The Opportunity for Partner Industry Knowledge Sharing within Audit Offices and Audit Quality

Paul N. Michas [a *]
Dan Russomanno [b]
Meiling Zhao [c]

The University of Arizona

We are grateful for thoughtful feedback provided by Joshua Gunn, Ben Van Landuyt, and the 2021 PCAOB Conference. The authors thank the Dhaliwal-Reidy School of Accountancy and the Eller College of Management at The University of Arizona for funding that makes this study possible.

[*] Corresponding author. [a] Paul N. Michas, Professor of Accounting, Dhaliwal - Reidy School of Accountancy, The University of Arizona, Tucson, AZ 85721, USA, paulmichas@arizona.edu; [b] Dan Russomanno, Assistant Professor of Accounting, Dhaliwal - Reidy School of Accountancy, The University of Arizona, Tucson, AZ 85721, USA, drusso01@arizona.edu; [c] Meiling Zhao, Doctoral Candidate in Accounting, Dhaliwal - Reidy School of Accountancy, The University of Arizona, Tucson, AZ 85721, USA, MeilingZhao@arizona.edu.

The Opportunity for Partner Industry Knowledge Sharing within Audit Offices and Audit Quality

ABSTRACT: We conjecture that a greater opportunity for audit partners to share personal industry knowledge with each other within audit offices benefits audit quality. Using recently available Form AP data, we analyze each partner's client portfolio and construct measures of the extent to which partners within the same audit office share similar industry knowledge and specialization, and how diffused this industry specific knowledge is shared across partners. We find negative associations between shared industry knowledge and both restatement likelihood and absolute abnormal accruals. In further cross-sectional analyses, we find that shared industry knowledge benefits audit quality for all but a partner's largest client in offices that are either the overall city-level industry leader or not. However, for partners' largest clients, the opportunity for industry knowledge sharing is associated with audit quality only when the office is also the city-level industry leader. This indicates an interplay between our novel constructs of the opportunity for partner industry knowledge sharing and extant constructs of city-level auditor office industry leadership. Taken together, our evidence is consistent with audit quality benefiting when there is a greater opportunity for partner industry knowledge sharing within audit offices.

JEL Classifications: D8, M41, M42

Data Availability: All data used in the study is publicly available.

Keywords: audit offices; audit partners; audit quality; Form AP; industry knowledge and specialization; knowledge sharing.

1. Introduction

In this study we investigate the opportunity of audit partners to share industry knowledge and specialization with each other within audit offices and its effect on audit quality. We argue that audit offices with more partners who share similar industry knowledge and specialization likely possess a greater opportunity to share this knowledge with each other. In this way, our study differs significantly from extant research that examines the effects of city- or national-level industry expertise/leadership on engagement-level audit quality. While we do measure partner-specific industry specialization, we go much further by examining whether the opportunity to *share* this partner-specific knowledge and specialization with other partners within an office affects audit quality. This within-office dynamic has not been investigated before in the literature, and it is important to investigate how partners in the same office may be able to share their expertise and knowledge with each other in ways that improve audit quality.[1]

An extensive body of research operationalizes measures of audit-office industry specialization to proxy for a local audit office's industry knowledge and expertise by comparing industry audit fees and clients aggregated at the audit office-level to the 'overall' audit office, audit firm, or city-level audit market (e.g., Craswell and Taylor 1991; Craswell at al. 1995; Ferguson and Stokes 2002; Knechel, Naiker, and Pacheco 2007; Reichelt and Wang 2010; Stein 2019). The findings within this research highlight the important role of a local audit office's 'overall' industry specialization on audit fees and audit quality. However, due to the lack of historical data on partner engagements, the analyses within these studies are limited to the audit office as the smallest unit of observation. Further, given these data limitations, research has been unable to examine any

[1] Duh, Knechel and Lin (2019) investigate knowledge sharing within audit firms. However, they do not look at the sharing of industry-specific knowledge. Further, they examine knowledge sharing with audit firms in Taiwan whereas we examine sharing within audit offices in the United States. We discuss these similarities and differences in Section 2.

within office variation in the extent to which partners possess partner-specific industry knowledge, and more importantly, whether the opportunity to share this knowledge with other partners (and other engagement personnel) within the same office benefits audit quality.

We address this unanswered question within the literature using recently released partner-specific engagement details publicly disclosed on PCAOB Form AP. This data now allows researchers to identify the individual partner who signs the audit opinion, which allows for the investigation of possible partner-level effects on audit quality. However, we investigate these possible effects from a different angle. Namely, we investigate the extent to which partners possess the opportunity to *share* their industry-specific knowledge with other partners within the same office, and whether this local opportunity to share industry knowledge is associated with audit quality. We proxy for this local opportunity to share industry knowledge by examining the number of partners within the same audit office that audit clients within the same industry, as well as specializing within a particular industry. Therefore, and importantly, we do not simply measure industry specialization at the partner or office level. Rather, we use this information to proxy for the extent to which partners are able to share their personal industry knowledge with other partners in the same office.

In auditing, the opportunity to share knowledge plays a critical role in the judgements and decisions made during an engagement (Duh et al. 2019). Knowledge sharing can occur horizontally (e.g., from partner to partner) or vertically (e.g., from partner to audit staff, or vice-versa) across peers and rank, where both types of knowledge sharing can deepen an auditor's understanding of factors impacting a decision (Duh et al. 2019; D'Eredita and Barreto 2006; Wang and Wang 2012). Authoritative guidance requires partners to maintain "industry-relevant technical

proficiency" and a "familiarity and understanding of the audit client's industry" (PCAOB 2021a).[2] Further, the deep knowledge on 'knowing-what' or 'knowing-how' resides within each audit partner in real time and often in advance of a firm updating and distributing explicit industry guidance from the national office to local audit offices. Accordingly, partner-level industry knowledge, and the ability to share this knowledge across partners within an audit office, can influence actions that impact audit quality.

To this end, when asked about industry knowledge sharing within an audit office, a partner from one of the largest national audit firms informed us of a recent experience participating in emergency brainstorming sessions with other partners within the same audit office and industry. These brainstorming sessions focused on responding to year-end audit challenges related to COVID-19 travel restrictions (e.g., developing workarounds to test the existence and cut-off assertions related to inventory, which traditionally require direct observation). Participation in this type of industry-specific brainstorming session was easier and quicker to mobilize within a group of partners from the same office. Accordingly, this timely knowledge sharing among partners specializing in similar industries occurred within the local audit office many weeks prior to the national office issuing audit guidance related to COVID-19 to all offices within the audit firm.

Investigating whether the opportunity to share industry-specific knowledge across partners within the same audit office affects audit quality is particularly important given the decentralized offices and size of the six largest national audit firms. For example, EY employs 298,965

[2] The nature and extent of the knowledge, skills, and abilities expected of partners should be based on the characteristics of a particular client, the client's industry, and the services provided (PCAOB 2021a). For example, supervising engagements and signing the audit report for clients in certain industries or engagements, such as financial services, governmental, or employee benefit plan engagements, require different competencies than what would be expected in performing attest services for clients in other industries (PCAOB 2021b). A partner should possess "industry-relevant technical proficiency", which includes an understanding of applicable accounting and auditing professional standards directly related to the industry in which a client operates and the kinds of transactions in which a client engages (PCAOB 2021b). Moreover, audit firms should ensure a partner has a "familiarity and understanding of the audit client's industry", which includes a familiarity and understanding of an industry's organization and operating characteristics sufficient to identify areas of high or unusual risk associated with an audit engagement, and to evaluate the reasonableness of industry specific estimates (AICPA 2020).

professionals in over 700 offices across 150 countries, making EY the largest audit firm in terms of people (second largest in terms of offices) in 2020 (EY 2020).[3] When coupled with the fact that knowledge transfer is typically discretionary and often beneficial for the recipient while being costly for the source (Reagans and McEvily 2003), it begs the questions of how a partner navigates who to ask for assistance, and what the quality of support will be, within such a dense web of resources across a global firm.

The personal knowledge about an audit client's industry and related accounting systems and operations is likely unevenly distributed across audit offices and audit personnel (Duh, Knechel and Lin 2020; Murthy and Kerr 2004; Harding and Trotman 1999). For example, consider two audit offices, each with five partners. In the first office all partners specialize in different industries, whereas in the second office four of the five partners specialize in the same industry. In this second office, four of the five partners have an increased opportunity to share valuable knowledge with each other that can create synergies that improve audit quality for all four partners when each individual partner's particular expertise is common, yet at least somewhat unique and 'personal'. In contrast, partners in the first office are acting within industry "silos" and, all else equal, have less of an opportunity to share their industry-specific knowledge in a way that can aid them on their own audit engagements.

We draw on a wide literature outside accounting and posit that absorptive capacity (i.e., the ability to recognize, value, and apply new information), associative learning (i.e., associating ideas to what one already knows), social cohesion (i.e., relationship ties of members belonging to the same social network), and physical proximity have a positive effect on knowledge sharing

[3] Details for the other largest five audit firms follow: Deloitte (2021) employs 286,000 professionals in 600 offices across 150 countries; PwC (2020) employs 284,000 professionals in 800 offices across 155 countries; KPMG (2021) employs 227,000 professionals in 650 offices across 146 countries; BDO (2020) employs 91,054 professionals in 1,658 offices across 167 countries; and Grant Thornton (2021) employs 58,000 professionals in 51 offices across 136 countries.

when industry specialization is more common across partners within the same audit office. Consequently, partners likely find it easier to absorb and associate new ideas in areas within their 'comfort zone' where they possess some expertise (e.g., industry specialization), while finding it more challenging to process, and at times even avoiding, new ideas outside of their immediate domain of expertise. When industry knowledge is shared across the same audit office, social cohesion (Reagans and McEvily 2003) suggests a greater willingness and motivation of partners to invest time, energy, and effort in sharing knowledge with others (Tillema, Dijst, and Schwanen 2010; Rocco 1998).[4] These elements that promote the opportunity to share industry knowledge within an audit office are more relevant than ever given the large role technology (e.g., e-mail, mobile auditing applications, Zoom®) plays in audit communication and remote auditing, and the adverse effect physical distance can have on both face-to-face and electronic communication (Tillema, Dijst, and Schwanen 2010; DiNapoli 2021).

We test our prediction using a sample of 10,469 firm-year observations from 2016 to 2019 with partners reported on Form AP, as well as other necessary data to examine restatement likelihood and abnormal accruals.[5] We create seven novel measures to proxy for the opportunity of partners within the same audit office to share industry knowledge with each other in a way that aids other partners in the office on their engagements. Importantly, we find our new measures are not highly correlated with extant city- or national-level industry specialization (all correlations are under 0.07). This univariate evidence is consistent with our partner-based constructs of industry knowledge shared within an office empirically capturing a component of industry knowledge that is novel and very different from extant constructs of industry specialization. These new measures

[4] We explain how these elements promote the opportunity for knowledge sharing within audit offices, as well as the ability and incentive for mutual monitoring when the opportunity is greater to share industry knowledge within an audit office in Section 2.
[5] Effective January 31, 2017, registered public accounting firms must file Form AP with the PCAOB as required by Rule 3211 (PCAOB 2017). See Downey, Rousseau, and Zehms (2019) for a review of PCAOB Form AP.

are correlated with audit office size at under 0.20 (and we include office size as a control in all specifications). Therefore, our industry sharing measures are not simply a proxy for office size. Further, we confirm inferences using extant measures of audit office industry specialization (e.g., within-office portfolio share, within-audit market share, and audit office industry diversity) are not the same as, or consistent with our new measures that indicate the extent to which partners within the same audit office share similar industry knowledge and specialization, and how diffused this industry specific knowledge is shared across partners.

Next, we test whether the opportunity for partners to share industry knowledge within audit offices is associated with audit quality. We follow prior research and use both restatements and the absolute value of abnormal accruals as salient measures of audit quality (e.g., DeFond and Zhang 2014; Francis et al. 2013). We find a negative association between restatement likelihood, as well as absolute abnormal accruals, and each of our seven knowledge sharing measures. Further, our results hold when analyzing all restatements or only material, non-reliance "Big R" restatements. The impact of industry knowledge shared within audit offices on restatement likelihood (absolute abnormal accruals) is economically significant. Depending on the sharing measure analyzed, we find a 10.6 to 46.7 percent decrease in restatement likelihood and a 5.0 to 12.1 percent reduction of absolute abnormal accruals, relative to the unconditional mean value of absolute abnormal accruals, as the values of our test variables go from the 25th to the 75th percentile values.

Moreover, our findings are robust to controlling for other auditor-based determinants of restatements and abnormal accruals such as audit firm industry leadership at both the national- and city-levels, audit office size, as well as year and industry fixed effects. Further, we include the office-year mean values of all our control variables to control for the possible effects of an office's

specific client portfolio, as this may be correlated with our partner knowledge sharing variables (Francis and Michas 2013).

We then examine whether the opportunity for partners to share industry knowledge within audit offices creates synergies only in offices that are the city-level industry leader (as commonly measured in extant studies) versus in offices that are not the city leader. Our results indicate this opportunity for knowledge sharing benefits audit quality for all but a partner's largest client in offices that are either the city-level industry leader or not. However, for partners' largest clients, the opportunity to share industry knowledge is associated with audit quality only when the office is also the city-level leader. Consequently, we provide important new inferences regarding the benefits of industry specialization that accrue to offices that are leaders in auditing clients in specific industries, and when partners within such offices possess an increased opportunity to share their own industry knowledge with other partners in the same office.

To better control for the possibility that audit-office characteristics that are correlated with partner industry sharing are somehow driving our results, we use propensity score matching to match audit offices with similar clientele characteristics except for the level of industry sharing. Our results are virtually identical after this matching procedure.

Our study leverages new information about audit partners recently made available in the PCAOB Form AP (Downey, Rousseau, and Zhemus 2019) and contributes to future research by presenting seven novel partner-based measures of the opportunity for partners to share their industry knowledge with their fellow partners in the same audit office. Further, our study builds on research arguing that auditor industry-specific knowledge may have both a "national" (firm-wide) dimension as well as a "local" (office-specific) characteristics (Reichelt and Wang 2010; Ferguson, Francis and Stokes 2003; Ferguson and Stokes 2002). In addition, investors and audit

clients may be interested in our findings given the audit-relevant disclosures now available in Form AP, the economically important role of the audit function to financial markets (DeFond and Zhang 2014), and the increased cost of capital associated with restatements (Hribar and Jenkins 2004; Kravet and Shevlin 2010; Rhodes and Russomanno 2020).

Finally, large national audit firms may be interested in our findings given their investment in the distribution of proprietary industry-specific materials to facilitate a wide range of industry training and knowledge sharing (e.g., BDO 2019; Deloitte 2019; EY 2019; Grant Thornton 2019; KPMG 2019; PwC 2013). As virtual communication becomes more common and cheaper with remote tools such as Microsoft Teams® and Zoom®, it may be less important to have clients physically in the same city.[6] In contrast, our evidence suggests it will remain important to have partners connected in a socially cohesive way that exploits the opportunity to share their industry knowledge.

2. Related literature and hypothesis development

Knowledge Sharing, Auditors, and Audit Quality

In knowledge-intensive professional services such as auditing, knowledge resources are considered to be the core competitive advantage of an organization (Alvesson 2004). Knowledge provides a base of power and a competitive edge for individuals (Jamshed et al. 2018) and offices (Casterella, Francis, Lewis and Walker 2004) who possess it. Overall, knowledge assets provide the intellectual direction of 'knowing what' and 'knowing how' (Jamshed, Nazri, Baker and Majeed 2018) to achieve objectives within an organization.

Knowledge sharing within teams occurs when individuals assist and learn from others' ideas, facts, expertise and judgments to develop new skills (Yang and Farn 2009; Kumar and

[6] PwC announced it will allow all its 40,000 U.S. client services employees to work virtually and live anywhere they want in perpetuity (DiNapoli 2021).

Ganesh 2009). Knowledge sharing promotes performance within organizations through teams and one-on-one interactions (Endres and Rhoad 2016; Quigley, Tesluk, Locke and Bartol 2007). As knowledge sharing influences team performance (Jamshed et al. 2018) it can significantly influence employee performance at the individual (Henttonen, Kianto, and Ritala 2016), team (Pangil and Chan 2014), and organizational levels (Ritala, Olander, Michailova, and Husted 2015).

The knowledge and expertise of the largest audit firms' personnel are spread over offices through a largely decentralized network of semi-autonomous practices offering tax, advisory and assurance services (Ferguson, Francis, and Stokes 2003; Beck, Gunn, and Hallman 2019; Seavy, Imhof, and Westfall 2018). Knowledge sharing can occur between partners or among audit staff (i.e., across peers and rank), where both types of knowledge sharing can deepen an auditor's understanding of factors impacting a decision (Duh et al. 2019; D'Erediate and Barreto 2006; Wang and Wang 2012). Over time, the largest national audit firms have grown significantly in their number of professionals, clients, and locations served. Accordingly, the importance and dispersion of industry knowledge across clients and locations requires large audit firms to invest heavily in industry-specific training and knowledge sharing.

In assurance services, engagement partners from individual audit offices are responsible for contracting, administering, and reporting on the audit (Reynolds and Francis 2000; Ferguson, Francis and Stokes 2003). Given this important role, PCAOB Rule 3211 recently mandated that auditors submit Form AP, which includes disclosure of the name of the engagement partner for each U.S. public audit engagement, beginning on or after June 30, 2017 (Downey, Rousseau, and Zehms 2019; PCAOB 2017). A firm-level view of audit quality assumes that partner-led audit teams provide a uniform level of audit quality across the audit firm as a whole (Lennox and Wu 2018; Ferguson, Francis, and Stokes 2003). Under a firm-wide view of audit quality, an audit firm

captures, transfers, and shares necessary inputs (e.g., knowledge and expertise, personnel, and resources) across its audit offices as needed in order to maintain a standard level of audit quality.

However, a compelling body of audit office research finds evidence inconsistent with a firm-wide view of audit quality. For example, related research finds larger audit offices are more likely to issue going-concern reports and to issue going-concern reports that are more accurate (Francis and Yu 2009), have clients with smaller abnormal accruals (Choi et al. 2010; Francis and Yu 2009), and have clients that are less likely to be associated with a restatement (Francis, Michas, and Yu 2013). A unifying explanation for these findings is that larger (smaller) audit offices have overall greater (less) in-house knowledge, expertise and skill in detecting material problems in the financial statements of their clients (Francis and Yu 2009). Accordingly, the findings within this audit office size stream of research suggest that audit quality varies across offices even within the same audit firm.

Industry Specialization and Audit Quality

Industry-specific generally accepted accounting principles (GAAP) help to promote consistent external reporting of the underlying economic activity (e.g., materials used, products produced, and services supplied) within firms across industries. For example, differences can arise in accounting systems and technical guidance due to industry-specific operations and assets, which impact the related accounting for inventory and inventory methods, capitalization and expensing rules, and revenue recognition. Industry knowledge is relevant to providing an accurate audit opinion given the selection and application of accounting policies for a client's financial reporting vary based on industry specific factors (Craswell, Francis and Taylor 1995). Consequently, differences across industry-specific operations and GAAP can impact audit quality depending on the industry knowledge available to those conducting the audit.

Accordingly, a related stream of audit office research examines industry-specific (rather than overall) knowledge and expertise. Empirically, industry knowledge and expertise vary across offices of large audit firms (Francis, Stokes, and Anderson 1999).[7] Clients audited by a city-level industry leader office exhibit smaller abnormal accruals and are less likely to meet or beat analysts' earnings expectations when the auditor is also a national industry specialist (Reichelt and Wang 2010). Further, client firms exhibit shorter audit delays (Whitworth and Lambert 2014), and benefit from significantly lower cost-of-debt financing (Li, Xie, and Zhou 2010). Moreover, industry specialist auditors are less likely to be associated with financial fraud (Carcello and Nagy 2004), poor disclosure quality (Dunn and Mayhew 2004), and earnings management (Krishnan 2003). Related research also finds auditors with knowledge of a client's industry make better audit risk assessments that help auditors anticipate potential misstatements (Taylor 2000; Low 2004). Additionally, Francis, Reichelt, and Wang (2005) find the demand for industry leaders is priced at both the national- and city-levels, but national-level industry leadership alone does not result in a fee premium in the United States.

