

The revolving door between the PCAOB and large audit firms

Bradley E. Hendricks, Wayne R. Landsman^{*}, F. Dimas Peña-Romera

University of North Carolina

June 2018

Abstract

This paper provides basic facts on worker flows between former Public Company Accounting Oversight Board (PCAOB) employees and large audit firms. Using a large sample of publicly available curricula vitae, we document that an increasing number of former PCAOB employees join U.S. audit firms in senior-level positions during recent years. We also find that the number of PCAOB employees hired by these firms is positively related to the number of deficiencies reported in their prior PCAOB inspection report, and that the number of deficiencies reported in firms' future inspection reports is negatively associated with the number of former PCAOB employees hired. However, this latter relation is not observed for the year in which these employees join the firm, but rather during the subsequent period when the employees would be less likely to have personal access to private information about the firm's annual inspection. Although this pattern of findings is generally supportive of a "human capital" hypothesis, we are unable to rule out that the future reductions may be attributable to former PCAOB employees that obtain confidential information about future inspections via former colleagues at the PCAOB.

Keywords: Regulation, Audit Quality, PCAOB, Revolving Door, Inter-Industry Worker Flows

JEL: G28, G38, M41, M49

^{*} Corresponding author: Wayne R. Landsman, wayne_landsman@unc.edu, University of North Carolina, Kenan-Flagler Business School, 300 Kenan Drive, Chapel Hill, NC 27599. We thank Mary Barth, Justin Hopkins, and seminar participants at Stanford University, The George Washington University Spring Conference, and the University of Chicago for helpful comments. We are grateful for the financial support of Kenan-Flagler School of Business.

1. Introduction

The Sarbanes-Oxley Act of 2002 was designed to protect investors by improving the accuracy and reliability of corporate disclosures. In pursuit of this objective, the Act created the Public Company Accounting Oversight Board (PCAOB) with the mission of overseeing the audits of public companies. This required, among other things, that auditors of U.S. public companies be subject to external and independent oversight for the first time in history. Recent studies find that this oversight now occupies an important signaling role in the market for audit services. In particular, the number of deficiencies identified in the firm's PCAOB inspection report can have a negative effect on an audit firm's ability to retain and attract new clients (Nagy, 2014; Aobdia and Shroff, 2017).

The link between an audit firm's inspection report and its market share for audit services provides strong motivation for firms to increase their audit quality. However, it also raises concerns that firms may use inappropriate means to reduce the number of audit deficiencies. Although such behavior can take many different forms, of particular concern raised by industry experts is the lack of independence caused by worker flows between the PCAOB and regulated audit firms (e.g., McKenna, 2011). These concerns have increased following the Department of Justice and the Security and Exchange's decision in January 2018 to bring charges against multiple former KPMG employees. Referencing this case, Lynn Turner, former SEC Chief Accountant, notes that "[w]e have a serious problem with the revolving door between the audit firms and the regulators who are supposed to be keeping the firms on the straight and narrow path...The people involved in [the KPMG] case are people who worked at a Big Four audit firm, went to work for the regulator, then left the regulator and went back to the firm, they illegally obtained information from the regulator that they then used inside the audit firm (Mokhiber, 2018)." Motivated by these concerns, our study seeks to provide basic facts on worker flows between the PCAOB and U.S. audit firms. We also seek to understand better the relation between these worker flows and an audit firm's future inspection reports.

The PCAOB generally performs inspections on a triennial basis. However, audit firms with more than one hundred issuers receive an annual inspection. Considering the high costs associated with these inspections, annually inspected firms stand to benefit most from hiring individuals that are knowledgeable about the inspection process. Further, because firms potentially gain and lose market share based on the results of their inspection reports, these large audit firms also have the most at stake in connection with the PCAOB’s findings. Thus, we focus our examination on the eleven different audit firms that have ever been included on the PCAOB’s annual inspection lists (“Big 11”).

Using a large sample of publicly available curricula vitae, we first document a steady increase over time in the number of PCAOB employees that accept senior-level positions in Big 11 firms.¹ We then examine the determinants of these hiring decisions, predicting that such decisions are motivated by an audit firm’s incentive to reduce the number of deficiencies reported on their annual inspection. Consistent with this prediction, we find that the number of PCAOB employees hired by a Big 11 firm is positively related to the number of engagement-level deficiencies identified in the firm’s most recent inspection report. In terms of economic magnitude, we estimate that moving from the mean of 9.2 deficiencies to one standard deviation above the mean number of deficiencies, i.e., to 16.2 deficiencies, with 7.0 deficiencies being the standard deviation, is associated with a Big11 firm hiring 1.12 additional PCAOB employees over the subsequent eighteen-month period. This increase is substantial when considering that the unconditional mean number of PCAOB employees hired into senior-level positions in a Big 11 firm over a similar period is only 1.23 per firm-year.

An important part of the PCAOB’s inspection process considers an audit firm’s quality control systems, “broadly defined as a process to provide the firm with reasonable assurance that its personnel comply with applicable professional standards and the firm’s standards of quality” (PCAOB, QC 20.02). These assessments, among other things, take into account whether the firm has repeated instances of similar deficiencies. This information, included in ‘Part II’ of an inspection report, is not generally released to the public. However, the PCAOB may disclose this information publicly if it

¹ As described in Section 3, we define senior-level as positions at or above the manager level.

determines the firm is not making sufficient progress to remedy the deficiencies included in Part I of its inspection report. Considering the risk that the firm's recurring deficiencies could lead to public disclosure of Part II of the inspection report, we predict that audit firms are likely to increase their hiring of PCAOB personnel if the audit firm's inspection report is relatively similar to the prior year's report. Using cosine similarity to measure the similarity between a firm's two most recent inspection reports, we find evidence consistent with this prediction. Relatedly, because Big 4 audit firms (EY, Deloitte, PwC, and KPMG) presumably are exposed to more reputational risk of losing clients after a negative inspection outcome, we also predict and find that the sensitivity of the hiring response is greater for these firms. By finding that the hiring sensitivity increases in accordance with the threat presented by the inspection report, these two findings suggest that the hiring of PCAOB personnel is at least partially motivated by an audit firm's efforts to improve future inspection reports.

Evidence that regulated entities hire former regulatory personnel in an attempt to resolve pre-existing concerns also exists in other regulatory settings, including the hiring of former Internal Revenue Service employees by public companies (Jiang, Robinson, and Wang, 2017). However, it is generally unclear whether these outflows of regulatory personnel are successful in accomplishing the desired objective, and if so, how quickly it occurs. In our setting, we identify two potential mechanisms through which former PCAOB personnel may enable audit firms to improve results of future inspections. First, former employees could use their human capital and detailed knowledge of the PCAOB inspection process to alter the firm's audit processes such that they align better with PCAOB standards. We refer to this mechanism as the "human capital hypothesis." Second, and as alleged in the case against former KPMG personnel, former employees could obtain confidential PCAOB information for the purpose of directing firm resources to expend extra effort on the specific engagements scheduled for inspection. We refer to this mechanism as the "inside information hypothesis." Although these two mechanisms are not mutually exclusive, the latter hypothesis is more likely to be associated with a large, immediate improvement in audit processes because it bypasses the challenges inherent to organizational learning.

Consistent with former PCAOB employees successfully assisting audit firms in their effort to improve future inspections, we find a negative relation between the number of former PCAOB employees that a firm hires and the number of deficiencies reported in its future inspection reports. However, the reduction is not present for the year in which these employees join the firm, but rather during the subsequent period when the former employees would have been less likely to have personally accessed private information related to the firm's upcoming inspections. Although this finding is more consistent with the human capital hypothesis, it does not preclude the possibility that the future reductions in deficiencies arise in part from the former PCAOB employees obtaining confidential information about future inspections via former colleagues at the PCAOB.²

Our finding that the hiring of PCAOB personnel is associated with improvements in audit firms' future inspection reports raises the question as to whether the hiring of PCAOB personnel also reduces other firm-wide measures of audit failure. However, we find no evidence of any association between the number of former PCAOB employees that a firm hires and the number of future restatements or SEC enforcement actions. Our findings combine to suggest that PCAOB personnel bring valuable knowledge about how to perform and document audit procedures that satisfy PCAOB reviewers, but that this expertise of the inspection process does not necessarily have direct implications for the accuracy and reliability of clients' financial reports.

We repeat our primary analyses using worker outflows from the Financial Accounting Standards Board (FASB) to senior-level positions in Big 11 firms. Although prior FASB employees possess high levels of accounting expertise that could be useful in assisting firms in improving their audit quality (and thereby reducing deficiencies), these individuals do not have the same level of familiarity with PCAOB standards and their inspection process. We find that the hiring of FASB

² Paragraphs 58 and 62 of the indictment against former KPMG employees includes several anecdotal examples of alleged behaviors that indicate a delayed reduction in deficiencies partially may be attributable to the inside information hypothesis rather than exclusively a result of the human capital hypothesis. These examples include: (1) a PCAOB employee providing general information about the location of an upcoming assignment that allowed KPMG to infer the identity of an engagement to be inspected that year, (2) a PCAOB employee informing a KPMG employee that an inspection had an unidentified fraud risk that then provided KPMG time to prepare a response as to why it had not identified the risk, and (3) a PCAOB employee providing a KPMG employee with a confidential list of 12 issuers that would be inspected that year (United States of America v. Middendorf et al., 2018).

personnel into senior-level positions is not related to the number of reported deficiencies in firms' PCAOB inspection report, and these hirings also are not associated with improved inspection reports subsequent to their having joined the firm. These findings, together with the findings relating to former PCAOB employees, suggest that unfavorable inspection reports lead firms to targeted hiring of individuals with specific knowledge of the PCAOB inspection process rather than to hire individuals with high levels of accounting expertise.

The inferences we draw from our study's findings are subject to several important caveats. First, as with other studies using publicly available curriculum vitae to study revolving doors (e.g., Lucca, Seru, and Trebbi, 2014; DeHaan, Kedia, Koh, and Rajgopal, 2015; Jiang et al., 2017), our study is subject to representativeness concerns related to individuals' posting of their curriculum vitae. However, because senior-level members of large audit firms are expected to use their connections to create and maintain business for their firms, it is unlikely that the individuals of interest in our study would not use professional networking sites.³ Second, our design lacks a clean instrument that is useful to establish causal relations. Although we attempt to reduce endogeneity concerns by including important control variables, by using multiple specifications, and by using entropy balancing to reduce model dependency (Hainmueller, 2012), findings from our tests may not support causal inferences if our tests do not account fully for all factors that affect both PCAOB employee hiring decisions and the deficiencies identified in firms' future inspection reports.

Subject to these caveats, our study makes several contributions to the existing literature. First, we provide basic facts related to the scope of Big 11 audit firms hiring PCAOB personnel. Politicians and industry experts have long voiced concerns about revolving doors among auditors and in the larger financial industry (e.g., McKenna, 2011; Grassley, 2013). However, we are not aware of any prior research that examines the extent to which audit firms hire their regulator's former employees.

³ This assertion is corroborated by a recent study that shows LinkedIn is the most frequently used social media site among accountants, with more than 90% of surveyed accountants indicating their use of that platform (Bramwell, 2013). This survey is also consistent with findings reported in the Economist that indicate 89% of Deloitte's workforce had profiles on LinkedIn during 2014 (Economist, 2014). This proportion was significantly larger than proportions relating to large non-audit firms such as JP Morgan Chase (71%), GE (55%), or Walmart (9%).

Our study also adds to the recent growth in studies that use publicly available curriculum vitae to provide detailed examinations of revolving doors in regulatory agencies tasked with oversight of capital markets (e.g., Lucca et al., 2014, DeHaan et al., 2016, Jiang et al., 2017).

Second, by showing that more former PCAOB personnel are hired into senior-level positions of Big 11 audit firms when these firms receive unfavorable inspection reports, our study indicates that audit firms do hire former regulatory personnel to remediate existing deficiencies identified by the PCAOB. Although our tests are not capable of detecting whether the employees leaving the PCAOB inspected the audit firms that they ultimately join, this result is consistent with prior studies that suggest regulatory employees are best able to attract the attention of potential employers through strict enforcement of regulatory requirements (Che, 1995).

Third, we show that the hiring of former PCAOB personnel is associated with improved future inspection reports. To the extent this relation is not the result of former PCAOB employees using inside information to reduce inspection deficiencies for their new employers, this finding is evidence that revolving doors are important channels that lead to improved regulatory compliance. However, to the extent that this relation is the result of former employees using inside information, our findings suggest that the PCAOB's recent actions to reinforce their safeguards against the improper disclosure of confidential information are warranted to ensure that investors' reliance on these reports is merited (Gipper, Leuz, and Maffett, 2017).

2. Institutional background and hypothesis development

2.1 Institutional background – PCAOB inspection report process

Section 104 of the Sarbanes-Oxley Act requires the PCAOB to oversee the work of each accounting firm that audits publicly traded companies. These inspections generally are performed on a triennial basis. However, audit firms with more than one hundred issuers are inspected on an annual basis. These inspections begin by PCAOB staff notifying the accounting firm about the upcoming inspection, and requesting information about the firm's audits of publicly traded companies. The

PCAOB then takes a risk-based approach in selecting audit engagements to review. Thus, selected engagements are not intended to be a random sample of the firm's clientele, but rather are selected after considering several factors, including firm personnel assigned to the audit, the issuer's market capitalization and industry, and audit issues likely to be encountered. Because the PCAOB treats the list of audits selected for inspection as highly confidential, the PCAOB generally will only inform a firm about an upcoming inspection after the audit documentation period has closed for that particular issuer (Center for Audit Quality, 2012).⁴

There are two primary components associated with PCAOB inspections. First, the PCAOB inspects and reviews a sample of the audit and review engagements performed by the firm. Upon identification of a potential deficiency, inspectors voice their concern to the firm. If the concern cannot be resolved, the firm may respond through a "comment form" that the PCAOB staff then use to consider more formally whether an audit failure has occurred. If the staff continues to believe the concern was not appropriately addressed, it includes the item in 'Part I' of their draft report that is presented to the five members of the PCAOB Board ("Board") prior to its official release to the firm. Upon approval by the Board, the final report is then sent to the firm and, barring appeal to the SEC, is publicly released thirty days later (Center for Audit Quality, 2012).

Second, the PCAOB also examines the sufficiency of a firm's quality control systems. Although the scope and emphasis of these reviews vary from year to year, issues of importance regularly include reviews of management structure (including tone at the top), client acceptance and retention, and processes for monitoring audit performance. Upon identification of a concern, PCAOB staff follows a similar course of action as described above. However, unlike the public disclosure of Part I, criticisms related to quality control systems are included as 'Part II' of the inspection report and not released initially to the public. Rather, these items are communicated privately to firms with

⁴ Auditors have 45 days from the release date, defined as the date the auditor grants permission to use the auditor's report in connection with the issuance of the company's financial statements, to assemble the complete and final set of audit documentation (PCAOB AS No. 3, Paragraph 15).

instructions to remediate the concerns within twelve months. In the event that the Board determines the firm is not making sufficient progress to remedy the issues, the Board may elect to disclose publicly these systemic deficiencies (Center for Audit Quality, 2012).

2.2 Related literature and hypothesis development

A growing literature examines the effects that PCAOB inspection reports have on audit quality (Abernathy, Barnes, and Stefaniak, 2013).⁵ Although initial studies raise questions related to the usefulness of these inspection reports (Lennox and Pittman, 2010), several recent studies provide compelling evidence that the market uses these reports as a valuable signal of audit quality. More specifically, these studies provide evidence that investors respond stronger to earnings news following the initiation of PCAOB oversight and the release of inspection reports (e.g., Offermans and Peek, 2011; Gipper et al., 2017). Aobdia and Shroff (2017) provides evidence that clients of audit firms also rely on these reports, reporting that non-US auditors inspected by the PCAOB gain 4% to 6% market share from competing auditors after PCAOB inspection reports are made public. However, the study also finds the market share gains are significantly lower when the inspection report reveals a high number of engagement-level deficiencies. Nagy (2014) provides additional evidence of this link by showing that market share significantly declines following the public disclosure of ‘Part II’ of a firm’s inspection report.

Consistent with audit firms being aware of the reputational effects associated with these inspection reports (Houston and Stefaniak, 2013), prior research finds that firms subject to PCAOB inspection provide higher quality audits as reflected by reductions in auditees’ abnormal accruals and issuance of more going concern opinions reporting of more material weaknesses by foreign SEC registrants whose auditors are subject to PCAOB inspection (e.g., Carcello, Hollingsworth, and Matriola, 2011; Gunny and Zhang, 2013; Lamoreaux, 2016). An increase in audit quality may have simply arisen when firms learned of the required inspections. However, recent research indicates that

⁵ Abernathy et al., (2013) provides an excellent review of PCAOB research from 2003 – 2013. The paper summarizes the literature’s findings into a framework of: 1) registration, 2) standard-setting, 3) inspections, and 4) enforcement.

at least a portion of this effect is not attributable to firms' actions in anticipation of their first inspection, but rather is attributable to firm behavior after having received an unfavorable inspection report. Specifically, DeFond and Lennox (2017) provides evidence that auditors increase the rigor of their internal control evaluations in response to the receipt of a critical PCAOB inspection report. Similarly, Aobdia (2017) finds that the engagement partner and the audit team increase the number of hours on engagements that receive a 'Part I' finding.

These findings are supportive of the PCAOB's description of the remediation process, of which the PCAOB notes "[a]fter the inspection report is received—and, in many cases, even before the final report is issued—the inspected firm considers how to address any audit deficiencies and any PCAOB criticisms of its quality controls (Center for Audit Quality, 2012)." This remediation process is often thought to consist of implementing new training or adopting new policies that allow the firm to elevate its level of performance to the desired standard. In doing so, the firm may hire individuals that have a deep knowledge and understanding of the regulator's practices and standards. Consistent with this possibility, the recent indictment against former KPMG personnel indicates that KPMG recruited PCAOB personnel exactly for this purpose. Specifically, Paragraph 18 reads "...in or about 2015, KPMG was engaged in efforts to improve its performance in PCAOB inspections. Among other steps, KPMG...recruited and hired [two] former PCAOB personnel (United States of America v. Middendorf et al., 2018).⁶" Considering the pressure audit firms have to remediate deficiencies, and the ability to hire individuals from the PCAOB that have a mastery of the regulatory rules, we believe the previously referenced KPMG anecdote applies more generally. Thus, we test the pervasiveness of this relation by examining the following hypothesis:

⁶ Paragraph 16 of the indictment provides additional information about the pressure KPMG faced in regards to improving its inspection report. Specifically, "KPMG fared poorly in its PCAOB inspections in or about 2013 and 2014. In or about 2014, KPMG received approximately 28 comments in connection with the approximately 51 audits inspected by the PCAOB that year. This was approximately twice as many comments as the average number of comments received by KPMG's competitors" (United States of America v. Middendorf et al., 2018).

