doyle et al. 2007) [Compustat]
CAP-INTENSITY	The ratio of net property plant and equipment to total assets [Compustat]
INV-REC	The ratio of inventory + accounts receivable to total assets [Compustat]
ACCELERATED	An indicator variable that equals one if the firm is an accelerated filer.

BUSY-SEASON	An indicator variable that equals one for firms with fiscal year end in December.
BIG4	=1 for a Big 4 auditor, zero otherwise [Audit Analytics]
AGE	The natural log of number of years the firm has Compustat data [Compustat]
MW	=1 for companies disclosing a material weakness in their SOX section 302/404, zero otherwise [Audit Analytics]

Table 1 – Derivation of balanced panel sample

U.S. public issuers with Form AP in PCAOB AuditorSearch with an audit report due date between June 2017 and June 2018	7,271
Less: Divided responsibility in audit report	(47)
Less: Non-U.S. lead auditor	(938)
Less: U.S. component auditor used	(21)
Less: Missing or duplicate CIK	(391)
Less: Missing Compustat or Audit Analytics coverage	(1,863)
Potential companies in sample	4,011
Less: Missing data in Compustat or Audit Analytics for control variables	(336)
Companies in full sample[35] (Table 4 and Columns 1-3 of Tables 5 and 6) (H1)	**3,675**
Less: Engagements not using at least one component auditor	(2,294)
Companies in component auditor use sample (Columns 4-6 of Tables 5 and 6) (H1)	**1,381**
Less: Engagements not using at least one component auditor that individually contributes 5 percent of total audit hours	(500)
Companies in characteristics sample (Tables 7 and 8) (H2 and H3)	**881**

[35] This table refers to the sample used in multivariate regressions where *AUDIT-DELAY* and *AUDIT-FEES* are the dependent variables. Some observations are dropped in logistic regressions with *RESTATEMENT* as the dependent variable since observations for which control variables (e.g., industry fixed effects) perfectly predict the likelihood of restatement will be dropped.

Table 2 – Descriptive statistics

Panel A – Test variables

Variable name	N	Mean	Median	Std. Dev.	25th percentile	75th percentile
COMPONENT-USE	3,675	0.376	0.000	0.484	0.000	1.000
COMPONENT-NUMBER	1,381	3.663	2.000	3.807	1.000	5.000
COMPONENT-PCT	1,381	18.252	15.000	16.559	2.500	30.000
Variables used in H2 and H3						
COMPONENT-PCT (separately listed)	881	21.667	15.000	13.421	7.500	30.000
HIGH-ENGLISH	881	12.065	7.500	10.487	7.500	15.000
LOW-ENGLISH	881	9.602	7.500	12.788	0.000	15.000
LOW-TIMEDIFF	881	14.721	15.000	12.618	7.500	22.500
HIGH-TIMEDIFF	881	6.946	0.000	10.798	0.000	7.500
HIGH-CPAS	881	10.615	7.500	11.010	0.000	15.000
LOW-CPAS	881	11.052	7.500	12.423	0.000	15.000
INDEXPERIENCE	881	10.480	7.500	11.188	0.000	15.000
NO-INDEXPERIENCE	881	11.187	7.500	13.144	0.000	15.000
HIGH-COMPETENCE	881	6.741	0.000	9.318	0.000	15.000
LOW-COMPETENCE	881	14.926	15.000	13.649	7.500	22.500