Taken together, the audit office size and audit office industry specialization streams of literature suggest the location of audit knowledge and expertise (i.e., inside or outside of the audit

[7] Francis, Stokes, and Anderson (1999) use a market-based measure to identify city-level industry leaders from national-level for Big Six audit firms and find the national market industry leader is often not the city-specific industry leader. Initial studies examine auditor industry leadership at the national-level. Collectively, these national-level studies present evidence consistent with industry leadership varying by audit firm and audit quality benefiting from auditor industry leadership. At the national firm-level, Craswell, Francis, and Taylor (1995) examine client demand for auditor industry specialization and find there is a fee premium associated with industry specialization, measured using market share, and being a Big Eight auditor. Balsam, Krishnan, and Yang (2003) examine earnings quality of clients of industry specialist and non-specialist auditors, measured using most clients, actual market share in an industry based on the number of clients, and the number of clients in an industry. They find clients of industry specialists have higher earnings quality (i.e., lower discretionary accruals and higher earnings response coefficients) than clients of non-specialists. Moreover, Krishnan (2003) examines alternative earnings quality measures. Krishnan finds industry specialist, measured in terms of auditor market share in an industry and the industry share of the auditor's portfolio of client industries, mitigates accruals-based earnings management more than non-specialist auditors. Dunn and Mayhew (2004) find a positive association between analysts' rankings of disclosure quality and industry-specialists, measured using a market share-based measures with a 20% market share cut-off.[7] Lim and Tan (2009) find industry specialization, measured by audit client sales, moderates the relation between non-audit services and audit quality, and find audit quality increases with the level of non-audit services acquired from industry specialist auditors compared to non-specialist auditors.

offices) and amount of audit knowledge and expertise (i.e., overall or industry-specific) influences audit quality. In doing so, these studies conclude knowledge and expertise within audit offices play a significant role in determining overall audit quality. However, a short-coming of this prior research is assuming industry knowledge occurs without directly measuring whether partners within the same audit office share similar industry knowledge and specialization, and how diffused this industry specific knowledge is shared across partners. We contribute to the literature by examining whether the opportunity to share industry knowledge among partners within the same audit office affects audit quality.

The Opportunity to Share Industry Knowledge

The opportunity to share knowledge plays a critical role as judgements and decisions can be assigned to members of the audit team with limited experience and knowledge. For example, Duh et al. (2019) survey audit professionals from 22 audit firms in Taiwan to measure the extent to which overall knowledge sharing is fostered. They find knowledge sharing within an *audit firm* is positively associated with lower absolute discretionary accruals, the issuance of more unfavorable audit opinions, and shorter audit lags. Our study is distinct from Duh et al. in that we focus on *industry-specific* knowledge and the *opportunity* to which audit partners within the same *audit office* can share such knowledge with each other. The survey used by Duh et al. avoids an investigation of industry-specific knowledge sharing, but does focus on auditors' own opinions of how much knowledge is *actually* shared within their audit firms and how well firms promote this knowledge sharing. Whereas Duh et al. measure actual knowledge sharing (according to the opinions of their respondents) using survey data of Taiwanese audit firms, we measure the opportunity to share knowledge using public data on the six largest audit offices in the United States. Specifically, we proxy for the opportunity for such industry knowledge sharing based on

partners' actual industry specialization within U.S. audit offices and the extent to which partners have industry specialization in common with other partners in the same office.[8] In doing so, we peer into the 'black box' of auditing by investigating whether audit quality is impacted by partners who share industry-specific knowledge and who are located in the same office.

While prior empirical research conceptually differentiates between industry and overall audit knowledge, we further differentiate theoretically between industry knowledge as either explicit or tacit as it can influence the likelihood and ease with which it can be shared. Whereas explicit knowledge is mainly retained in "documents, publications, reports and databases" (Jamshed et al. 2018), tacit knowledge is solely personal, challenging to codify or communicate, and thus not easily shared with others (Jamshed et al. 2018; Nonaka and Takeuchi 1995; Polanyi 2015; Polanyi 1962).[9] For example, explicit audit knowledge, such as standardized audit programs or documents on industry specific GAAP and GAAS that is maintained on a firm's intranet likely transfers between offices or between an office and the national office with relative ease.[10] Moreover, other explicit industry knowledge, such as databases detailing industry-specific best practices, industry-specific risks, errors, or unusual transactions (Krishnan 2003), and technical guidance on changes in industry-specific revenue recognition standards, is typically maintained, updated, and accessible on an audit firm's intranet. This explicit knowledge should also be easier to share, transfer, codify and distribute across all offices. Thus, explicit industry knowledge is

[8] By measuring partners' actual industry specialization within audit offices, we investigate the opportunity for a specific type of knowledge sharing. In doing so, we overcome one limitation in Duh et al.'s (2019) investigation of 'general' (rather than a specific mechanism for) knowledge sharing. Moreover, by examining partners' actual industry specialization we avoid survey specific limitations such as low response rate from participants, non-response bias, biased responses, and limited depth of issues probed in highly structured questionnaires (Brown, Call, Clement, and Sharp 2015; Smith 2019).

[9] Polanyi (1958) was one of the earliest works to classify organizational knowledge into explicit and tacit. In one example, Polyanyi (1966) states "we can know more than we can tell", suggesting some tacit knowledge cannot be conveyed by verbal means. Jamshed et al. (2018), Polanyi (2015), and Nonaka and Takeuchi (1995) distinguish between explicit and tacit knowledge, and how these different types of knowledge can promote the likelihood of knowledge sharing within a general team culture.

[10] National audit firms set firm-wide policies and provide technical support for their city-based practice offices (Francis, Stokes, and Anderson 1999).

likely efficiently and effectively managed at the national level and easily transferred through technology and training to the resources in the local offices. In doing so, economies of scale can be achieved from sharing this type of industry knowledge across all audit offices within a national firm (Fung, Gul and Krishnan 2012). Accordingly, the impact of an individual auditor's personal knowledge on a firm's explicit industry knowledge sharing may be only marginally significant.

In contrast, the impact of an individual auditor's industry knowledge on an audit office's overall tacit industry knowledge sharing may be significant as tacit knowledge, unlike explicit knowledge, is "solely personal, challenging to codify, and difficult to share widely and efficiently" across an entire audit firm (Jamshed et al. 2018; Seavy, Imhof, and Westfall 2018; Nonaka and Takeuchi 1995; Polanyi 2015; Polanyi 1962). This is the case as the deep industry knowledge acquired through a partner's specific work history resides in an audit firm's expert partners who predominately serve clients in one office location (Ferguson, Francis, and Stokes 2003). For example, Krishnan (2003) states auditors who specialize in the banking industry can use their recent professional experience to assess the adequacy of loan loss provisions more competently than non-specialist auditors, which can improve the credibility of reported earnings. Moreover, auditors with expertise in manufacturing can use their tacit knowledge to better evaluate the reasonableness of a client's provision for warranty obligations with respect to real-time changes in industry standards compared to an auditor without this knowledge or expertise (Krishnan 2003).

Audit partners with access to tacit industry-specific knowledge and expertise possessed by other partners within their audit office can benefit from this knowledge sharing when conducting their own audit engagements. To this end, inter-personal interactions such as consultations with peers or individuals with different levels of experience (Duh et al. 2019; Knechel and Leiby 2016), teamwork (Libby, Trotman, and Zimmer 1987), brainstorming (Morris and Empson 1998; Read

and Thibodeau 1999; Lynch, Murthy, and Engle 2009; Gissel and Johnstone 2017), and on-the-job training (Bonner and Walker 1994) may benefit from sharing tacit industry specialization within audit offices. Relative to explicit industry knowledge, tacit industry-specific knowledge is harder or even impossible to share, transfer, codify and distribute across offices. As such, tacit industry-specific knowledge is likely not largely accessible at the national level, nor easily transferred through technology or training to the national level or between audit offices**.** Thus, the intra-office sharing of tacit industry knowledge may be just as, or even more influential, on audit quality than explicit knowledge that can be shared through inter-office transfers.

Hypothesis Development

We conjecture improvements in absorptive capacity and associative learning, as well as social cohesion, proximity and mutual monitoring increase the likelihood of knowledge sharing when the opportunity for partners to share industry knowledge within audit offices is higher. Following a discussion of these elements, we present our hypothesis on how the opportunity for partners to share tacit industry knowledge within audit offices impacts audit quality.

Absorptive Capacity and Associative Learning

Improvements in absorptive capacity and associative learning can increase the *likelihood* of knowledge sharing when the *opportunity* for partners to share industry knowledge within audit offices is higher. One of the most important ways that people learn new ideas is by associating those ideas with what they already know. Consequently, people find it easier to absorb new ideas in areas in which they have some expertise (Regans and McEvily 2003). Accordingly, the ability to recognize, value, and apply new information (i.e., absorptive capacity), and to associate ideas to what one already knows (i.e., associative learning), are higher among individuals with knowledge in common (Cohen and Levinthal 1990). In an abstract sense, two people with common

knowledge and in the same position are similarly situated in the flow of knowledge and information (Burt 1987; Strang and Tuma 1993; Rogers 1995; Reagans and McEvily 2003). In our setting, partners likely find it easier to absorb and associate new ideas in areas within their 'comfort zone' where they possess common industry knowledge, and maintain the same position (i.e., partners within the same office). In contrast, partners likely find it more challenging to process, to the point where they possibly avoid new information outside of their immediate domain of expertise.

Social Cohesion and Proximity

Moreover, stronger social cohesion and closer proximity can promote the opportunity for partners to share industry knowledge within audit offices. A knowledge-based theory of the firm suggests organizations are viewed as social communities specializing in efficient knowledge creation and transfer, where informal interpersonal networks are thought to play a critical role in the knowledge transfer process (Kogut and Zander, 1996; Reagans and McEvily 2003). Social cohesion arises when bonds link members of a social group to one another, whereby social cohesion should have a positive effect on knowledge transfer by influencing the willingness of individuals to devote time and effort to assisting others (Reagans and McEvily 2003). The higher propensity to share knowledge when strong social ties exist may stem from the desire to reciprocate (Granovetter 1973) or maintain balanced relationships (Heider 1958).

In our setting, social cohesion is likely stronger (weaker) for partners located inside (outside) of the same audit office as physical proximity can impact the propensity for knowledge sharing. Despite virtual technology playing a more significant role than ever in audit communication, the frequency of both face-to-face and electronic communication declines when physical distance increases (Tillema, Dijst, and Schwanen 2010). Moreover, the trust which

underpins knowledge sharing, especially over the longer term, tends to break down in electronic-only contexts where face-to-face communication is absent (Rocco 1998). Related to proximity, Beck, Gunn, and Hallman (2019) show decreased proximity between audit offices reduces the spill-over effect of inter-office audit quality. Accordingly, and consistent with the knowledge-based theory of the firm, we conjecture the stronger social cohesion and proximity of partners within the same industry and also the same audit office promotes the opportunity for knowledge sharing within the complex network of an audit firm.

The opportunity for social interactions within audit offices that promote knowledge sharing, easier access to knowledge and professionals when questions arise, and fewer barriers to communication and information exchange (Yang and Farn 2009) should increase when more partners in an office are part of the same industry-knowledge 'network.' These social interactions can happen by chance or occur more organically with someone located in the same office (e.g., over lunch or a meeting that does not require much of an introduction or advanced notice). In contrast, such social interactions that promote tacit knowledge sharing may be more challenging to coordinate when that knowledge is located outside of an office (e.g., introducing oneself through email without a prior connection or relationship) or when similar knowledge is not shared by partners.[11] Relatedly, Seavy, Imhof, and Westfall (2018) consider audit firms as a network of local offices and find that more connected offices, measured as the inverse of the average distance of audit office parings of the same audit firm, are associated with fewer restatements and lower

[11] Academic researchers may be able to relate to these real differences conditional on the location of tacit-knowledge. For example, consider a request for feedback on an early draft of a study from a professor with area expertise within one's academic institution or department, and a similar request from a professor with area expertise outside of one's institution/department. Whereas feedback from a professor in the same department can be requested by simply walking to the next office or sending a casual message to meet, feedback from someone outside of one's institution may require an introductory email (assuming no prior connection). To this end, it is difficult to gauge whether requested feedback will receive a response, what the response quality may be, and what the timeliness of a response may be given differences in expertise and incentives to share knowledge. In this example, we conjecture these feedback dimensions would be better when feedback is requested within the same institution/department.

discretionary accruals. Moreover, Cai, Kim, Park and White (2016) find evidence that communication across audit offices is harder than within offices. Specifically, they find a common auditor effect (i.e., where merger and acquisition deals with common auditors have higher acquisition announcement returns than deals without a common auditor) is more pronounced for deals involving acquirers and targets that are audited by the same local office of the common auditor.

Mutual Monitoring

In addition to tacit industry-specific knowledge sharing directly benefiting audit quality in performing the audit, industry knowledge sharing can promote an audit office's ability and incentive to be effective at mutual monitoring. Mutual monitoring is a costly quality control activity to address potential moral hazard problems (e.g., a shirking partner) where a peer audit partner's effort and risk aversion are not directly observable.[12] A concurring partner review is a primary mutual monitoring control intended to provide an independent and fresh review of the audit evidence to ensure the evidence supports the opinion issued (Schneider, Church and Ramsay 2003).[13] Frictions can arise due to the complexities of professional work and the only partial observability of the engagement partner's actions (Lennox and Wu 2017; Alchian and Demsetz 1972). A review partner specializing within the same industry as the engagement partner should be more familiar with the tasks, challenges, and expectations within that industry and be able to

[12] Moral hazard problems, such as shirking, arise in audit partnerships given a partner's effort is not fully observable or contractible (Narayanan 1995), and that a partner incurs the full cost of expending effort while realizing only 1/n of the profits in an n-partner firm (Lennox and Wu 2017; Kandel and Lazear 1992). A partnership as a whole can incur losses from litigation and reputation damage related to a shirking partner's lack of effort (Lennox and Wu 2017). With respect to audit quality, shirking can involve professional negligence, such as inadequate supervision of the audit or junior staff performing the audit, failing to perform a required audit procedure, or being too accommodating to client preferences for aggressive financial reporting (Huddart and Liang 2005).

[13] Mutual monitoring helps to reduce agency costs that arise from not being able to perfectly observe audit effort supplied by effort-averse auditors. Under costless mutual monitoring, agency costs are minimized as if the auditor's effort could be perfectly observed (Balachandran and Ramakrishnan 1987).

better communicate value-added feedback with less effort (Kandel and Lazear 1992). [14] Thus, tacit industry knowledge shared among partners within audit offices likely increases an audit office's ability to competently perform mutual monitoring activities.

Moreover, the reputational costs of an audit failure likely increase as more partners possess common industry specialization because each of the partners' individual reputations align more closely with the perceived audit quality of the office overall. It follows that partners likely have a stronger incentive to protect their reputational capital through mutual monitoring as more partners in an office share industry knowledge.

Taken together, improvements in absorptive capacity, associative learning, social cohesion, proximity and mutual monitoring can increase the likelihood of knowledge sharing when the opportunity for partners to share tacit industry knowledge is higher. In turn, this can benefit audit quality directly. On the other hand, if industry knowledge is a competitive advantage for a partner in gaining new clients, partners may not be willing to share knowledge as freely as our above discussion indicates. However, given the possibly enormous reputational damage that can occur throughout an audit firm as a result of audit failures (e.g., Arthur Andersen and Enron), we believe any incentives for partners to withhold knowledge sharing are outweighed by the incentives to provide higher audit quality. We formally state our hypothesis in the alternative form as follows:

HYPOTHESIS**:** *A higher level of opportunity for partners to share tacit industry knowledge within an audit office is positively associated with audit quality.*

3. Research Design, Sample, and Descriptive Statistics

Measurement of Partners' Opportunity to Share Knowledge

We estimate the opportunity for partners to share industry knowledge within audit offices

[14] Academic researchers may be able to relate to challenges similar to the concurring partner review from experiences as a peer reviewer of an academic article. To this end, consider how much easier and impactful it is for a reviewer that specializes in the same area or method of research to provide timely and effective value-added feedback to an author and editor.

by first evaluating each partner's industry of specialization in a given year. We then go on to measure the extent to which partners within an audit office possess knowledge in a specific industry that aligns with other partners in their office, thus creating the opportunity to share this knowledge with each other. We count the number of partners that share industry specialization and separately measure how widely spread (i.e., the diffusion of) industry specialization is within an audit office. Whereby, on one extreme, all partners in the office audit clients that are all in the same industry. At the other extreme, each partner audits clients in industries different from those of all other partners in the same office. In doing so, we argue this promotes the opportunity for partners to share their tacit industry knowledge with other partners in their office, thus impacting overall audit quality generated by the office.

To do this we exploit the relatively new PCAOB Form AP that provides data on which specific audit partners are in charge of the audit for specific client firms with fiscal year ends beginning January 1, 2017, inclusive. We use this data to create seven different measures capturing the level of opportunity to share industry knowledge within an audit office by 2-digit SIC code with our test variables: *NUM_PARTNERS, NUM_SPECIAL_FEES, NUM_SPECIAL_CL, DIFFUSE_FEES, DIFFUSE_CL, DIFFUSE_SPECIAL_FEES,* and *DIFFUSE_SPECIAL_CL* (see Appendix A for definitions of all variables used in our analyses). Collectively, we use *SHARED* to refer to these seven measures that proxy for the opportunity to share industry knowledge among partners within an office.

In constructing our variables, we first examine each client-year observation (i.e., client *i* in year *t*) to identify the industry (2-digit SIC code) that client-year observation operates in. Next, our first variable, *NUM_PARTNERS*, is a simple count of the number of partners in an office who audit one or more clients in the same industry as client *i* in year *t*. Thus, this is a simple measure

of how many partners in an office possess the opportunity to share industry knowledge with the engagement partner in charge of the client *i*, year *t* audit when considering *all* partners within an office. Similarly, we calculate two other measures based on a partner count by industry and office, but only for *specialist* partners. Specifically, *NUM_SPECIAL_FEES* and *NUM_SPECIAL_CL* measure the number of partners in an office who are considered specialists in the same industry as client *i* in year *t*. A partner's industry of specialization is defined as the industry a partner charges the largest amount of fees to or audits the largest number of clients in (indicated by the notation '*FEES'* and '*CL'* at the end of the variable names, respectively).

Four other *SHARED* measures estimate the diffusion of audits within an industry in an audit office among all partners, as well as only industry specialist partners, in that office. Simply put, more diffusion means that industry-specific knowledge is spread more widely across the engagement partner's audit office. We measure these diffusion-based *SHARED* variables utilizing the Herfindahl-Hirschman Index (HHI). The HHI is a commonly accepted measure of market concentration used in economics, and is used in audit studies such as Francis, Michas, and Seavey (2013) and Czerney, Jang, and Omer (2019). In our application, the HHI equals the sum of the squared-fractional share of audits across partners of audits within an industry (i.e., the concentration level). For ease of interpretation, we subtract each HHI-based concentration level from one to calculate diffusion. For client *i* in year *t*, a higher value of a diffusion variable indicates industry-specific knowledge is spread more widely across the engagement partner's audit office. A diffusion variable equal to 0 indicates industry specific knowledge is "siloed" to only one partner and not spread across the engagement partner's audit office at all. Accordingly, *DIFFUSE_FEES* and *DIFFUSE_CL* (*DIFFUSE_SPECIAL_FEES* and *DIFFUSE_SPECIAL_CL*) measure industry knowledge diffused among all partners (only specialist partners) by fees and clients, respectively.

Appendix B presents a detailed walkthrough on the calculation of all seven *SHARED* test variables. Specifically, Panels A and B demonstrate the steps to compile, evaluate, and calculate each test variable for two example audit offices. Further, in the first summary analysis across these example audit offices, Panel C shows audit fees (in total and by industry), the number of clients (in total and by industry), and the number of partners (in total and by clients per partner) are the same for both audit office examples. We intentionally hold these office level dimensions of size (i.e., audit fees, clients, and the number of partners) constant to illustrate how variation in the calculated *SHARED* measures can still arise. In the second summary analysis, Panel D shows the variation in the *SHARED* measures across example audit offices is explained by partner portfolio industry clients and audit fees for all partners, as well as only specialist partners within an audit office. Accordingly, the examples in Appendix B illustrate how the variation in the *SHARED* measures is starkly different from extant measures that focus on office/city-level, or national/firm-level audit fees and client industries to construct various measures of industry specialization.