***H1:** The number of PCAOB personnel hired by an audit firm is positively related to the number of deficiencies found in the firm’s PCAOB inspection report.*

Our first hypothesis is based on the framework from Che (1995), which portrays revolving doors as “inescapable consequences” that arise from human capital that is valuable both to firms and regulatory agencies.⁷ Although prior research recognizes that these revolving doors may create a source of bias in regulatory decisions (Cohen, 1986; Dal Bò, 2006), it is also the case that the restriction of these worker flows may result in suboptimal regulatory performance because it discourages regulatory personnel from collecting the human capital needed for effective regulation (Che, 1995). DeHaan et al., (2015), in an examination of SEC trial lawyers, provides evidence consistent with revolving doors providing regulatory personnel with an incentive to enforce regulatory standards aggressively. Lucca et al., (2014), in an examination of bank regulators, provides further evidence that workers leverage regulatory experience to acquire expertise that increases their value to banks. Based on this line of research that indicates regulatory work experiences are used to increase individuals’ human capital, we test the following hypothesis:

***H2:** The number of deficiencies identified in an audit firm’s future PCAOB inspection reports is negatively related to the number of PCAOB personnel recently hired by the audit firm.*

Although we motivate our hypothesis using the human capital hypothesis, we recognize that a similar improvement in firms’ inspection reports could occur if the former employees simply used confidential information from the PCAOB to direct firm resources towards the engagements scheduled for inspection. As previously noted, we do not believe these two explanations are mutually

⁷ One way that regulators have addressed concerns relating to revolving doors is to impose a cooling-off period that prohibits worker outflows from a regulatory agency to a regulated firm within a specific period of time. Although such a period does not exist between the PCAOB and audit firms, the SEC has instituted a one-year cooling-off period that prohibits a member of an audit engagement team from commencing employment in a “financial reporting oversight role” with the issuer if the issuer is to remain independent. Although the ethics code at the PCAOB prohibits new hires from participating in the inspections of their former employers for a one-year period (PCAOB EC 8), PCAOB employees are not currently restricted from joining firms that they inspect. This is evident by the fact that the accusations against the two former KPMG employees with prior PCAOB experience were both previously assigned to the team tasked with inspecting KPMG (Paragraph 21-22, United States of America v. Middendorf et al., 2018).

exclusive. Further, and as with other studies of revolving doors, our research design is not capable of ruling out fully one of these possible explanations. Nonetheless, we perform some additional analyses designed to exploit differences that may exist between the two explanations.⁸

3. Data description

3.1. PCAOB inspection reports

On March 1, 2018, we obtained a listing of all 2,361 inspection reports of US registered audit firms that had been released prior to that date from the PCAOB website. Because firms that are inspected most frequently stand to benefit most from hiring individuals that are knowledgeable about the PCAOB's inspection process, we include in our sample only inspection reports for the eleven firms that have appeared on the annual inspection list. These firms are: BDO USA, Cohen & Company, Crowe Horwath, Deloitte & Touche, Ernst & Young, Grant Thornton, KPMG, MaloneBailey, Marcum, RSM US, PricewaterhouseCoopers LLP, and any predecessors of these firms (e.g., RSM US previously operated under the name of McGladrey). We find 127 reports for these eleven firms, spanning from inspection year 2003 to inspection year 2016. Table 1 lists each firm and the years in which their inspection reports are in our sample.⁹

INSERT TABLE 1

We use textual analysis to create the following three variables that reflect information about the extent of engagement-level deficiencies included in 'Part I' of PCAOB inspection reports. Because 'Part I' includes a detailed description of the identified deficiencies, a lengthier 'Part I' description indicates a greater number of deficiencies. Thus, we create the first variable, *Length_i*,

⁸ For example, we note that the time in which these improvements are realized is likely to be different between the two mechanisms because the human capital (inside information) mechanism is not (is) able to bypass the challenges related to organizational learning.

⁹ Note that our sample requirement is that the firm is included on the annual inspection list at some point since the PCAOB's inception. Thus, as Table 1 shows, we do not have an inspection report for every year for all eleven firms included in our sample. Untabulated findings from analyses in which we exclude the nine inspection reports that were conducted prior to a firm being part of the annual inspection process yield the same inferences as those based on tabulated findings.

which is the number of lines contained in ‘Part I’ of the inspection reports. In addition, we find that deficiencies are predominantly phrased using the root word ‘fail’ (i.e., “the firm failed to”, “the firm failed in”, etc.). Accordingly, we create the second variable, *Fail_Lines_t*, which is the number of distinct lines that contain a word with the root ‘fail’. Finally, although the format used by the PCAOB to communicate ‘Part I’ deficiencies has slightly evolved over time, the inspection reports have consistently used the term ‘Issuer’ (i.e., Issuer A, Issuer B, etc.) to indicate specific engagements wherein PCAOB staff has identified deficiencies. To reflect this information, we create the third variable, *Deficiencies_t*, which is the number of engagements that are separately mentioned in ‘Part I’ of PCAOB inspection reports.¹⁰ The subscript *t* refers to inspection fiscal year that varies between 2003 and 2016. Appendix A provides several examples of identified deficiencies, along with how our variables quantify this deficiency-related information.

We recognize that each of these variables reflects a portion, but not all, of the information related to the deficiencies included in firms’ inspection reports. For example, a high value for *Length* or *Fail_Lines* indicates that there are many deficiencies. However, it represents an isolated rather than a systemic problem in the firm if it corresponds to a small value for *Deficiencies*. Thus, we create a single measure that reflects information related to each of these three dimensions. To do so, we use primary component analysis and find that the first principal component has an eigenvalue of 2.57 and accounts for 85.5% of the variation across our three measures. Thus, we create a composite measure, *Composite_t*, which is the first principal component, and use it throughout our study to reflect multiple dimensions of the deficiency-related information contained in firms’ inspection reports.¹¹

¹⁰ Since inspection year 2014, inspection reports include a summary table that indicates the number of engagements in which deficiencies were identified, along with a breakdown as to whether these deficiencies related to 1) the financial statement audit only, 2) internal controls over financial reporting audit only, or 3) both. A comparison of this table with our *Deficiencies_t* measure reveals that the number of deficiencies determined by our measure is identical to the number shown in the table for all twenty-eight inspection reports that include this summary table.

¹¹ The weightings of the original variables to create the *Composite_t* variable is: *Fail_Lines_t* = 0.6060, *Length_t* = .5615, and *Deficiencies_t* = 0.5635. Considering this is a relatively equal weighting of the original variables, it is unsurprising that untabulated analyses reveal similar inferences as those documented in our study when we use a simple composite score that equals the average decile-rank across the three individual variables.

3.2. Career information for former PCAOB employees

We use publicly available curricula vitae from social networking websites to collect career path details of current and former PCAOB employees. Our searches, performed in February 2018, yield 1,581 individuals with an employment-related connection to the PCAOB. We are able to access self-reported employment histories for 1,545 of the 1,581 individuals. Because our empirical analyses focus on employment transitions between the PCAOB and Big 11 audit firms, our sample is further reduced to 875 individuals after removing the 670 individuals that do not indicate having worked for a Big 11 audit firm at any point in their careers. We then remove an additional 619 individuals that worked at a Big 11 firm prior to the PCAOB, but do not indicate having returned to a Big 11 firm upon leaving the PCAOB. Finally, because we are interested in individuals whose expertise and/or access to confidential information might provide firms with the ability to improve their inspection results, we further limit the sample to include only those individuals that 1) work in inspections-related positions at the PCAOB, and 2) are hired into senior-level positions at Big 11 firms. As shown in Panel A of Table 2, this final restriction (which Appendix B explains in greater detail) results in the elimination of 152 individuals and a final sample that consists of 104 distinct individuals.

INSERT TABLE 2

Panel B of Table 2 provides the ten most frequent job titles, upon entering the PCAOB, for the individuals in our final sample. Largely by design, based on our restriction to exclude individuals that likely did not possess sufficient expertise related to the inspection process, the ten most frequent positions of these individuals indicate significant involvement with the inspection process and/or a high level of seniority within the PCAOB. More specifically, we find that ‘Inspections Specialist’, ‘Associate or Assistant Director’, and Inspections Leader or Manager are the first, second, and third most frequent positions reported to be held by these individuals.¹²

¹² An alternative way to construct our sample would be to use only those individuals whose job descriptions clearly indicate a role related to audit quality in a Big 11 firm. Unfortunately, this approach is not feasible because less than a

Panel C of Table 2 provides information about these individuals' career paths both prior to, and subsequent to, their employment at the PCAOB. The vast majority of individuals included in our study, 72.1% (= 75 / 104), accept a position as a partner, principal, or director of a Big 11 firm upon leaving the PCAOB.¹³ This high proportion is important for our study because it indicates our sample of individuals holds positions that could enable them to affect a firm's efforts to improve audit quality across the entire firm.¹⁴ Panel C also indicates that seventy-three of the 104 individuals joined the PCAOB from a Big 11 audit firm. Panel D of Table 2, which provides a job title-based transition matrix for these seventy-three individuals, indicates that 74% (i.e., sum of the darkly shaded area = 54 / 73 total profiles) received a higher position in a Big 11 firm relative to the one they had upon joining the PCAOB. On the other hand, 21.9% (i.e., sum of the lightly shaded area = 16 / 73 total profiles) and 4.1% (i.e., sum of the non-shaded area = 3 / 73 total profiles) maintained or lowered their relative position upon exiting the PCAOB.¹⁵ These findings are consistent with work experience at the PCAOB being a useful channel through which accountants may advance their careers.

Our first hypothesis examines the number of PCAOB personnel hired by audit firms in response to deficiencies identified on current year's PCAOB inspection report. In testing this

third of these individuals provides a description of their role in the Big 11 firm that they join. However, many of the individuals in our sample that provide such descriptions include explicit reference to PCAOB inspections or to improving the firm's audit quality. Appendix C provides several examples of these employees' job descriptions.

¹³ We considered restricting our analyses to include only individuals hired in these executive-level positions rather than into manager-level positions. However, as Appendix C indicates, several non-executive level hires, e.g., managers, senior-managers, and consultants, provide descriptive information about their positions in a Big 11 audit firm that clearly states that the position was related to the firm's efforts to improve audit quality across the firm. Nonetheless untabulated findings from analyses in which we restrict the sample to include only executive-level hires reveal the same inferences as those based on tabulated findings.

¹⁴ One indication that the employees in our sample have the potential to affect firm-level measures of audit quality is that many are hired by Big 11 audit firms to work in large cities. We cannot conduct a comprehensive analysis because more than a third of the individuals do not provide a city of employment. However, individuals that do provide such information indicate their employment is in cities that generally employ individuals tasked with national- or area- level responsibilities for audit firms. More specifically, 84.3% of these individuals are employed in one of the ten largest metropolitan areas, with Washington DC, New York, and Atlanta being the three most frequent cities of employment. The smallest metropolitan area in our sample is Salt Lake City, Utah, which hired one individual with the title of "Director – National Monitoring Leader for Risk Assurance."

¹⁵ We also examine the proportion of these individuals that return to the same Big 11 audit firm or join a different firm. Untabulated statistics reveal that 34.3% (i.e., 25 / 73) of the individuals return to the same firm they left prior to exiting the PCAOB. Further, the individuals that join a different Big 11 audit firm most frequently move to a smaller audit firm relative to the one they worked for prior to their PCAOB employment.

hypothesis, we require a variable that reflects the number of former PCAOB employees hired by the firm subsequent to the firm learning of its performance on the inspection. Unfortunately, firms do not learn about their performance at a single point in time. Rather, as described in Section 2.1, this information is gradually revealed in conjunction with requests from PCAOB staff to provide explanations related to potential audit failures identified during the inspection process. However, three facts indicate that firms are unlikely to learn substantial information about their performance on the fiscal year t inspection until at least April 30 of fiscal year $t+1$. Specifically, (1) the majority of publicly traded firms have a fiscal year-end of December 31, (2) depending on a publicly traded firm's market capitalization, they have 60-90 days to file their 10-K, and (3) auditors have 45 days from the release date to assemble the complete and final set of audit documentation. Considering this information, it is unlikely that significant portions of an inspection take place prior to this date.

INSERT FIGURE 1

Thus, we create a variable, *Revolving_{18M}*, which reflects the number of individuals hired by a firm over an eighteen-month period subsequent to April 30 of fiscal year $t+1$. We choose eighteen months to allow sufficient time for the PCAOB to communicate the inspection list, the inspection to begin, the fieldwork to be completed, appeals processes to take place, and management to identify and recruit individuals capable of assisting the firm in their remediation efforts. Although eighteen months may seem too long for this process to take place, such a window is consistent with the median (average) number of months between the end of calendar year t and the release of that year's inspection report is 21.1 (23.8) months.¹⁶

In considering employees hired over this time span, we note that employees that flow out of the PCAOB after October 31 may have confidential information about which of the firm's engagements have been selected for the inspection of fiscal year $t+1$ because the PCAOB typically

¹⁶ We also conduct our tests using an alternative hiring window that begins at the midpoint of a firm's inspection and extends through the midpoint of the firm's subsequent inspection. Untabulated findings reveal that the correlation between these two measures is 91.8% and inferences based on hirings using the alternative date specification are the same as those based on tabulated findings.

finalizes its inspection list “in the winter of each year” (United States of America v. Middendorf et al., 2018). Because that information could be used to direct the firm’s resources to engagements selected for inspection through April 30 of $t+2$, it is possible firms prefer to hire during this six-month period relative to the other twelve months when the employees are less likely to possess confidential information about the upcoming inspection. Thus, we distinguish these two groups by referring to them as “informational hires” and “expertise hires,” denoted as *Revolv_Info_{18M}* and *Revolv_Expert_{18M}*. Figure 1 provides a detailed timeline depiction of this eighteen-month period and when *Revolving_{18M}*, *Revolv_Info_{18M}*, and *Revolv_Expert_{18M}* are measured.

INSERT FIGURE 2

Our second hypothesis examines the relation between the hiring of PCAOB personnel and changes in firms’ future inspection reports. In considering the timeframe described above, we note that individuals hired subsequent to April 30 of year $t+2$ are unlikely to have an impact on the inspection report for fiscal year $t+1$. Thus, we remove the portion of employees from *Revolving_{18M}* that were hired subsequent to April 30 of year $t+2$ to create a variable, *Revolving_{12M}*, that reflects the total number of individuals hired by a firm for twelve months prior to this date. As before, we recognize that the employees hired subsequent to November 1 of year $t+1$ but before the close of the audit documentation period (i.e., April 30 of year $t+2$) are relatively more likely to possess restricted information about that year’s upcoming inspection. Thus, we again distinguish these two groups by creating a variable for the informational hires, *Revolv_Info_{12M}*, and a separate variable for the expertise hires, *Revolv_Expert_{12M}*. Figure 2 provides a detailed timeline depiction of this twelve-month period and when *Revolv_Info_{12M}* and *Revolv_Expert_{12M}* are measured.

The variables described above reflect information related to the number of individuals with PCAOB work experience recently hired by a Big 11 audit firm. However, because individuals are continuously hired, firms establish a stock of these individuals. Thus, we also create a variable, *Revolving_Level_t*, which is the number of former PCAOB employees on an audit firm’s staff as of

April 30. Figure 3, which charts an aggregation of these individuals from 2003 – 2017, reveals very few former PCAOB personnel worked in Big 11 audit firms in the nascent years of the PCAOB. However, consistent with the Lucca et al. (2014) finding that workers increasingly flow out of regulatory positions during periods of economic growth, Figure 3 indicates a significant increase in this number as the financial crisis came to an end.

INSERT FIGURE 3

3.3 Control Variables

In addition to inspection year fixed effects, we create several time-varying control variables that may be associated both with an audit firm’s decision to hire experts into senior-level positions and its performance on PCAOB inspection reports. These variables include both the number of an audit firm’s clients, $Clients_t$, and the annual percentage change in clients, $\Delta Clients_t$. We also create a variable as a proxy for the complexity of audits performed by the firm, $Complexity_t$, which is the median amount of audit fees received from a client during the year. We also include an indicator variable that takes the value of one if the audit firm is a Big 4 auditor, $Big4_t$. We include an indicator variable, $Rebrand_t$, that takes the value of one if the firm has undergone a rebranding in in the current year (e.g., in 2015, McGladrey was rebranded as RSM) as a control for changes in the firm’s organizational structure. We include the percentage of accounting restatements during the year, $Restate_t$, as a control for a firm’s audit quality. Lastly we use cosine similarity to create a control variable, $Report_Similarity_t$, that is intended to reflect the similarity of a firm’s inspection report relative to its previously received report.¹⁷ Table 3 provides descriptive statistics and correlation

¹⁷ More specifically, we pre-process the vector of words included in Part I of the inspection reports by 1) converting all text to lower case, 2) removing numbers and punctuation, 3) removing stop words, and 4) retaining the stem of each word. We then weigh each term in the vector by its term frequency-inverse document frequency (“TF-IDF”). TF normalizes each term according to the document length, expressing each term as a fraction of the total word count in the document. IDF scales each term by its inverse document frequency, based on the concept that less frequently used terms contain more information. Based on this construction, relatively higher (lower) values of $Report_Similarity_t$ indicate that the vector of words included in the firm’s inspection report is more (less) similar relative to the prior inspection report.

coefficients for these, and the previously described variables in this section. We also include additional information related to the construction of each variable in Appendix D.