Panel B – Dependent and control variables

	N	Mean	Median	Std. Dev.	25th percentile	75th percentile
RESTATEMENT	3,675	0.056	0.000	0.231	0.000	0.000
AUDIT-DELAY	3,675	-6.991	-6.000	10.286	-13.000	-1.000
Audit fees (in thousands $)	3,675	2,545.300	1,131.660	4,105.357	397.766	2,759.800
AUDIT-FEES	3,675	13.870	13.939	1.384	12.894	14.831
Total assets (in millions $)	3,675	8,206.671	1,037.995	24,844.366	174.308	4,465.349
SIZE	3,675	6.746	6.945	2.404	5.161	8.404
BUS-SEG	3,675	1.765	1.000	1.366	1.000	3.000
GEO-SEG	3,675	1.844	1.000	2.060	0.000	3.000
FOREIGN-OPERATIONS	3,675	0.462	0.000	0.499	0.000	1.000
FOREIGN-SUBSIDIARIES	3,675	1.230	0.000	1.570	0.000	2.303
US-SUBSIDIARIES	3,675	1.729	1.609	1.519	0.000	2.773
ARC	3,675	5.803	5.820	0.414	5.509	6.116
LOSS	3,675	0.443	0.000	0.497	0.000	1.000
LEVERAGE	3,675	0.279	0.212	0.298	0.049	0.405
EXTERNAL-FINANCING	3,675	0.183	0.000	0.386	0.000	0.000
EXTREME-GROWTH	3,675	0.181	0.000	0.385	0.000	0.000
CAP-INTENSITY	3,675	0.212	0.098	0.256	0.023	0.304
INV-REC	3,675	0.274	0.204	0.243	0.074	0.409
ACCELERATED	3,675	0.700	1.000	0.458	0.000	1.000
BUSY-SEASON	3,675	0.796	1.000	0.403	1.000	1.000
BIG4	3,675	0.627	1.000	0.484	0.000	1.000
AGE	3,675	2.878	2.996	0.793	2.303	3.466
MW	3,675	0.140	0.000	0.347	0.000	0.000

Table 3 - Determinants of component auditor use

	(1) *COMPONENT-USE*	(2) *COMPONENT-USE*
SIZE	0.474***	0.141***
	(14.45)	(3.23)
LOSS	0.318***	0.095
	(3.09)	(0.79)
LEVERAGE	0.343**	0.242
	(2.18)	(1.34)
EXTERNAL-FINANCING	-0.209*	-0.031
	(-1.69)	(-0.22)
EXTREME-GROWTH	-0.037	0.023
	(-0.31)	(0.17)
CAP-INTENSITY	-0.648**	-0.024
	(-2.46)	(-0.08)
INV-REC	1.092***	0.760**
	(3.69)	(2.32)
ACCELERATED	0.195	-0.087
	(1.53)	(-0.60)
BUSY-SEASON	-0.051	0.039
	(-0.45)	(0.29)
BIG4	0.262**	0.130
	(2.16)	(0.94)
AGE	0.144**	-0.045
	(2.18)	(-0.59)
BUS-SEG		0.080*
		(1.67)
GEO-SEG		0.212***
		(6.86)
FOREIGN-OPERATIONS		0.956***