It is important to emphasize that our measures of within-office shared industry knowledge are conceptually and econometrically very different from the industry leadership measures commonly used in the auditor industry leadership literature. Prior literature classifies an audit engagement as being performed, or not, by an audit office (audit firm) which is deemed to be the city- (national-) level industry leader compared to other audit offices (audit firms) located in the same MSA (throughout the U.S.). Therefore, it is a comparative measure of one audit office (firm) compared to all other audit offices (firms) in terms of which office or firm is *the* leader within an industry. Further, some engagements within an office are 'industry leader' engagements and some are not. Conversely, our measures of the opportunity to share industry knowledge represent a characteristic of the audit office based on the industry distribution across partners within an office.

Therefore, an engagement is not deemed an 'industry leader' engagement or not. Rather, we are interested in whether higher levels of the opportunity to shared industry knowledge across partners *within the same office in* the same *year* affect the overall quality level of audits performed, on average, for clients in the same industry and year. We conjecture that when the opportunity exists for partners to increasingly share their industry-specific knowledge with other partners in their office, this promotes the likelihood of tacit industry knowledge sharing within an audit office that can benefit audit quality.

Importantly, we also control for industry specialization as measured in the extant literature in all our analyses so as not to confound these measures. Interestingly (and importantly), we find that our test variables are not highly correlated with industry leadership, as proxied by *CITY_LEADER* and *NAT_LEADER*, which we discuss in detail below and which are defined in Appendix A. Consequently, simply because a specific client is audited by an audit office or firm measured as the industry leader (at either the city or national level), it does not mean these offices are also able to share a high amount of industry knowledge among the partners within that office. Therefore, our study introduces a very different, new and important concept into the literature.

Using actual office level data, Appendix C illustrates the differences between extant measures for auditor industry knowledge-specialization and the *SHARED* measures using an example audit market (i.e., Denver, CO) based on Audit Analytics data for fiscal year 2017 for KPMG.[15] Specifically, we calculate three extant measures of industry specialization: (1) within-auditor differentiation across industries (i.e., *PORTFOLIO SHARE*) following Stein (2019); (2) within-industry differentiation across competing auditors (i.e., *MARKET SHARE*) following Stein

[15] Appendix C follows the measures presented in Appendix A from Stein (2019). However, we include the *DIVERSITY* measure and limit our presentation to KPMG. Our conclusions remain the same in untabulated analysis when comparing the extant measures to our *SHARED* measures for the other three Big-Four firms located in the Denver, CO audit market in 2017. Finally, our discussion focuses on *NUM_PARTNERS* and *DIFFUSE_FEES* for brevity. However, our conclusions remain the same when considering the other five *SHARED* measures.

(2019) and Numan and Willekens (2012); and (3) the extent to which there is competition for knowledge resources in the audit office portfolio given the number of clients audited by that audit office in a different industry and the total number of clients audited by the office (i.e., *DIVERSITY*), following Beardsley, Goldman and Omer (2020).[16]

The *MARKET SHARE* and *PORTFOLIO SHARE* measures vary by industry within the audit office. Sometimes *MARKET SHARE* is suggestive of the *SHARED* measures. For example, the KPMG -Denver office maintains 100 percent of the market share of SIC=48 and accordingly this industry knowledge is possessed by many audit partners within this audit office, where *NUM_PARTNERS*=6 and *DIFFUSE_FEES*=79%. However, other instances exist where *MARKET SHARE* spuriously infers the opportunity for industry knowledge sharing among partners within an audit office. For example, this same audit office also maintains 100 percent of the market share of SIC=54, yet this industry-specific knowledge is "siloed" to only one partner and not diffused among the partners within the audit office given *NUM_PARTNERS*=1 and *DIFFUSE_FEES*=0.0%. Similarly, *PORTFOLIO SHARE* is a noisy indicator of the *SHARED* measures. For example, the KPMG-Denver office maintains a 10.8 percent portfolio share of SIC = 67, where *NUM_PARTNERS*=4 and *DIFFUSE_FEES*=62.4%. Yet, when the *PORTFOLIO SHARE* is slightly lower at 10.1 percent for SIC=59, industry-specific knowledge is again "siloed" to only one partner and not diffused among the audit office partners given the *NUM_PARTNERS*=1 and *DIFFUSE_FEES*=0.0%. Finally, we note the *DIVERSITY* measure is an office level score that does not vary by industry. Thus, *DIVERSITY* does not provide insight into specialization by industry, or the opportunity for how industry knowledge can be shared across partners within the

[16] Stein (2019) notes limitations to the portfolio share measure include classifying auditors with small market shares in an industry as specialists and the lack of variation among auditors in certain industries. Moreover, limitations to the market share measure include the designation of specialists in industries that are too small to generate significant revenues for the audit firm/office, and not adequately recognizing specialization in highly competitive industries where most of the auditors generate significant revenues and devote considerable resources.

same audit office (i.e., our *SHARED* measures).

Taken together, Appendix C suggests extant measures of audit office industry specialization are quite noisy in inferring the opportunity for industry knowledge sharing among partners within audit offices. This is unsurprising given (1) our *SHARED* measures are the first to directly measure the common industries among partners within an audit office, and (2) the inherent noise that can arise in using extant measures (i.e., that aggregate office level fees or client data) to infer common industry audits among partners within an audit office. Thus, Appendix C substantiates that our novel *SHARED* measures go beyond extant measures to proxy for the opportunity to share industry knowledge among partners within an audit office.

Model of Within-Office Shared industry Knowledge and Audit Quality

To test our Hypothesis, that a higher level of opportunity to share tacit industry knowledge within an audit office is positively associated with audit quality, we estimate the following model:

$$DEP\_VAR_{it} = f(SHARED, Auditor\ Controls, Client\ Firm\ Controls, City\ Controls, Auditor\ Office\ Client\ Portfolio\ Controls, Industry\ and\ Year\ Fixed\ Effects) \quad (1)$$

where *DEP_VAR* is one of the following three outcome variables: Pr(*RESTATE=1*), Pr(*MATERIAL_RESTATE=1*), or *ABS_ABACC.* We use restatements as an outcome variable of interest given it is the auditor's responsibility to issue an accurate opinion about whether a client's financial statements are free from material misstatement, and restatements are a salient measure of poor audit quality used in extant studies (e.g., Dechow, Ge, Larson, and Sloan 2010; Francis, Michas, and Yu 2013; Ashraf, Michas, and Russomanno 2020). *RESTATE* equals 1 if client *i* restates, at some point in the future, its 10-K or 10-Q filing for year *t,* and 0 otherwise. Alternatively, *MATERIAL_RESTATE* equals 1 if client *i* issues, at some point in the future, an Item 4.02-restated 10-K or 10-Q filing for year *t* (i.e., a "Big R" non-reliance restatement), and 0 otherwise. Finally, our third audit quality proxy, *ABS_ABACC,* equals the absolute value of client *i*'s abnormal

accruals in year *t*, calculated following Kothari et al. (2005) and controlling for concurrent return on assets. This is a widely-used proxy for audit quality in the literature (e.g., Francis and Michas 2012; Bills, Swanquist, and Whited 2016; Lee, Nagy, and Zimmerman 2019). Evidence of a negative coefficient on the *SHARED* test variables would be consistent with our Hypothesis, and would provide evidence that higher levels of industry knowledge sharing among audit partners within the same office is positively associated with audit quality.

We control for a large number of auditor, client, and city variables associated with audit quality (Balsam, Krishnan and Yang 2003; Beck, Francis and Gunn 2018; Callen, Robb and Segal 2008; Francis, Michas and Yu 2013; Frankel, Johnson and Nelson 2002; Kedia and Rajgopal 2011; Lim and Tan 2007; Reichelt and Wang 2010; Reynolds and Francis 2000). We also include year and industry fixed effects in our model to account for the idiosyncratic effect of time and industry characteristics. All variable definitions can be found in Appendix A.

Sample

Table 1 summarizes our sample selection process. We begin with 19,066 firm-year observations available in Compustat and Audit Analytics from client fiscal years 2016 through 2019. We start in 2016 since PCAOB Rule 3211 requires auditor reports issued on or after January 31, 2017 to include engagement partner information, and thus we have audit partner data on firms' financial reports beginning in fiscal year 2016. We eliminate 2,303 (1,771) observations with missing data in Audit Analytics and Form AP filings (Compustat). In this step, we only retain audit clients that are categorized in the Form AP data as "Issuers, other than Employee Benefit Plan or Investment Company". To construct meaningful within-office measures for the opportunity to share industry knowledge we delete 2,196 observations where an audit office has less than three partners. Finally, we eliminate 2,327 observations that use an audit firm other than one of the six

largest auditors (which includes Deloitte, EY, KPMG, PwC, Grant Thornton and BDO) for two reasons. First, we wish to avoid any possible selection bias induced through firms choosing to be audited by the largest audit firms in the U.S. (Lawrence, Minutti-Meza and Zhang 2011). Second, these six firms audit the vast majority of the market share and clients of U.S. public firms.[17] This results in 10,469 firm-year observations that comprise 880 unique auditor-office years used to analyze restatements. The sample used to analyze absolute abnormal accruals is further reduced to 9,291 firm-year observations due to necessary data requirements to calculate this outcome variable.

Descriptive Statistics and Correlations

Table 2, Panel A presents descriptive statistics on all variables used in the study. We find that about eight (two) percent of firms eventually restate their financial statements in any way (through an Item 4.02 non-reliance "Big R" restatement), which is consistent with other studies (Francis, Michas, and Yu 2013; Ashraf, Michas, and Russomanno 2020). Our other outcome variable, *ABS_ABACC,* also shows statistics in line with extant research (Francis and Michas 2012; Bills, Swanquist, and Whited 2016).

Turning to our main test variables, the mean value of *NUM_PARTNERS* shows that 3.36 partners audit clients for a given industry in the average audit office. The 75th percentile value is 4.0. Although not included in the table, the 90th percentile, 95th percentile and maximum values for this test variable are about 9, 11 and 18. Our diffusion variables theoretically vary between zero and 1.0, by definition, given they are based on the HHI calculation. Our *NUM_SPECIAL_FEES* and *NUM_SPECIAL_CL* variables show slightly lower rates compared to *NUM_PARTNERS.* This is not surprising as partners are not always specialists in the industry of

[17] Over our sample, the six largest auditors audit 98.9 percent of total market capitalization and 67.8 percent of all public clients.

all clients they audit. Finally, the variable *LARGEST* is equal to one for a client-year observation if that client is a partner's largest client during a year. We use this variable in cross-sectional analyses later in the study.

Table 2, Panel A also presents our audit-office clientele portfolio controls where we take the mean value of each client firm-level variable within audit-office-year groupings. We do this to control for the "average" client of an office across many client-level characteristics as audit partners' industry specialization is likely correlated to some extent with the office's overall client portfolio (Francis and Michas 2013).

Table 2, Panel B presents descriptive statistics on the number of partners within offices (with a mean value of 9.13 partners), the number of industries audited within offices (mean value of 7.26), the number of clients a partner audits (mean value of 1.80), and the amount of audit fees charged by partners to their clients (mean value of about $4.1 million).

Table 3 presents Pearson correlations between all variables used in the study, with bold values indicating statistical significance at $p<0.05$ (except that we exclude our mean auditor office clientele variables for brevity).[18] We discuss a few of these important correlations here. First, our seven test variables are correlated with each at between 0.74 and 0.99. This provides comfort that we are proxying for the opportunity for industry knowledge sharing among partners in ways that are somewhat similar, but that also pick up somewhat different aspects to which partners within the same audit office share industry knowledge. This increases confidence we are not homing in on one or a few variables, but rather consider proxies that take into account these possible different aspects. Second, while there is an obvious possibility our measures of shared industry specialization depend to some extent on office size as it is *a priori* more likely that more partners

[18] Our clientele variables exhibit low untabulated correlations with all our test variables, indicating collinearity is not of concern.

share industry specialization in larger offices, we find the correlations between our test variables and *OFFICE_SIZE* to be between only 0.17 and 0.19. Therefore, while there does exist correlation between these variables, the correlations are not sufficiently high enough to suggest our test variables are simply an alternative proxy for audit office size. Nonetheless, we control for audit office size in all subsequent analyses to ensure it does not confound our results. Finally, and importantly, our test variables are correlated with more traditional measures of auditor industry leadership (*CITY_LEADER* and *NAT_LEADER)* at very low levels in all cases, some of which are negative. When coupled with our discussion related to Appendix C, this provides persuasive evidence that our new industry specialization sharing variables are not simply alternative proxies for city- and national-level auditor industry leadership commonly found in the auditor industry leadership literature. The correlations between our test variables and all other control variables are relatively low in the vast majority of cases. Moreover, low variance inflation factor (VIF) values of less than 1.85 on our seven test variables in all analyses, which are well below the 10.0 threshold in Kennedy (1992), indicate multicollinearity is not a concern in our regression analyses.

4. Results

Within-Office Shared Industry Knowledge and Audit Quality

Table 4 presents our results of testing our Hypothesis using restatements as our outcome proxy for audit quality. Panel A (Panel B) estimates the likelihood of *RESTATE (MATERIAL_RESTATE)*. We include seven models in each panel analyzing each of our test variables separately. The coefficients on all the test variables are negative and statistically significant ($p<0.01$ and $p<0.05$) in all 14 specifications over both panels. Accordingly, this evidence is consistent with our Hypothesis where a higher level of opportunity to share tacit industry knowledge within an audit office is positively associated with audit quality. These results

are also economically significant. When going from the 25th to the 75th percentile values of our two tests variables, clients are between 10.6 and 21.9 (19.2 and 46.7) percent less likely to restate their financial statements using any kind of restatement (an Item 4.02 restatement) when analyzing the seven models in Panel A (Panel B).[19]

Table 5 presents our results using absolute abnormal accruals (*ABS_ABACC*) as the outcome variable to test our Hypothesis. Again, all seven columns show that our test variables are negatively and significantly associated with absolute abnormal accruals ($p<0.01$ and $p<0.05$), which also provides evidence of a positive association with audit quality. Further, economic significance analyses show that absolute abnormal accruals are reduced by between 5.0 and 12.1 percent, relative to the unconditional mean value of absolute abnormal accruals of 0.24 shown in Table 2, as our test variables go from their 25th to 75th percentile values.[20]

Shared Industry Knowledge in Conjunction with City-Level Auditor Industry Leadership

In this analysis we investigate whether our new partner industry knowledge sharing construct is one that works in conjunction with, or separate from, the traditional proxies for auditor industry leadership used widely in the literature. We begin this analysis in Table 6 by presenting the distribution of city-level industry leadership within four-by-four matrices based on quartiles for each *SHARED* variable and quartiles based on office size. We include office size given our discussion above that larger offices with more partners may have a greater opportunity to share industry knowledge. The calculation in each of the 112 cells presented (i.e., 16 cells multiplied by seven *SHARED* variables) is the within-cell mean value of the percentage of engagements in an

[19] We use the "margins" command in STATA to estimate the change in likelihood of issuing a restatement when going from the 25th to the 75th percentile values of our test variables. For example, in Panel A, column (1) the likelihood a firm issues a restatement when in an office at the 25th (75th) percentile value of *SHARED_FEES* is 8.31 (7.12) percent. This represents a 14.4, or [(7.12-8.31)/8.31], reduction in restatement likelihood.

[20] These values are calculated by multiplying the coefficient on our test variable in each model by the difference in the 25th and 75th percentile values of the test variables, and then scaling this by the unconditional mean value of absolute abnormal accruals of 0.24.

audit-office-year grouping where the office is considered a city-level industry leader. An office is considered the leader when it shows the largest total amount of audit fees charged within an industry within the same Metropolitan Statistical Area (MSA) in a year. Accordingly, this tabulated distribution suggests the percentage of audits within an office conducted as the city-level industry leader is relatively similarly distributed across all 112 cells. Specifically, this percentage ranges from a low (high) of 38 (75) percent. There is no clear overall pattern in terms of an increase or decrease in these percentages across the cells. Specifically, neither office size nor the preponderance of city-level industry leadership systematically drives the opportunity for industry knowledge sharing among partners within offices. This provides even more comfort our *SHARED* variables are not simply alternative proxies for either office size or city-level industry leadership.

Next, we test whether the opportunity to share industry knowledge among partners within the same audit office works in conjunction with, or separate from, the audit office's city-level industry leadership on audit engagements. Specifically, we examine whether an office needs to be deemed the city-level leader on specific engagements for partner industry knowledge sharing to be associated with audit outcomes. To do so, we interact *SHARED* with *CITY_LEADER.* Therefore, the coefficient on *SHARED* estimates the main effect of the opportunity to share partner industry knowledge on engagements where the audit office *is not* a city-level industry leader on a specific engagement. Further, the combined coefficients on (*SHARED* + *SHARED*CITY_LEADER*) estimate the effect of the opportunity for partner industry sharing on engagements where the audit office *is* the city-level industry leader. We perform this analysis when estimating *MATERIAL_RESTATE* and *ABS_ABACC* in Panels A and B of Table 7, respectively.[21]

In Table 7, Panel A, the coefficients on the main effects of all seven of our *SHARED* test

[21] Untabulated results using the *RESTATE* variable are very similar.

variables are not significant, indicating that the opportunity for partner industry knowledge within an office is not associated with audit quality when the audit office *is* not the city-level industry leader on an audit engagement. However, all seven combined coefficients (i.e., *SHARED* + *SHARED*CITY_LEADER*) are negative and significant. This indicates that the opportunity for partner industry knowledge sharing is positively associated with audit quality, but only when the auditor office is the overall industry leader in a client firm's industry. These results suggest a very interesting interplay between the opportunity for partner knowledge sharing and the overall industry leadership of the audit office taken as a whole. Thus, we document not only a new conceptual construct not before investigated in the audit literature, but also how this new construct interacts with an important construct that has been widely investigated by extant research.

Table 7, Panel B, which presents results analyzing abnormal accruals, shows very similar results. The only exception is that two of the main effects are negative and significant. Thus, we do not believe this provides enough evidence to suggest partner industry sharing affects audit quality when the audit office is not the industry leader overall.

Shared Industry Knowledge and Client Size

In Tables 8 and 9 we investigate whether client size affects the ability of partner industry knowledge sharing to affect audit quality. Partners have a range of clients. When auditing their largest client, it is more likely this client is somewhat unique, and more challenging to audit from all other clients in that partner's portfolio. Thus, it is possible that other partners' knowledge of an industry overall may be somewhat limited when it comes to aiding a specific partner on the audit of their largest client.

We test this conjecture by creating the variable *LARGEST* which is equal to one if client *i* in year *t* is the partner's largest client based on audit fees. We then interact this variable with all

seven of our test variables. Further, we conduct this analysis on sub-samples where *CITY_LEADER* equals zero (in Panels A of both tables) and where *CITY_LEADER* equals one (Panels B of both tables), given our analyses in Table 7.

Table 8, Panel A presents our results using material restatements as our outcome variable on the sub-sample where the audit office is *not* the city-level industry leader on an engagement. The main effect on all seven *SHARED* variables indicates that the opportunity for partner industry knowledge across partners within an office is negatively associated ($p<0.05$) with audit quality for clients that are not a partner's largest client. Interestingly, this also provides evidence that it is *not necessary* in all cases for an audit office to be the city-level industry leader for the opportunity for partner industry knowledge sharing to benefit audit quality. Further, the combined coefficients on (*SHARED + SHARED*LARGEST*) are all insignificant. This result aligns with our conjecture above in that the opportunity for partner sharing is not associated with audit quality for partners' largest clients in offices that are not the overall city-level industry leader.