INSERT TABLE 3

4. Empirical results

4.1 Audit firms' PCAOB inspection reports and their hiring of PCAOB personnel

Our first hypothesis examines whether the number of PCAOB employees hired by an audit firm is positively related to the number of deficiencies found in the firm's PCAOB inspection report. Figure 4 provides a scatterplot of firms' engagement-level deficiencies, *Deficiencies*, and the number of PCAOB employees hired over the subsequent eighteen-month period, *Revolving_{18M}*. Although this figure indicates a clear positive relation between the two variables, it is possible that this relation is endogenously the result of different firm or time characteristics that are associated with these two variables. To mitigate these potential effects, we estimate the following multivariate regression that relates *Revolving_{18M}* sequentially with our four inspection report variables, *Composite_t*, *Fail_Lines_t*, *Length_t*, and *Deficiencies_t*, as well as control variables described above that serve as proxies for other factors that can influence an audit firm's decision to hire experts into senior-level positions:

$$\begin{aligned}
 Revolving_{18M} = & \beta_0 + \beta_1 Inspection_Var_t + \beta_2 Revolving_Level_t + \\
 & \beta_3 Report_Similarity_t + \beta_4 Big4_{t+1} + \beta_5 Clients_{t+1} + \beta_6 Complexity_{t+1} + \\
 & \beta_7 \Delta Clients_{t+1} + \beta_8 Rebrand_{t+1} + \beta_9 Restate_{t+1} + fixed\ effects + \varepsilon.
 \end{aligned}
 \tag{1}$$

Inspection_Var_t equals *Composite_t*, *Fail_Lines_t*, *Length_t*, or *Deficiencies_t* depending on the model being estimated. These variables reflect information about the extent of deficiencies included in the audit firm's inspection report related to the audits they completed in fiscal year *t*. We also include inspection-year fixed effects to reduce concerns that our results are affected by time-invariant factors. All other variables are motivated and defined in Section 3.3. For this regression, and all subsequent

regressions, we cluster standard errors by the month in which the PCAOB concluded their fieldwork to account for within-cluster correlation of residuals.

INSERT FIGURE 4

Table 4 presents the results from estimating Equation (1). Each column reports regression estimates for the same equation, alternating which *Inspection_Var_t* variable is included. We use *Composite_t*, as indicated at the bottom of the Table 4, in our first specification shown in Column 1. Consistent with the H1 prediction, we find that increased deficiencies in firms' inspection reports is significantly positively related to the number of PCAOB employees subsequently hired into senior-level positions within the firm (coefficient = 0.9088, p-value < 0.000).¹⁸ The findings in Columns 2-4 reveal a similarly significant association based on the three *Composite* measures. Focusing on Column 4 to assess more readily the economic magnitude of our findings, *Deficiencies_t* has a coefficient of 1.6088 (p-value < 0.000). Thus, a one standard deviation change in the number of engagement-level deficiencies (see table 3), 0.70, which is equivalent to 7 engagement level deficiencies in the actual PCAOB inspection report, is associated with a Big11 firm hiring 1.12 (= 0.7 x 1.6088) additional PCAOB employees in the subsequent eighteen month period. This is a substantial increase when considering that the average number of PCAOB employees hired into senior-level positions in a Big 11 firm during this timeframe is 1.23.

INSERT TABLE 4

As discussed in Section 3.2, and indicated on our timeline in Figure 1, we divide the employees hired during this eighteen-month period into informational hires, *Revolv_Info_{18M}*, and expertise hires, *Revolv_Expert_{18M}*. Panel B of Table 4 presents findings from estimations of versions of Equation 1 in which we replace *Revolving_{18M}* with *Revolv_Info_{18M}*, *Revolv_Expert_{18M}*. We also

¹⁸ Throughout, we use the term significant (marginally significant) to denote a five (ten) percent significance level under a two-sided alternative.

estimate versions of Equation (1) using as the dependent variable *Revolv_Info_%_{18M}*, which is the proportion of informational hires relative to total hires for the eighteen-month window of interest.

The findings in Panel B reveal that *Composite_t* is significantly positively related to the number of informational hires (Column 1, coefficient = 0.1646, p-value = 0.096) and the number of expertise hires (Column 2, coefficient = 0.6703, p-value < 0.000), although only marginally so for informational hires. Moreover, based on the magnitude of these coefficients, it does not appear that audit firms focus their hiring in periods in which PCAOB personnel are more likely to have direct access to restricted information about the firm's upcoming inspections. Consistent with this, there is no significant relation between unfavorable inspection reports and the proportion of a firm's hires that are informational hires (Column 3, coefficient = -0.0232, p-value = 0.502). In addition, when we limit the sample to those firms that hired a PCAOB employee over the eighteen month time period, untabulated findings reveal that unfavorable inspection reports are actually associated with a lower proportion of informational hires (coefficient = -0.1352, p-value = 0.026). Although the findings in Panel A provide evidence that firms do increase their hiring of PCAOB personnel in response to unfavorable inspection reports, the findings in Panel B suggest that the timing of these hirings are such that the new hires are unlikely to have direct information about the firm's upcoming inspections.

4.2 The role of audit firms' reputational concerns on the relation between inspection report deficiencies and the hiring of PCAOB personnel

As Section 2.1 notes, an important part of the PCAOB's inspection process considers the firm's quality control systems that, among other things, assesses whether the audit firm has repeated instances of similar deficiencies. Although these quality control assessments are not generally released to the public, the Board may subsequently publicly disclose the information if it determines the firm is not making sufficient progress to remedy the issues. Considering the reputational concerns associated with having 'Part II' of the inspection report released publicly, we predict that the hiring of PCAOB personnel is greater when the audit firm's inspection report is relatively more similar to

the prior year’s report. To test whether this is the case, we modify Equation (1) to include an interaction between *Inspection_Var_t* and *Report_Similarity_t*.

$$\begin{aligned}
 Revolving_{18M} = & \beta_0 + \beta_1 Inspection_Var_t + \beta_2 Report_Similarity_t + \\
 & \beta_3 Inspection_Var_t * Report_Similarity_t + \beta_{4-10} Remaining\ Controls_t + \\
 & fixed\ effects + \varepsilon.
 \end{aligned}
 \tag{1.1}$$

INSERT TABLE 5

The results of estimating Equation (1.1) are shown in Panel A of Table 5. Regardless of which inspection variable we use, we find evidence consistent with our prediction that recurring deficiencies increase the sensitivity of the hiring response. All but one of the interaction coefficients is significantly positive (the *Length_t* interaction coefficient is marginally significant). This result is illustrated in Figure 5, which plots the results of based on *Deficiencies_t* in Column 4, and depicts lines to represent the linear predictions for *Revolve_{18M}* using various values of *Report_Similarity_t*. The graph also includes small x-marks to indicate actual values of our underlying data.¹⁹ Assuming a value of 1 for *Deficiencies* (which closely approximates the mean value of 0.92), this figure shows that the predicted number of PCAOB hirings ranges from 0.3547 to 2.8951 depending on the degree of similarity between the firm’s two most recently received inspection reports.

INSERT FIGURE 5

This finding suggests that reputational concerns associated with receiving unfavorable inspection reports leads audit firms to increase the sensitivity of their hiring response. As another test of the influence of reputational considerations, we examine whether the hiring response also is greater for Big 4 audit firms that have more reputational capital relative to the other audit firms in our sample

¹⁹ Because *Revolve_{18M}* and *Deficiencies_t* are based on integer values, we often observe several observations in our data that have the same values for these two variables. Thus, to provide a sense for these data concentration points, we add a small amount of noise into the scatterplot that is included in Figure 5. We repeat this process in Figure 6 to allow for a better visualization of the underlying data.

(e.g., Beatty, 1989; Francis, 2004). To do so, we again modify Equation (1) such that the model includes an indicator variable for Big4 auditors, $Big4_{t+1}$, interacted with $Inspection_Var_t$.

$$Revolving_{18M} = \beta_0 + \beta_1 Inspection_Var_t + \beta_2 Big4_{t+1} + \beta_3 Inspection_Var_t * Big4_{t+1} + \beta_{4-10} Remaining_Controls_t + fixed\ effects + \varepsilon. \quad (1.2)$$

Panel B of Table 5 presents the results of estimating Equation (1.2). As in Panel A, all but one of the interaction coefficients is significantly positive (the $Length_t$ interaction coefficient is marginally significant). Hence, we again find evidence consistent with our prediction that the sensitivity of hiring PCAOB personnel in response to the deficiencies included in firms' inspection reports is enhanced for firms with greater reputational stakes, in this case Big4 audit firms. Figure 6 provides a graphical illustration of this finding based on $Deficiencies_t$ in Column 4, by depicting lines for linear predictions of $Revolving_{18M}$ based on Big 4 status (solid line = Big4, dashed line = Non-Big 4). The graph also includes small x's (o's) to indicate actual values of the underlying data for Non-Big 4 (Big 4) audit firms. Figure 6 indicates that the hiring response is similar for both types of firms when $Deficiencies_t = 1.5$. Considering this value represents the 80th percentile of the distribution, this result indicates that Big 4 audit firms are less likely to hire PCAOB personnel in response to inspection reports unless the number of deficiencies included therein is nearing the right tail of the distribution. This result, that hiring sensitivity increases in accordance with the threat that the inspection report poses to the audit firm, provides additional evidence that the hiring of PCAOB personnel is motivated by efforts to remediate existing deficiencies, and thereby, improving future reports.

INSERT FIGURE 6

4.3 The hiring of PCAOB personnel and changes to firms' future PCAOB inspection reports

Our second hypothesis is that the number of PCAOB personnel hired by an audit firm is negatively related to changes in the number of deficiencies identified in the firm's future PCAOB inspection reports. Although there is a possibility that these employees may bring restricted information from the PCAOB that enables them to make a large and immediate difference to the

firm’s inspection report, the difficulties associated with organizational learning are such that these improvements may not be immediately realized. Thus, in our testing of this hypothesis, we examine the relation over multiple periods of time.

4.3.1 – Hiring of PCAOB personnel and firms’ future inspection reports, immediate impact

We begin by examining whether the hiring of PCAOB personnel is associated with an immediate impact to firms’ inspection reports. To examine this prediction, we estimate the following multivariate regression:

$$\begin{aligned}
 \text{Inspection_Var}_{t+1} = & \beta_0 + \beta_1 \text{Revolving}_{12M} + \beta_2 \text{Inspection_Var}_t + \\
 & \beta_3 \text{Reporting_Level}_t + \beta_4 \text{Big4}_{t+1} + \beta_5 \text{Clients}_{t+1} + \beta_6 \text{Complexity}_{t+1} + \\
 & \beta_7 \Delta \text{Clients}_{t+1} + \beta_8 \text{Rebrand}_{t+1} + \beta_9 \text{Restate}_{t+1} + \text{fixed effects} + \varepsilon
 \end{aligned} \tag{2}$$

Inspection_Var_{t+1} equals *Composite_{t+1}*, *Fail_Lines_{t+1}*, *Length_{t+1}*, or *Deficiencies_{t+1}* depending on the model being estimated. Because our control variables include lagged values of these variables, i.e., *Inspection_Var_t*, this specification is designed to identify the determinants of the changes in firms’ inspection reports.²⁰ *Revolving_{12M}* is our primary variable of interest and reflects the number of PCAOB employees hired during the twelve month period prior to April 30 of fiscal year *t+1*, the date on which most audit engagements will be required to have archived the final set of audit documentation for audits examined as part of fiscal year *t+1* (refer to Figure 2 for additional details of the timeline). All other variables are motivated and defined in Section 3.3.

INSERT TABLE 6

Panel A of Table 6 presents the findings relating to estimation of Equation (2), with each column presenting corresponding findings based on each of the four *Inspection_Var_{t+1}* variables as the dependent variable. The findings in Panel A fail to provide any significant evidence that the hiring

²⁰ We also estimate a changes specification by subtracting *Inspection_Var_t* from the *Inspection_Var_{t+1}* and including the difference as the dependent variable. This specification effectively constrains the coefficient on *Inspection_Var_t* to be -1 . Untabulated findings reveal that inferences regarding the association between the hiring of PCAOB personnel and subsequent inspection reports are the same as those based on tabulated findings.

of PCAOB personnel results in the immediate improvement of firms' inspection reports. Setting aside statistical insignificance, we note that the economic magnitude of the *Revolving*_{12M} coefficients is also small. For example, in Column 4 *Revolving*_{12M} has an estimated coefficient of -0.0108 (p-value = 0.849). This represents 1.54% of the standard deviation for *Deficiencies*_{t+1} (i.e., $-0.0108 / 0.70 = 1.54\%$). Thus, even in the event a firm hires several PCAOB employees, our tests indicate the immediate impact to a firm's inspection report is statistically and economically insignificant.

Panel A indicates that newly hired PCAOB employees do not have an immediate impact on firms' inspection reports. However, because informational hires are more likely to have information about the firm's inspection in year $t+1$ relative to expert hires, it is possible that there is an immediate impact of informational hires, *Revolv_Info*_{12M}, but that this effect is masked by combining them with expert hires, *Revolv_Expert*_{12M}. To test whether this is the case, we estimate versions of Equation (2) in which we sequentially replace *Revolving*_{12M} with *Revolv_Info*_{12M} and *Revolv_Expert*_{12M}, and a third variable that examines the ratio of informational hires relative to total hires, *Revolv_Info_%*_{12M}.

Panel B of Table 6 presents the findings relating to these three versions of Equation (2). Using the composite measure of firms' inspection results for year $t+1$, i.e., *Composite*_{t+1}, we fail to find evidence that informational hires (Column 1, *Revolv_Info*_{12M} p-value = 0.564) or expertise hires (Column 2, *Revolv_Expert*_{12M} p-value = 0.384) have a significant impact on firms' inspection reports in the year of hire. Similarly, there is no significant relation with firms' future inspection reports and the ratio of informational hires (Column 3, *Revolv_info_%*_{12M} p-value = 0.364). In addition, when we limit the sample to those firms that hired a PCAOB employee over the twelve month period of interest, untabulated findings reveal there is no significant relation with firms' future inspection reports and the ratio of informational hires (*Revolv_info_%*_{12M} p-value = 0.471). These results, combined with those from Panel A, suggest that the hiring of PCAOB personnel does not have a meaningful, immediate impact on firms' future inspection reports.

4.3.2 – Hiring of PCAOB personnel and firms’ future inspection reports, a delayed impact

We next examine whether the hiring of PCAOB personnel is associated with an impact on firms’ inspection reports beyond the immediate period. To do so, we estimate versions of Equation (3) such that the dependent variable reflects information about the inspection report for the fiscal period after the one in which these employees joined the audit firm, i.e., replacing *Inspection_Var_{t+1}* in Equation (2) with *Inspection_Var_{t+2}*.

$$\begin{aligned} \text{Inspection_Var}_{t+2} = & \beta_0 + \beta_1 \text{Revolving}_{12M} + \beta_2 \text{Inspection_Var}_t + \\ & \beta_3 \text{Reporting_Level}_t + \beta_4 \text{Big4}_{t+1} + \beta_5 \text{Clients}_{t+1} + \beta_6 \text{Complexity}_{t+1} + \\ & \beta_7 \Delta \text{Clients}_{t+1} + \beta_8 \text{Rebrand}_{t+1} + \beta_9 \text{Restate}_{t+1} + \text{fixed effects} + \varepsilon \end{aligned} \quad (3)$$

Panel A of Table 7 reports the results associated with the Equation (3) estimations. In sharp contrast to Panel A of Table 6, Panel A of Table 7 provides consistent evidence that the hiring of PCAOB personnel is significantly associated with improved inspection reports. In particular, *Revolving_{12M}* has a significantly negative association with all four of the inspection report variables. Focusing again on Column 4 to assess the economic magnitude of this finding, *Revolve_{12M}* has an estimated coefficient of -0.1015 (p-value = 0.047). Because we scale *Deficiencies* by ten, this indicates that the hiring of a PCAOB employee is associated with one less engagement-level deficiency in the second year after the employee joins the audit firm. Further evidence that this represents a meaningful reduction is that it represents 10.35% of the mean (i.e., $-0.1015 / 0.98 = 10.35\%$) and 14.71% of the standard deviation for *Deficiencies_{t+2}* (i.e., $-0.1015 / 0.69 = 14.71\%$).

INSERT TABLE 7

Hence, the findings in Panel A of Table 7 indicate that the hiring of PCAOB employees is associated with improved PCAOB inspection results after two years. Although Table 6 indicates that this result is not attributable to improvements made in year 1, the improvement in inspection results in year 2 may be attributable, at least in part, to the number of PCAOB employees hired during the 2nd year and the changes in firms’ inspection reports through year 1. To examine whether this is the

case, we estimate versions of Equation (3) that include the most recent lag of the firm's inspection report, $Inspection_Var_{t-1}$, and add a new variable to the equation that reflects the number of PCAOB employees hired into the firm during the 2nd year, $Revolving_{13M-24M}$.

Panel B of Table 7 presents the results of estimating this modified version of Equation (3). Consistent with Panel A, we again find evidence of a significantly negative relation between $Revolving_{12M}$ and the various inspection report variables, $Inspection_Var_{t+2}$. Further, and consistent again with Panel A of Table 6, we fail to find a significant relation between $Revolving_{13M-24M}$ and the $Inspection_Var_{t+2}$. These results, when considering that none of the employees reflected by $Revolving_{12M}$ were at the PCAOB during the period in which the inspection list was generated for inspection year $t+2$, are generally more supportive of the human capital hypothesis relative to the inside information hypothesis. However, our tests do not permit us to rule out that the future reductions may be attributable—at least in part—to former PCAOB employees that obtain confidential information about future inspections via former colleagues at the PCAOB.

5. Additional analyses

5.1 Audit firm hiring of PCAOB personnel and future accounting restatements

Our finding that the hiring of PCAOB personnel is associated with improvements in audit firms' future inspection reports raises the question as to whether improvements in the hiring of PCAOB personnel also is associated with other measures related to audit failure. PCAOB inspection reports define 'audit failures' as one or more deficiencies that are of such significance that at the time it issued its audit report, it appears that the audit firm had failed to obtain sufficient appropriate audit evidence to support its audit opinion on the financial statements and/or on the effectiveness of internal control over financial reporting (Center for Audit Quality, 2012). Thus, decreases in the number of 'audit failures' included in a firm's PCAOB inspection report should indicate that the firm also has fewer clients at risk of restating their financial statements. This link, between findings in PCAOB inspection

reports and the likelihood of client restatements, is supported by evidence in Panel B of Table 3 that reports positive correlation coefficients between each of our four inspection report variables and $Restate_t$. However, we test whether this association manifests in a multivariate context by estimating versions of Equation (2) (Equation (3)) in which $Restate_{t+1}$ ($Restate_{t+2}$) is the dependent variable and removing $Inspection_Var_t$ as an independent variable.