		(7.85)
FOREIGN-SUBSIDIARIES		0.646***
		(12.44)
US-SUBSIDIARIES		-0.256***
		(-5.33)
ARC		0.954***
		(4.42)
Industry fixed effects	Included	Included
Constant	-5.037***	-8.545***
	(-11.96)	(-7.44)
Observations	3,650	3,650
Pseudo R^2	0.283	0.424

This table reports results of regressions of client characteristics on *COMPONENT-USE*. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

Table 4 - H1: Component auditor use and audit outcomes

Panel A - Full sample

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
COMPONENT-USE	-0.329	0.442	0.123***
	(-1.46)	(1.00)	(5.68)
SIZE	-0.025	-1.576***	0.360***
	(-0.36)	(-10.91)	(50.97)
BUS-SEG	-0.115	0.216	0.022***
	(-1.49)	(1.37)	(2.84)
GEO-SEG	0.078	-0.187*	0.018***
	(1.61)	(-1.82)	(3.64)
FOREIGN-OPERATIONS	-0.331	-0.363	0.103***
	(-1.41)	(-0.79)	(4.56)
FOREIGN-SUBSIDIARIES	0.066	0.311*	0.065***
	(0.81)	(1.79)	(7.59)
US-SUBSIDIARIES	0.045	0.297**	0.008
	(0.64)	(2.01)	(1.17)
ARC	1.695***	4.164***	0.453***
	(4.91)	(5.95)	(13.21)
LOSS	-0.021	-0.658*	0.157***
	(-0.11)	(-1.65)	(8.03)
LEVERAGE	-0.667**	1.182**	0.049*
	(-2.19)	(2.00)	(1.69)
EXTERNAL-FINANCING	-0.244	-0.618	0.055**
	(-1.08)	(-1.38)	(2.49)
EXTREME-GROWTH	0.064	0.706	-0.016
	(0.30)	(1.62)	(-0.76)
CAP-INTENSITY	0.056	-0.494	-0.297***
	(0.12)	(-0.50)	(-6.14)
INV-REC	-0.307	1.063	0.039
	(-0.56)	(0.99)	(0.74)
ACCELERATED	-0.480**	5.258***	0.146***
	(-2.03)	(11.18)	(6.34)
BUSY-SEASON	-0.587***	1.136***	0.068***
	(-2.95)	(2.67)	(3.24)
BIG4	-0.036	-1.349***	0.562***
	(-0.16)	(-2.96)	(25.19)
AGE	-0.078	-0.461*	-0.014
	(-0.66)	(-1.88)	(-1.13)
MW	2.006***	7.588***	0.141***
	(11.35)	(15.44)	(5.85)
RESTATEMENT		2.501***	0.053
		(3.53)	(1.53)
Industry fixed effects	Included	Included	Included
Constant	-11.676***	-24.787***	7.983***
	(-6.39)	(-6.79)	(44.65)
Observations	3,370	3,675	3,675
Pseudo/Adjusted R^2	0.164	0.167	0.890