Table 8, Panel B provides evidence that partner knowledge sharing is associated with audit quality for *all* of a partner's clients when the audit office *is* the city-level industry leader (given the negative and significant coefficients on all main effects and combined coefficients). These analyses, when combined with those in Table 7, show when and where partner industry knowledge sharing is associated with audit quality. When a client is a partner's largest, the opportunity for knowledge sharing evidently only helps a partner on his or her audit when the office as a whole *is* an industry leader. However, for all other clients, the opportunity for partner knowledge sharing alone is enough to have an effect on audit quality. Again, this provides new evidence on a novel construct that is important to audit outcomes.

Finally, the results in Table 9, using abnormal accruals as our outcome variable, are

consistent with results presented in Table 8 that use material restatements as our outcome variable. There is one exception where one of the combined coefficients in Table 9, Panel B is not statistically significant.

Additional Untabulated Analyses

To further address the possibility that differences across audit offices that drive our measures for the opportunity to share industry knowledge also drive our results, we use propensity score matching to match audit offices that exhibit low/high partner knowledge sharing but are otherwise similar. To create low and high partitions of audit offices, we first calculate the mean value of all our seven test variables within each audit-office-year. We then assign each office as a low or high sharing office based on the median value of each test variable across all audit offices in a year. Next, we use a propensity score matching model that includes all of our office-level control variables (i.e., *m_SIZE, m_LOSS*, etc.). We do this without replacement using a one-to-many radius match while allowing for a maximum caliper distance of 0.03.[22] Finally, we rerun all our analyses using client-year observations corresponding to these matched audit offices. We find that the results for our main analyses of audit quality, the engagement-specific specialization analyses, and client size analyses hold using the matching technique.

Many partners audit only one client. In our sample we find that 66.3 percent of partners have only one client in a year. To mitigate concern that our results may be driven by these instances we delete these observations and rerun our analyses in Tables 8 and 9. We find that for partners with two or more clients, the opportunity to share industry knowledge among partners within an office is still positive and significantly associated with audit quality (for both smaller clients as

[22] Shipman, Swanquist and White (2017) discuss the challenges of dichotomizing a continuous variable for the purposes of matching we implement. They conclude it "tends to yield matched samples where the treatment level in the control group is more similar to that of the treatment group, *reducing the effect size* (pg. 214, italics emphasis added)." They conclude this diminishes the power of such tests, which serves to bias against us finding a statistical association between partner knowledge sharing and audit quality after implementing our matching procedure.

well as the partner's largest client), but only for partners in an office that is considered a city-level industry leader overall. This provides more evidence of the interplay discussed above between shared partner industry knowledge and overall city-level industry leadership.

We also examine whether our test variables are associated with audit efficiency. We proxy for audit efficiency with audit lags, calculated as the natural log of the number of days between client firms' fiscal year end date and the audit report date. Untabulated results show that audit partner industry knowledge sharing is negatively and statistically associated with audit lags in all models. This result also holds after our matching procedure described above.

Additionally, we examine whether office size affects the conclusions reported in Table 7. To do so we break offices into small and large based on the median size of all offices within year groupings. We then rerun our Table 7 analyses within both office size groups. We find most of our results in Table 7 hold in both small and large audit offices. The one exception is that partner knowledge sharing is not associated with absolute abnormal accruals in small offices when that office is the city-level industry leader.

Finally, we examine whether our findings are robust to audit office industry diversity following Beardsley, Lassila, and Omer (2019) and Beardsley, Goldman and Omer (2020). Whereas our *SHARED* measures estimate the opportunity to share industry knowledge shared using partner portfolio data, the audit office industry diversity measures estimate the extent to which there is competition for knowledge resources at the audit office level. We rerun our main analyses and find our results remain robust to including measures of audit office industry diversity.

5. Conclusion

In this study, we investigate the opportunity of audit partners to share tacit industry knowledge with each other within audit offices and its effect on audit quality. We conjecture that

absorptive capacity, associative learning, social cohesion, and physical proximity can have a positive effect on knowledge sharing, as well as the ability and incentive for mutual monitoring, when industry knowledge is shared more across partners within the same audit office. Thus, we predict audit quality benefits from a higher level of opportunity for partners to share tacit industry knowledge within an audit office.

Consistent with our prediction, we find the opportunity for partners to share industry knowledge within an audit office is positively associated with audit quality (i.e., lower restatement likelihood using non-reliance restatements and all restatements, as well as smaller values of absolute abnormal accruals) using each of our seven industry knowledge sharing measures. Additionally, we find that the opportunity for industry knowledge sharing among partners within an audit office benefits audit quality for all but a partner's largest client in offices that are either the overall city-level industry leader or not. However, for partners' largest clients, this opportunity to share industry knowledge is associated with audit quality only when the office is also the city-level industry leader. This indicates an interplay between our novel construct of the opportunity for partner knowledge sharing and extant constructs of city-level auditor office industry leadership.

Taken together, our evidence is consistent with audit quality benefiting when partners within offices possess an increased opportunity to share their own industry knowledge with other partners in the same office. To this end, our study extends, but differs significantly both conceptually and empirically, from extant research that examines the effects of city- or national-level industry expertise/leadership on engagement-level audit quality (e.g., Craswell and Taylor 1991; Craswell at al. 1995; Ferguson and Stokes 2002; and Knechel, Naiker, and Pacheco 2007; Reichelt and Wang 2010). Moreover, audit firms may want to consider our evidence in organizing their audit offices, especially as virtual communication becomes more common with remote

auditing through tools such as Microsoft Teams® and Zoom®. Accordingly, our evidence suggests it will remain important for partners to remain connected in a socially cohesive way that exploits the opportunity to share their industry knowledge and avoid industry knowledge "silos".

An important caveat of our study is the challenge and choice in measuring the opportunity for partners to share industry specific knowledge within an audit office. We restrict our measurement of this important concept to partners' portfolios within audit offices and create seven novel measures of the opportunity for partners within the same audit office to share tacit industry knowledge by evaluating the industry specific clients and fees within each audit partner's portfolio using Form AP data. These seven measures, which are not highly correlated with extant city- or national-level industry specialization or audit office size, identify the number of partners and how widely spread industry specific knowledge is among partners within the same audit office considering all (as well as just specialist) partners. However, given the archival nature of our study, we are not able to directly measure the extent to which partners actually share knowledge.

We also caveat that our analyses examine only the six largest audit firms that audit approximately 98.9% of the market capitalization of publicly traded firms. Although a large number of audits are performed on private companies (Lennox and Wu 2018), we have no reason to suspect a systematic difference exists in terms of the effect of the opportunity for partners to share industry knowledge within an office on audit quality for such audits. Finally, we look forward to future research that examines other outcomes (e.g., profitability or portfolio diversification) to understand the full costs and benefits associated with the opportunity for industry knowledge sharing among partners within audit offices.

References

Ajith Kumar, J., and L. S. Ganesh. 2009. Research on knowledge transfer in organizations: a morphology. *Journal of Knowledge Management* 39: 88.

Alchian, A. A., and H. Demsetz. 1972. Production, Information Costs, and Economic Organization. *The American economic review* 62 (5): 777–795.

Alvesson, M. 2004. *Knowledge Work and Knowledge-Intensive Firms*. OUP Oxford.

American Institute of Certified Public Accountant (AICPA). 2020. *A Firm's System of Quality Control*. Available at: https://www.aicpa.org/research/standards/auditattest/downloadabledocuments/qc-00010.pdf.

Ashraf, M., P. N. Michas, and D. Russomanno. 2020. The impact of audit committee information technology expertise on the reliability and timeliness of financial reporting. *The Accounting Review* 95 (5): 23–56.

Balachandran, B. V., and Ram T. S. Ramakrishnan. 1987. A Theory of Audit Partnerships: Audit Firm Size and Fees. *Journal of Accounting Research* 25 (1): 111–126.

Balsam, S., J. Krishnan, and J. S. Yang. 2003. Auditor Industry Specialization and Earnings Quality. *AUDITING: A Journal of Practice & Theory* 22 (2): 71–97.

BDO. 2019. *DELIVERING SUSTAINED AUDIT QUALITY BDO 2019 AUDIT QUALITY REPORT*. Available at: https://www.bdo.com/getattachment/b123fdbf-7efa-4e32-8746-9f2f3f94f971/attachment.aspx?ASSR_2019-BDO-Audit-Quality-Report_web.pdf.

BDO. 2020. ONE ORGANISATION – GLOBALLY CONNECTED. Available at: https://www.bdo.global/en-gb/about/our-global-network/our-global-network.

Beardsley, E. L., Goldman, N. C., & Omer, T. C. 2020. Audit office industry diversity and audit quality. *Journal of Accounting, Auditing & Finance*, 0148558X20942618.

Beardsley, E. L., Lassila, D. R., & Omer, T. C. 2019. How do audit offices respond to audit fee pressure? Evidence of increased focus on nonaudit services and their impact on audit quality. *Contemporary Accounting Research*, *36*(2), 999-1027.

Beck, M. J., J. R. Francis, and J. L. Gunn. 2018. Public company audits and city-specific labor characteristics. *Contemporary Accounting Research* 35 (1): 394–433.

Beck, M. J., Gunn, J. L., & Hallman, N. 2019. The geographic decentralization of audit firms and audit quality. *Journal of Accounting and Economics*, *68*(1), 101234.

Bills, K. L., Q. T. Swanquist, and R. L. Whited. 2016. Growing pains: Audit quality and office growth. *Contemporary accounting research* 33 (1): 288–313.

Bonner, S. E., and P. L. Walker. 1994. The Effects of Instruction and Experience on the Acquisition of Auditing Knowledge. *The Accounting Review* 69 (1): 157–178.

Brown, L. D., A. C. Call, M. B. Clement, and N. Y. Sharp. 2015. Inside the "black box" of sell-side financial analysts. *Journal of accounting research* 53 (1): 1–47.

Burt, R. S. 1987. Social Contagion and Innovation: Cohesion versus Structural Equivalence. *The American journal of sociology* 92 (6): 1287–1335.

Callen, J. L., S. W. G. Robb, and D. Segal. 2008. Revenue Manipulation and Restatements by Loss Firms. *AUDITING: A Journal of Practice & Theory* 27 (2): 1–29.

Cai, Y., Kim, Y., Park, J. C., & White, H. D. (2016). Common auditors in M&A transactions. *Journal of Accounting and Economics*, *61*(1), 77-99.

Carcello, J. V., and A. L. Nagy. 2004. Audit Firm Tenure and Fraudulent Financial Reporting. *AUDITING: A Journal of Practice & Theory* 23 (2): 55–69.

Casterella, J. R., J. R. Francis, B. L. Lewis, and P. L. Walker. 2004. Auditor industry specialization, client bargaining power, and audit pricing. *Auditing A Journal of Practice & Theory* 23 (1): 123–140.

Cheffers, M., D. Whalen, and O. Usvyatsky. 2011. *2010 financial restatements: A ten year comparison*. Audit Analytics.

Choi, J., C. Kim, J. Kim, and Y. Zang. 2010. Audit Office Size, Audit Quality, and Audit Pricing. *AUDITING: A Journal of Practice & Theory* 29 (1): 73–97.

Cohen, W. M., and D. A. Levinthal. 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative science quarterly* 35 (1): 128–152.

Craswell, A. T., and S. L. Taylor. 1991. The market structure of auditing in Australia: The role of industry specialization. *Research in Accounting Regulation* 5 (1): 55–77.

Craswell, A. T., J. R. Francis, and S. L. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20 (3): 297–322.

Czerney, K., D. Jang, and T. C. Omer. 2019. Client Deadline Concentration in Audit Offices and Audit Quality. *AUDITING: A Journal of Practice & Theory* 38 (4): 55–75.

D'Eredita, M. A., and C. Barreto. 2006. How Does Tacit Knowledge Proliferate? An Episode-Based Perspective. *Organization Studies* 27 (12): 1821–1841.

Dechow, P., W. Ge, C. Larson, and R. Sloan. 2010. Predicting material accounting misstatements, forthcoming in. *Contemporary Accounting Research*.

DeFond, M., and J. Zhang. 2014. A review of archival auditing research. *Journal of Accounting and Economics* 58 (2): 275–326.

Deloitte. 2018. *Audit Quality Reward and Recognition Program Playbook for member firm professional staff*. Available at: https://www2.deloitte.com/content/dam/Deloitte/pt/Documents/audit/Audit%20Quality%20Reward%20and%20Recog

nition%20Playbook%20-%20for%20Professional%20staff.pdf.
Deloitte. 2021. About Deloitte Learn about our global organization. Available at: https://www2.deloitte.com/na/en/pages/about-deloitte/articles/about-deloitte.html.
Dinapoli, J. 2021. *Exclusive PwC offers U.S. employees full-time remote work*. Available at: https://www.reuters.com/business/exclusive-pwc-tells-us-employees-they-need-never-return-office-2021-09-30/
Downey, D. H., L. M. Rousseau, and K. M. Zehms. 2019. PCAOB Form AP: Leveraging Information about Audit Personnel. *Current Issues in Auditing* 13 (1): A42–A55.
Duh, R-R., W. R. Knechel, and C.-C. Lin. 2020. The Effects of Audit Firms' Knowledge Sharing on Audit Quality and Efficiency. *Auditing: A Journal of Practice & Theory* 39 (2): 51–79.
Dunn, K. A., and B. W. Mayhew. 2004. Audit Firm Industry Specialization and Client Disclosure Quality. *Review of Accounting Studies* 9 (1): 35–58.
Endres, M. L., and K. T. Rhoad. 2016. What makes a high performer share knowledge? *Team Performance Management* 39: 88.
EY. 2019. What EY can do for you. Available at: https://www.ey.com/en_us/audit/services.
EY. 2020. Global review 2020 – EY Global Chairman and CEO's letter. Available at: https://www.ey.com/en_gl/global-review/2020/global-review-2020-chairman-and-ceos-letter.
Ferguson, A., and D. Stokes. 2002. Brand name audit pricing, industry specialization, and leadership premiums post-big 8 and big 6 mergers. *Contemporary accounting research* 19 (1): 77–110.
Ferguson, A., J. R. Francis, and D. J. Stokes. 2003. The Effects of Firm-Wide and Office-Level Industry Expertise on Audit Pricing. *The Accounting Review* 78 (2): 429–448.
Francis, J. R., and M. D. Yu. 2009. Big 4 Office Size and Audit Quality. *The Accounting Review* 84 (5): 1521–1552.
Francis, J. R., and P. N. Michas. 2013. The Contagion Effect of Low-Quality Audits. *The Accounting Review* 88 (2): 521–552.
Francis, J. R., D. J. Stokes, and D. Anderson. 1999. City markets as a unit of analysis in audit research and the re-examination of big 6 market shares. *Abacus* 35 (2): 185–206.
Francis, J. R., K. Reichelt, and D. Wang. 2005. The Pricing of National and City-Specific Reputations for Industry Expertise in the U.S. Audit Market. *The Accounting Review* 80 (1): 113–136.
Francis, J. R., P. N. Michas, and M. D. Yu. 2013. Office size of big 4 auditors and client restatements. *Contemporary accounting research* 30 (4): 1626–1661.
Francis, J. R., P. N. Michas, and S. E. Seavey. 2013. Does audit market concentration harm the quality of audited earnings? Evidence from audit markets in 42 countries. *Contemporary accounting research* 30 (1): 325–355.
Frankel, R. M., M. F. Johnson, and K. K. Nelson. 2002. The Relation between Auditors' Fees for Nonaudit Services and Earnings Management. *The Accounting Review* 77 (s-1): 71–105.
Fung, S. Y. K., F. A. Gul, and J. Krishnan. 2012. City-Level Auditor Industry Specialization, Economies of Scale, and Audit Pricing. *The Accounting Review* 87 (4): 1281–1307.
Gissel, J. L., and K. M. Johnstone. 2017. Information Sharing during Auditors' Fraud Brainstorming: Effects of Psychological Safety and Auditor Knowledge. *AUDITING: A Journal of Practice & Theory* 36 (2): 87–110.
Granovetter, M. S. 1973. The Strength of Weak Ties. *The American journal of sociology* 78 (6): 1360–1380.
Grant Thornton. 2019. *Audit Quality and Transparency Report*. Available at: https://www.grantthornton.com/-/media/content-page-files/audit/pdfs/2019/audit-quality-transparency-report.ashx.
Grant Thornton. 2021. *We are Grant Thornton United States*. Available at: https://www.grantthornton.global/en/locations/United-States/.
Harding, N., and K. T. Trotman. 1999. Hierarchical differences in audit workpaper review performance. *Contemporary accounting research* 16 (4): 671–684.
Heider, F. 1958. The Psychology of Interpersonal Relationships, New York.
Henttonen, K., A. Kianto, and P. Ritala. 2016. Knowledge sharing and individual work performance: an empirical study of a public sector organisation. *Journal of Knowledge Management* 39: 88.
Hribar, P., and N. T. Jenkins. 2004. The Effect of Accounting Restatements on Earnings Revisions and the Estimated Cost of Capital. *Review of Accounting Studies* 9 (2): 337–356.
Huddart, S., and P. J. Liang. 2005. Profit sharing and monitoring in partnerships. *Journal of Accounting and Economics* 40 (1): 153–187.
Jamshed, S., M. Nazri, and R. Abu Bakar. 2018. The Effect of Knowledge Sharing on Team Performance through Lens of Team Culture. *Oman Chapter of*.
Kandel, E., and E. P. Lazear. 1992. Peer Pressure and Partnerships. *The journal of political economy* 100 (4): 801–817.
Kedia, S., and S. Rajgopal. 2011. Do the SEC's enforcement preferences affect corporate misconduct? *Journal of Accounting and Economics* 51 (3): 259–278.
Kennedy, P. 2008. *A Guide to Econometrics*. John Wiley & Sons.
Knechel, W. R., and J. Leiby. 2016. If you want my advice: Status motives and audit consultations about accounting estimates. *Journal of accounting research* 54 (5): 1331–1364.
Knechel, W. R., V. Naiker, and G. Pacheco. 2007. Does auditor industry specialization matter? Evidence from market reaction to auditor switches. *Auditing A Journal of Practice & Theory* 26 (1): 19–45.
Kogut, B., and U. Zander. 1996. What Firms Do? Coordination, Identity, and Learning. *Organization Science* 7 (5): 502–518.
Kothari, S. P., A. J. Leone, and C. E. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1): 163–197.