INSERT TABLE 8

Table 8 provides the results from estimating these modified versions of Equations (2) and (3). Panel A reveals the absence of a statistically significant relation between the primary variable of interest, $Revolving_{12M}$, and accounting restatements over a one-year (Column 1) or two-year horizon (Columns 2 and 3). Columns 4-6 reveal similar inferences when substituting SEC investigations (i.e., SEC_Inv) as the dependent variable in place of accounting restatements used in Columns 1-3, i.e., no significant association between SEC investigations and hiring of PCAOB employees. Although the findings reported in Table 7 indicate the hiring of PCAOB personnel results in reduced audit failures, the Table 8 findings indicate that the inference may be restricted to PCAOB-based measures of audit failure. Taken together, these findings may also indicate that the PCAOB personnel bring valuable knowledge about how to document audit procedures to satisfy PCAOB reviewers, but that their expertise of the inspection process does not necessarily have direct implications for the quality of service provided by these firms.

5.2 Audit firm hiring decisions and changes to firms' future PCAOB inspection reports

5.2.1 – Big 11 audit firms and the hiring of personnel from the FASB

Our results suggest that audit firms increase their hiring of PCAOB personnel in response to unfavorable inspection results, and that these former PCAOB employees are then valuable resources in assisting the firm to improve future inspection reports. Although our hypotheses are built on the premise that the PCAOB employees are hired based on their familiarity with the inspection process, it is possible that audit firms are simply hiring these individuals because they have the expertise to

improve their audit quality, more broadly. If so, our pattern of findings may also be evident when examining the Big 11 firms' hiring of other experts into senior-level positions that *do not* have PCAOB experience, but *do* possess high levels of expertise. To examine this possibility, we re-perform our primary analyses, defined as Equations (1) through (3), using former employees of the Financial Accounting Standards Board (*FASB*) rather than the PCAOB, and using *Composite_t* as the measure of inspection deficiencies. In these estimations, the number of former FASB employees hired are denoted by *Revolving_FASB_{18M}* and *Revolving_FASB_{12M}*.

Untabulated findings reveal no evidence that audit firms increase their hiring of individuals from the FASB in response to unfavorable PCAOB inspection reports (*Composite_t* coefficient = 0.0102, p-value = 0.917). Also, in contrast to our findings when examining recently hired PCAOB personnel, additional untabulated findings reveal no evidence that the hiring of individuals from the FASB is associated with improvements in future inspection reports over either a one-year or two-year horizon (*Revolving_FASB_{12M}* coefficient p-values all > 0.10). These findings are consistent with unfavorable inspection reports leading audit firms to target specific individuals that have a deep knowledge about the PCAOB process rather than experts with a deep knowledge of accounting rules and their application more generally.

5.2.2 – Big 11 audit firms and the hiring of PCAOB interns

Our hypotheses are built on the premise that the PCAOB employees are hired based on their familiarity with the inspection process. However, it is possible that our findings reflect a factor related to the timing of worker outflows from the PCAOB back to industry and not necessarily their familiarity with the inspection process. Thus, to mitigate this concern, we repeat our primary analyses using PCAOB interns that 1) do not have the expertise related to the PCAOB inspection process to improve audit quality across a Big 11 firm, and 2) generally are placed in client serving roles within the Big 11 firms rather than in professional practice and firm-wide audit quality positions such as those generally filled by the individuals examined in our primary analyses (see: Appendix C). Thus,

we re-estimate Equations (1) through (3), using PCAOB interns and $Composite_t$ as the measure of inspection deficiencies. In these estimations, the number of former PCAOB interns hired are denoted by $Revolving_Intern_{18M}$ and $Revolving_Intern_{12M}$.

Untabulated findings reveal no evidence that audit firms increase their hiring of PCAOB interns in response to unfavorable PCAOB inspection reports ($Composite_t$ coefficient = 0.2038, p-value = 0.317). Also, in contrast to our findings when examining recently hired senior-level PCAOB personnel (Tables 6-7), yet similar to our findings when examining FASB personnel, additional untabulated findings reveal no evidence that the hiring of PCAOB interns is associated with improvements in future inspection reports over either a one-year or two-year horizon ($Revolving_FASB_{12M}$ p-values all > 0.10). These findings provide additional evidence that the manager-level PCAOB employees examined in our primary analyses are hired based on their familiarity with the inspection process and are not simply an effect related to general worker outflows from the PCAOB back to the auditing industry.

5.3 Sensitivity Analyses

5.3.1 - Audit firm fixed effects and multivariate matching techniques

Our study provides basic facts on worker flows between former PCAOB employees and large audit firms. Although we attempt to reduce omitted variable bias by including several control variables, our design does not include an instrument capable of identifying a causal relation. We further address the potential for omitted variable bias in several ways. First, we insert audit firm fixed effects to create a within-firm research design. As documented in Panel A of Table 9, our inferences remain unchanged when including audit firm fixed effects in the specifications. In particular, the findings in Column 1 reveal that $Composite_t$ is positively related with the number of individuals hired from the PCAOB over the next eighteen-month period (coefficient = 0.5112, p-value < 0.001); the

findings in Column 3 reveal a negative relation between a firm's recent hires (i.e., *Revolving*_{12M}) and *Composite*_{t+2} (coefficient = -0.2421, p-value = 0.039).²¹

A second approach to address omitted variable bias is to use multivariate matching techniques. Although propensity score is the predominant form of multivariate matching used in accounting research, recent studies indicate that propensity score matching often exacerbates differences between the individual variables used in the first stage of the propensity score match (e.g., Imbens and Rubin, 2015; King and Nielsen, 2016). On the other hand, entropy balancing uses continuous weights that exactly account for inequalities in the first, second, and possibly higher moments of the covariate distributions (Hainmueller, 2012). Our use of entropy balancing is complicated both by our study's small sample size and the fact that our treatment variables are not binary. Despite these limitations, we seek to provide additional evidence of the robustness of our inferences. Thus, we create an indicator variable, *Revolving_Ind*_{12M}, that takes the value of one if *Revolving*_{12M} > 0. We then include all the independent variables from Equation (2), with the exception of *Revolving*_{12M}, as variables in the first-stage that estimates continuous weights to achieve covariate balance.

INSERT TABLE 9

Column 1 of Panel B, Table 9, presents the results of re-estimating Equation (2) after employing the reweighting determined by the first stage of entropy balancing. Consistent with Panel A of Table 6, the findings in Column 1 provide evidence that hiring PCAOB employees has no impact on firms' inspection reports during the first year (i.e., coefficient = -0.1975, p-value = 0.415). We then repeat the entropy balancing process by again performing the first stage, but using the control variables from Equation (3). Consistent with our prior findings (i.e., Panel A of Table 7), the findings in Column 2 reveal a marginally significantly negative coefficient for the *Revolving_Ind*_{12M} variable,

²¹ The use of audit firm fixed effects suggests that our results are unlikely to be attributable to the inclusion of any single audit firm into our sample. However, because media focus has been on KPMG's hiring of former PCAOB personnel, we conduct additional tests to confirm that our results are not simply the result of inclusion of KPMG in our sample. In particular, we remove the thirteen KPMG inspection reports from our sample and re-perform our various analyses. We find that all inferences made in our paper are the same when KPMG is excluded from our tests. Thus, we conclude that our findings and the inferences we draw are not limited to KPMG.

-0.4317 (p-value = 0.081). Further, Column 3 provides evidence that our inferences regarding reductions in the 2nd year deficiencies (initially documented as Panel B of Table 7) also are unchanged when using entropy balancing (i.e., *Revolving_IND_{12M}* coefficient = -0.5211, p-value = 0.045). Lastly, Columns 4-6 report similar inferences when continue to match on *Revolving_Ind_{12M}* to generate the weights, but revert to the original *Revolving_{12M}* variable in the second-stage regressions. Overall, the Table 9 findings provide evidence that our inferences are insensitive to alternative approaches to addressing omitted variable bias.

5.3.2 – Scaled measure of PCAOB audit failures

Our analyses use four unscaled measures of inspection report deficiencies. However, the measures we use likely are correlated with firm size. This raises the possibility that the associations we document may be the result of scale bias, even though our estimations include firm size (i.e., *Clients*) as a linear control along with several other control variables that are positively correlated with firm size (i.e., *Big4*, *Complexity*, *Restate*). To address this potential bias, we define a scaled measure of deficiencies, *Deficiencies_Scaled*, which equals *Deficiencies* divided by the number of audits examined by the PCAOB, and re-estimate Equations (1) through (3) using *Deficiencies_Scaled_t* as *Inspection_Var_t*. Because number of audits examined by the PCAOB is provided only for inspection reports that were issued subsequent to 2009, our sample for these estimations excludes observations from 2003-2009. When estimating the modified version of Equation (1), we also include, *Def_High_t*, an indicator variable that equals one if *Deficiencies_t* exceeds the sample median value of nine audit deficiencies, and its interaction with *Deficiencies_Scaled_t*. Inclusion of the interaction term relaxes the constraint that the *Deficiencies_Scaled* coefficient is a cross-sectional constant, i.e., to permit firms with relatively large scaled deficiency ratios but only a small number of deficiencies to be predictably less responsive to hiring PCAOB employees than those with a large number of deficiencies.

Panel C of Table 9, which presents the findings from modified versions of Equations (1) through (3), reveals essentially the same inferences as those based on versions with unscaled

Deficiencies. In particular, Column 1 reveals that audit firms increase their hiring of PCAOB employees in response to unfavorable PCAOB inspection reports, but only for those firms with a relatively large number of deficiencies ($Deficiencies_Scaled_t * Def_High_t$ coefficient = 7.3822, p-value = 0.003). Again consistent with our prior results, Column 2 fails to find evidence that the hiring of PCAOB personnel is associated with an immediate reduction in the number of identified deficiencies (i.e., the $Revolving_{12M}$ coefficient = -0.0107, p-value = 0.587). On the other hand, and again consistent with prior results, Columns 3 and 4 provide evidence of a negative relation between $Revolving_{12M}$ and $Deficiencies_Scaled_{t+2}$ (coefficients = -0.0574, and -0.0503; p-values = < 0.001).

5.4 PCAOB hiring of Big 11 personnel and changes to firms' future inspection reports

To this point, our study documents basic facts related to the outflow of PCAOB employees to management-level positions in Big 11 audit firms. However, concerns related to the independence of audit firms and their regulator also extend to worker inflows from the audit firms to the PCAOB as these individuals may retain loyalty to their prior employer or colleagues that could compromise the integrity of the inspection process. To alleviate such concerns, and as noted in footnote 8, the ethics code at the PCAOB prohibits new hires from participating in the inspections of their former employers for a one-year period (PCAOB EC 8). Although such a policy reduces the probability that PCAOB employees will compromise the inspection process to benefit their prior employer, it remains a possibility. Thus, we examine the relation between worker inflows from Big 11 audit firms to the PCAOB and changes to firms' future inspection reports.

As described in Panel A of Table 2, 619 employees entered the PCAOB from Big 11 audit firms and are either: 1) still employed with the PCAOB, or 2) have left the PCAOB for employment with a non-Big 11 audit firm. We add this group of individuals to the seventy-three individuals included in our primary analyses that both entered and exited the PCAOB from a Big 11 audit firm (as discussed in Section 3.2). We then create the variable, $Inflows_Level_t$, that sums the number of Big 11 alumni working at the PCAOB as of April 30 of year t . We also create the variable, $Inflows_{12M}$,

that sums the number of Big 11 alumni that joined the PCAOB between May 1 of year t and April 30 of year $t+1$. Although the ethics code at the PCAOB would have prohibited such individuals from working on the inspection of their former employers during this initial year of hire, it is possible that they could still obtain information about their prior employer's engagements selected for inspection through access to PCAOB planning documents or through discussions with colleagues at the PCAOB assigned to that firm's inspection team. We then modify Equation (2) and (3) to include these variables as additional independent variables.

INSERT TABLE 10

As documented in Table 10, we find no evidence that the accumulation of former employees at the PCAOB or the number of recently departed employees that join the PCAOB ($Inflows_{12M}$) is associated with improvements in future inspection reports over either a one-year (Column 1) or two-year (Columns 2-3) horizon. Focusing on Column 2 that shows the aggregate effect over the two-year horizon, the $Inflows_Level_t$ and $Inflows_{12M}$ coefficients are insignificantly different from zero (p-values = 0.422 and 0.935). We repeat these analyses using versions of $Inflows_Level_t$ and $Inflows_{12M}$ that include only the twenty-five individuals that exit the PCAOB to re-join the Big 11 audit firm with whom they were previously employed (see footnote 17). By focusing the examination on these individuals, referred to as "Boomerangs" in our analyses, we isolate the portion of employee inflows that most likely retained a strong connection to their prior employer while employed at the PCAOB. As the findings in Columns 4-6 reveal, we again find no evidence that the accumulation of these employees at the PCAOB ($Boomerangs_Level_t$ coefficient p-values all > 0.10) or that the number of these employees that have recently departed to join the PCAOB ($Boomerangs_{12M}$ coefficient p-values all > 0.10) are associated with improvements in the future inspection reports of Big 11 audit firms. Taken together, and in stark contrast to our findings related to worker outflows into Big 11 audit firms, the results in Table 10 indicate that former employee inflows to the PCAOB do not result in that firm realizing improvements in their PCAOB inspection reports.

6. Summary and Concluding Remarks

This paper provides basic facts on worker flows between former PCAOB employees and large audit firms. Using a large sample of publicly available curricula vitae, we document an increasing number of former PCAOB employees join U.S. audit firms in senior-level positions during recent years. We also find that the number of PCAOB employees hired by these firms is positively related to the number of deficiencies reported in their prior PCAOB inspection report, and that the number of deficiencies reported in firms' future inspection reports is negatively associated with the number of former PCAOB employees hired. However, this latter relation is not observed for the year in which these employees join the firm, but rather during the subsequent period when the employees would be less likely to have personal access to private information about the firm's annual inspection. In addition, we find no evidence of any association between the number of former PCAOB employees that a firm hires and the number of future restatements or SEC enforcement actions. These findings collectively suggest that PCAOB personnel bring valuable knowledge about how to perform and document audit procedures that satisfy PCAOB reviewers, but that this expertise of the inspection process does not necessarily have direct implications for the accuracy and reliability of clients' financial reports.

Our study is subject to the important caveat that our research design lacks a clean instrument that is useful to establish causal relations. We do, however, attempt to reduce endogeneity concerns by including important control variables, showing that our results are robust to multiple specifications, running falsification test using FASB personnel, and using entropy balancing to reduce model dependency. However, to the extent that these tests do not account fully for all factors that affect both PCAOB hiring decisions and the deficiencies identified in firms' future inspection reports, our findings may not support causal inferences. Further, although our pattern of findings is generally supportive of the human capital hypothesis, we are unable to rule out that the future reductions may be attributable to former PCAOB employees that obtain confidential information about future inspections via former colleagues at the PCAOB.

References

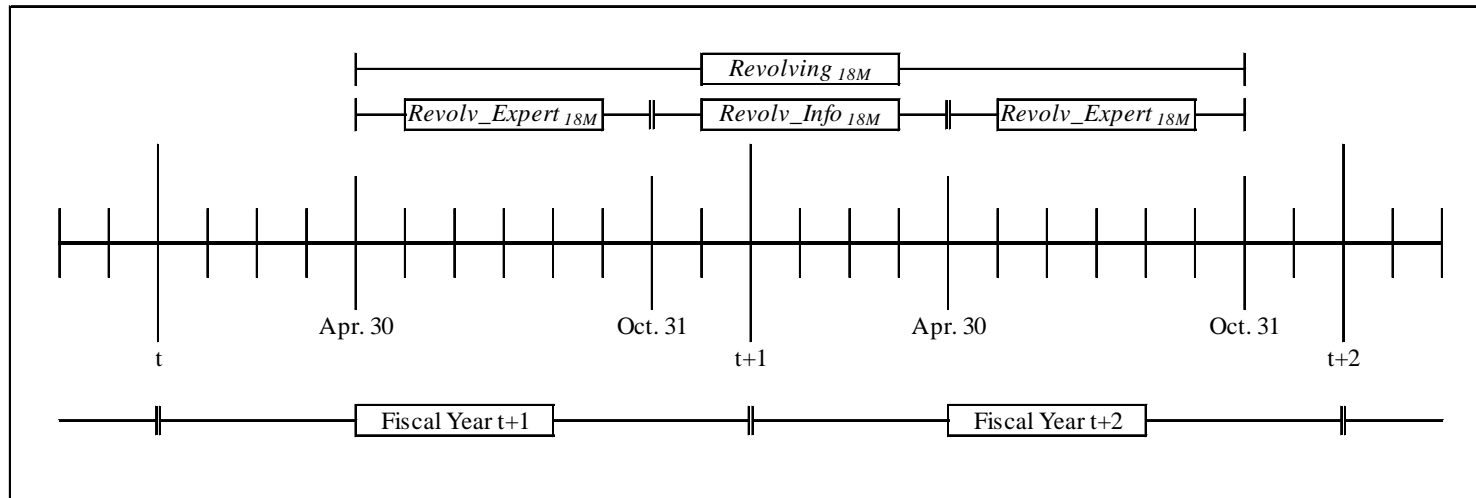
- Abernathy, J. L., Barnes, M., & Stefaniak, C. (2013). A summary of 10 years of PCAOB research: What have we learned? *Journal of Accounting Literature*, 32(1), 30-60.
- Aobdia, D. (2017). The Impact of the PCAOB Individual Engagement Inspection Process-Preliminary Evidence. *The Accounting Review*.
- Aobdia, D., & Shroff, N. (2017). Regulatory oversight and auditor market share. *Journal of Accounting and Economics*, 63(2-3), 262-287.
- Beatty, R. P. (1989). Auditor reputation and the pricing of initial public offerings. *Accounting Review*, 64(4), 693-709.
- Bramwell, J. (2013). Accountants' social media use focus of SocialCPAs survey. Retrieved from: <https://www.accountingweb.com>
- Carcello, J. V., Hollingsworth, C., & Mastroia, S. A. (2011). The effect of PCAOB inspections on Big 4 audit quality. *Research in Accounting Regulation*, 23(2), 85-96.
- Center for Audit Quality. (2012). Guide to PCAOB inspections. Retrieved from: <https://www.thecaq.org>.
- Che, Y. K. (1995). Revolving doors and the optimal tolerance for agency collusion. *The Rand journal of economics*, 378-397.
- Cohen, J. E. (1986). The Dynamics of the "Revolving Door" on the FCC. *American Journal of Political Science*, 689-708.
- Dal Bó, E. (2006). Regulatory capture: A review. *Oxford Review of Economic Policy*, 22(2), 203-225.
- DeFond, M. L., & Lennox, C. S. (2017). Do PCAOB inspections improve the quality of internal control audits? *Journal of Accounting Research*, 55(3), 591-627.
- DeHaan, E., Kedia, S., Koh, K., & Rajgopal, S. (2015). The revolving door and the SEC's enforcement outcomes: Initial evidence from civil litigation. *Journal of Accounting and Economics*, 60(2-3), 65-96.
- Economist. (2014). *Workers of the world, log in*. Retrieved from: <https://www.economist.com>
- Francis, J. R. (2004). What do we know about audit quality? *The British Accounting Review*, 36(4), 345-368.
- Gipper, B., Leuz, C., & Maffett, M. (2017). *Public audit oversight and reporting credibility: Evidence from the PCAOB inspection regime*. Working paper, National Bureau of Economic Research.
- Grassley, C. (2013). *SEC's revolving door* [Memorandum]. Washington, DC. Retrieved from: <https://www.grassley.senate.gov/news/news-releases/sec%E2%80%99s-revolving-door>
- Gunny, K. A., & Zhang, T. C. (2013). PCAOB inspection reports and audit quality. *Journal of Accounting and Public Policy*, 32(2), 136-160.
- Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20(1), 25-46.