Table 4 (continued)
Panel B - Propensity score matched sample

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
COMPONENT-USE	0.017	0.264	0.095***
	(0.05)	(0.47)	(3.54)
Control variables	Included	Included	Included
Constant	-11.199***	-20.683***	8.740***
	(-3.28)	(-2.87)	(25.57)
Observations	1,188	1,188	1,188
Pseudo/Adjusted R^2	0.210	0.202	0.846

This table tests H1 and reports results of regressions of *COMPONENT-USE* on several dependent variables, with Panel A using the full sample and Panel B using a propensity score matched sample. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

Table 5 - H1: Number of component auditors involved in the audit and audit outcomes

Panel A

	Full sample			***Component auditor use sample***		
	(1)	(2)	(3)	(4)	(5)	(6)
	RESTATEMENT	*AUDIT-DELAY*	*AUDIT-FEES*	*RESTATEMENT*	*AUDIT-DELAY*	*AUDIT-FEES*
COMPONENT-NUMBER	0.032	0.070	0.043***	0.020	0.064	0.045***
	(1.03)	(0.96)	(12.25)	(0.51)	(0.79)	(11.90)
SIZE	-0.042	-1.593***	0.347***	0.085	-1.549***	0.368***
	(-0.59)	(-10.87)	(49.11)	(0.70)	(-6.87)	(35.23)
BUS-SEG	-0.119	0.213	0.018**	-0.063	0.350*	0.029***
	(-1.53)	(1.35)	(2.42)	(-0.56)	(1.69)	(3.05)
GEO-SEG	0.057	-0.190*	0.011**	0.076	-0.187	0.004
	(1.16)	(-1.84)	(2.29)	(1.21)	(-1.53)	(0.75)
FOREIGN-OPERATIONS	-0.406*	-0.274	0.129***	0.150	0.198	0.095***
	(-1.76)	(-0.61)	(5.93)	(0.33)	(0.26)	(2.69)
FOREIGN-SUBSIDIARIES	0.007	0.302*	0.044***	0.091	0.211	0.044***
	(0.08)	(1.70)	(5.11)	(0.68)	(0.84)	(3.76)
US-SUBSIDIARIES	0.066	0.302**	0.016**	-0.043	0.189	-0.003
	(0.93)	(2.03)	(2.27)	(-0.29)	(0.72)	(-0.25)
ARC	1.637***	4.195***	0.454***	1.670***	3.425***	0.331***
	(4.76)	(6.01)	(13.49)	(2.76)	(3.12)	(6.50)
LOSS	-0.005	-0.643	0.166***	0.048	-1.417**	0.129***
	(-0.02)	(-1.61)	(8.61)	(0.15)	(-2.45)	(4.80)
LEVERAGE	-0.695**	1.168**	0.037	-1.492**	0.593	0.005
	(-2.27)	(1.97)	(1.31)	(-2.20)	(0.55)	(0.11)
EXTERNAL-FINANCING	-0.237	-0.621	0.055**	0.248	-1.007	0.105***
	(-1.05)	(-1.38)	(2.52)	(0.55)	(-1.26)	(2.84)
EXTREME-GROWTH	0.066	0.704	-0.017	-0.297	0.676	-0.012
	(0.31)	(1.61)	(-0.82)	(-0.69)	(0.94)	(-0.36)
CAP-INTENSITY	0.077	-0.449	-0.270***	0.083	-1.582	-0.324***
	(0.16)	(-0.45)	(-5.68)	(0.09)	(-0.98)	(-4.33)
INV-REC	-0.352	1.082	0.036	0.027	-0.485	0.227***
	(-0.64)	(1.00)	(0.69)	(0.03)	(-0.26)	(2.60)
ACCELERATED	-0.452*	5.304***	0.174***	-1.188**	6.472***	0.241***
	(-1.90)	(11.22)	(7.66)	(-2.57)	(7.45)	(5.99)
BUSY-SEASON	-0.592***	1.115***	0.056***	0.000	1.884***	0.037
	(-2.98)	(2.62)	(2.74)	(0.00)	(3.13)	(1.32)
BIG4	-0.027	-1.320***	0.578***	-0.358	-1.194	0.437***
	(-0.12)	(-2.89)	(26.27)	(-0.85)	(-1.51)	(11.92)
AGE	-0.076	-0.480*	-0.024**	0.129	-0.968**	-0.048**
	(-0.65)	(-1.95)	(-2.01)	(0.60)	(-2.42)	(-2.58)
MW	1.985***	7.601***	0.139***	2.397***	7.535***	0.193***
	(11.27)	(15.49)	(5.90)	(7.68)	(9.86)	(5.46)
RESATEMENT		2.471***	0.041		3.424***	0.047
		(3.49)	(1.20)		(3.16)	(0.93)
Industry fixed effects	Included	Included	Included	Included	Included	Included
Constant	-11.307***	-24.802***	8.075***	-13.930***	-21.257***	8.901***
	(-6.21)	(-6.79)	(45.90)	(-4.16)	(-3.65)	(32.98)
Observations	3,370	3,675	3,675	1,149	1,381	1,381
Pseudo/Adjusted R^2	0.163	0.167	0.893	0.219	0.164	0.879