KPMG. 2019. *People. Perspectives. Possibilities. 2019 KPMG Global Review*. Available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2019/12/global-annual-review-2019.pdf.
KPMG. 2021. Who we are. Available at: https://home.kpmg/xx/en/home/about/who-we-are.html.
Kravet, T., and T. Shevlin. 2010. Accounting restatements and information risk. *Review of Accounting Studies* 15 (2): 264–294.
Krishnan, G. V. 2003. Does big 6 auditor industry expertise constrain earnings management? *Accounting horizons* 17 (s-1): 1–16.
Lawrence, A., M. Minutti-Meza, and P. Zhang. 2011. Can Big 4 versus Non-Big 4 Differences in Audit-Quality Proxies Be Attributed to Client Characteristics? *The Accounting Review* 86 (1): 259–286.
Lee, H. S. (grace), A. L. Nagy, and A. B. Zimmerman. 2019. Audit Partner Assignments and Audit Quality in the United States. *The Accounting Review* 94 (2): 297–323.
Lennox, C. S., and X. Wu. 2018. A Review of the Archival Literature on Audit Partners. *Accounting Horizons* 32 (2): 1–35.
Li, C., Y. Xie, and J. Zhou. 2010. National Level, City Level Auditor Industry Specialization and Cost of Debt. *Accounting Horizons* 24 (3): 395–417.
Libby, R., K. T. Trotman, and I. Zimmer. 1987. Member variation, recognition of expertise, and group performance. *The Journal of applied psychology* 72 (1): 81–87.
Lim, C. Y., and H.-T. Tan. 2009. Does Auditor Tenure Improve Audit Quality? Moderating Effects of Industry Specialization and Fee Dependence. *Moderating Effects of Industry Specialization and*.
Low, K. 2004. The Effects of Industry Specialization on Audit Risk Assessments and Audit-Planning Decisions. *The Accounting Review* 79 (1): 201–219.
Lynch, A. L., U. S. Murthy, and T. J. Engle. 2009. Fraud Brainstorming Using Computer-Mediated Communication: The Effects of Brainstorming Technique and Facilitation. *The Accounting Review* 84 (4): 1209–1232.
Morris, T., and L. Empson. 1998. Organisation and expertise: An exploration of knowledge bases and the management of accounting and consulting firms. *Accounting, Organizations and Society* 23 (5): 609–624.
Murthy, U. S., and D. S. Kerr. 2004. Comparing Audit Team Effectiveness via Alternative Modes of Computer-Mediated Communication. *AUDITING: A Journal of Practice & Theory* 23 (1): 141–152.
Narayanan, V. G. 1995. Litigation and agency problems in audit firms. search.proquest.com.
Nonaka, I., and H. Takeuchi. 1995. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press.
Numan, W., & Willekens, M. 2012. An empirical test of spatial competition in the audit market. *Journal of Accounting and Economics*, *53*(1-2), 450-465.
Pangil, F., and J. M. Chan. 2014. The mediating effect of knowledge sharing on the relationship between trust and virtual team effectiveness. *Journal of Knowledge Management* 39: 88.
Polanyi, M. 1958. Personal knowledge: towards a post-critical. *Philosophy* 2.
Polanyi, M. 1962. Tacit Knowing: Its Bearing on Some Problems of Philosophy. *Reviews of modern physics* 34 (4): 601–616.
Polanyi, M. 1966. The Logic of Tacit Inference. *Philosophy* 41 (155): 1–18.
Polanyi, M. 2015. *Personal Knowledge: Towards a Post-Critical Philosophy*. University of Chicago Press.
Public Company Accounting Oversight Board (PCAOB). 2017. *Staff Guidance Form Ap, Auditor Reporting of Certain Audit Participants and Related Voluntary Audit Report Disclosure Under AS 3101, Reports on Audited Financial Statements*. Available at: https://pcaobus.org/Standards/Documents/2017-01-26-Form-AP-Staff-Guidance.pdf.
Public Company Accounting Oversight Board (PCAOB). 2021a. *AS 1210: Using the Work of an Auditor-Engaged Specialist*. Available at: https://pcaobus.org/oversight/standards/auditing-standards/details/AS1210.
Public Company Accounting Oversight Board (PCAOB). 2021b. *QC Section 40: The Personnel Management Element of a Firm's System of Quality Control-Competencies Required by a Practitioner-in-Charge of an Attest Engagement*. Available at: https://pcaobus.org/oversight/standards/qc-standards/details/QC40.
PwC. 2013. *PwC Academy Be curious: learn, share and innovate Training Programme Catelogue*. Available at: https://www.pwc.com/mk/en/services/assets/training_catalogue_2013-14.pdf.
PwC. 2020. Our people Global Annual Review 2020. Available at: https://www.pwc.com/gx/en/about/global-annual-review-2020/our-people.html.
Quigley, N. R., P. E. Tesluk, E. A. Locke, and K. M. Bartol. 2007. A Multilevel Investigation of the Motivational Mechanisms Underlying Knowledge Sharing and Performance. *Organization Science* 18 (1): 71–88.
Read, W. J., and J. Thibodeau. 1999. Knowledge From Within-It's time to take a more structured approach to sharing expertise internally. *Practical Accountant* 32 (12): 59–61.
Reagans, R., and B. McEvily. 2003. Network Structure and Knowledge Transfer: The Effects of Cohesion and Range. *Administrative science quarterly* 48 (2): 240–267.
Reichelt, K. J., and D. Wang. 2010. National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of accounting research* 48 (3): 647–686.
Reynolds, J. K., and J. R. Francis. 2000. Does size matter? The influence of large clients on office-level auditor reporting decisions. *Journal of Accounting and Economics* 30 (3): 375–400.
Rhodes, A., and D. Russomanno. 2020. Executive Accountants and the Reliability of Financial Reporting. *Management science*.
Ritala, P., H. Olander, S. Michailova, and K. Husted. 2015. Knowledge sharing, knowledge leaking and relative innovation performance: An empirical study. *Technovation* 35: 22–31.
Rocco, E. 1998. Trust breaks down in electronic contexts but can be repaired by some initial face-to-face contact. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 496–502. CHI '98. USA: ACM Press/Addison-

Wesley Publishing Co.
Rogers, E. M. 1995. Diffusion of Innovations: Modifications of a Model for Telecommunications. In *Die Diffusion von Innovationen in der Telekommunikation*, edited by M.-W. Stoetzer and A. Mahler, 25–38. Berlin, Heidelberg: Springer Berlin Heidelberg.
Schneider, A., B. K. Church, and R. J. Ramsay. 2003. CONCURRING PARTNER REVIEW: DOES INVOLVEMENT IN AUDIT PLANNING AFFECT OBJECTIVITY? *Research in Accounting Regulation* 16: 185–195.
Seavey, S. E., Imhof, M. J., & Westfall, T. J. 2018. Audit firms as networks of offices. *Auditing: A Journal of Practice & Theory*, *37*(3), 211-242.
Shipman, J. E., Q. T. Swanquist, and R. L. Whited. 2017. Propensity Score Matching in Accounting Research. *The Accounting Review* 92 (1): 213–244.
Smith, M. 2019. *Research methods in accounting*. Sage.
Strang, D., and N. B. Tuma. 1993. Spatial and Temporal Heterogeneity in Diffusion. *The American journal of sociology* 99 (3): 614–639.
Stein, S. E. 2019. Auditor industry specialization and accounting estimates: Evidence from asset impairments. *Auditing: A Journal of Practice & Theory*, *38*(2), 207-234.
Taylor, M. H. 2000. The effects of industry specialization on auditors' inherent risk assessments and confidence judgements. *Contemporary accounting research* 17 (4): 693–712.
Tillema, T., M. Dijst, and T. Schwanen. 2010. Face-to-face and electronic communications in maintaining social networks: the influence of geographical and relational distance and of information content. *New Media & Society* 12 (6): 965–983.
Wang, Z., and N. Wang. 2012. Knowledge sharing, innovation and firm performance. *Expert systems with applications* 39 (10): 8899–8908.
Whitworth, J. D., and T. A. Lambert. 2014. Office-Level Characteristics of the Big 4 and Audit Report Timeliness. *AUDITING: A Journal of Practice & Theory* 33 (3): 129–152.
Yang, S.-C., and C.-K. Farn. 2009. Social capital, behavioural control, and tacit knowledge sharing—A multi-informant design. *International journal of information management* 29 (3): 210–218.

Appendix A
Variable Definitions

Variable		Definition [Data Source]
Dependent Variables		
RESTATE	=	1 if client *i* restates, at some point in the future, its 10-K or 10-Q filing for year *t,* and 0 otherwise [Audit Analytics]
MATERIAL_RESTATE	=	1 if client *i* issues, at some point in the future, an Item 4.02-restated 10-K or 10-Q filing for year *t* (i.e., a "Big R" non-reliance restatement), and 0 otherwise [Audit Analytics]
ABS_ABACC	=	absolute value of client *i*'s abnormal accruals in year *t*, calculated following Kothari et al. (2005) and controlling for concurrent return on assets [Compustat]
Test Variables		
NUM_PARTNERS	=	the number of partners in audit office *j* in year *t* who audit clients in the same 2-digit SIC industry as client *i* in year *t*. [Audit Analytics; AuditorSearch]
DIFFUSE_FEES	=	one minus the level of concentration$_1$ in client *i*'s 2-digit SIC industry in audit office *j* in year *t* across all partners who audit clients in that same industry. Concentration$_1$ is calculated (based on the Herfindahl-Hirschman Index) as the sum of the squared fractional audit fees of each partner who conducts at least one audit in client *i*'s industry. [Audit Analytics; AuditorSearch]
DIFFUSE_CL	=	one minus the level of concentration$_2$ in client *i*'s 2-digit SIC industry in audit office *j* in year *t* across all partners who audit clients in that same industry. Concentration$_2$ is calculated (based on the Herfindahl-Hirschman Index) as the sum of the squared number of clients of each partner who conducts at least one audit in client *i*'s industry. [Audit Analytics; AuditorSearch]
NUM_SPECIAL_FEES	=	the number of partners in audit office *j* in year *t* who specialize in the same 2-digit SIC code industry as client *i* in year *t*. Each partner's industry of specialization is calculated as the 2-digit SIC industry with the highest percentage of audit fees within each partner's client portfolio in year *t*. [Audit Analytics; AuditorSearch]
NUM_SPECIAL_CL	=	the number of partners in audit office *j* in year *t* who specialize in the same 2-digit SIC code industry as client *i* in year *t*. Each partner's industry of specialization is calculated as the 2-digit SIC industry with the highest percentage of clients within each partner's client portfolio in year *t*. A partner specializes in more than one industry if a tie exists across 2-digit industries with the highest percentage of clients within each partner's client portfolio in year *t*. [Audit Analytics; AuditorSearch]
DIFFUSE_SPECIAL_FEES	=	one minus the level of concentration$_3$ in client *i*'s 2-digit SIC industry in audit office *j* in year *t* across only partners who possess specialization in that same industry. Concentration$_3$ is calculated (based on the Herfindahl-Hirschman Index) as the sum of the squared fractional audit fees of each partner who specializes in client *i*'s industry. Each partner's industry of specialization is calculated as the 2-digit SIC industry with the highest percentage of audit fees within each partner's client portfolio in year *t.* [Audit Analytics; AuditorSearch]
DIFFUSE_SPECIAL_CL	=	one minus the level of concentration$_4$ in client *i*'s 2-digit SIC industry in audit office *j* in year *t* across only partners who possess specialization in that same industry. Concentration$_4$ is calculated (based on the Herfindahl-Hirschman Index) as the sum of the squared fractional number of clients of each partner who specializes in client *i*'s industry. Each partner's industry of specialization is calculated as the 2-digit SIC industry with the highest percentage of clients within each partner's client portfolio in year *t*. A partner specializes in more than one industry if a tie exists across 2-digit industries with the highest percentage of clients within each partner's client portfolio in year *t*. [Audit Analytics; AuditorSearch]
LARGEST	=	if client *i* is the largest client in its audit partner's portfolio based on audit fees in year t, and 0 otherwise [Audit Analytics]
Auditor Control Variables		
CITY_LEADER	=	1 if client *i*'s audit office has the highest market share of audit fees in the client's industry at the MSA level in year *t*, and 0 otherwise [Audit Analytics]
NAT_LEADER	=	1 if client *i*'s auditor has the highest market share of audit fees in the client's industry at the national level in year *t*, and 0 otherwise [Audit Analytics]

Appendix A (continued)
Variable Definitions

Variable		Definition [Data Source]
OFFICE_SIZE	=	number of SEC registrants audited by an audit office in year *t* [Audit Analytics]
LN_AUDIT_FEES	=	natural log of total audit fees for client *i* in year *t* [Audit Analytics]
LN_NONAUDIT_FEES	=	natural log of total non-audit fees for client *i* in year *t* [Audit Analytics]
TENURE	=	number of consecutive years the current auditor has audited client *i* in year *t* [Audit Analytics]
LN_DISTANCE	=	natural log of the geographical distance between client *i*'s headquarters and its auditor's home office [Audit Analytics; Compustat]
Client Firm Control Variables		
SIZE	=	natural log of total assets for client *i* in year *t* [Compustat]
LOSS	=	1 if client *i*'s net income is negative in year *t*, and 0 otherwise [Compustat]
LEV	=	long-term debt scaled by total assets for client *i* in year *t* [Compustat]
BTM	=	book value of equity scaled by the market value of equity for client *i* in year *t* [Compustat]
BUS_SEG	=	number of business segments for client *i* in year *t* [Compustat]
GEO_SEG	=	number of geographical segments for client *i* in year *t* [Compustat]
ACQUISITION	=	1 if client *i* is involved in an acquisition in year *t*, and 0 otherwise [Compustat]
FOREIGN	=	1 if client *i* has non-zero pre-tax foreign income in year *t*, and 0 otherwise [Compustat]
DECEMBER	=	1 if client *i* has a December fiscal year-end in year *t*, and 0 otherwise [Compustat]
LIQUIDITY	=	1 if client *i* has positive working capital in year *t*, and 0 otherwise [Compustat]
City and Auditor Office Clientele Control Variables		
MSA_HERF	=	Herfindahl-Hirschman Index (HHI) for the MSA of an audit office in year *t*, calculated as the sum of the squared fractional market share (based on audit fees) of each audit office in the MSA [Audit Analytics]
MSA_NUM_OFFICES	=	number of unique audit offices in an office's MSA in year *t* [Audit Analytics]
LN_POPULATION	=	natural log of the population of the audit office's city in year *t* [US Census Bureau]
m_VARIABLE	=	mean value of a control variable (e.g., *m_CITY_LEADER*, *m_SIZE*, etc.) within audit-office-year groupings. All control variables that vary across firms-year observations within the same audit office are included [Audit Analytics; Compustat]

Appendix B: Calculation and Summary Analyses of *SHARED* Measures

Panels A and B present detailed walk-throughs of the steps to (1) compile, (2) evaluate, and (3) calculate SHARED measures for example Audit Offices #1 and #2, respectively. Panel C summarizes office-level descriptives for the example audit offices and discusses factors that do not explain the variation in *SHARED* across these example audit offices. Panel D summarizes the calculated *SHARED* measures using partner-level client portfolio data by example audit office and discusses factors explaining the variation in *SHARED* across these example audit offices. See Appendix A for detailed definitions related to the seven calculated *SHARED* measures.

Panel A: Walk-through of *SHARED* calculations for Audit Office #1 at time *t*

Step 1: Compile Partner level client portfolio details on audit fees and industry for Audit Office *j* at time *t*.

Partner *i*	Client ID	Audit Fees (in $)	2-digit SIC Industry
A	1001	$ 1,000,000	50
	1002	1,200,000	50
	1003	2,950,000	60
B	1004	1,150,000	50
	1005	1,700,000	50
	1006	1,800,000	60
C	1007	1,700,000	50
	1008	700,000	70
	1009	1,200,000	70
D	1010	4,100,000	70
		$ 17,500,000	

Step 2: Evaluate each Partner's client portfolio for Audit Office *j* at time *t* for the following:

Partner *i*	**All Industries Audited** by Partner *i*	Industries of Specialization based on Partner *i's* highest percentage of **Audit Fees**	Industries of Specialization based on Partner *i's* highest percentage of **Clients**	Partner *i's* Fractional Share of Audits across **All Partners by Industry** based on: **Audit Fees** SIC=50	SIC=60	SIC=70	**Clients** SIC=50	SIC=60	SIC=70	Partner *i's* Fractional Share of Audits across **Only Specialist Partners by Industry** based on: **Audit Fees** SIC=50	SIC=60	SIC=70	**Clients** SIC=50	SIC=60	SIC=70
A	50, 60	60	50	32.59%	62.11%	0.00%	40.00%	50.00%	0.00%	0.00%	100.00%	0.00%	50.00%	0.00%	0.00%
B	50, 60	50	50	42.22%	37.89%	0.00%	40.00%	50.00%	0.00%	100.00%	0.00%	0.00%	50.00%	0.00%	0.00%
C	50, 70	70	70	25.19%	0.00%	31.67%	20.00%	0.00%	66.67%	0.00%	0.00%	31.67%	0.00%	0.00%	66.67%
D	70	70	70	0.00%	0.00%	68.33%	0.00%	0.00%	33.33%	0.00%	0.00%	68.33%	0.00%	0.00%	33.33%
				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	100%

Step 3: Based on the columnar evaluations from Step 2, calculate the *SHARED* measures by Industry across Partners in Audit Office *j* at time *t:*

Office *j's* **Number** of Partners with Industry Specific Knowledge

***SHARED* =**	***NUM_PARTNERS***			***NUM_SPECIAL_FEES***			***NUM_SPECIAL_CL***		
	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
	3	2	2	1	1	2	2	0	2

Office *j's* Concentration$_{\#}$, measured as the sum of squared fractional shares across **All Partners by Industry:**

Concentration$_1$			**Concentration$_2$**		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.35	0.53	0.57	0.36	0.50	0.56

Office *j's* Diffusion of Industry Knowledge across **All Partners by Industry**, calculated as 1 - Concentration$_{\#}$:

DIFFUSE_FEES			***DIFFUSE_CL***		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.65	0.47	0.43	0.64	0.50	0.44

Office *j's* Concentration$_{\#}$, measured as the sum of squared fractional shares across **Only Specialist Partners by Industry:**

Concentration$_3$			**Concentration$_4$**		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
1.00	1.00	0.57	0.50	0.00	0.56

Office *j's* Diffusion of Industry Knowledge across **Only Specialist Partners by Industry**, calculated as 1 - Concentration$_{\#}$:

DIFFUSE_SPECIAL_FEES			***DIFFUSE_SPECIAL_CL***		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.00	0.00	0.43	0.50	No Specialist	0.44

Appendix B: Calculation and Summary Analyses of *SHARED* Measures (continued)

Panel B: Walk-through of *SHARED* calculations for Audit Office #2 at time *t*

Step 1: Compile Partner level client portfolio details on audit fees and industry for Audit Office *j* at time *t* .

Partner *i*	Client ID	Audit Fees	2-digit SIC Industry
W	2001	$ 1,000,000	50
	2002	1,700,000	50
	2003	1,200,000	50
X	2004	1,150,000	50
	2005	1,700,000	50
	2006	1,800,000	60
Y	2007	2,950,000	60
	2008	700,000	70
	2009	1,200,000	70
Z	2010	4,100,000	70
		$ 17,500,000	

Step 2: Evaluate each Partner's client portfolio for Audit Office *j* at time *t* for the following:

Partner *i*	**All Industries Audited** by Partner *i*	Industries of Specialization based on Partner i*'s* highest percentage of **Audit Fees**	Industries of Specialization based on Partner i*'s* highest percentage of **Clients**
W	50	50	50
X	50, 60	50	50
Y	60, 70	60	70
Z	70	70	70

Partner *i's* Fractional Share of Audits across **All Partners by Industry** based on:

Audit Fees			**Clients**		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
57.78%	0.00%	0.00%	60.00%	0.00%	0.00%
42.22%	37.89%	0.00%	40.00%	50.00%	0.00%
0.00%	62.11%	31.67%	0.00%	50.00%	66.67%
0.00%	0.00%	68.33%	0.00%	0.00%	33.33%
100%	100%	100%	100%	100%	100%

Partner *i's* Fractional Share of Audits across **Only Specialist Partners by Industry** based on:

Audit Fees			**Clients**		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
57.78%	0.00%	0.00%	60.00%	0.00%	0.00%
42.22%	0.00%	0.00%	40.00%	0.00%	0.00%
0.00%	100.00%	0.00%	0.00%	0.00%	66.67%
0.00%	0.00%	100.00%	0.00%	0.00%	33.33%
100%	100%	100%	100%	0%	100%

Step 3: Based on the columnar evaluations from Step 2, calculate the *SHARED* measures by Industry across Partners in Audit Office *j* at time *t:*

Office *j*'s Concentration$_{\#}$, measured as the sum of squared fractional shares across **All Partners by Industry:**

Concentration$_1$			**Concentration$_2$**		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.51	0.53	0.57	0.52	0.50	0.56

Office *j*'s Concentration$_{\#}$, measured as the sum of squared fractional shares across **Only Specialist Partners by Industry:**

Concentration$_3$			**Concentration$_4$**		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.51	1.00	1.00	0.52	0.00	0.56

***SHARED* =**

Office *j's* **Number** of Partners with Industry Specific Knowledge

NUM_PARTNERS			***NUM_SPECIAL_FEES***			***NUM_SPECIAL_CL***		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
2	2	2	2	1	1	2	0	1

Office *j's* Diffusion of Industry Knowledge across **All Partners by Industry**, calculated as 1 - Concentration$_{\#}$:

DIFFUSE_FEES			***DIFFUSE_CL***		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.49	0.47	0.43	0.48	0.50	0.44

Office *j's* Diffusion of Industry Knowledge across **Only Specialist Partners by Industry**, calculated as 1 - Concentration$_{\#}$:

DIFFUSE_SPECIAL_FEES			***DIFFUSE_SPECIAL_CL***		
SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
0.49	0.00	0.00	0.48	No Specialist	0.44

Appendix B: Calculation and Summary Analyses of *SHARED* Measures (continued)

Panel C: Summary Analysis - Descriptives by Audit Office:

	Audit Fees (in $)				Clients				Partners		
	Total	SIC=50	SIC=60	SIC=70	Total	SIC=50	SIC=60	SIC=70	Total	with 3 Clients	with 1 client
Office #1	$ 17,500,000	$ 6,750,000	$ 4,750,000	$ 6,000,000	10	5	2	3	4	3	1
Office #2	17,500,000	6,750,000	4,750,000	6,000,000	10	5	2	3	4	3	1

Factors that do not explain variation in *SHARED* across example audit offices: Audit Fees and Clients at the Office Level

The summary descriptives by audit office in Panel C show the audit fees (in total and by industry) and the number of clients (in total and by industry) are the same for both audit office examples. Given our study's partner level focus, the number of partners (in total) and distribution of partners with three or one client are also the same for both audit offices. By holding these office level dimensions of size (i.e., audit fees, clients, and the number of partners) constant, we eliminate these dimensions in explaining the variation in the calculated *SHARED* measures that follow in Panel D of Appendix B. In doing so, this example design illustrates that the variation in the *SHARED* measures (see Panel D discussion) is starkly different from extant measures that focus on office level audit fees and client industries to construct various measures of industry specialization.