References, continued

- Houston, R. W., & Stefaniak, C. M. (2012). Audit partner perceptions of post-audit review mechanisms: An examination of internal quality reviews and PCAOB inspections. *Accounting Horizons*, 27(1), 23-49.
- Imbens, G. W., & Rubin, D. B. (2015). *Causal Inference in Statistics, Social, and Biomedical Sciences*. Cambridge University Press.
- Jiang, J., Robinson, J. R., & Wang, M. (2017). Sleeping with the enemy: Taxes and former IRS employees. Working paper, Michigan State University.
- King, G., & Nielsen, R. (2016). Why propensity scores should not be used for matching. Working paper, Harvard University.
- Lamoreaux, P. T. (2016). Does PCAOB inspection access improve audit quality? An examination of foreign firms listed in the United States. *Journal of Accounting and Economics*, 61(2-3), 313-337.
- Lennox, C., & Pittman, J. (2010). Auditing the auditors: Evidence on the recent reforms to the external monitoring of audit firms. *Journal of Accounting and Economics*, 49(1-2), 84-103.
- Lucca, D., Seru, A., & Trebbi, F. (2014). The revolving door and worker flows in banking regulation. *Journal of Monetary Economics*, 65, 17-32.
- McKenna, F. 2011. PCAOB auditor identification proposal signals slow but steady reform. *Forbes*. Retrieved from: <https://www.forbes.com/sites/francinemckenna/#1f7cbf4b4f5b>.
- Mokhiber, R. 2018. Lynn Turner wants to break up the Big Four. *Corporate Crime Reporter*. Retrieved from: <https://www.corporatecrimereporter.com/news/200/lynn-turner-wants-break-big-four/>
- Nagy, A. L. (2014). PCAOB quality control inspection reports and auditor reputation. *Auditing: A Journal of Practice & Theory*, 33(3), 87-104.
- Offermanns, M., & Peek, E. (2011). Investor reactions to PCAOB inspection reports. Working paper, Maastricht University.
- PCAOB (Public Company Accounting Oversight Board). AS 3.15. Retention of and subsequent changes to audit documentation. Retrieved from: <https://pcaobus.org/Standards/Auditing>
- PCAOB (Public Company Oversight Board). EC 8. Ethics Code, Disqualification. Retrieved from: https://pcaobus.org/Rules/Pages/Ethics_Code
- PCAOB (Public Company Accounting Oversight Board). QC 20.02. System of Quality Control for a CPA Firm's Accounting and Auditing Practice. Retrieved from: <https://pcaobus.org/Standards/QC>
- United States of America v. Middendorf, D., Whittle, T., Britt, D., Holder, C., and Wada, J. Retrieved from: <http://online.wsj.com/public/resources/documents/middendorfetal.pdf>

Figures

Figure 1: Timeline used to examine the relation between an audit firm’s PCAOB inspection report and its hiring of PCAOB personnel



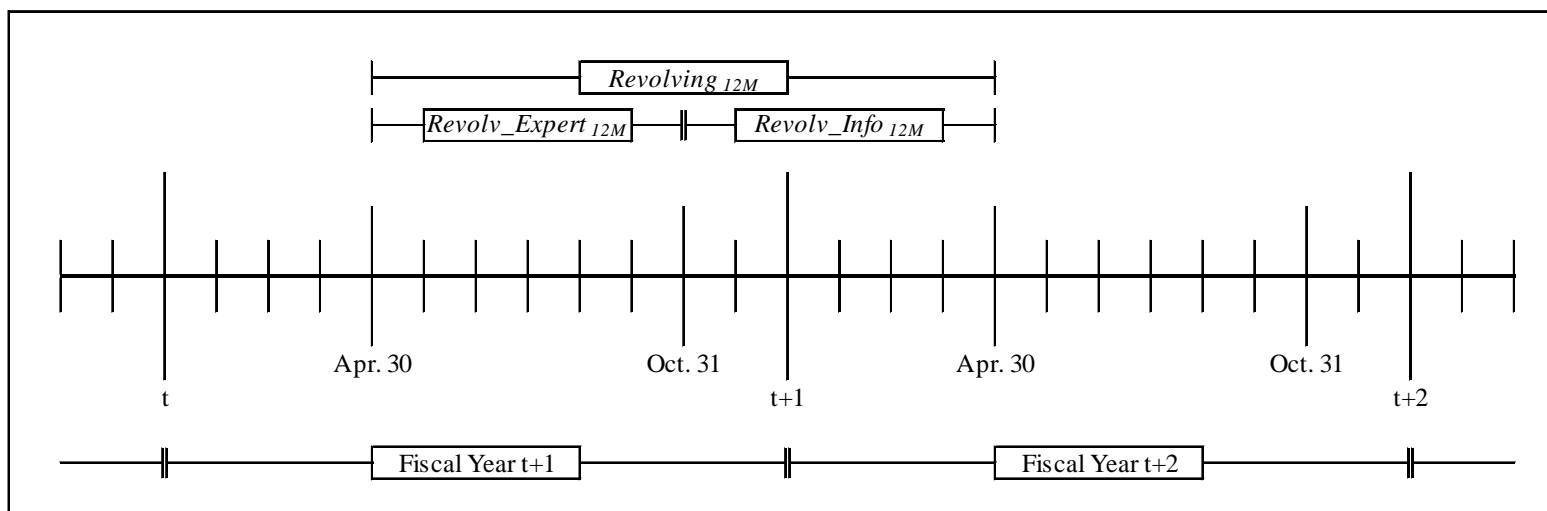
Notes: This timeline depicts our research design related to our first hypothesis that examines the relation between an audit firm’s PCAOB inspection report and its hiring of PCAOB personnel. Our timeline is based on the following information: (1) the majority of publicly traded firms have a fiscal year-end of December 31; (2) depending on a publicly traded firm’s market capitalization, they have 60-90 days to file their 10-K; (3) auditors have 45 days from the release date to assemble the complete and final set of audit documentation.

These three facts are such that auditors will have generally archived the final set of audit documentation, for fiscal year t , by April 30 of year $t+1$. Because the PCAOB only informs audit firms of which engagements will be inspected after the documentation period is complete, engagements selected for inspection will not be made known to the audit firm until after this date. As described in Section 2.1, audit firms then receive feedback related to their performance over an extended period as the fieldwork is completed.

Our first hypothesis examines whether firms, upon receiving negative feedback related to year t , will increase their hiring of PCAOB personnel. We examine hiring over an eighteen-month period (*Revolving_{18M}*). While each of the individuals hired from the PCAOB is believed to have developed a high-level of expertise, the employees that flow out of the PCAOB after October 31 of year $t+1$ may have confidential information about which of the firm’s engagements have been selected for the inspection of fiscal year $t+1$ since the PCAOB typically finalizes its inspection list in the winter of each year. Because that information could be used to direct the firm’s resources to those engagements through April 30 of year $t+2$, when the audit documentation period typically closes, it is possible firms prefer to hire PCAOB personnel during this period (“*Revolv_Info_{18M}*”) relative to other periods (“*Revolv_Expert_{18M}*”) when the employees are less likely to possess confidential information about the firm’s upcoming inspection.

Figures, continued

Figure 2: Timeline used to examine relation between an audit firm's hiring of PCAOB personnel and the favorability of future inspection reports

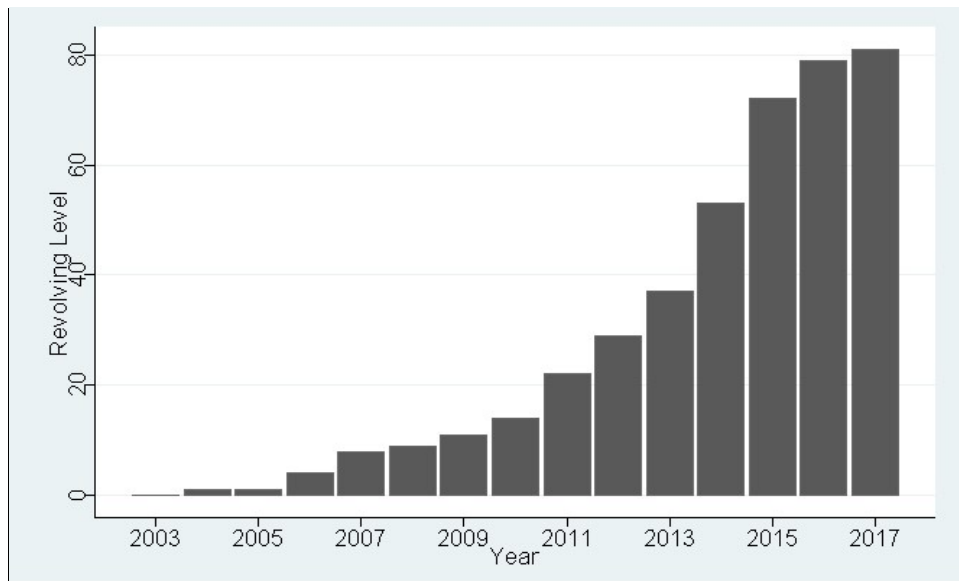


Notes: This timeline depicts our research design related to our second hypothesis that examines the relation between an audit firm's hiring of former PCAOB personnel and changes in its future inspection reports. We examine hiring over a twelve-month period (*Revolving*_{12M}). Our timeline is based on the following information: (1) the majority of publicly traded firms have a fiscal year-end of December 31; (2) depending on a publicly traded firm's market capitalization, they have 60-90 days to file their 10-K; (3) auditors have 45 days from the release date to assemble the complete and final set of audit documentation. These three facts are such that auditors will have generally archived the final set of audit documentation, for engagements conducted during fiscal year t+1, by April 30 of year t+2.

Our second hypothesis examines whether the number of an audit firm's recently hired PCAOB personnel is related to changes in that audit firm's future inspection reports. To examine this hypothesis, we note that employees hired April 30 of year t+2 are unlikely to have an impact on the inspection results for fiscal year t+1. However, in considering the employees that were hired prior to April 30 of year t+2, the individuals hired subsequent to the date when the PCAOB finalized its inspection list (i.e., typically in the winter of each year) may have directly accessed confidential information about which of the firm's engagements are scheduled for inspection in the fiscal year t+1 inspection. By using this information to direct firm resources towards engagements scheduled for inspection, the employees hired during this six-month period (*Revolv_Info*_{12M}) may be able to have a more immediate impact on the firm's inspection report relative to employees hired during other periods of time (*Revolv_Expert*_{12M}).

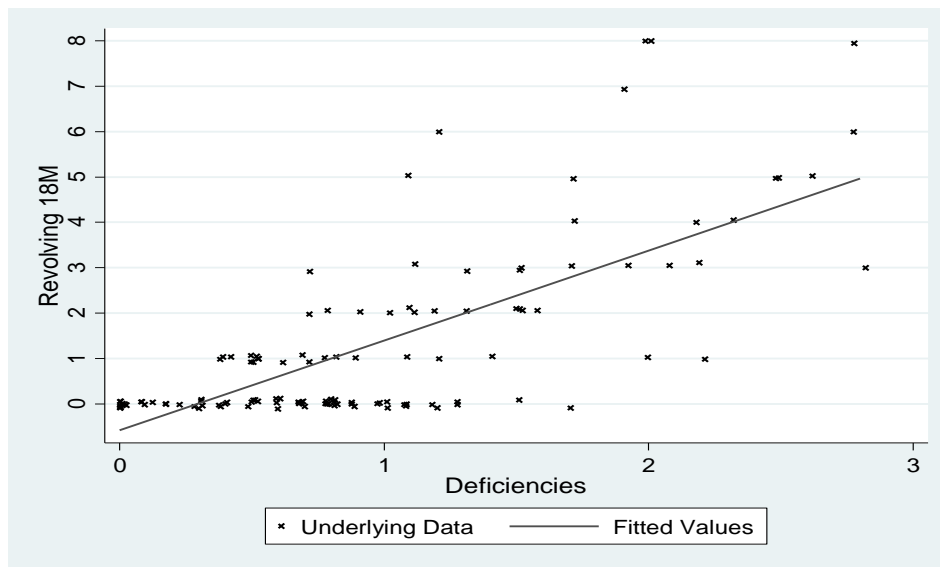
Figures, continued

Figure 3: The number of former PCAOB employees employed by Big 11 audit firms.



Notes: This figure charts the number of former PCAOB employees in our sample that are working for a Big 11 audit firm as of the year-end

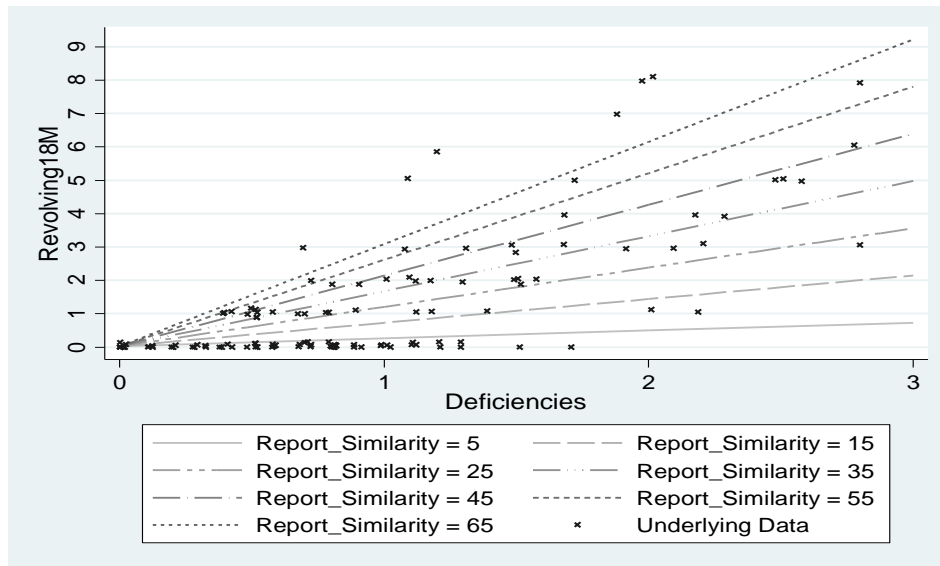
Figure 4: Univariate relation of inspection report deficiencies and the hiring of PCAOB personnel



Notes: This figure charts the number of former PCAOB employees hired by a Big 11 audit firm over an eighteen month period beginning on April 30 of year t+1 (y-axis) and the number engagement-level deficiencies included in the firm's inspection report for fiscal year t (x-axis).

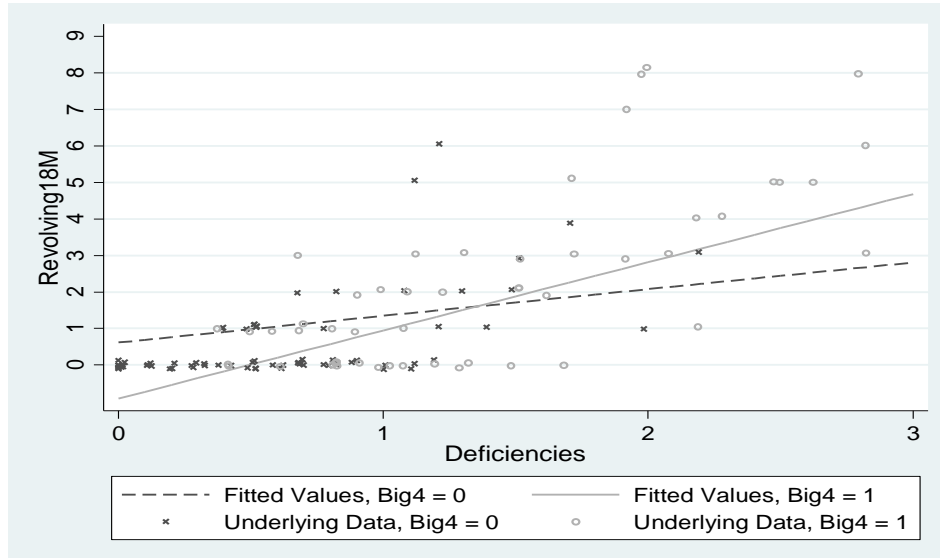
Figures, continued

Figure 5: The relation of recurring inspection deficiencies on the hiring of PCAOB personnel



Notes: This figure charts the number of former PCAOB employees hired by a Big 11 audit firm over the eighteen month period beginning after April 30 of year $t+1$ (y-axis) and the number of engagement-level deficiencies included in the audit firm's inspection report for fiscal year t (x-axis). The chart fits 5 lines that each corresponds to a different level of similarity between a firm's two most recently received PCAOB inspection reports (*Report_Similarity*).