Table 5 (continued)
Panel B - Propensity score matched sample

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
COMPONENT-NUMBER	-0.033	0.009	0.183***
	(-0.07)	(0.01)	(5.06)
Industry fixed effects	Included	Included	Included
Constant	-12.682**	-24.936**	9.088***
	(-2.22)	(-2.44)	(17.95)
Observations	532	532	532
Pseudo/Adjusted R^2	0.239	0.170	0.807

This table tests H1 and reports results of regressions of *COMPONENT-NUMBER* on several dependent variables, with Panel A using a sample of firms that use at least one component auditor and Panel B using a propensity score matched sample. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

Table 6 - H1: Percentage of audit hours conducted by component auditors and audit outcomes

Panel A

	Full sample			***Component auditor use sample***		
	(1)	(2)	(3)	(4)	(5)	(6)
	RESTATEMENT	*AUDIT-DELAY*	*AUDIT-FEES*	*RESTATEMENT*	*AUDIT-DELAY*	*AUDIT-FEES*
COMPONENT-PCT	0.014**	0.040***	0.004***	0.021***	0.047***	0.003***
	(2.22)	(2.59)	(5.91)	(2.62)	(2.74)	(3.91)
SIZE	-0.039	-1.595***	0.360***	0.075	-1.551***	0.398***
	(-0.56)	(-11.04)	(50.86)	(0.64)	(-7.15)	(37.75)
BUS-SEG	-0.117	0.203	0.021***	-0.061	0.338	0.033***
	(-1.51)	(1.29)	(2.74)	(-0.55)	(1.64)	(3.31)
GEO-SEG	0.038	-0.232**	0.016***	0.044	-0.237*	0.010*
	(0.76)	(-2.23)	(3.06)	(0.68)	(-1.93)	(1.65)
FOREIGN-OPERATIONS	-0.437*	-0.326	0.121***	0.155	0.201	0.073**
	(-1.88)	(-0.72)	(5.46)	(0.33)	(0.26)	(1.96)
FOREIGN-SUBSIDIARIES	-0.021	0.214	0.061***	0.006	0.059	0.064***
	(-0.26)	(1.21)	(7.09)	(0.04)	(0.23)	(5.19)
US-SUBSIDIARIES	0.079	0.343**	0.011	0.013	0.314	-0.018
	(1.10)	(2.30)	(1.51)	(0.09)	(1.19)	(-1.36)
ARC	1.611***	4.075***	0.452***	1.611***	3.222***	0.342***
	(4.67)	(5.82)	(13.18)	(2.62)	(2.93)	(6.41)
LOSS	0.004	-0.627	0.161***	0.088	-1.370**	0.122***
	(0.02)	(-1.57)	(8.23)	(0.27)	(-2.37)	(4.35)
LEVERAGE	-0.688**	1.185**	0.051*	-1.386**	0.647	0.028
	(-2.25)	(2.01)	(1.76)	(-2.03)	(0.60)	(0.54)
EXTERNAL-FINANCING	-0.227	-0.600	0.056**	0.259	-0.955	0.110***
	(-1.01)	(-1.34)	(2.55)	(0.57)	(-1.20)	(2.86)
EXTREME-GROWTH	0.055	0.692	-0.018	-0.303	0.662	-0.017
	(0.26)	(1.59)	(-0.83)	(-0.70)	(0.92)	(-0.49)
CAP-INTENSITY	0.023	-0.593	-0.307***	-0.073	-2.006	-0.421***
	(0.05)	(-0.60)	(-6.36)	(-0.08)	(-1.25)	(-5.38)
INV-REC	-0.441	0.930	0.032	-0.410	-0.916	0.232**
	(-0.80)	(0.86)	(0.60)	(-0.38)	(-0.48)	(2.52)
ACCELERATED	-0.438*	5.337***	0.155***	-1.038**	6.637***	0.200***
	(-1.85)	(11.33)	(6.72)	(-2.21)	(7.67)	(4.75)
BUSY-SEASON	-0.600***	1.090**	0.062***	-0.048	1.825***	0.052*
	(-3.02)	(2.56)	(2.97)	(-0.14)	(3.04)	(1.78)
BIG4	-0.025	-1.303***	0.568***	-0.375	-1.117	0.429***
	(-0.11)	(-2.86)	(25.46)	(-0.88)	(-1.41)	(11.17)
AGE	-0.070	-0.473*	-0.016	0.112	-0.971**	-0.027
	(-0.60)	(-1.93)	(-1.30)	(0.52)	(-2.44)	(-1.39)
MW	1.968***	7.541***	0.140***	2.354***	7.416***	0.197***
	(11.14)	(15.36)	(5.82)	(7.47)	(9.71)	(5.31)
RESTATEMENT		2.410***	0.040		3.209***	0.042
		(3.40)	(1.16)		(2.96)	(0.80)
Industry fixed effects	Included	Included	Included	Included	Included	Included
Constant	-11.135***	-23.989***	8.022***	-13.490***	-20.042***	8.672***
	(-6.10)	(-6.55)	(44.73)	(-4.03)	(-3.45)	(30.69)
Observations	3,370	3,675	3,675	1,149	1,381	1,381
Pseudo/Adjusted R^2	0.165	0.168	0.890	0.230	0.168	0.868

Table 6 (continued)
Panel B - Propensity score matched sample

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
COMPONENT-PCT	0.650*	1.086*	0.095***
	(1.84)	(1.70)	(2.97)
Industry fixed effects	Included	Included	Included
Constant	-12.459***	-30.309***	8.432***
	(-3.14)	(-3.66)	(20.45)
Observations	752	752	752
Pseudo/Adjusted R^2	0.169	0.184	0.862

This table tests H1 and reports results of regressions of *COMPONENT-PCT* on several dependent variables, with Panel A using a sample of firms that use at least one component auditor and Panel B using a propensity score matched sample. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

Table 7 - H2: Percentage of audit hours conducted by component auditors with coordination and communication challenges