Panel D: Summary Analysis - *SHARED* measures by Audit Office and Industry:

	Office *j's* **Number** of Partners with Industry Specific Knowledge									Office *j's* Diffusion of Industry Knowledge across **All Partners by Industry**, calculated as 1 - Concentration$_{ij}$:						Office *j's* Diffusion of Industry Knowledge across **Only Specialist Partners by Industry**, calculated as 1 - Concentration$_{ij}$:					
***SHARED* =**	***NUM_PARTNERS***			***NUM_SPECIAL_FEES***			***NUM_SPECIAL_CL***			***DIFFUSE_FEES***			***DIFFUSE_CL***			***DIFFUSE_SPECIAL_FEES***			***DIFFUSE_SPECIAL_CL***		
	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70	SIC=50	SIC=60	SIC=70
Office #1	3	2	2	1	1	2	2	0	2	0.65	0.47	0.43	0.64	0.50	0.44	0.00	0.00	0.43	0.50	No Specialist	0.44
Office #2	2	2	2	2	1	1	2	0	1	0.49	0.47	0.43	0.48	0.50	0.44	0.49	0.00	0.00	0.48	No Specialist	0.44

Factors that *explain* variation in *SHARED* across example audit offices: Partner Portfolio Industry Clients and Audit Fees & All vs Only Specialist Partners with an Audit Office

We emphasize that the variation across audit offices in the *SHARED* measures for the opportunity to share industry specific knowledge across partners within an audit office are not due to audit fees, clients and the number of partners measured at the office level (see Panel C discussion). Rather, the variation in the *SHARED* measures, as presented in Panel D, are explained by variation in partners' client portfolios. Specifically, the variation in the *SHARED* measures across example audit offices is explained by the variation in industry clients and audit fees within each partner's portfolio measured across all partners, as well as only specialist partners within an audit office. This partner portfolio variation is presented in Step 1 of the detailed walk-throughs for Audit Offices #1 and 2 in Panels A and B of Appendix B, respectively.

For each *SHARED* measure, grey shading indicates the office with the greater opportunity to share industry specific knowledge across partners within an audit office. With respect to differences in *NUM_PARTNERS*, we observe that Office #1 (Office #2) has 3 (2) partners auditing clients in SIC=50. However, when we condition on partners' industries of specialization based on Partner i's highest percentage of Audit Fees, *NUM_SPECIAL_FEES*, we observe that Office #1 has fewer specialist partners (i.e., 1) auditing SIC=50 compared to Office #2's specialist partners (i.e., 2) for the same industry. However, when we condition on partner's industries of specialization based on Partner i's highest percentage of clients, *NUM_SPECIAL_CL*, we observe that each office has the same number of specialist partners (i.e., 2) auditing SIC=50. Given this, we note that these three partner count-based *SHARED* measures can and do vary conditional on the eligible set of partners (i.e., all vs. specialists) and dimension (i.e., audit fees vs. clients) used to evaluate industry specific knowledge.

With respect to differences in *DIFFUSE_FEES*, we observe the diffusion score of 0.65 for industry knowledge across all partners for SIC =50 is higher in Office #1 (0.49 for Office #2). Whereas, when we measure diffusion conditional on industry knowledge across only specialist partners by industry based on audit fees, *DIFFUSE_SPECIAL_FEES*, we observe a diffusion score of 0.00 for industry knowledge across all partners for SIC =50 in Office #1 and a diffusion score of 0.49 for Office #2. To this end, a diffusion score of 0.00 indicates industry knowledge is concentrated within one partner and accordingly, not widely spread across partners within Office #1.

Finally, when we measure diffusion conditional on industry knowledge across only specialist partners by industry based on clients, we observe that office #1 has a higher diffusion score regardless of whether diffusion is evaluated across all partners (i.e., *DIFFUSE_CL*=0.64) or only specialist partners (i.e., *DIFFUSE_SPECIAL_CL*=0.50). Additionally, the specialist-based diffusion measure will be missing when there is not a partner specializing in a specific industry (e.g., *DIFFUSE_SPECIAL_CL* = missing as neither office has a specialist based on clients in SIC=60). Given this, we note that these four diffusion-based *SHARED* measures can also vary conditional on the eligible set of partners (i.e., all vs. specialists) and dimension (i.e., audit fees vs. clients) used to evaluate how widely spread industry specific knowledge is within an audit office.

Appendix C
Comparison of Extant Measures of Audit Office Industry Specialization to *SHARED* Measures
KPMG - Denver, CO - Fiscal Year 2017

Audit Market for DENVER, CO (MSA #19740) in 2017				KPMG - Denver, CO									
				Extant Measures			*SHARED* Measures						
Industry Description	Two-Digit SIC	Total Audit Fees	No. of Clients	*PORTFOLIO SHARE*	*MARKET SHARE*	*DIVERSITY*	*NUM_ PARTNERS*	*NUM_ SPECIAL_FEES*	*NUM_ SPECIAL_CL*	*DIFFUSE_ FEES*	*DIFFUSE_ CL*	*DIFFUSE_ SPECIAL_FEES*	*DIFFUSE_ SPECIAL_CL*
Metal Mining	10	$ 6,545,745	15	0.5%	6.0%	89.2%	1	0	1	0.0%	0.0%	0.0%	0.0%
Coal Mining	12	5,442,540	4										
Oil and Gas Extraction	13	21,375,475	25	9.3%	31.4%	89.2%	5	3	5	74.7%	77.8%	74.7%	77.8%
Mining and Quarrying of Nonmetallic Minerals, Except Fuels	14	4,935,846	4	6.8%	99.3%	89.2%	3	1	1	31.5%	66.7%	0.0%	0.0%
Construction - General Contractors & Operative Builders	15	3,076,520	2										
Food and Kindred Products	20	9,707,790	8	4.5%	33.7%	89.2%	1	1	1	0.0%	0.0%	0.0%	0.0%
Chemicals and Allied Products	28	3,914,557	23	0.7%	12.6%	89.2%	1	1	1	0.0%	0.0%	0.0%	0.0%
Rubber and Miscellaneous Plastic Products	30	2,374,400	2										
Primary Metal Industries	33	1,081,750	1										
Fabricated Metal Products	34	10,959,342	2										
Industrial and Commercial Machinery and Computer Equipment	35	3,229,000	4										
Electronic & Other Electrical Equipment & Components	36	9,232,020	11	4.6%	36.1%	89.2%	2	2	2	34.6%	50.0%	34.6%	50.0%
Pipelines, Except Natural Gas	46	688,000	1										
Transportation Services	47	1,067,000	2	1.4%	96.3%	89.2%	1	1	1	0.0%	0.0%	0.0%	0.0%
Communications	48	29,196,080	7	40.3%	100.0%	89.2%	6	4	6	79.0%	81.6%	79.0%	81.6%
Electric, Gas and Sanitary Services	49	5,330,062	6	0.3%	3.9%	89.2%	1	0	1	0.0%	0.0%	0.0%	0.0%
Wholesale Trade - Durable Goods	50	9,281,540	2										
Food Stores	54	850,000	1	1.2%	100.0%	89.2%	1	0	1	0.0%	0.0%	0.0%	0.0%
Eating and Drinking Places	58	2,418,282	4	1.0%	31.2%	89.2%	1	1	1	0.0%	0.0%	0.0%	0.0%
Miscellaneous Retail	59	7,360,400	3	10.1%	99.6%	89.2%	1	1	1	0.0%	0.0%	0.0%	0.0%
Depository Institutions	60	7,355,324	3										
Insurance Carriers	63	7,907,600	1										
Real Estate	65	2,315,920	3	2.2%	69.1%	89.2%	1	0	1	0.0%	0.0%	0.0%	0.0%
Holding and Other Investment Offices	67	13,820,348	19	10.8%	56.9%	89.2%	4	3	4	62.4%	66.7%	62.4%	66.7%
Business Services	73	12,277,868	22	3.7%	21.9%	89.2%	2	1	2	46.0%	44.4%	46.0%	44.4%
Amusement and Recreation Services	79	3,942,160	4										
Health Services	80	2,350,000	4	2.6%	79.1%	89.2%	1	0	1	0.0%	0.0%	0.0%	0.0%
Engineering, Accounting, Research, and Management Services	87	1,488,860	7										
		$ 189,524,429		100%									

Notes: This table compares extant measures for audit office industry specialization and the *SHARED* measures using an example from one audit market based on Audit Analytics data. *PORTFOLIO SHARE* equals the audit fee revenue generated by an audit office in a two-digit SIC industry relative to the total fee revenue generated by that office in a given year (Stein 2019). *MARKET SHARE* equals the audit fee revenue generated by an audit office in a two-digit SIC industry relative to the total audit revenue generated by that audit market location in a given year (Stein 2019; Numan and Willekens 2012). *DIVERSITY* equals the sum of the diversity weight (i.e., the number of clients audited by that audit office in a different industry from the client divided by the total number of clients audited by the office) divided by the total number of clients in the office (Beardsley, Lassila, and Omer 2019; Beardsley, Goldman, and Omer 2020). *DIVERSITY* ranges between zero and one, with higher values indicating greater industry diversity for that audit office. See Appendix A for variable definitions and Appendix B for calculation details and summary analyses of the *SHARED* measures.

TABLE 1
Sample Selection

Main sample	**N**
U.S.-headquartered clients in both Audit Analytics and COMPUSTAT for the sample period fiscal years 2016 through 2019	19,066
Less: Client-year observations with missing data in Audit Analytics and Form AP	(2,303)
Less: Client-year observations with missing data in COMPUSTAT	(1,771)
Less: Client-year observations with auditor offices that have less than three partners	(2,196)
Less: Client-year observations without one of the six largest auditors	(2,327)
Main sample for restatement and audit lag analyses	**10,469**
Unique auditor-office-years	880
Abnormal accruals sample	
Main sample	10,469
Less: Client-year observations with missing data for accrual variables	(1,178)
Abnormal accruals sample	**9,291**

TABLE 2
Descriptive Statistics

Panel A: Distributional Properties of Variables

Variable	N	Mean	Std. Dev.	25%	Median	75%
Dependent Variables						
RESTATE	10,469	0.08	0.28	0.00	0.00	0.00
MATERIAL_RESTATE	10,469	0.02	0.13	0.00	0.00	0.00
ABS_ABACC	9,291	0.24	0.42	0.02	0.07	0.23
Test Variables						
NUM_PARTNERS	10,469	3.36	3.48	1.00	2.00	4.00
DIFFUSE_FEES	10,469	0.34	0.33	0.00	0.35	0.65
DIFFUSE_CL	10,469	0.39	0.36	0.00	0.50	0.75
NUM_SPECIAL_FEES	10,469	2.79	3.19	1.00	1.00	3.00
NUM_SPECIAL_CL	10,469	3.26	3.43	1.00	2.00	4.00
DIFFUSE_SPECIAL_FEES	10,469	0.33	0.33	0.00	0.33	0.65
DIFFUSE_SPECIAL_CL	10,469	0.38	0.36	0.00	0.50	0.72
LARGEST	10,469	0.70	0.50	0.00	1.00	1.00
Auditor Control Variables						
CITY_LEADER	10,469	0.53	0.50	0.00	1.00	1.00
NAT_LEADER	10,469	0.29	0.45	0.00	0.00	1.00
OFFICE_SIZE	10,469	73.88	130.11	13.00	30.00	71.00
AUDIT_FEES (in $000s)	10,469	3274.46	5555.28	875.00	1688.42	3365.00
NON_AUDIT_FEES (in $000s)	10,469	808.81	3049.00	20.00	153.49	587.70
TENURE	10,469	9.40	6.46	3.00	8.00	16.00
DISTANCE	10,469	98.37	322.69	7.65	13.17	27.37
Client Firm Control Variables						
SIZE (in $millions)	10,469	14026.50	97943.88	388.25	1589.42	5931.24
LOSS	10,469	0.36	0.48	0.00	0.00	1.00
LEV	10,469	0.31	0.26	0.10	0.29	0.46
BTM	10,469	0.50	0.54	0.14	0.35	0.68
BUS_SEG	10,469	4.26	3.47	1.00	4.00	6.00
GEO_SEG	10,469	1.29	0.78	1.00	1.00	2.00
ACQUISITION	10,469	0.10	0.30	0.00	0.00	0.00
FOREIGN	10,469	0.55	0.50	0.00	1.00	1.00
DECEMBER	10,469	0.82	0.38	1.00	1.00	1.00
LIQUIDITY	10,469	0.96	0.20	1.00	1.00	1.00
City and Auditor Office Clientele Control Variables						
MSA_HERF	10,469	0.26	0.10	0.19	0.23	0.28
MSA_NUM_OFFICES	10,469	26.37	24.60	11.00	17.00	24.00
POPULATION (in $000s)	10,469	6299.10	5440.22	2142.51	4552.40	6371.77
m_CITY_LEADER	10,469	0.53	0.29	0.31	0.55	0.75
m_NAT_LEADER	10,469	0.29	0.24	0.03	0.26	0.47
m_AUDIT_FEES (in $000s)	10,469	3274.46	2091.73	1838.03	2758.96	4225.78
m_NON_AUDIT_FEES (in $000s)	10,469	808.81	927.42	283.39	552.23	961.26
m_TENURE	10,469	9.40	2.83	7.64	9.26	11.12
m_DISTANCE	10,469	98.37	100.21	31.27	68.49	125.06
m_SIZE (in $millions)	10,469	14026.50	25977.51	2798.64	6296.68	14125.54
m_LOSS	10,469	0.36	0.22	0.20	0.33	0.50
m_LEV	10,469	0.31	0.10	0.25	0.32	0.38
m_BTM	10,469	0.50	0.21	0.36	0.47	0.60

TABLE 2 (continued)
Descriptive Statistics

Variable	N	Mean	Std. Dev.	25%	Median	75%
m_BUS_SEG	10,469	4.26	1.35	3.46	4.17	5.00
m_GEO_SEG	10,469	1.29	0.29	1.13	1.27	1.50
m_ACQUISITION	10,469	0.10	0.09	0.03	0.09	0.14
m_FOREIGN	10,469	0.55	0.20	0.41	0.55	0.67
m_DECEMBER	10,469	0.82	0.14	0.75	0.83	0.91
m_LIQUIDITY	10,469	0.96	0.06	0.93	1.00	1.00

Panel B: Partner Descriptive Statistics within Auditor Offices

Variable	N	Mean	Std. Dev.	25%	Median	75%
Number of Partners	880	9.13	8.36	6.00	11.00	20.00
Number of 2-digit SIC Industries	880	7.26	4.49	6.00	9.00	14.00
Average Number of Clients across Partners	880	1.80	0.84	1.60	2.07	2.56
Average Audit Fees across Partners (in $000s)	880	4155.46	2522.92	3722.02	5557.88	7443.53

Notes: All variables are defined in Appendix A and winsorized at the 1st and 99th percentiles.

TABLE 3
Pearson Correlations

Panel A: Pearson Correlations for Columns (1) – (15)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	RESTATE															
(2)	MATERIAL RESTATE	**0.43**														
(3)	ABS ABACC	0.00	0.00													
(4)	NUM PARTNERS	**-0.06**	**-0.04**	**0.19**												
(5)	DIFFUSE FEES	**-0.06**	**-0.04**	**0.23**	**0.81**											
(6)	DIFFUSE CL	**-0.06**	**-0.04**	**0.23**	**0.78**	**0.97**										
(7)	NUM SPECIAL FEES	**-0.06**	**-0.04**	**0.17**	**0.97**	**0.76**	**0.74**									
(8)	NUM SPECIAL CL	**-0.06**	**-0.04**	**0.19**	**0.99**	**0.80**	**0.78**	**0.97**								
(9)	DIFFUSE SPECIAL FEES	**-0.06**	**-0.04**	**0.23**	**0.81**	**0.99**	**0.95**	**0.77**	**0.81**							
(10)	DIFFUSE SPECIAL CL	**-0.05**	**-0.04**	**0.23**	**0.79**	**0.96**	**0.98**	**0.75**	**0.79**	**0.97**						
(11)	LARGEST	**0.02**	0.02	**-0.06**	**-0.12**	**-0.12**	**-0.09**	0.00	**-0.11**	**-0.10**	**-0.08**					
(12)	CITY LEADER	0.02	0.00	**-0.13**	0.01	**-0.07**	**-0.07**	**0.05**	0.02	**-0.07**	**-0.06**	**0.07**				
(13)	NAT LEADER	-0.01	0.00	**-0.05**	**0.09**	**0.04**	**0.05**	**0.11**	**0.09**	**0.04**	**0.05**	**0.02**	**0.23**			
(14)	OFFICE SIZE	**-0.02**	-0.01	0.01	**0.19**	**0.17**	**0.18**	**0.18**	**0.19**	**0.17**	**0.18**	-0.01	**-0.08**	**-0.03**		
(15)	LN AUDIT FEES	0.02	**-0.02**	**-0.09**	**-0.03**	**-0.05**	-0.01	**0.03**	**-0.02**	**-0.04**	0.00	**0.37**	**0.24**	**0.20**	**0.05**	
(16)	LN NONAUDIT FEES	0.01	**-0.03**	**-0.05**	0.01	**-0.03**	-0.01	**0.04**	0.01	**-0.02**	0.00	**0.21**	**0.15**	**0.13**	**0.05**	**0.48**
(17)	TENURE	**-0.05**	**-0.06**	**-0.13**	**-0.13**	**-0.13**	**-0.11**	**-0.10**	**-0.13**	**-0.13**	**-0.11**	**0.14**	**0.16**	**0.13**	-0.01	**0.33**
(18)	LN DISTANCE	**0.05**	**0.04**	0.00	**-0.07**	**-0.07**	**-0.06**	**-0.07**	**-0.07**	**-0.06**	**-0.06**	-0.01	-0.01	**-0.05**	-0.01	**-0.07**
(19)	SIZE	**-0.03**	**-0.04**	**-0.21**	**-0.08**	**-0.09**	**-0.05**	-0.02	**-0.07**	**-0.08**	**-0.04**	**0.31**	**0.23**	**0.21**	0.02	**0.76**
(20)	LOSS	0.02	**0.02**	**0.16**	**0.21**	**0.20**	**0.18**	**0.16**	**0.20**	**0.20**	**0.18**	**-0.16**	**-0.13**	**-0.12**	**0.03**	**-0.29**
(21)	LEV	0.01	**0.02**	**-0.06**	**-0.05**	**-0.05**	**-0.04**	**-0.03**	**-0.04**	**-0.04**	**-0.04**	**0.08**	**0.05**	**0.06**	0.00	**0.14**
(22)	BTM	**0.04**	0.01	**-0.10**	**-0.02**	**-0.03**	**-0.03**	-0.02	-0.02	**-0.03**	**-0.03**	**0.02**	**-0.05**	**-0.04**	-0.01	**-0.08**
(23)	BUS SEG	**0.03**	0.00	**-0.08**	**-0.16**	**-0.15**	**-0.12**	**-0.13**	**-0.16**	**-0.15**	**-0.12**	**0.22**	**0.11**	**0.08**	**0.03**	**0.47**
(24)	GEO SEG	**0.04**	0.00	-0.01	**-0.12**	**-0.10**	**-0.08**	**-0.10**	**-0.12**	**-0.10**	**-0.08**	**0.15**	**0.07**	**0.05**	0.01	**0.38**
(25)	ACQUISITION	0.02	0.00	-0.02	**-0.08**	**-0.07**	**-0.06**	**-0.07**	**-0.08**	**-0.07**	**-0.07**	**0.06**	**0.04**	0.01	-0.02	**0.13**
(26)	FOREIGN	**0.03**	0.00	**0.03**	**-0.08**	**-0.07**	**-0.05**	**-0.06**	**-0.08**	**-0.07**	**-0.05**	**0.19**	**0.05**	**0.03**	**0.03**	**0.43**
(27)	DECEMBER	-0.01	0.00	**0.04**	**0.09**	**0.10**	**0.10**	**0.09**	**0.09**	**0.10**	**0.10**	-0.01	-0.01	0.01	**0.02**	**-0.04**
(28)	LIQUIDITY	0.01	0.00	**0.03**	**-0.02**	**-0.05**	**-0.04**	**-0.02**	**-0.02**	**-0.05**	**-0.05**	0.01	**0.04**	**-0.03**	-0.01	**0.07**
(29)	MSA HERF	**0.02**	0.02	**-0.07**	**-0.19**	**-0.19**	**-0.20**	**-0.18**	**-0.19**	**-0.19**	**-0.19**	**0.03**	**0.21**	**0.05**	**-0.19**	**0.03**
(30)	MSA NUM OFFICES	0.01	0.00	0.02	**0.19**	**0.14**	**0.17**	**0.21**	**0.19**	**0.15**	**0.17**	**0.06**	**-0.21**	-0.01	**0.22**	**0.05**
(31)	LN POPULATION	-0.01	-0.01	**0.02**	**0.20**	**0.18**	**0.21**	**0.21**	**0.20**	**0.18**	**0.21**	**0.02**	**-0.26**	**-0.02**	**0.35**	**0.04**