Figure 6: The relation of reputational capital on the hiring of PCAOB personnel



Notes: This figure charts the number of former PCAOB employees hired by a Big 11 audit firm over the eighteen month period beginning after April 30 of year $t+1$ (y-axis) and the number of engagement-level deficiencies included in the audit firm's inspection report for fiscal year t (x-axis). The chart fits 2 lines, one for Big 4 audit firms and one for non-Big 4 audit firms.

Table 1 –PCAOB inspection reports

Audit firm	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
BDO USA	0	1	1	1	1	1	1	1	1	1	1	1	1	0	12
Cohen & Company	0	1	0	0	1	0	0	1	0	0	1	0	0	1	5
Crowe Horwath	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13
Deloitte	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Ernst & Young	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Grant Thornton	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13
KPMG	1	1	1	1	1	1	1	1	1	1	1	1	1	0	13
MaloneBailey	0	1	0	0	1	1	1	1	1	1	1	1	1	1	11
Marcum	0	1	0	0	1	0	1	0	0	1	0	0	1	0	5
PricewaterhouseCoopers	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
RSMUS	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13
Total	4	11	8	8	11	9	10	10	9	10	10	9	10	8	127

Notes: Table 1 shows the sample of Big 11 firms included in our study, and the years in which inspections were performed by the PCAOB.

Table 2 – PCAOB worker flows

Panel A – Sample selection – PCAOB employees

Initial search results of individuals with PCAOB work experience	1581
<u>Less:</u> Individuals for whom we are unable to access a complete self-reported employment history	(36)
<u>Less:</u> Individuals that do not indicate having ever worked for one of the Big 11 audit firms or one of their predecessor firms.	(670)
<u>Less:</u> Individuals that worked at a Big 11 audit firm prior to working for the PCAOB, but are either still employed at the PCAOB or accepted employment at a non-Big 11 audit firm following their regulatory spell with the PCAOB	(619)
<u>Less:</u> Individuals that did not work in an inspections-related position at the PCAOB or accepted a junior-level of employment with a Big 11 firm rather than a senior-level position	(152)
Final number of individuals that transition from the PCAOB to a Big11 audit firm	104

Notes: Panel A, Table 2 details our sample selection process of PCAOB employees.

Panel B – Job title frequencies

Rank	Initial Job Title at PCAOB	Count
1	Inspections Specialist	26
2	Associate or Assistant Director	20
3	Inspections Leader or Manager	18
4	Inspections	8
5	Division of Registration and Inspections	5
6	Director	4
7	Regional Associate Director	3
8	Associate or Assistant Chief Auditor	3
9	Assistant General Counsel	3
10	Enforcement and Investigations	2

Notes: Panel B, Table 2 shows the ten most frequent job titles held at the PCAOB for individuals included in our sample.

Table 2 – PCAOB worker flows, continued

Panel C – Transition matrix detailing frequencies of pre-PCAOB employers and post-PCAOB job titles

Pre-PCAOB Employer	Post-PCAOB Job Title and Frequencies					Total
	Partner	Principal or Director	Senior Manager	Manager	Other	
Deloitte	9	8	3	1	1	22
Ernst & Young	7	11	2	1	0	21
KPMG	7	4	2	0	0	13
Price waterhouse Coopers	3	4	3	1	0	11
Grant Thornton	1	2	0	1	0	4
Securities and Exchange Co	0	0	1	0	2	3
RSM	1	0	0	0	1	2
Other	8	10	3	6	1	28
Total	36	39	14	10	5	104

Notes: Panel C, Table 2 shows a transition matrix that depicts the career paths of the individuals in our final sample. The rows in the matrix show the institution that the individual worked for immediately prior to joining the PCAOB. The columns in the matrix show the position accepted by individuals in a Big 11 firm upon leaving the PCAOB.

Panel D – Transition matrix detailing frequencies of pre- and post-PCAOB job titles in Big11 Firms

Pre-PCAOB Big11 Job Title	Post-PCAOB Big11 Job Title					Total
	Partner	Principal or Director	Senior Manager	Manager	Other	
Partner	6	0	0	0	2	8
Principal or Director	2	3	1	0	0	6
Senior Manager	15	6	4	0	0	25
Manager	5	16	3	3	0	27
Other	0	4	2	1	0	7
Total	28	29	10	4	2	73

Notes: Panel D, Table 2 shows a job-title based transition matrix of the 73 individuals in our final sample whose job immediately prior to and after joining the PCAOB was at a Big 11 audit firm. The rows in the matrix show the job title held by these individuals prior to joining the PCAOB, while the columns in the matrix show the positions accepted by individuals upon leaving the PCAOB and re-joining a Big 11 firm.

Table 3 – Descriptive statistics*Panel A: Descriptive statistics*

Variable	Obs.	Mean	Std. Dev.	Q1	Median	Q3
<i>Composite_t</i>	126	-0.01	1.58	-1.09	-0.48	0.88
<i>Fail_Lines_t</i>	126	0.51	0.49	0.15	0.32	0.73
<i>Length_t</i>	126	0.55	0.45	0.23	0.37	0.79
<i>Deficiencies_t</i>	126	0.92	0.70	0.40	0.80	1.30
<i>Revolving_{18M}</i>	126	1.23	1.91	0.00	0.00	2.00
<i>Revolving_{12M}</i>	126	0.67	1.21	0.00	0.00	1.00
<i>Revolving_Level_t</i>	126	1.60	2.56	0.00	0.00	2.00
<i>Report_Similarity_t</i>	115	27.72	16.65	12.74	22.94	38.80
<i>Big4_t</i>	126	0.44	0.50	0.00	0.00	1.00
<i>Clients_t</i>	126	8.69	8.15	1.25	3.56	16.56
<i>Complexity_t</i>	126	5.41	1.00	5.14	5.68	6.18
Δ <i>Clients_t</i>	126	2.44	11.90	-4.68	-0.52	4.55
<i>Rebrand_t</i>	126	0.04	0.20	0.00	0.00	0.00
<i>Restate_t</i>	126	6.40	3.50	4.05	5.81	8.55
<i>Revolv_Info_{18M}</i>	126	0.36	0.73	0.00	0.00	0.00
<i>Revolv_Expert_{18M}</i>	126	0.85	1.35	0.00	0.00	1.00
<i>Revolv_Info_%_{18M}</i>	126	0.14	0.30	0.00	0.00	0.00
<i>Revolv_Info_{12M}</i>	126	0.30	0.62	0.00	0.00	0.00
<i>Revolv_Expert_{12M}</i>	126	0.35	0.74	0.00	0.00	0.00
<i>Revolv_Info_%_{12M}</i>	126	0.16	0.34	0.00	0.00	0.00

Notes: Panel A, Table 3 provides descriptive statistics about the primary variables included in our study. The subscript details the point in time in which each of the variables was observed, relative to the fiscal year of the engagements inspected in the report. All variables are as motivated and defined in Section 3.

Table 3 – Descriptive statistics, continued

Panel B: Correlation coefficients, Pearson (Spearman) correlations shown on the lower (upper) diagonal

Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<i>Composite_t</i>	1	1	0.96	0.93	0.93	0.67	0.48	0.65	0.29	0.42	0.43	0.70	-0.16	-0.11	0.24	0.41	0.67	0.33	0.33	0.49	0.27
<i>Fail_Lines_t</i>	2	0.97	1	0.86	0.86	0.65	0.46	0.64	0.29	0.35	0.36	0.71	-0.24	-0.09	0.16	0.40	0.65	0.32	0.30	0.48	0.24
<i>Length_t</i>	3	0.90	0.84	1	0.78	0.60	0.45	0.68	0.47	0.30	0.30	0.62	-0.05	-0.14	0.16	0.40	0.59	0.33	0.34	0.46	0.28
<i>Deficiencies_t</i>	4	0.90	0.85	0.66	1	0.68	0.46	0.56	0.07	0.56	0.61	0.70	-0.18	-0.11	0.40	0.40	0.69	0.32	0.32	0.47	0.27
<i>Revolving_{18M}</i>	5	0.81	0.79	0.73	0.73	1	0.48	0.47	0.21	0.41	0.45	0.59	-0.14	-0.17	0.42	0.68	0.91	0.62	0.31	0.51	0.25
<i>Revolving_{12M}</i>	6	0.58	0.54	0.60	0.48	0.56	1	0.47	0.27	0.36	0.32	0.56	-0.20	-0.14	0.22	0.36	0.48	0.28	0.78	0.81	0.74
<i>Revolving_Level_t</i>	7	0.58	0.51	0.67	0.42	0.43	0.62	1	0.34	0.26	0.26	0.71	-0.22	-0.03	0.03	0.27	0.50	0.18	0.35	0.49	0.27
<i>Report_Similarity_t</i>	8	0.36	0.35	0.55	0.10	0.32	0.35	0.35	1	-0.21	-0.33	0.11	0.28	-0.07	-0.18	0.21	0.23	0.13	0.25	0.29	0.19
<i>Big4_t</i>	9	0.40	0.30	0.33	0.46	0.38	0.34	0.31	-0.20	1	0.86	0.68	-0.33	-0.17	0.21	0.25	0.39	0.21	0.26	0.31	0.23
<i>Clients_t</i>	10	0.32	0.22	0.25	0.41	0.31	0.27	0.20	-0.28	0.95	1	0.63	-0.36	-0.18	0.40	0.20	0.46	0.16	0.19	0.33	0.16
<i>Complexity_t</i>	11	0.58	0.54	0.49	0.57	0.46	0.42	0.48	-0.01	0.56	0.52	1	-0.49	-0.06	0.04	0.35	0.58	0.27	0.42	0.52	0.35
Δ <i>Clients_t</i>	12	-0.23	-0.22	-0.15	-0.25	-0.14	-0.20	-0.21	0.24	-0.30	-0.29	-0.48	1	-0.14	0.08	-0.11	-0.06	-0.15	-0.10	-0.16	-0.11
<i>Rebrand_t</i>	13	-0.14	-0.12	-0.14	-0.14	-0.13	-0.11	-0.06	-0.03	-0.18	-0.19	-0.07	-0.12	1	-0.25	-0.11	-0.15	-0.11	-0.10	-0.10	-0.10
<i>Restate_t</i>	14	0.15	0.06	0.13	0.24	0.19	0.08	-0.06	-0.24	0.22	0.32	0.04	0.01	-0.24	1	0.31	0.37	0.30	0.15	0.23	0.14
<i>Revolv_Info_{18M}</i>	15	0.53	0.50	0.51	0.45	0.77	0.44	0.28	0.28	0.23	0.16	0.29	-0.16	-0.10	0.17	1	0.40	0.97	0.23	0.40	0.18
<i>Revolv_Expert_{18M}</i>	16	0.81	0.80	0.70	0.75	0.93	0.51	0.43	0.27	0.40	0.34	0.47	-0.11	-0.13	0.18	0.49	1	0.28	0.31	0.49	0.26
<i>Revolv_Info_%_{18M}</i>	17	0.17	0.15	0.15	0.16	0.34	0.16	0.08	0.00	0.12	0.07	0.11	-0.20	-0.10	0.19	0.73	0.08	1	0.17	0.31	0.13
<i>Revolv_Info_{12M}</i>	18	0.42	0.37	0.45	0.35	0.42	0.80	0.48	0.29	0.27	0.18	0.31	-0.15	-0.10	0.04	0.29	0.39	0.08	1	0	0.98
<i>Revolv_Expert_{12M}</i>	19	0.56	0.53	0.55	0.47	0.56	0.86	0.52	0.29	0.32	0.27	0.39	-0.18	-0.10	0.10	0.46	0.50	0.18	0.39	1	0.26
<i>Revolv_Info_%_{12M}</i>	20	0.21	0.18	0.22	0.21	0.22	0.52	0.25	0.14	0.18	0.11	0.19	-0.15	-0.10	0.03	0.12	0.22	0.04	0.84	0.10	1

Notes: Panel B, Table 3 provides the Pearson (Spearman) correlation coefficients between each of the variables listed in Panel A, Table 3. All variables are as motivated and defined in Section 3.

Table 4 – Inspection report deficiencies and the hiring of PCAOB personnel

Panel A: Inspection report deficiencies and the hiring of PCAOB personnel

Variables	Prediction	<i>Revolving_{18M}</i>			
		(1)	(2)	(3)	(4)
<i>Inspection_Var_t</i>	+	0.9088*** (0.000)	2.5511*** (0.000)	3.3623*** (0.000)	1.6088*** (0.000)
<i>Revolving_Level_t</i>		-0.0029 (0.965)	0.0184 (0.787)	-0.0465 (0.518)	0.0277 (0.683)
<i>Report_Similarity_t</i>		0.0093 (0.264)	0.0101 (0.226)	0.0121 (0.156)	0.0162* (0.099)
<i>Big4_{t+1}</i>		0.2414 (0.794)	0.5780 (0.540)	0.2541 (0.795)	0.1685 (0.857)
<i>Clients_{t+1}</i>		0.0247 (0.662)	0.0162 (0.776)	0.0406 (0.496)	0.0200 (0.744)
<i>Complexity_{t+1}</i>		-0.1335 (0.404)	-0.0845 (0.603)	-0.0604 (0.682)	0.0204 (0.901)
Δ <i>Clients_{t+1}</i>		0.0083 (0.360)	0.0059 (0.479)	-0.0010 (0.898)	0.0120 (0.247)
<i>Rebrand_{t+1}</i>		-0.0051 (0.986)	0.1212 (0.681)	-0.0042 (0.988)	-0.2527 (0.413)
<i>Restate_{t+1}</i>		0.0820 (0.113)	0.1155** (0.025)	0.1132** (0.025)	0.1096** (0.039)
<i>Inspection_Var_t</i>		<i>Composite_t</i>	<i>Fail_Lines_t</i>	<i>Length_t</i>	<i>Deficiencies_t</i>
Year Fixed Effects		Included	Included	Included	Included
Observations		115	115	115	115
Adjusted R-squared		0.641	0.629	0.622	0.600

Notes: Panel A, Table 4 presents regression summary statistics from estimating equation (1). The dependent variable is *Revolving_{18M}*, the number of former PCAOB employees hired by a Big 11 audit firm over an eighteen-month period beginning after April 30 of year $t+1$. *Inspection_Var_t* is our primary variable of interest and takes the value of *Composite_t*, *Fail_Lines_t*, *Length_t*, or *Deficiencies_t* in columns 1 through 4, respectively. These variables reflect information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year t . All other variables are as motivated and defined in Section 3. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 4 – Inspection report deficiencies and the hiring of PCAOB personnel, continued

Panel B: Inspection report deficiencies and the hiring of personnel with potentially confidential information

Variables	<i>Revolv_Info</i> _{18M} (1)	<i>Revolv_Expert</i> _{18M} (2)	<i>Revolv_Info_%</i> _{18M} (3)
<i>Composite</i> _t	0.1646* (0.096)	0.6703*** (0.000)	-0.0232 (0.502)
<i>Revolving_Level</i> _t	-0.0060 (0.866)	-0.0010 (0.982)	-0.0007 (0.949)
<i>Report_Similarity</i> _t	0.0047 (0.332)	0.0053 (0.406)	-0.0002 (0.918)
<i>Big4</i> _{t+1}	0.5866 (0.277)	-0.4817 (0.464)	0.4739* (0.064)
<i>Clients</i> _{t+1}	-0.0282 (0.379)	0.0619 (0.132)	-0.0280* (0.071)
<i>Complexity</i> _{t+1}	-0.0250 (0.812)	-0.0654 (0.457)	0.0015 (0.979)
Δ <i>Clients</i> _{t+1}	-0.0047 (0.423)	0.0116 (0.117)	-0.0045 (0.220)
<i>Rebrand</i> _{t+1}	0.0713 (0.720)	-0.0972 (0.608)	-0.0334 (0.730)
<i>Restate</i> _{t+1}	0.0379 (0.181)	0.0585 (0.109)	0.0219 (0.134)
Year Fixed Effects	Included	Included	Included
Observations	115	115	115
Adjusted R-squared	0.242	0.645	0.009

Notes: Panel B, Table 4 presents the regression summary statistics of a modified version of Equation (1) in which we include variables related to two employee classifications as the dependent variable. *Revolv_Info*_{18M} (column 1) and *Revolv_Expert*_{18M} (column 2), reflect the number of PCAOB employees classified as informational and expert hires, respectively. *Revolv_Info_%*_{18M} (columns 3 and 4), is the proportion of informational hires relative to total hires for the eighteen-month period beginning after April 30 of year t+1. *Composite*_t is our primary variable of interest, which is a composite measure that reflects the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year t. All other variables are as motivated and defined in Section 3. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5 – Reputational threats and the hiring of PCAOB personnel

Panel A: The relation of recurring inspection deficiencies on the hiring of PCAOB personnel

Variables	Prediction	Revolving _{18M}			
		(1)	(2)	(3)	(4)
<i>Ins_Report_Var_t</i> * <i>Report_Similarity_t</i>	+	0.0176*** (0.007)	0.0564*** (0.005)	0.0456* (0.094)	0.0564*** (0.000)
<i>Ins_Report_Var_t</i>		0.1313 (0.607)	-0.0065 (0.993)	1.0992 (0.365)	-0.3083 (0.542)
<i>Report_Similarity_t</i>		0.0243** (0.027)	-0.0053 (0.529)	-0.0044 (0.703)	-0.0141 (0.176)
<i>Inspection_Var_t</i>		<i>Composite_t</i>	<i>Fail_Lines_t</i>	<i>Length_t</i>	<i>Deficiencies_t</i>
Remaining Control Variables		Included	Included	Included	Included
Year Fixed Effects		Included	Included	Included	Included
Observations		115	115	115	115
Adjusted R-squared		0.671	0.655	0.633	0.670

Notes: Panel A Table 5 presents the regression summary statistics of a modified version of Equation (1). The dependent variable is *Revolving_{18M}*, the number of former PCAOB employees hired by a Big 11 audit firm over an eighteen-month period starting after April 30 of year t+1. *Inspection_Var_t* takes the value of *Composite_t*, *Fail_Lines_t*, *Length_t*, or *Deficiencies_t*, in columns 1 through 4, respectively. These variables reflect information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year *t*. *Report_Similarity_t* is the cosine similarity of an audit firm’s two most recently received inspection reports. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel B: The relation of reputational capital on the hiring of PCAOB personnel