Panel A - English language proficiency

	(1)	(2)	(3)
	RESTATEMENT	*AUDIT-DELAY*	*AUDIT-FEES*
HIGH-ENGLISH	0.024	0.027	-0.001
	(1.63)	(0.86)	(-0.67)
LOW-ENGLISH	0.023*	0.082***	0.000
	(1.91)	(3.09)	(0.00)
SIZE	0.018	-1.333***	0.403***
	(0.13)	(-5.10)	(30.99)
BUS-SEG	-0.042	0.250	0.027**
	(-0.34)	(1.04)	(2.22)
GEO-SEG	0.050	-0.232	0.016**
	(0.67)	(-1.62)	(2.20)
FOREIGN-OPERATIONS	-0.354	-2.723**	0.144***
	(-0.61)	(-2.46)	(2.61)
FOREIGN-SUBSIDIARIES	0.121	-0.138	0.082***
	(0.72)	(-0.43)	(5.14)
US-SUBSIDIARIES	-0.174	0.306	-0.041**
	(-0.96)	(0.91)	(-2.43)
ARC	1.818**	2.893**	0.343***
	(2.28)	(2.07)	(4.94)
LOSS	0.242	-1.192*	0.104***
	(0.66)	(-1.74)	(3.07)
LEVERAGE	-1.001	0.127	0.040
	(-1.24)	(0.09)	(0.57)
EXTERNAL-FINANCING	0.420	-1.929*	0.076
	(0.77)	(-1.85)	(1.46)
EXTREME-GROWTH	-0.247	0.925	-0.021
	(-0.50)	(1.02)	(-0.46)
CAP-INTENSITY	-0.230	-0.503	-0.406***
	(-0.20)	(-0.24)	(-3.95)
INV-REC	-1.365	-2.714	0.326***
	(-1.05)	(-1.15)	(2.77)
ACCELERATED	-1.109**	7.805***	0.215***
	(-2.01)	(7.00)	(3.87)
BUSY-SEASON	0.042	1.683**	0.048
	(0.11)	(2.39)	(1.35)
BIG4	-0.328	-1.371	0.412***
	(-0.65)	(-1.38)	(8.31)
AGE	0.221	-1.031**	-0.014
	(0.89)	(-2.16)	(-0.61)
MW	2.220***	8.166***	0.144***
	(5.97)	(8.78)	(3.10)
RESTATEMENT		2.856**	0.065
		(2.41)	(1.10)
Industry fixed effects	Included	Included	Included
Constant	-12.949***	-19.380***	8.767***
	(-3.13)	(-2.63)	(23.90)
Observations	704	881	881
Pseudo/Adjusted R^2	0.224	0.229	0.870

Table 7 (continued)
Panel B - Time zone differences

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
LOW-TIMEDIFF	0.020	0.042	-0.000
	(1.61)	(1.56)	(-0.05)
HIGH-TIMEDIFF	0.031**	0.092***	-0.001
	(2.09)	(2.94)	(-0.60)
SIZE	0.007	-1.344***	0.404***
	(0.05)	(-5.13)	(30.99)
BUS-SEG	-0.047	0.242	0.027**
	(-0.37)	(1.00)	(2.22)
GEO-SEG	0.047	-0.243*	0.016**
	(0.64)	(-1.70)	(2.20)
FOREIGN-OPERATIONS	-0.304	-2.748**	0.142**
	(-0.52)	(-2.48)	(2.58)
FOREIGN-SUBSIDIARIES	0.115	-0.115	0.082***
	(0.69)	(-0.36)	(5.17)
US-SUBSIDIARIES	-0.164	0.299	-0.041**
	(-0.90)	(0.89)	(-2.46)
ARC	1.906**	3.141**	0.339***
	(2.36)	(2.23)	(4.84)
LOSS	0.255	-1.255*	0.102***
	(0.70)	(-1.84)	(3.01)
LEVERAGE	-0.953	0.258	0.039
	(-1.19)	(0.18)	(0.55)
EXTERNAL-FINANCING	0.399	-2.022*	0.076
	(0.73)	(-1.93)	(1.46)
EXTREME-GROWTH	-0.230	0.923	-0.022
	(-0.46)	(1.02)	(-0.49)
CAP-INTENSITY	-0.174	-0.311	-0.406***
	(-0.15)	(-0.15)	(-3.94)
INV-REC	-1.314	-2.411	0.326***
	(-1.02)	(-1.02)	(2.76)
ACCELERATED	-1.090**	7.757***	0.211***
	(-1.97)	(6.96)	(3.80)
BUSY-SEASON	0.053	1.753**	0.047
	(0.14)	(2.48)	(1.34)
BIG4	-0.263	-1.233	0.406***
	(-0.51)	(-1.23)	(8.11)
AGE	0.234	-1.045**	-0.015
	(0.94)	(-2.20)	(-0.65)
MW	2.212***	8.279***	0.148***
	(5.96)	(8.95)	(3.21)
RESTATEMENT		2.784**	0.065
		(2.35)	(1.10)
Industry fixed effects	Included	Included	Included
Constant	-13.568***	-20.920***	8.802***
	(-3.20)	(-2.80)	(23.70)
Observations	704	881	881
Pseudo/Adjusted R^2	0.225	0.228	0.870