Panel B: Pearson Correlations for Columns (16) – (30)

		(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
(17)	TENURE	**0.23**														
(18)	LN DISTANCE	**-0.09**	**-0.04**													
(19)	SIZE	**0.44**	**0.39**	**-0.07**												
(20)	LOSS	**-0.21**	**-0.30**	-0.02	**-0.46**											
(21)	LEV	**0.10**	**0.02**	0.01	**0.23**	**-0.06**										
(22)	BTM	**-0.06**	**-0.02**	**0.04**	0.01	**0.10**	**-0.08**									
(23)	BUS SEG	**0.27**	**0.28**	**0.02**	**0.34**	**-0.20**	**0.02**	-0.01								
(24)	GEO SEG	**0.22**	**0.18**	0.01	**0.22**	**-0.14**	-0.01	**-0.10**	**0.52**							
(25)	ACQUISITION	**0.10**	0.01	0.02	**0.07**	**-0.07**	**0.02**	0.00	**0.15**	**0.11**						
(26)	FOREIGN	**0.29**	**0.15**	**-0.02**	**0.22**	**-0.13**	**-0.04**	**-0.11**	**0.45**	**0.58**	**0.12**					
(27)	DECEMBER	**-0.05**	**-0.08**	-0.01	0.01	**0.07**	**0.07**	0.02	**-0.09**	**-0.14**	0.00	**-0.15**				
(28)	LIQUIDITY	0.01	-0.01	0.01	**-0.06**	0.01	**-0.22**	**-0.07**	**0.07**	**0.10**	**0.03**	**0.16**	**-0.06**			
(29)	MSA HERF	**0.04**	**0.12**	-0.01	**0.06**	**-0.09**	0.01	**-0.03**	**0.07**	**0.03**	**0.05**	**0.03**	**-0.02**	**0.04**		
(30)	MSA NUM OFFICES	**0.04**	**-0.07**	**0.03**	**0.05**	-0.02	**0.06**	**0.05**	**-0.03**	**-0.03**	**-0.02**	0.01	0.01	**-0.05**	**-0.52**	
(31)	LN POPULATION	**0.02**	**-0.07**	**0.02**	**0.03**	0.00	**0.07**	**0.05**	**-0.04**	**-0.03**	**-0.03**	0.00	**0.04**	**-0.05**	**-0.67**	**0.82**

Notes: All variables are defined in Appendix A. Auditor office clientele control variables are omitted for brevity. Bold values indicate significance levels of 0.05.

TABLE 4
Industry Knowledge Shared across Partners within Audit Offices and Restatements

Panel A: All Restatements Analysis

	Dependent Variable = Prob. (*RESTATE* = 1)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Independent Variables	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)
NUM_PARTNERS	**-0.057*****						
	(-3.605)						
DIFFUSE_FEES		**-0.439*****					
		(-2.968)					
DIFFUSE_CL			**-0.363*****				
			(-2.656)				
NUM_SPECIAL_FEES				**-0.062*****			
				(-3.645)			
NUM_SPECIAL_CL					**-0.060*****		
					(-3.759)		
DIFFUSE_SPECIAL_FEES						**-0.414*****	
						(-2.816)	
DIFFUSE_SPECIAL_CL							**-0.353*****
							(-2.602)
CITY_LEADER	0.197**	0.178*	0.179*	0.204**	0.200**	0.177*	0.179*
NAT_LEADER	-0.113	-0.124	-0.121	-0.114	-0.114	-0.125	-0.123
OFFICE_SIZE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
LN_AUDIT_FEES	0.528***	0.526***	0.528***	0.535***	0.528***	0.525***	0.527***
LN_NONAUDIT_FEES	0.004	0.003	0.003	0.004	0.004	0.003	0.003
TENURE	-0.019***	-0.018***	-0.018***	-0.019***	-0.019***	-0.018***	-0.018***
LN_DISTANCE	0.059**	0.059**	0.059**	0.060**	0.059**	0.060**	0.060**
SIZE	-0.256***	-0.253***	-0.253***	-0.256***	-0.256***	-0.253***	-0.253***
LOSS	-0.052	-0.051	-0.052	-0.056	-0.052	-0.050	-0.050
LEV	0.218	0.210	0.208	0.220	0.218	0.212	0.210
BTM	0.290***	0.290***	0.289***	0.292***	0.290***	0.290***	0.290***
BUS_SEG	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011
GEO_SEG	0.015	0.017	0.017	0.015	0.015	0.017	0.017
ACQUISITION	0.067	0.068	0.070	0.068	0.067	0.068	0.070
FOREIGN	-0.084	-0.082	-0.082	-0.082	-0.084	-0.082	-0.080
DECEMBER	-0.086	-0.077	-0.078	-0.087	-0.087	-0.078	-0.079
LIQUIDITY	-0.053	-0.065	-0.066	-0.053	-0.054	-0.066	-0.067
MSA_HERF	0.927**	0.922*	0.933**	0.947**	0.928**	0.923*	0.933**
MSA_NUM_OFFICES	0.004	0.004	0.004	0.004	0.004	0.004	0.004
LN_POPULATION	0.034	0.034	0.038	0.033	0.035	0.033	0.038
m_CITY_LEADER	-0.066	-0.084	-0.088	-0.078	-0.064	-0.085	-0.087
m_NAT_LEADER	0.544**	0.517**	0.509**	0.544**	0.545**	0.515**	0.507**
m_LN_AUDIT_FEES	-0.113	-0.138	-0.143	-0.105	-0.111	-0.138	-0.143
m_LN_NONAUDIT_FEES	0.017	0.017	0.017	0.016	0.016	0.017	0.017
m_TENURE	-0.043**	-0.041**	-0.041**	-0.042**	-0.043**	-0.041**	-0.041**
m_LN_DISTANCE	0.006	0.003	0.005	0.004	0.005	0.004	0.006
m_SIZE	-0.187*	-0.186*	-0.185*	-0.191*	-0.188*	-0.187*	-0.185*
m_LOSS	0.129	0.069	0.053	0.103	0.122	0.057	0.045
m_LEV	0.647	0.728	0.755	0.666	0.646	0.732	0.755
m_BTM	0.271	0.272	0.279	0.281	0.273	0.278	0.284
m_BUS_SEG	0.144***	0.148***	0.149***	0.145***	0.145***	0.149***	0.149***
m_GEO_SEG	0.467**	0.474**	0.474**	0.462**	0.466**	0.475**	0.474**
m_ACQUISITION	-0.648	-0.636	-0.633	-0.656	-0.647	-0.636	-0.630
m_FOREIGN	-0.118	-0.126	-0.127	-0.130	-0.118	-0.126	-0.126
m_DECEMBER	0.167	0.180	0.180	0.163	0.163	0.171	0.170
m_LIQUIDITY	0.105	0.057	0.051	0.099	0.103	0.053	0.046
Intercept	-0.962	-0.655	-0.721	-1.076	-1.004	-0.624	-0.698
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	10,469	10,469	10,469	10,469	10,469	10,469	10,469
Pseudo R^2	0.082	0.081	0.081	0.082	0.082	0.081	0.081
Area Under ROC	0.715	0.715	0.714	0.716	0.716	0.714	0.714

TABLE 4 (continued)
Industry Knowledge Sharing across Partners within Auditor Offices and Restatements

Panel B: Material Restatements Analysis

	Dependent Variable = Prob. (*MATERIAL_RESTATE* = 1)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Independent Variables	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)
NUM_PARTNERS	**-0.117*****						
	(-3.197)						
DIFFUSE_FEES		**-0.835****					
		(-2.498)					
DIFFUSE_CL			**-0.856*****				
			(-2.707)				
NUM_SPECIAL_FEES				**-0.109*****			
				(-2.825)			
NUM_SPECIAL_CL					**-0.121*****		
					(-3.236)		
DIFFUSE_SPECIAL_FEES						**-0.802****	
						(-2.470)	
DIFFUSE_SPECIAL_CL							**-0.826*****
							(-2.716)
CITY_LEADER	0.319	0.277	0.292	0.318	0.323	0.275	0.290
NAT_LEADER	0.504*	0.505*	0.508*	0.506*	0.499*	0.505*	0.505*
OFFICE_SIZE	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
LN_AUDIT_FEES	0.425**	0.425**	0.427**	0.438**	0.423**	0.424**	0.426**
LN_NONAUDIT_FEES	-0.015	-0.016	-0.016	-0.014	-0.014	-0.015	-0.015
TENURE	-0.072***	-0.072***	-0.072***	-0.072***	-0.072***	-0.072***	-0.072***
LN_DISTANCE	0.103**	0.105**	0.104**	0.104**	0.103**	0.105**	0.104**
SIZE	-0.136*	-0.131	-0.128	-0.136*	-0.135*	-0.131	-0.128
LOSS	0.030	0.026	0.025	0.025	0.031	0.031	0.030
LEV	0.529	0.521	0.507	0.538*	0.529	0.526	0.514
BTM	0.255*	0.255*	0.251*	0.254*	0.254*	0.257*	0.254*
BUS_SEG	-0.034	-0.035	-0.035	-0.034	-0.034	-0.035	-0.036
GEO_SEG	-0.091	-0.089	-0.090	-0.091	-0.091	-0.088	-0.089
ACQUISITION	-0.033	-0.035	-0.035	-0.026	-0.029	-0.031	-0.032
FOREIGN	0.282	0.279	0.279	0.288	0.284	0.281	0.282
DECEMBER	-0.025	-0.003	-0.008	-0.032	-0.028	-0.007	-0.011
LIQUIDITY	-0.286	-0.306	-0.325	-0.276	-0.287	-0.304	-0.323
MSA_HERF	1.382	1.372	1.372	1.443	1.383	1.371	1.369
MSA_NUM_OFFICES	0.010*	0.010*	0.010	0.011*	0.011*	0.010*	0.010*
LN_POPULATION	-0.076	-0.098	-0.082	-0.089	-0.075	-0.102	-0.087
m_CITY_LEADER	0.009	-0.044	-0.060	-0.024	0.012	-0.042	-0.054
m_NAT_LEADER	-0.163	-0.227	-0.224	-0.181	-0.163	-0.232	-0.230
m_LN_AUDIT_FEES	-0.274	-0.311	-0.311	-0.274	-0.266	-0.307	-0.308
m_LN_NONAUDIT_FEES	0.026	0.024	0.024	0.025	0.025	0.024	0.024
m_TENURE	0.030	0.033	0.035	0.032	0.031	0.033	0.034
m_LN_DISTANCE	-0.089	-0.094	-0.090	-0.090	-0.091	-0.093	-0.089
m_SIZE	-0.490**	-0.488**	-0.484**	-0.500**	-0.494**	-0.491**	-0.485**
m_LOSS	-0.257	-0.335	-0.310	-0.337	-0.275	-0.358	-0.334
m_LEV	1.267	1.432	1.427	1.355	1.279	1.439	1.430
m_BTM	0.274	0.274	0.271	0.310	0.282	0.285	0.283
m_BUS_SEG	0.150*	0.159*	0.159*	0.155*	0.152*	0.160*	0.161**
m_GEO_SEG	1.265***	1.287***	1.276***	1.279***	1.264***	1.292***	1.280***
m_ACQUISITION	-2.838***	-2.813***	-2.794***	-2.894***	-2.839***	-2.822***	-2.800***
m_FOREIGN	-1.551**	-1.576**	-1.555**	-1.605**	-1.558**	-1.580**	-1.557**
m_DECEMBER	-0.170	-0.183	-0.165	-0.173	-0.177	-0.197	-0.185
m_LIQUIDITY	1.180	1.146	1.173	1.127	1.174	1.140	1.160
Intercept	4.179	4.898	4.443	4.386	4.161	4.955	4.533
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	10,469	10,469	10,469	10,469	10,469	10,469	10,469
Pseudo R^2	0.136	0.134	0.135	0.135	0.136	0.134	0.135
Area Under ROC	0.804	0.802	0.803	0.802	0.804	0.802	0.802

Notes: This table reports coefficient estimates (z-statistics in parentheses) for tests of the association between the opportunity for partner industry knowledge within audit offices and all (material) client restatements in Panels A (B). *RESTATE* equals 1 if client *i* restates its 10-K or 10-Q filing for year *t*, and 0 otherwise. *MATERIAL_RESTATE* equals 1 if client *i* issues an Item 4.02-restated 10-K or 10-Q filing for year *t* (i.e., a "Big R" non-reliance restatement), and 0 otherwise. All other variables are defined in Appendix A. Industry fixed effects are based on 2-digit SIC codes. ROC is the area under the receiver operating characteristic curve. Statistical significance is calculated with robust standard errors clustered at the auditor-office-year level and reported using two-tailed tests. *, **, *** indicate significance levels of 0.10, 0.05, and 0.01, respectively.

TABLE 5
Industry Knowledge Sharing across Partners within Auditor Offices and Abnormal Accruals
Dependent Variable = *ABS_ABACC*

Independent Variables	(1) Coeff. (t-stat)	(2) Coeff. (t-stat)	(3) Coeff. (t-stat)	(4) Coeff. (t-stat)	(5) Coeff. (t-stat)	(6) Coeff. (t-stat)	(7) Coeff. (t-stat)
NUM_PARTNERS	**-0.006***** (-2.595)						
DIFFUSE_FEES		**-0.043***** (-2.669)					
DIFFUSE_CL			**-0.030**** (-2.110)				
NUM_SPECIAL_FEES				**-0.006**** (-2.405)			
NUM_SPECIAL_CL					**-0.007***** (-2.836)		
DIFFUSE_SPECIAL_FEES						**-0.045***** (-2.772)	
DIFFUSE_SPECIAL_CL							**-0.032**** (-2.249)
CITY_LEADER	0.010	0.007	0.006	0.011	0.011	0.007	0.006
NAT_LEADER	0.018	0.017	0.017	0.018	0.018	0.017	0.017
OFFICE_SIZE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
LN_AUDIT_FEES	0.004	0.004	0.004	0.005	0.004	0.004	0.004
LN_NONAUDIT_FEES	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
TENURE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
LN_DISTANCE	0.003	0.003	0.003	0.003	0.003	0.003	0.003
SIZE	-0.015***	-0.015***	-0.015***	-0.015***	-0.015***	-0.015***	-0.015***
LOSS	-0.054***	-0.055***	-0.055***	-0.055***	-0.054***	-0.055***	-0.055***
LEV	0.097***	0.097***	0.098***	0.098***	0.097***	0.097***	0.098***
BTM	0.001	0.002	0.002	0.002	0.001	0.002	0.002
BUS_SEG	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***	0.004***
GEO_SEG	0.002	0.002	0.003	0.002	0.002	0.002	0.002
ACQUISITION	-0.001	0.001	0.001	0.001	-0.001	0.001	0.001
FOREIGN	0.007	0.007	0.007	0.007	0.007	0.007	0.007
DECEMBER	-0.001	0.001	0.001	-0.001	-0.001	0.001	0.001
LIQUIDITY	-0.024	-0.024	-0.024	-0.024	-0.024	-0.025	-0.024
MSA_HERF	-0.016	-0.017	-0.016	-0.014	-0.016	-0.017	-0.016
MSA_NUM_OFFICES	0.001	0.001	0.001	0.001	0.001	0.001	0.001
LN_POPULATION	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
m_CITY_LEADER	-0.017	-0.019	-0.019	-0.019	-0.017	-0.020	-0.019
m_NAT_LEADER	-0.032	-0.036*	-0.037*	-0.033	-0.031	-0.036*	-0.037*
m_LN_AUDIT_FEES	0.004	-0.001	-0.001	0.005	0.005	-0.001	-0.001
m_LN_NONAUDIT_FEES	0.001	0.001	0.001	0.001	0.001	0.001	0.001
m_TENURE	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
m_LN_DISTANCE	0.003	0.003	0.003	0.002	0.002	0.003	0.003
m_SIZE	0.002	0.003	0.003	0.002	0.002	0.003	0.003
m_LOSS	-0.026	-0.036	-0.040	-0.030	-0.025	-0.036	-0.040
m_LEV	0.059	0.073	0.078	0.062	0.057	0.072	0.077
m_BTM	0.018	0.019	0.020	0.019	0.018	0.019	0.020
m_BUS_SEG	0.001	0.001	0.002	0.001	0.001	0.001	0.001
m_GEO_SEG	0.018	0.019	0.019	0.017	0.017	0.019	0.019
m_ACQUISITION	-0.040	-0.039	-0.039	-0.041	-0.040	-0.039	-0.039
m_FOREIGN	-0.022	-0.019	-0.020	-0.022	-0.022	-0.019	-0.019
m_DECEMBER	-0.016	-0.017	-0.018	-0.016	-0.015	-0.017	-0.018
m_LIQUIDITY	0.004	-0.003	-0.005	0.002	0.004	-0.003	-0.005
Intercept	0.083	0.152	0.157	0.076	0.070	0.147	0.152
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9,291	9,291	9,291	9,291	9,291	9,291	9,291
Adjusted R^2	0.409	0.409	0.408	0.409	0.410	0.409	0.408

Notes: This table reports coefficient estimates (t-statistics in parentheses) for tests of the association between the opportunity for partner industry knowledge sharing within audit offices and a client's absolute abnormal accruals. *ABS_ABACC* equals the absolute value of client *i*'s abnormal accruals in year *t*, calculated following Kothari et al. (2005) and controlling for concurrent return on assets. All other variables are defined in Appendix A. Industry fixed effects are based on 2-digit SIC codes. Statistical significance is calculated with robust standard errors clustered at the auditor-office-year level and reported using two-tailed tests. *, **, *** indicate significance levels of 0.10, 0.05, and 0.01, respectively.