Variables	Prediction	Revolving _{18M}			
		(1)	(2)	(3)	(4)
<i>Ins_Report_Var_t</i> * <i>Big4_{t+1}</i>	+	0.5292** (0.015)	1.9510*** (0.003)	1.4576* (0.094)	1.1369** (0.025)
<i>Ins_Report_Var_t</i>		0.5338** (0.011)	1.2165* (0.058)	2.3950*** (0.004)	0.7305 (0.135)
<i>Big4_{t+1}</i>		0.0065 (0.425)	0.0072 (0.391)	0.0115 (0.160)	0.0117 (0.237)
<i>Inspection_Var_t</i>		<i>Composite_t</i>	<i>Fail_Lines_t</i>	<i>Length_t</i>	<i>Deficiencies_t</i>
Remaining Control Variables		Included	Included	Included	Included
Year Fixed Effects		Included	Included	Included	Included
Observations		115	115	115	115
Adjusted R-squared		0.670	0.671	0.639	0.618

Notes: Panel B Table 5 presents the regression summary statistics of a modified version of Equation (1). The dependent variable is *Revolving_{18M}*, the number of former PCAOB employees hired by a Big 11 audit firm over an eighteen-month period starting after April 30 of year t+1. *Inspection_Var_t* takes the value of *Composite_t*, *Fail_Lines_t*, *Length_t*, or *Deficiencies_t*, in columns 1 through 4, respectively. These variables reflect information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year *t*. *Big4_{t+1}* is an indicator variable equal to one if the audit firm is a Big4 audit firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 6 – PCAOB hires and firms’ future inspection reports (1 Yr)

Panel A: PCAOB hires and the number of deficiencies in firms’ future inspection reports (1 Yr)

Variables	Prediction	<i>Composite</i> _{<i>t</i>+1}	<i>Fail_Lines</i> _{<i>t</i>+1}	<i>Length</i> _{<i>t</i>+1}	<i>Deficiencies</i> _{<i>t</i>+1}
		(1)	(2)	(3)	(4)
<i>Revolving</i> _{12M}	—	-0.1181 (0.384)	-0.0353 (0.438)	-0.0307 (0.301)	-0.0108 (0.849)
<i>Ins_Report_Var</i> _{<i>t</i>}		0.7152*** (0.000)	0.6931*** (0.000)	0.8012*** (0.000)	0.4808*** (0.000)
<i>Revolving_Level</i> _{<i>t</i>}		-0.0543 (0.188)	-0.0220 (0.137)	-0.0111 (0.272)	-0.0259 (0.203)
<i>Big4</i> _{<i>t</i>+1}		0.3590 (0.475)	0.0362 (0.824)	0.1200 (0.237)	0.3265 (0.292)
<i>Clients</i> _{<i>t</i>+1}		-0.0042 (0.897)	0.0023 (0.829)	-0.0047 (0.483)	-0.0053 (0.791)
<i>Complexity</i> _{<i>t</i>+1}		0.3908*** (0.000)	0.1344*** (0.000)	0.0905*** (0.000)	0.1920*** (0.001)
Δ <i>Clients</i> _{<i>t</i>+1}		0.0092 (0.217)	0.0027 (0.270)	0.0029 (0.119)	0.0024 (0.541)
<i>Rebrand</i> _{<i>t</i>+1}		-0.7189** (0.018)	-0.3184*** (0.009)	-0.1308* (0.095)	-0.1799* (0.055)
<i>Restate</i> _{<i>t</i>+1}		0.0538** (0.034)	0.0132 (0.105)	0.0148** (0.024)	0.0374** (0.011)
<i>Inspection_Var</i> _{<i>t</i>}		<i>Composite</i> _{<i>t</i>}	<i>Fail_Lines</i> _{<i>t</i>}	<i>Length</i> _{<i>t</i>}	<i>Deficiencies</i> _{<i>t</i>}
Year Fixed Effects		Included	Included	Included	Included
Observations		115	115	115	115
Adjusted R-squared		0.805	0.763	0.881	0.684

Notes: Panel A, Table 6 presents regression summary statistics from estimating Equation (2). The dependent variable is *Inspection_Var*_{*t*+1}, that takes the value of *Composite*_{*t*+1}, *Fail_Lines*_{*t*+1}, *Length*_{*t*+1}, or *Deficiencies*_{*t*+1} in columns 1 through 4, respectively. These variables reflect information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year *t*+1. *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 firm over a twelve-month period prior to April 30 of year *t*+2. All other variables are as motivated and defined in Section 3. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 6 – PCAOB hires and firms’ future inspection reports (1 Yr), continued

Panel B: PCAOB hires with potentially confidential information and the number of deficiencies in firms’ future inspection reports (1 Year)

Variables	<i>Composite_{t+1}</i>		
	(1)	(2)	(3)
<i>Revolv_Info_{12M}</i>	-0.1031 (0.564)		
<i>Revolv_Expert_{12M}</i>		-0.1666 (0.384)	
<i>Revolv_info_%_{12M}</i>			-0.2045 (0.364)
Remaining Control Variables	Included	Included	Included
Year Fixed Effects	Included	Included	Included
Observations	115	115	115
Adjusted R-squared	0.803	0.805	0.803

Notes: Panel B, Table 6 presents regression summary statistics from estimating a modified version of Equation (2). The dependent variable is *Composite_{t+1}*, a variable that reflects information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year *t+1*. *Revolving_{12M}* is the number of former PCAOB employees hired by a Big 11 firm over a twelve-month period prior to April 30 of year *t+2*. *Revolving_Info_{12M}* is the number of former PCAOB employees hired by a Big 11 firm during the latter half of the *Revolving_{12M}* time period (i.e., between Nov 1 of year *t* and Apr 30 of year *t+2*). *Revolving_Expert_{12M}* is the number of former PCAOB employees hired by a Big 11 firm during first half of the *Revolving_{12M}* period (i.e., May 1 of year *t+1* and Oct 31 of year *t+1*). *Revolv_Info_%_{12M}* is the percentage of *Revolving_{12M}* hires that are classified as *Revolv_Info_{12M}*. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7 – PCAOB hires and firms’ future inspection reports (2 Yr)

Panel A: PCAOB hires and the number of deficiencies in firms’ future inspection reports (2 Yrs)

Variables	Prediction	<i>Composite</i> _{<i>t</i>+2}	<i>Fail_Lines</i> _{<i>t</i>+2}	<i>Length</i> _{<i>t</i>+2}	<i>Deficiencies</i> _{<i>t</i>+2}
		(1)	(2)	(3)	(4)
<i>Revolving</i> _{12M}	—	-0.3095** (0.015)	-0.1003** (0.042)	-0.0657** (0.034)	-0.1015** (0.047)
<i>Ins_Report_Var</i> _{<i>t</i>}		0.4864*** (0.001)	0.4689*** (0.000)	0.6414*** (0.000)	0.2023 (0.110)
<i>Revolving_Level</i> _{<i>t</i>}		0.0420 (0.599)	0.0081 (0.768)	0.0092 (0.626)	0.0177 (0.611)
<i>Big4</i> _{<i>t</i>+1}		0.5330 (0.463)	0.0638 (0.800)	0.1546 (0.318)	0.4738 (0.204)
<i>Clients</i> _{<i>t</i>+1}		0.0020 (0.963)	0.0053 (0.725)	-0.0035 (0.703)	-0.0052 (0.824)
<i>Complexity</i> _{<i>t</i>+1}		0.6665*** (0.000)	0.2241*** (0.000)	0.1505*** (0.000)	0.3086*** (0.000)
Δ <i>Clients</i> _{<i>t</i>+1}		2.1155* (0.055)	0.6761* (0.066)	0.5293* (0.077)	0.7108 (0.138)
<i>Rebrand</i> _{<i>t</i>+1}		-0.6884** (0.045)	-0.2442* (0.058)	-0.0787 (0.364)	-0.3412** (0.029)
<i>Restate</i> _{<i>t</i>+1}		0.0640** (0.044)	0.0169* (0.099)	0.0181** (0.019)	0.0395** (0.016)
<i>Inspection_Var</i> _{<i>t</i>}		<i>Composite</i> _{<i>t</i>}	<i>Fail_Lines</i> _{<i>t</i>}	<i>Length</i> _{<i>t</i>}	<i>Deficiencies</i> _{<i>t</i>}
Year Fixed Effects		Included	Included	Included	Included
Observations		104	104	104	104
Adjusted R-squared		0.696	0.620	0.804	0.595

Notes: Panel A, Table 7 presents regression summary statistics from estimating Equation (3). The dependent variable is *Inspection_Var*_{*t*+2}, which takes the value of *Composite*_{*t*+2}, *Fail_Lines*_{*t*+2}, *Length*_{*t*+2}, or *Deficiencies*_{*t*+2} in columns 1 through 4, respectively. These variables reflect information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year *t*+2. *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 firm over a twelve-month period prior to April 30 of year *t*+2. All other variables are as defined in the Appendix. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7 – PCAOB hires and firms’ future inspection reports (2 Yr), continued

Panel B: PCAOB hires and the number of deficiencies in firms’ future inspection reports (2nd Yr)

Variables	Prediction	<i>Composite</i> _{<i>t</i>+2}	<i>Fail_Lines</i> _{<i>t</i>+2}	<i>Length</i> _{<i>t</i>+2}	<i>Deficiencies</i> _{<i>t</i>+2}
		(1)	(2)	(3)	(4)
<i>Revolving</i> _{12M}	—	-0.2023** (0.036)	-0.0660* (0.056)	-0.0349 (0.121)	-0.0952** (0.028)
<i>Revolving</i> _{13M-24M}		-0.1058 (0.445)	-0.0315 (0.508)	-0.0283 (0.362)	-0.0145 (0.813)
<i>Ins_Report_Var</i> _{<i>t</i>+1}		0.7775*** (0.000)	0.7506*** (0.000)	0.8636*** (0.000)	0.5710*** (0.000)
<i>Inspection_Var</i> _{<i>t</i>+1}		<i>Composite</i> _{<i>t</i>+1}	<i>Fail_Lines</i> _{<i>t</i>+1}	<i>Length</i> _{<i>t</i>+1}	<i>Deficiencies</i> _{<i>t</i>+1}
Remaining Control Variables		Included	Included	Included	Included
Year Fixed Effects		Included	Included	Included	Included
Observations		115	115	115	115
Adjusted R-squared		0.790	0.734	0.874	0.673

Notes: Panel B, Table 7 presents regression summary statistics from estimating a modified version of Equation (3). The dependent variable is *Inspection_Var*_{*t*+2}, which takes the value of *Composite*_{*t*+2}, *Fail_Lines*_{*t*+2}, *Length*_{*t*+2}, or *Deficiencies*_{*t*+2} in columns 1 through 4, respectively. These variables reflect information about the extent of deficiencies included in the audit firm’s inspection report related to their audits in fiscal year *t*+2. *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 firm over a twelve-month period prior to April 30 of year *t*+2. *Revolving*_{13M-24M} is the number of former PCAOB employees hired by a Big 11 firm between May 1 of year *t*+2 and April 30 of year *t*+3. All other variables are as motivated and defined in Section 3. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 8 – Audit firm hiring of PCAOB personnel and future accounting restatements

Variables	<i>Restate</i> _{<i>t</i>+1}	<i>Restate</i> _{<i>t</i>+2}	<i>Restate</i> _{<i>t</i>+2}	<i>SEC_Inv</i> _{<i>t</i>+1}	<i>SEC_Inv</i> _{<i>t</i>+1}	<i>SEC_Inv</i> _{<i>t</i>+2}
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Revolving</i> _{12M}	0.0456 (0.792)	-0.0096 (0.961)	-0.1087 (0.391)	-0.0172 (0.590)	-0.0160 (0.604)	0.0019 (0.952)
<i>Revolving</i> _{13-24M}			0.1243 (0.286)			0.0133 (0.588)
<i>Ins_Report_Var</i>	0.7539*** (0.000)	0.5212*** (0.000)	0.7612*** (0.000)	0.2795** (0.019)	0.3427** (0.029)	0.2669* (0.060)
<i>Revolving_Level</i> _{<i>t</i>}	-0.0078 (0.932)	0.0215 (0.850)	0.0312 (0.681)	0.0278 (0.211)	0.0077 (0.676)	0.0170 (0.342)
<i>Big4</i> _{<i>t</i>+1}	0.0773 (0.921)	0.0538 (0.953)	0.3862 (0.656)	-0.4508** (0.037)	-0.3284 (0.124)	-0.3443** (0.047)
<i>Clients</i> _{<i>t</i>+1}	-0.0268 (0.568)	-0.0230 (0.674)	-0.0473 (0.346)	0.0274* (0.071)	0.0221 (0.108)	0.0198* (0.056)
<i>Complexity</i> _{<i>t</i>+1}	0.2458 (0.452)	0.5758 (0.149)	0.2988 (0.246)	0.0484 (0.568)	0.0994* (0.073)	0.0309 (0.683)
Δ <i>Clients</i> _{<i>t</i>+1}	0.0220 (0.321)	0.0485* (0.074)	0.0208 (0.167)	0.0070 (0.329)	0.0091** (0.026)	0.0030 (0.333)
<i>Rebrand</i> _{<i>t</i>+1}	-1.3266 (0.355)	-0.9587 (0.404)	0.1198 (0.773)	-0.2990 (0.191)	0.0778 (0.830)	0.1387 (0.493)
<i>Restate</i> _{<i>t</i>+1}						
<i>Ins_Report_Var</i>	<i>Restate</i> _{<i>t</i>}	<i>Restate</i> _{<i>t</i>}	<i>Restate</i> _{<i>t</i>+1}	<i>SEC_Inv</i> _{<i>t</i>}	<i>SEC_Inv</i> _{<i>t</i>}	<i>SEC_Inv</i> _{<i>t</i>+1}
Remaining Control Variables	Included	Included	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included	Included	Included
Observations	115	115	126	115	115	126
Adjusted R-squared	0.744	0.450	0.771	0.325	0.332	0.349

Notes: Table 8 presents regression summary statistics from estimating modified versions of Equations (2) and (3). The dependent variable is *Restate*_{*t*}, *Restate*_{*t*+1} and *Restate*_{*t*+1} in columns 1, 2 and 3 respectively. *Restate*_{*t*} measures percentage of an audit firm's clients that subsequently restate their financial statements due to misapplication of an accounting rule. The dependent variable is *SEC_Inv*_{*t*}, *SEC_Inv*_{*t*+1} and *SEC_Inv*_{*t*+1} in columns 4,5 and 6 respectively. *SEC_Inv*_{*t*} measures the percentage of an audit firm's clients that subsequently restate their financials in response to an SEC investigation. *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 firm over the twelve-month period prior to April 30 of year *t*+2. All other variables are as motivated and defined in Section 3. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 9 – Sensitivity tests*Panel A: Audit firm fixed effects*

Variables	<i>Revolving</i> _{18M}	<i>Composite</i> _{t+1}	<i>Composite</i> _{t+2}	<i>Composite</i> _{t+2}
	(1)	(2)	(3)	(4)
<i>Composite</i> _t	0.5112*** (0.000)	0.6584*** (0.000)	0.3806*** (0.001)	
<i>Revolving</i> _{12M}		-0.0769 (0.575)	-0.2421** (0.039)	-0.2056** (0.044)
Remaining Control Variables	Included	Included	Included	Included
Audit Firm Fixed Effects	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included
Observations	115	115	104	115
Adjusted R-squared	0.491	0.805	0.739	0.796

Notes: Panel A, Table 9 presents regression summary statistics from our sensitivity analysis in which we re-estimate our primary analysis described in Equations (1) through (3), but including audit firm fixed effects. We estimate Equation (1), (2), and (3) in columns 1, 2 and 3-4, respectively. The dependent variable is *Revolving*_{18M} in column 1, which is the number of former PCAOB employees hired by a Big 11 audit firm over an eighteen-month period starting after April 30 of year t+1. *Composite*_t is a composite measure that reflects the extent of deficiencies included in the audit firm's inspection report related to audits completed in fiscal year t. The dependent variable is *Composite*_{t+1} in column 2 and *Composite*_{t+2} in columns 3 and 4. *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 audit firm over a twelve-month period prior to April 30 of year t+2. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel B: Entropy balanced matching

Variables	<i>Composite</i> _{t+1}	<i>Composite</i> _{t+2}	<i>Composite</i> _{t+2}	<i>Composite</i> _{t+1}	<i>Composite</i> _{t+2}	<i>Composite</i> _{t+2}
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Revolving_Ind</i> _{12M}	-0.1975 (0.415)	-0.4317* (0.081)	-0.5211** (0.045)			
<i>Revolving</i> _{12M}				-0.0446 (0.694)	-0.2751** (0.018)	-0.2517** (0.011)
Remaining Control Variables	Included	Included	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included	Included	Included
Observations	115	104	115	115	104	115
Adjusted R-squared	0.846	0.803	0.846	0.843	0.816	0.846

Notes: Panel B, Table 9 presents regression summary statistics our sensitivity analysis in which we re-estimate our primary analysis described in Equations (2) and (3) after using the weights determined by entropy balancing. The dependent variable is *Composite*_{t+1} in columns 1 and 4, and *Composite*_{t+2} in the remaining columns. *Composite*_{t+1} is a composite measure that reflects the extent of deficiencies included in an audit firm's inspection report related to their audits in fiscal year t+1. *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 audit firm over a twelve-month period prior to April 30 of year t+2. *Revolving_Ind*_{12M} is an indicator variable that takes the value of one if *Revolving*_{12M} is greater than zero. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 9 – Sensitivity tests, continued

Panel C: Scaled measure of PCAOB audit failures

Variables	<i>Revolving</i> _{18M}	<i>Deficiencies_Scaled</i> _{t+1}	<i>Deficiencies_Scaled</i> _{t+2}	
	(1)	(2)	(3)	(4)
<i>Deficiencies_Scaled</i> _t	-1.1072 (0.378)	0.4313*** (0.004)	0.1574 (0.396)	
<i>Deficiencies_Scaled</i> _t * <i>Def_High</i>	7.3822*** (0.003)			
<i>Def_High</i> _t	-1.8342 (0.117)			
<i>Revolving</i> _{12M}		-0.0107 (0.587)	-0.0574*** (0.001)	-0.0503*** (0.001)
Remaining Control Variables	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included
Observations	76	65	54	65
Adjusted R-squared	0.540	0.314	0.170	0.340