This table tests H2 and reports results of regressions of several sets of variables that capture work conducted by those with more and less coordination and communication challenges on several dependent variables, with Panel A examining English language proficiency and Panel B time zone differences. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

Table 8 - H3: Percentage of audit hours conducted by component auditors with high versus low competence and audit outcomes

Panel A - Number of CPAs

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
HIGH-CPAS	0.024	0.040	0.001
	(1.62)	(1.34)	(0.60)
LOW-CPAS	0.023*	0.076***	-0.001
	(1.90)	(2.78)	(-1.01)
SIZE	0.018	-1.316***	0.403***
	(0.13)	(-5.03)	(31.01)
BUS-SEG	-0.043	0.252	0.026**
	(-0.34)	(1.05)	(2.19)
GEO-SEG	0.050	-0.236	0.015**
	(0.67)	(-1.64)	(2.17)
FOREIGN-OPERATIONS	-0.354	-2.782**	0.143***
	(-0.61)	(-2.51)	(2.60)
FOREIGN-SUBSIDIARIES	0.121	-0.151	0.084***
	(0.72)	(-0.47)	(5.28)
US-SUBSIDIARIES	-0.174	0.307	-0.042**
	(-0.96)	(0.91)	(-2.52)
ARC	1.819**	2.955**	0.339***
	(2.28)	(2.11)	(4.88)
LOSS	0.242	-1.285*	0.103***
	(0.66)	(-1.88)	(3.03)
LEVERAGE	-1.001	0.114	0.043
	(-1.24)	(0.08)	(0.60)
EXTERNAL-FINANCING	0.420	-1.970*	0.076
	(0.77)	(-1.88)	(1.46)
EXTREME-GROWTH	-0.247	0.915	-0.024
	(-0.50)	(1.01)	(-0.53)
CAP-INTENSITY	-0.230	-0.417	-0.403***
	(-0.20)	(-0.20)	(-3.92)
INV-REC	-1.364	-2.725	0.338***
	(-1.06)	(-1.15)	(2.87)
ACCELERATED	-1.109**	7.635***	0.214***
	(-2.01)	(6.85)	(3.88)
BUSY-SEASON	0.042	1.704**	0.048
	(0.11)	(2.41)	(1.37)
BIG4	-0.331	-1.219	0.394***
	(-0.64)	(-1.19)	(7.78)
AGE	0.221	-1.046**	-0.016
	(0.89)	(-2.19)	(-0.68)
MW	2.220***	8.303***	0.149***
	(5.98)	(8.97)	(3.23)
RESTATEMENT		2.805**	0.066
		(2.36)	(1.11)
Industry fixed effects	Included	Included	Included
Constant	-12.947***	-19.802***	8.812***
	(-3.14)	(-2.67)	(23.97)
Observations	704	881	881
Pseudo/Adjusted R^2	0.224	0.227	0.870

Table 8 (continued)
Panel B - Industry experience

	(2) *RESTATEMENT*	(4) *AUDIT-DELAY*	(5) *AUDIT-FEES*
INDEXPERIENCE	0.021	0.056*	0.001
	(1.40)	(1.79)	(0.74)
NO-INDEXPERIENCE	0.025**	0.064**	-0.001
	(2.03)	(2.32)	(-1.08)
SIZE	0.019	-1.321***	0.403***
	(0.13)	(-5.04)	(31.04)
BUS-SEG	-0.042	0.245	0.027**
	(-0.33)	(1.02)	(2.26)
GEO-SEG	0.051	-0.238*	0.016**
	(0.68)	(-1.66)	(2.20)
FOREIGN-OPERATIONS	-0.352	-2.764**	0.139**
	(-0.61)	(-2.49)	(2.51)
FOREIGN-SUBSIDIARIES	0.119	-0.119	0.082***
	(0.71)	(-0.37)	(5.19)
US-SUBSIDIARIES	-0.171	0.293	-0.042**
	(-0.94)	(0.87)	(-2.51)
ARC	1.827**	2.908**	0.337***
	(2.29)	(2.08)	(4.85)
LOSS	0.247	-1.282*	0.102***
	(0.67)	(-1.88)	(3.01)
LEVERAGE	-0.990	0.139	0.042
	(-1.22)	(0.10)	(0.59)
EXTERNAL-FINANCING	0.422	-1.966*	0.076
	(0.77)	(-1.88)	(1.47)
EXTREME-GROWTH	-0.244	0.884	-0.023
	(-0.49)	(0.97)	(-0.51)
CAP-INTENSITY	-0.224	-0.377	-0.411***
	(-0.19)	(-0.18)	(-3.99)
INV-REC	-1.354	-2.544	0.316***
	(-1.05)	(-1.07)	(2.68)
ACCELERATED	-1.104**	7.670***	0.212***
	(-2.00)	(6.88)	(3.83)
BUSY-SEASON	0.045	1.707**	0.047
	(0.12)	(2.42)	(1.34)
BIG4	-0.296	-1.399	0.389***
	(-0.56)	(-1.35)	(7.56)
AGE	0.217	-1.063**	-0.015
	(0.87)	(-2.23)	(-0.62)
MW	2.217***	8.323***	0.149***
	(5.96)	(8.98)	(3.25)
RESTATEMENT		2.821**	0.066
		(2.38)	(1.12)
Industry fixed effects	Included	Included	Included
Constant	-13.042***	-19.360***	8.837***
	(-3.14)	(-2.60)	(23.95)
Observations	704	881	881
Pseudo/Adjusted R^2	0.224	0.226	0.870