TABLE 6
Distribution of City-Level Industry Leadership within Auditor Offices

		Mean Value of *CITY_LEADER* within Auditor Offices			
		OFFICE_SIZE Quartile			
SHARED VARIABLE:	**Quartile**	**1 (Small)**	**2**	**3**	**4 (Large)**
NUM_PARTNERS	**1 (Low)**	0.70	0.73	0.75	0.74
	2	0.55	0.58	0.66	0.53
	3	0.68	0.48	0.56	0.54
	4 (High)	0.41	0.40	0.41	0.48
DIFFUSE_FEES	**1 (Low)**	0.70	0.73	0.75	0.74
	2	0.53	0.56	0.64	0.51
	3	0.59	0.50	0.53	0.53
	4 (High)	0.59	0.45	0.42	0.49
DIFFUSE_CL	**1 (Low)**	0.70	0.73	0.75	0.74
	2	0.41	0.58	0.63	0.49
	3	0.63	0.50	0.57	0.52
	4 (High)	0.55	0.39	0.38	0.50
NUM_SPECIAL_FEES	**1 (Low)**	0.60	0.66	0.58	0.47
	2	0.70	0.65	0.63	0.60
	3	0.61	0.54	0.62	0.55
	4 (High)	0.60	0.38	0.39	0.48
NUM_SPECIAL_CL	**1 (Low)**	0.70	0.73	0.73	0.70
	2	0.55	0.57	0.64	0.50
	3	0.68	0.48	0.57	0.55
	4 (High)	0.41	0.40	0.40	0.49
DIFFUSE_SPECIAL_FEES	**1 (Low)**	0.70	0.73	0.73	0.74
	2	0.54	0.56	0.63	0.51
	3	0.60	0.49	0.56	0.53
	4 (High)	0.54	0.47	0.41	0.48
DIFFUSE_SPECIAL_CL	**1 (Low)**	0.70	0.73	0.73	0.74
	2	0.41	0.57	0.61	0.49
	3	0.63	0.49	0.59	0.52
	4 (High)	0.55	0.41	0.38	0.50

Notes: This table presents the distribution of aggregated office-year level engagement-specific industry specialization within the 16 audit office groups divided based on the quartiles of office size and the quartiles of partner industry knowledge sharing variables aggregated on office-year level. *CITY_LEADER* equals 1 if client *i*'s audit office has the highest market share of audit fees in the client's industry at the MSA-level in year *t*, and 0 otherwise. *NUM_PARTNERS* equals the number of partners in audit office *j* in year *t* who audit clients in the same 2-digit SIC industry as client *i* in year *t*. *DIFFUSE_FEES* (*DIFFUSE_CL*) equals one minus the level of $concentration_1$ ($concentration_2$) in client *i*'s 2-digit SIC industry in audit office *j* in year *t* across all partners who audit clients in that same industry, where $concentration_1$ ($concentration_2$) is calculated, based on the Herfindahl-Hirschman Index, as the sum of the squared fractional audit fees (number of clients) of each partner who conducts at least one audit in client *i*'s industry. *NUM_SPECIAL_FEES* (*NUM_SPECIAL_CL*) equals the number of partners in audit office *j* in year *t* who specialize in the same 2-digit SIC code industry as client *i* in year *t*, where each partner's industry of specialization is calculated as the 2-digit SIC industry with the highest percentage of audit fees (clients) within each partner's client portfolio in year *t*. *DIFFUSE_SPECIAL_FEES* (*DIFFUSE_SPECIAL_CL*) equals one minus the level of $concentration_3$ ($concentration_4$) in client *i*'s 2-digit SIC industry in audit office *j* in year *t* across only partners who possess specialization in that same industry, where $concentration_3$ ($concentration_4$) is calculated, based on the Herfindahl-Hirschman Index, as the sum of the squared fractional audit fees (clients) of each partner who specializes in client *i*'s industry, and where each partner's industry of specialization is calculated as the 2-digit SIC industry with the highest percentage of audit fees (clients) within each partner's client portfolio in year *t*.

TABLE 7
Industry Knowledge Sharing across Partners within Auditor Offices, Restatements and Abnormal Accruals
City-Level Office Industry Leadership Analyses

Panel A: Material Restatements

	Dependent Variable = Prob. (*MATERIAL_RESTATE* = 1)						
***SHARED* Variables**	**(1) Coeff. (z-stat)**	**(2) Coeff. (z-stat)**	**(3) Coeff. (z-stat)**	**(4) Coeff. (z-stat)**	**(5) Coeff. (z-stat)**	**(6) Coeff. (z-stat)**	**(7) Coeff. (z-stat)**
NUM_PARTNERS	-0.062						
	(-1.334)						
*NUM_PARTNERS*CITY_LEADER*	-0.098						
	(-1.578)						
DIFFUSE_FEES		-0.276					
		(-0.680)					
*DIFFUSE_FEES*CITY_LEADER*		**-1.168****					
		(-2.307)					
DIFFUSE_CL			-0.332				
			(-0.841)				
*DIFFUSE_CL*CITY_LEADER*			**-1.061****				
			(-2.289)				
NUM_SPECIAL_FEES				-0.0520			
				(-0.943)			
*NUM_SPECIAL_FEES*CITY_LEADER*				-0.099			
				(-1.414)			
NUM SPECIAL CL					-0.070		
					(-1.436)		
*NUM SPECIAL CL*CITY LEADER*					-0.089		
					(-1.395)		
DIFFUSE SPECIAL FEES						-0.269	
						(-0.685)	
*DIFFUSE SPECIAL FEES*CITY LEADER*						**-1.120****	
						(-2.225)	
DIFFUSE SPECIAL CL							-0.321
							(-0.847)
*DIFFUSE SPECIAL CL*CITY LEADER*							**-1.029****
							(-2.228)
CITY LEADER	0.559**	0.578**	0.602***	0.510**	0.528**	0.553**	0.578**
	(2.266)	(2.509)	(2.594)	(2.201)	(2.193)	(2.445)	(2.553)
*SHARED + SHARED*CITY_LEADER*	**-0.160*****	**-1.444*****	**-1.392*****	**-0.151*****	**-0.159*****	**-1.389*****	**-1.349*****
Prob>Chi^2	0.001	0.001	0.001	0.003	0.002	0.001	0.001
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	10,469	10,469	10,469	10,469	10,469	10,469	10,469
Pseudo R^2	0.137	0.137	0.138	0.136	0.137	0.137	0.138
ROC	0.805	0.803	0.804	0.802	0.804	0.802	0.803

TABLE 7 (continued)
Industry Knowledge Sharing across Partners within Auditor Offices, Restatements and Abnormal Accruals
City-Level Office Industry Leadership Analyses

Panel B: Abnormal Accruals

	Dependent Variable = *ABS_ABACC*						
***SHARED* Variables**	**(1) Coeff. (t-stat)**	**(2) Coeff. (t-stat)**	**(3) Coeff. (t-stat)**	**(4) Coeff. (t-stat)**	**(5) Coeff. (t-stat)**	**(6) Coeff. (t-stat)**	**(7) Coeff. (t-stat)**
NUM_PARTNERS	-0.006						
	(-1.458)						
*NUM_PARTNERS*CITY_LEADER*	-0.001						
	(-0.260)						
DIFFUSE_FEES		-0.036					
		(-1.348)					
*DIFFUSE_FEES*CITY_LEADER*		-0.014					
		(-0.361)					
DIFFUSE_CL			-0.023				
			(-0.955)				
*DIFFUSE_CL*CITY_LEADER*			-0.013				
			(-0.381)				
NUM_SPECIAL_FEES				**-0.008***			
				(-1.899)			
*NUM_SPECIAL_FEES*CITY_LEADER*				0.002			
				(0.339)			
NUM_SPECIAL_CL					**-0.007***		
					(-1.742)		
*NUM_SPECIAL_CL*CITY_LEADER*					-0.001		
					(-0.089)		
DIFFUSE_SPECIAL_FEES						-0.039	
						(-1.451)	
*DIFFUSE_SPECIAL_FEES*CITY_LEADER*						-0.011	
						(-0.298)	
DIFFUSE_SPECIAL_CL							-0.028
							(-1.113)
*DIFFUSE_SPECIAL_CL*CITY_LEADER*							-0.009
							(-0.268)
CITY_LEADER	0.014	0.011	0.011	0.007	0.012	0.010	0.010
	(1.101)	(1.076)	(1.066)	(0.585)	(1.008)	(1.048)	(0.975)
*SHARED + SHARED*CITY_LEADER*	**-0.007****	**-0.049****	**-0.036***	**-0.006***	**-0.007****	**-0.051****	**-0.037***
Prob>F	0.019	0.030	0.060	0.073	0.016	0.027	0.057
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	9,291	9,291	9,291	9,291	9,291	9,291	9,291
Adjusted R^2	0.410	0.409	0.408	0.409	0.410	0.409	0.408

Notes: This table reports results of analyses that jointly consider engagement-specific industry specialization and the opportunity for partner industry knowledge sharing within audit offices. Panels A and B report the coefficient estimates (related test statistics in parentheses) on the interaction term of interest (i.e., being a city leader and the opportunity for partner industry knowledge sharing within audit offices) when estimating restatement likelihood and absolute abnormal accruals, respectively. *MATERIAL_RESTATE* equals 1 if client *i* issues an Item 4.02-restated 10-K or 10-Q filing for year *t* (i.e., a "Big R" non-reliance restatement), and 0 otherwise. *ABS_ABACC* equals the absolute value of client *i*'s abnormal accruals in year *t*, calculated following Kothari et al. (2005) and controlling for concurrent return on assets. *CITY_LEADER* equals 1 if client *i*'s audit office has the highest market share of audit fees in the client's industry at the MSA-level in year *t*, and 0 otherwise. All other variables are defined in Appendix A. Industry fixed effects are based on 2-digit SIC codes. ROC is the area under the receiver operating characteristic curve. Statistical significance is calculated with robust standard errors clustered at the auditor-office-year level and reported using two-tailed tests. *, **, *** indicate significance levels of 0.10, 0.05, and 0.01, respectively.

TABLE 8
Material Restatements Analyses of Largest Client in a Partner's Portfolio

Panel A: *CITY_LEADER* = 0 Subsample

	Dependent Variable = Prob. (*MATERIAL_RESTATE* = 1)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
***SHARED* Variables**	**Coeff. (z-stat)**	**Coeff. (z-stat)**	**Coeff. (z-stat)**	**Coeff. (z-stat)**	**Coeff. (z-stat)**	**Coeff. (z-stat)**	**Coeff. (z-stat)**
NUM_PARTNERS	**-0.442*****						
	(-2.596)						
*NUM_PARTNERS*LARGEST*	**0.477*****						
	(2.980)						
DIFFUSE_FEES		**-2.190*****					
		(-3.002)					
*DIFFUSE_FEES*LARGEST*		**2.671*****					
		(3.543)					
DIFFUSE_CL			**-2.173*****				
			(-2.877)				
*DIFFUSE_CL*LARGEST*			**2.568*****				
			(3.538)				
NUM_SPECIAL_FEES				**-0.487****			
				(-2.395)			
*NUM_SPECIAL_FEES*LARGEST*				**0.544*****			
				(2.830)			
NUM_SPECIAL_CL					**-0.488*****		
					(-2.872)		
*NUM_SPECIAL_CL*LARGEST*					**0.518*****		
					(3.224)		
DIFFUSE_SPECIAL_FEES						**-2.386*****	
						(-3.354)	
*DIFFUSE_SPECIAL_FEES*LARGEST*						**2.914*****	
						(3.853)	
DIFFUSE_SPECIAL_CL							**-2.371*****
							(-3.265)
*DIFFUSE_SPECIAL_CL*LARGEST*							**2.820*****
							(3.964)
LARGEST	-1.157***	-0.851**	-0.886**	-0.762**	-1.160***	-0.869**	-0.903**
	(-2.666)	(-2.320)	(-2.336)	(-2.269)	(-2.828)	(-2.435)	(-2.470)
*SHARED + SHARED*LARGEST*	0.035	0.481	0.395	0.056	0.030	0.528	0.449
Prob>Chi^2	0.515	0.418	0.461	0.360	0.589	0.368	0.397
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4874	4874	4874	4874	4874	4874	4874
Pseudo R^2	0.171	0.168	0.170	0.172	0.173	0.171	0.172
ROC	0.815	0.813	0.813	0.815	0.815	0.815	0.815

TABLE 8 (continued)
Material Restatements Analyses of Largest Client in a Partner's Portfolio

Panel B: *CITY_LEADER* = 1 Subsample

	Dependent Variable = Prob. (*MATERIAL_RESTATE* = 1)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
***SHARED* Variables**	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)	(z-stat)
NUM_PARTNERS	**-0.242****						
	(-2.569)						
*NUM_PARTNERS*LARGEST*	0.072						
	(0.613)						
DIFFUSE_FEES		**-1.911****					
		(-2.357)					
*DIFFUSE_FEES*LARGEST*		0.289					
		(0.327)					
DIFFUSE_CL			**-1.841****				
			(-2.454)				
*DIFFUSE_CL*LARGEST*			0.280				
			(0.346)				
NUM_SPECIAL_FEES				**-0.223***			
				(-1.892)			
*NUM_SPECIAL_FEES*LARGEST*				0.028			
				(0.208)			
NUM_SPECIAL_CL					**-0.227****		
					(-2.551)		
*NUM_SPECIAL_CL*LARGEST*					0.057		
					(0.502)		
DIFFUSE_SPECIAL_FEES						**-1.833****	
						(-2.235)	
*DIFFUSE_SPECIAL_FEES*LARGEST*						0.277	
						(0.312)	
DIFFUSE_SPECIAL_CL							**-1.780****
							(-2.342)
*DIFFUSE_SPECIAL_CL*LARGEST*							0.253
							(0.310)
LARGEST	0.588	0.741*	0.749*	**0.883****	0.645	**0.746****	**0.759****
	(1.389)	(1.951)	(1.951)	(2.278)	(1.584)	(1.982)	(1.993)
*SHARED + SHARED*LARGEST*	**-0.170****	**-1.622*****	**-1.561*****	**-0.195****	**-0.170****	**-1.557*****	**-1.527*****
Prob>Chi^2	0.026	0.005	0.002	0.038	0.031	0.008	0.002
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,595	5,595	5,595	5,595	5,595	5,595	5,595
Pseudo R^2	0.196	0.197	0.198	0.195	0.196	0.195	0.197
ROC	0.850	0.849	0.850	0.849	0.850	0.849	0.850

Notes: This table reports results of analyses that jointly consider whether a client is the largest client in a partner's portfolio and the opportunity for partner industry knowledge sharing within audit offices. Panels A and B report the coefficient estimates (z-statistics in parentheses) on the interaction term of interest (i.e., being the largest client and the opportunity for partner industry knowledge sharing within audit offices) when estimating restatement likelihood using *CITY_LEADER*=0 and *CITY_LEADER* =1 subsamples, respectively. *MATERIAL_RESTATE* equals 1 if client *i* issues an Item 4.02-restated 10-K or 10-Q filing for year *t* (i.e., a "Big R" non-reliance restatement), and 0 otherwise. *LARGEST* equals 1 if client *i* is the largest client in its audit partner's portfolio based on audit fees in year *t*, and 0 otherwise. All other variables are defined in Appendix A. Industry fixed effects are based on 2-digit SIC codes. ROC is the area under the receiver operating characteristic curve. Statistical significance is calculated with robust standard errors clustered at the auditor-office-year level and reported using two-tailed tests. *, **, *** indicate significance levels of 0.10, 0.05, and 0.01, respectively.

TABLE 9
Accruals Analyses of Largest Client in a Partner's Portfolio

Panel A: *CITY_LEADER* = 0 Subsample

	Dependent Variable = *ABS_ABACC*						
***SHARED* Variables**	**(1) Coeff. (t-stat)**	**(2) Coeff. (t-stat)**	**(3) Coeff. (t-stat)**	**(4) Coeff. (t-stat)**	**(5) Coeff. (t-stat)**	**(6) Coeff. (t-stat)**	**(7) Coeff. (t-stat)**
NUM_PARTNERS	**-0.010****						
	(-2.082)						
*NUM_PARTNERS*LARGEST*	**0.012*****						
	(3.275)						
DIFFUSE_FEES		**-0.087****					
		(-2.223)					
*DIFFUSE_FEES*LARGEST*		**0.099*****					
		(2.648)					
DIFFUSE_CL			**-0.062**				
			(-1.615)				
*DIFFUSE_CL*LARGEST*			**0.078****				
			(2.110)				
NUM_SPECIAL_FEES				**-0.013*****			
				(-3.046)			
*NUM_SPECIAL_FEES*LARGEST*				**0.014*****			
				(3.102)			
NUM_SPECIAL_CL					**-0.011****		
					(-2.345)		
*NUM_SPECIAL_CL*LARGEST*					**0.012*****		
					(3.225)		
DIFFUSE_SPECIAL_FEES						**-0.084****	
						(-2.125)	
*DIFFUSE_SPECIAL_FEES*LARGEST*						**0.092****	
						(2.495)	
DIFFUSE_SPECIAL_CL							**-0.061**
							(-1.586)
*DIFFUSE_SPECIAL_CL*LARGEST*							**0.072****
							(1.982)
LARGEST	-0.030*	-0.027*	-0.022	-0.021	-0.028*	-0.022	-0.018
	(-1.882)	(-1.675)	(-1.338)	(-1.321)	(-1.795)	(-1.473)	(-1.159)
*SHARED + SHARED*LARGEST*	0.002	0.012	0.016	0.001	0.001	0.008	0.011
Prob>F	0.650	0.685	0.545	0.859	0.860	0.791	0.675
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4,266	4,266	4,266	4,266	4,266	4,266	4,266
Adjusted R^2	0.366	0.365	0.365	0.366	0.366	0.365	0.365

TABLE 9 (continued)
Accruals Analyses of Largest Client in a Partner's Portfolio

Panel B: *CITY_LEADER* = 1 Subsample

	Dependent Variable = *ABS_ABACC*						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
***SHARED* Variables**	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
NUM_PARTNERS	**-0.011****						
	(-2.207)						
*NUM_PARTNERS*LARGEST*	0.005						
	(1.314)						
DIFFUSE_FEES		**-0.094****					
		(-2.580)					
*DIFFUSE_FEES*LARGEST*		**0.061***					
		(1.765)					
DIFFUSE_CL			**-0.068****				
			(-2.222)				
*DIFFUSE_CL*LARGEST*			0.040				
			(1.282)				
NUM_SPECIAL_FEES				**-0.009**			
				(-1.567)			
*NUM_SPECIAL_FEES*LARGEST*				0.004			
				(0.940)			
NUM_SPECIAL_CL					**-0.011****		
					(-2.221)		
*NUM_SPECIAL_CL*LARGEST*					0.005		
					(1.259)		
DIFFUSE_SPECIAL_FEES						**-0.098*****	
						(-2.650)	
*DIFFUSE_SPECIAL_FEES*LARGEST*						**0.064***	
						(1.804)	
DIFFUSE_SPECIAL_CL							**-0.073****
							(-2.310)
*DIFFUSE_SPECIAL_CL*LARGEST*							0.044
							(1.382)
LARGEST	-0.010	-0.012	-0.006	0.002	-0.009	-0.012	-0.007
	(-0.769)	(-1.070)	(-0.583)	(0.194)	(-0.677)	(-1.084)	(-0.665)
*SHARED + SHARED*LARGEST*	**-0.006****	**-0.033***	**-0.029***	-0.005	**-0.006****	**-0.035***	**-0.029***
Prob>F	0.042	0.098	0.100	0.145	0.035	0.082	0.096
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,025	5,025	5,025	5,025	5,025	5,025	5,025
Adjusted R^2	0.447	0.445	0.444	0.445	0.447	0.445	0.445

Notes: This table reports results of analyses that jointly consider whether a client is the largest client in a partner's portfolio and the opportunity for partner industry knowledge sharing within audit offices. Panels A and B report the coefficient estimates (t-statistics in parentheses) on the interaction term of interest (i.e., being the largest client and the opportunity for partner industry knowledge sharing within audit offices) when estimating restatement likelihood using *CITY_LEADER*=0 and *CITY_LEADER* =1 subsamples, respectively. *ABS_ABACC* equals the absolute value of client *i*'s abnormal accruals in year *t*, calculated following Kothari et al. (2005) and controlling for concurrent return on assets. *LARGEST* equals 1 if client *i* is the largest client in its audit partner's portfolio based on audit fees in year *t*, and 0 otherwise. All other variables are defined in Appendix A. Industry fixed effects are based on 2-digit SIC codes. Statistical significance is calculated with robust standard errors clustered at the auditor-office-year level and reported using two-tailed tests. *, **, *** indicate significance levels of 0.10, 0.05, and 0.01, respectively.