Notes: Panel C, Table 9 presents regression summary statistics from our sensitivity analysis in which we re-estimate our primary analysis described in Equations (1) through (3), but using a scaled measure of audit failures that include the number of engagements inspected by the PCAOB (i.e., beginning in 2010). We estimate Equation (1), (2), and (3) in columns 1, 2 and 3-4, respectively. The dependent variable is *Revolving*_{18M} in column 1, which is the number of former PCAOB employees hired by a Big 11 audit firm over an eighteen-month period starting after April 30 of year t+1. *Deficiencies_Scaled*_t is the distinct number of audit engagements with identified deficiencies of such significance that the board considers that an audit failure occurred scaled by the number of audit engagements inspected by the PCAOB. The dependent variable is *Deficiencies_Scaled*_{t+1} in column 2 and *Deficiencies_Scaled*_{t+2} in columns 3 and 4. *Def_High*_t is an indicator variable that takes the value of one if the number of audit failures in the *Deficiencies_Scaled*_t variable is equal to or greater than nine (i.e., the median value). *Revolving*_{12M} is the number of former PCAOB employees hired by a Big 11 audit firm over a twelve-month period prior to April 30 of year t+2. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 10 – PCAOB hiring of Big 11 personnel and changes to firms’ future inspection reports

Variables	<i>Composite</i> _{<i>t+1</i>}	<i>Composite</i> _{<i>t+2</i>}	<i>Composite</i> _{<i>t+2</i>}	<i>Composite</i> _{<i>t+1</i>}	<i>Composite</i> _{<i>t+2</i>}	<i>Composite</i> _{<i>t+2</i>}
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Inflows_Level</i> _{<i>t</i>}	0.0142 (0.105)	0.0117 (0.422)	0.0090 (0.436)			
<i>Inflows</i> _{<i>12M</i>}	-0.0222 (0.415)	-0.0033 (0.935)	0.0030 (0.935)			
<i>Boomerangs_Level</i> _{<i>t</i>}				0.0793 (0.279)	0.1875* (0.094)	0.1512 (0.111)
<i>Boomerangs</i> _{<i>12M</i>}				0.1901 (0.337)	0.1211 (0.617)	-0.0202 (0.914)
Remaining Control Variables	Included	Included	Included	Included	Included	Included
Year Fixed Effects	Included	Included	Included	Included	Included	Included
Observations	115	104	115	115	104	115
Adjusted R-squared	0.807	0.693	0.788	0.809	0.713	0.798


Notes: Table 10 presents regression summary statistics from estimating modified versions of Equations (2) and (3). The dependent variable is *Composite*_{*t+1*} in columns 1 and 4, and *Composite*_{*t+2*} in the remaining columns. *Composite*_{*t+1*} (*Composite*_{*t+1*}) is a composite measure that reflects the extent of deficiencies included in an audit firm’s inspection report related to their audits in fiscal year *t+2*. *Inflows_Level*_{*t*} is the number of Big 11 alumni working at the PCAOB as of April 30 of year *t+1*. *Inflows*_{*12M*} is the number of Big 11 alumni that departed the firm to join the PCAOB over a twelve-month period prior to April 30 of year *t+2*. *Boomerangs_Level*_{*t*} is the number of Big 11 alumni working at the PCAOB as of April 30 of year *t+1* that eventually exited the PCAOB to resume working at the same Big 11 firm for whom they worked prior to joining the PCAOB. *Boomerangs*_{*12M*} is the number of Big 11 alumni that departed the firm to join the PCAOB over a twelve-month period prior to April 30 of year *t+2* but later rejoined the same Big 11 firm subsequent to that point in time. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Appendix A

Variable construction for PCAOB inspection related deficiency variables

We program an R script that creates several variables related to the deficiencies included in ‘Part I’ of PCAOB inspection reports. First, a lengthier ‘Part I’ description indicates a greater number of deficiencies. Thus, we create the $Length_t$ variable by using our script to count the number of lines contained in Part I. Second, deficiencies are predominantly phrased using the root word ‘fail’ (i.e., “the firm failed to”, “the firm failed in”, etc.). Accordingly, we create the $Fail_Lines_t$ variable by using our script to count the number of distinct lines that contain a word with the root ‘fail’. Finally, we use regular expressions to count how many engagements (i.e., Issuer A, Issuer B, etc. are separately mentioned in ‘Part I’ of the inspection report.

Example 1 – Excerpt of inspection of PricewaterhouseCoopers LLP November 17, 2005 – pp.7



Public Company Accounting Oversight Board

PCAOB Release No. 104-2005-120
Inspection of PricewaterhouseCoopers LLP
November 17, 2005
Page 7

with the unremitted earnings from its non-U.S. subsidiaries that were included in other comprehensive income. Statement of Financial Accounting Standards ("SFAS") No. 109, *Accounting for Income Taxes*, requires that a deferred tax liability be recorded in this situation. The Firm should have addressed the incorrect accounting.^{9f}

Issuer V

The Firm **failed** to evaluate the appropriateness of an issuer's classification of certain investments as cash equivalents. The issuer subsequently determined that approximately 89 percent of its reported cash and cash equivalents were invested in securities that were not appropriate for classification as cash or cash equivalents under SFAS No. 95, *Statement of Cash Flows*.^{10f}

Issuer R

On one audit, the Firm **failed** to evaluate whether certain contracts to purchase a commodity constituted derivatives.


Issuer W

The issuer entered into option and contingent purchase contracts to acquire land. The aggregate value of the option contracts, as documented in the work papers, was approximately 20 percent of the issuer's total assets. The issuer analyzed the contracts and concluded that it was not the primary beneficiary of the contracts, and therefore, it was not required to consolidate them under FASB Interpretation No. 46R, *Consolidation of Variable Interest Entities*. The Firm **failed** to evaluate, or **failed** to include evidence in the work papers that it had evaluated, the issuer's analysis.

Note: Based on this single page, our script would calculate $Fail_Lines_t$ (unscaled) = 3 based on the number of lines with the root word ‘fail’ and $Deficiencies_t$ (unscaled) = 3 based on the number of distinct engagements referenced on the page.

Appendix A, continued

Example 2 – Excerpt of inspection KPMG LLP October 15, 2015 – pp.15

 <p>Public Company Accounting Oversight Board</p>	PCAOB Release No. 104-2015-189 Inspection of KPMG LLP October 15, 2015 Page 15
<ul style="list-style-type: none">○ For one component of the reserve, which the issuer calculated using external loan data as a significant input, the Firm failed to evaluate the relevance and comparability to the issuer's data of the external data. In addition, the Firm failed to sufficiently test the appropriateness of the reserve rate the issuer used to calculate another component of the reserve, as the Firm limited its procedures to comparing the reserve rate used to the issuer's loss experience for loans that had originated several years ago, without evaluating whether the loans and originations in that year were comparable to the relevant loans. (AU 342, paragraph .11)	
A.4. <u>Issuer D</u>	
<p>In this audit, the Firm failed in the following respects to obtain sufficient appropriate audit evidence to support its audit opinions on the financial statements and on the effectiveness of ICFR –</p>	
<ul style="list-style-type: none">• This issuer's most significant category of revenue typically consisted of arrangements that included multiple deliverables. The Firm failed in the following respects to perform sufficient procedures related to this category of revenue –<ul style="list-style-type: none">○ The Firm failed to identify and test any controls over the allocation of the consideration among the separate units of accounting. (AS No. 5, paragraph 39)○ With respect to one of the issuer's segments, which reported approximately eighty percent of this revenue, the Firm failed to perform any substantive procedures to test the allocation of the consideration among the separate units of accounting. (AS No. 13, paragraph 8)• The issuer deferred revenue for two types of transactions in both of its segments. The Firm's procedures related to the deferred revenue were not sufficient, as follows –	

Note: Based on this single page, our script would calculate *Fail_Lines*, (unscaled) = 6 based on the number of lines with the root word 'fail' and *Deficiencies*, (unscaled) = 1 based on the number of distinct engagements referenced on the page.

Appendix B

Selection process for our sample of former PCAOB employees

As indicated in Panel A of Table 2, we identify 256 individuals that have experience at a Big 11 audit firm after having worked at the PCAOB. However, in reviewing the profiles of these individuals, it is clear that many of them were in positions unrelated to the inspection process (e.g., human resources personnel) or that they were not at the PCAOB long enough to build an exceptional understanding of the inspection process (e.g., intern). Thus, we construct two separate wordlists to remove such individuals from consideration in our study. The first word list removes all profiles whose job title at the PCAOB does not contain any of the following words: *'inspec'*, *'director'*, *'board'*, *'counsel'*, *'chief'*, *'senior'*, *'office of research'* or *'special advisor.'* We then create a second wordlist that removes profiles that do contain any of the following words: *'intern'*, *'budget'*, *'human'*, *'recruit'* or *'external relations'*.

Following this screening of PCAOB titles, we then seek to remove individuals that joined Big 11 audit firms in junior-level positions since such positions are not generally relied upon to alter a firm's accounting quality across the entire organization. Thus, we create another wordlist that removes all profiles whose job title at the Big 11 firm does contain any of the following words: *'assurance associate'*, *'audit associate'*, *'financial services office'*, *'oil & gas transaction'*, *'senior associate'*, *'tax'*, *'audit senior'* or *'assurance staff'*. We then create a second wordlist that remove profiles that do not contain at least one of the following words that are commonly used to reference positions of upper-level management in Big 11 audit firms: *'partner'*, *'director'*, *'principal'*, *'counsel'*, *'leader'* and *'manager'*.

This process removes 152 individuals in total. While Panel B of Table 2 provided the most frequently recurring job titles for the 104 individuals that were retained in our sample, the following table provides this information for the 152 individuals excluded from our study based on our application of the word lists described above.

Rank	Job Title at PCAOB	Count
1	Risk Analysis Intern	24
2	Intern	17
3	Accounting Intern	9
4	Research and Analysis Intern	8
5	Office of Research and Analysis Intern	7
6	Intern, Office of Research and Analysis	4
7	Intern in the Office of Research and Ana	3
8	Intern, Office of Finance	3
9	Broker-Dealer Intern	2
10	Director, Human Resources	2
11	Enforcement Intern	2
12	Inspections Analyst	2
13	Intern-Office of Board Member	2
14	Research & Analysis Intern	2

Appendix C

Sample job descriptions at Big 11 audit firms for former PCAOB employees included in our study

Position	City	Position Description
Senior Regulatory Partner	Washington DC	Advisor to [Firm] Leadership on audit regulatory matters involving public policy, inspection, standards, rules, litigation and enforcement involving the PCAOB, SEC and foreign audit and securities regulators.
Partner	Not Provided	Developed U.S. firm policy and guidance on the application of auditing and related professional practice standards to financial statement and internal control audits and other assurance engagements. Provided advice to the firm's personnel on the application of professional standards and firm policy.
Managing Director	Los Angeles	Hold positions in a number of leadership groups including the Firm's Audit Practice Review team, ICFR Resource Center, an internal group (Cybersecurity and the role of the Auditor), and serve as liaison to the PCAOB. Help evaluate root causes of issues identified in various audit inspection processes, work with various groups within the Firm to eliminate those issues, and proactively seek out potential audit trouble areas before these become issues.
Director	New York City	My responsibilities included supporting assurance personnel and educating engagement teams regarding compliance with PCAOB Auditing Standards through firm monitoring programs, including internal inspections and coaching. Additionally, I also assisted with the development and delivery of programs and initiatives that addressed new and emerging audit and accounting issues as well as issues that may have been identified as part of the internal and external inspections processes.
Director	San Francisco	Director, Inspections Group. My role is to assist the Assurance Practice Leadership in the execution and oversight of the Firm's internal inspection processes related to audit quality. This is accomplished through the conduct of analyses that leverages creative and critical thinking, problem solving and technical auditing skills. This also involves providing advise on and/or providing solutions to PCAOB-, SEC-, and/or other inspection-related processes and issues to meet compliance with regulatory standards.
Senior Manager	Atlanta	Quality implementation
Senior Manager	New York City	Northeast Quality Network - Assurance Services
Program Manager	Washington DC	Supported international member firms with PCAOB registration, reporting, and inspections activities.
Southeast Region Inspections Support Leader	Atlanta	Southeast Region Inspections Support Leader. Southeast Region Audit Analytics Lead Coach.
Consultant	Washington DC	Collaborated with a team of independent consultants to help the firm drive continuous improvement in its quality control system. Evaluated the firm's governance, organization, and operations. Evaluated the firm's procedures for performing audits of financial statements. Conducted interviews and analyzed data to identify opportunities for improvement. Developed recommendations based on findings.

Appendix D - Variable descriptions

Variables	Definition
<i>Composite</i>	The first principal component obtained from performing a principal components analysis with the <i>Fail_Lines</i> , <i>Length</i> and <i>Deficiencies</i> variables.
<i>Fail_Lines</i>	The number of distinct lines in ‘Part I’ of an audit firm’s inspection report that contain the root ‘fail’. Specific examples are provided as part of Appendix B.
<i>Length</i>	The number of distinct lines in ‘Part I’ of an audit firm’s inspection report.
<i>Deficiencies</i>	The distinct number of audit engagements with identified deficiencies of such significance that the board considers that an audit failure occurred. This variable is measured as the distinct number of ‘ <i>Issuers</i> ’ independently discussed in ‘Part I’ of an audit firm’s inspection report.
<i>Revolving</i> _{18M}	The total number of former PCAOB employees hired by a Big 11 firm over an eighteen month period after the typical documentation period closes for audit engagements completed in fiscal year t (i.e., April 30 of year $t+1$). Refer to Figure 1 for a detailed timeline of this period.
<i>Revolving</i> _{12M}	The total number of former PCAOB employees hired by a Big 11 firm over a twelve month period prior to the typical documentation period closing for audit engagements completed in fiscal year t (i.e., April 30 of year $t+2$). Refer to Figure 2 for a detailed timeline of this period.
<i>Revolving_Level</i>	The number of former PCAOB employees working for a Big 11 firm as of the typical documentation period closing date for audit engagements completed in fiscal year t (i.e., April 30 of year $t+1$).
<i>Report_Similarity</i>	The similarity of an audit firm’s two most recently received inspection reports. This measure is calculated as the tf-idf adjusted <i>cosine similarity</i> of the vector of words included in ‘Part I’ of the firm’s two most recently received inspection reports. To compute this variable, we pre-process the vector of words included in the inspection reports by 1) converting all text to lower case, 2) removing numbers and punctuation, 3) removing stop words, and 4) retaining the stem of each word. We then weigh each term in the vector by its term frequency-inverse document frequency (“TF-IDF”). TF normalizes each term according to the document length, expressing each term as a fraction of the total number of words in the document. IDF scales each term by its inverse document frequency, based on the concept that less frequently used terms contain more information. Based on this construction, relatively higher (lower) values of <i>Report_Similarity</i> _{t} indicate that the vector of words included in the firm’s inspection report is more (less) similar relative to the prior inspection report.
<i>Big4</i>	Indicator variable equal to one if the audit firm is a Big4 audit firm.
<i>Clients</i>	The number (measured in hundreds) of an audit firm’s distinct clients with positive dollar denominated audit fees, as obtained from Audit analytics.
<i>Complexity</i>	The natural log of a firm’s median audit fees (measured in thousands), as obtained from Audit analytics.

Appendix D - Variable descriptions, continued

Variables	Definition
<i>Rebrand</i>	Indicator variable that takes a value of 1 if the audit firm has changed its name in the year of the report and 0 otherwise.
<i>Restate</i>	The percentage of an audit firm's clients (with positive dollar denominated audit fees) that subsequently restate their financial statements due to misapplication of an accounting rule (GAAP/FASB), as obtained from Audit analytics.
<i>SEC_Inv</i>	The percentage of an audit firm's clients (with positive dollar denominated audit fees) that subsequently restate their financials in response to an SEC investigation, as obtained from Audit analytics.
<i>Revolv_Info_{18M}</i>	The number of former PCAOB employees hired by a Big 11 firm during months 7-12 of <i>Revolving_{18M}</i> period (i.e., between Nov 1 of year t+1 and Apr 30 of year t+2). However, because this group of individuals proxies for employees with potential information about a firm's upcoming inspection, we exclude those employees that join in this period but left the PCAOB prior to Nov 1 of year t+1 since it is less likely the inspection report exists prior to that date. Refer to Figure 1 for a detailed timeline of this period.
<i>Revolv_Expert_{18M}</i>	The number of former PCAOB employees hired by a Big 11 firm during the <i>Revolving_{18M}</i> period less the six months used to calculate <i>Revolv_Info_{18M}</i> . Because these individuals did not leave the PCAOB during the months in which the inspection list was most likely to have been finalized, these employees are less likely to possess information about the specific engagements subject to the fiscal year t+1 PCAOB inspection. Refer to Figure 1 for a detailed timeline of this period.
<i>Revolv_info_%_{18M}</i>	The percentage of <i>Revolving_{18M}</i> hires that are classified as <i>Revolv_Info_{18M}</i> . Refer to Figure 1 for a detailed timeline of this period.
<i>Revolv_Info_{12M}</i>	The number of former PCAOB employees hired by a Big 11 firm during months 7-12 of <i>Revolving_{12M}</i> period (i.e., between Nov 1 of year t+1 and Apr 30 of year t+2). However, because this group of individuals proxies for employees with potential information about a firm's upcoming inspection, we exclude those employees that join in this period but left the PCAOB prior to Nov 1 of year t+1 since it is less likely the inspection report exists prior to that date. Refer to Figure 2 for a detailed timeline of this period.
<i>Revolv_Expert_{12M}</i>	The number of former PCAOB employees hired by a Big 11 firm during the <i>Revolving_{12M}</i> period less the six months used to calculate <i>Revolv_Info_{12M}</i> . Because these individuals did not leave the PCAOB during the months when the inspection list was most likely to have been finalized, these employees are less likely to possess information about the specific engagements subject to the fiscal year t+1 PCAOB inspection. Refer to Figure 2 for a detailed timeline of this period.
<i>Revolv_info_%_{12M}</i>	The percentage of <i>Revolving_{12M}</i> hires that are classified as <i>Revolv_Info_{12M}</i> . Refer to Figure 2 for a detailed timeline of this period.