This table tests H3 and reports results of regressions of several sets of variables that capture work conducted by more and less competent component auditors on several dependent variables, with Panel A examining the number of CPAs, Panel B experience on U.S. audits, and Panel C industry experience. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.

Table 9 - Additional analysis: Percentage of audit hours conducted by component auditors with high and low competence in countries with and without coordination and communication challenges

Panel A – Aggregate competence variable

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
HIGH-COMPETENCE	0.028	0.052	0.002
	(1.62)	(1.45)	(0.84)
LOW-COMPETNECE	0.022*	0.064**	-0.001
	(1.95)	(2.52)	(-0.85)
Control variables	Included	Included	Included
Constant	-12.878***	-19.373***	8.820***
	(-3.12)	(-2.61)	(23.96)
Observations	704	881	881
Pseudo/Adjusted R^2	0.224	0.226	0.870

Panel B – English language proficiency

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
HIGH-ENGLISH	0.023	0.029	-0.001
	(1.21)	(0.93)	(-0.89)
LOW-ENGLISH-	0.032*	0.096***	-0.002
LOW-COMPETENCE	(1.91)	(3.27)	(-1.47)
LOW-ENGLISH-	0.029	0.021	0.009***
HIGH-COMPETENCE	(0.68)	(0.34)	(3.03)
Control variables	Included	Included	Included
Constant	-18.015***	-20.462***	8.928***
	(-2.84)	(-2.75)	(24.29)
Observations	652	881	881
Pseudo/Adjusted R^2	0.382	0.229	0.872

Panel C – Time zone differences

	(1) *RESTATEMENT*	(2) *AUDIT-DELAY*	(3) *AUDIT-FEES*
LOW-TIMEDIFF	0.020	0.043	-0.000
	(1.60)	(1.63)	(-0.23)
HIGH-TIMEDIFF-	0.030*	0.115***	-0.004**
LOW-COMPETENCE	(1.90)	(3.28)	(-2.20)
HIGH-TIMEDIFF-	0.035	0.009	0.009***
HIGH-COMPETENCE	(1.05)	(0.14)	(2.94)
Control variables	Included	Included	Included
Constant	-13.537***	-21.680***	8.897***
	(-3.19)	(-2.90)	(24.08)
Observations	704	881	881
Pseudo/Adjusted R^2	0.225	0.229	0.872

This table reports results of regressions of several sets of variables that capture work conducted by more and less competent component auditors in countries with and without coordination and communication challenges on several dependent variables. First, Panel A validates the aggregate *HIGH-COMPETENCE* and *LOW-COMPETENCE* variables. *HIGH-COMPETENCE* is determined based on the component auditor meeting both of the competence criteria (i.e., employs above average number of CPAs, and has experience as either a lead or component auditor on at least one additional client in the same industry). Panels B and C then examine English language proficiency and time zone differences, respectively. Variables are defined in Appendix B. Regressions include two-digit SIC code industry fixed effects. Numbers in parentheses are *t*-statistics. Two-tailed statistical significance is indicated by ***, **, and * for 1%, 5%, and 10%, respectively.