Weak Incentives for Audit Quality: Evidence from Broker-Dealers

Zachary T Kowaleski
University of Texas at Austin

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ABSTRACT:

I study whether audit quality predictions based on incentives and competence generalize to a setting with weak incentives, the broker-dealer industry. Specifically, I use proprietary data to test whether larger firms and industry specialists provide better audit quality, as proxied by audit adjustments. Consistent with prior literature, I find that larger firms provide higher audit quality. In contrast, industry specialists perform worse than non-specialists; industry specialist partners in small firms drive this result. These findings suggest that clients with weak demand for auditing hire low quality auditors, who in turn gain market share in the industry. Consequently, this study not only advances understanding of broker-dealer audit quality, but also reveals that clientele-based measures proxy for client preferences as well as industry specialization.

Keywords: Audit Adjustments, Auditor Size, Audit Partner, Broker-Dealer, Incentives, Industry Specialization, Private Entities

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I. INTRODUCTION

Incentives for companies to demand and auditors to supply audit quality provide fundamental elements of theory underlying audit research. Specifically, agency costs incentivize demand for audit quality (Jensen and Meckling 1976, Watts and Zimmerman 1983, 1986), and both reputation and litigation risks incentivize auditors to supply quality audits (DeAngelo 1981, DeFond and Zhang 2014). Then, to satisfy client demand or manage supply incentives, or both, auditors develop competence to supply quality audits. This theoretical framework explains why larger audit firms and industry specialist auditors often provide higher audit quality. Though the framework relies on incentives, extant literature says little about whether the framework's inferences extrapolate to weak incentive settings. Thus, I examine whether this theoretical framework generalizes to the U.S. broker-dealer (BD) industry – an important setting with weak incentives for privately owned companies to demand and auditors to supply audit quality. Specifically, I test whether larger firms and industry specialists provide higher BD audit quality, as indicated by audit adjustments.

BDs connect investors to capital markets, annually executing trades worth over 50 trillion dollars. One way regulators seek to protect investors and promote capital market integrity is by requiring all BDs to submit audited financial statements to regulators, the report's primary user. Problematically, regulators do not incentivize BDs to hire high-quality auditors; in fact, BD management can directly select their auditor despite criticism that managers may prefer an agreeable or perfunctory audit (Coffee 2019; Hurley, Mayhew, and Obermire 2019). This distinguishes the mandated audits of many privately owned BDs from those of public companies. Specifically, many privately owned BDs lack incentives and mechanisms that increase public

company demand for audit quality, notably agency costs and audit committees. Therefore, BDs have weak incentives to demand high audit quality.

Relative to public ownership, private ownership also weakens incentives for auditors to supply high audit quality, notably reputation and litigation risk (Badertscher, Jorgensen, Katz, and Kinney 2014; Bell, Landsman, and Shackelford 2001; Johnstone and Bedard 2003, 2004). Institutional factors further reduce supply incentives as BD management can request confidential treatment for nearly all financial statement information and need not file an 8-K announcing restatement. This limits audit failure visibility, its harm to auditor reputation, and potential litigation. Therefore, BD auditors have weak incentives to supply high quality services.

To study audits in this weak incentive setting, I use non-public regulator data to develop the first audit adjustment measure that covers every engagement in a U.S. audit market, spanning several years. Audit adjustments provide a sound proxy for audit quality because auditors plan and perform audits to obtain reasonable assurance that the financial statements are free of material misstatement. When an auditor detects a material misstatement and management corrects the financial statements before communicating the results to external users, the audit function improves financial reporting. Similar to Lennox, Wu, and Zhang (2014), I obtain unaudited financial information and identify material differences from the audited reports. To improve audit quality identification, I structure my analyses around auditor changes and control for prior year audit adjustments, thus balancing the BD's time-invariant propensity to misstate across predecessor and successor auditors. Then, to test the theoretical framework's generalizability, I examine whether audit firm size and partner-level industry specialization predict audit adjustments when privately owned BDs change audit firms. As the demand and supply factors described above

affect all BD audits, I test whether predictions generalize to the BD setting and do not study the effect of varying incentives within the industry.

Larger audit firms should have both the incentive and competence necessary to deliver higher audit quality as supported by many empirical studies (DeAngelo 1981; DeFond and Zhang 2014; Jiang, Wang, and Wang 2019). Still, it is not clear whether large audit firms will develop the competence to perform higher quality audits without incentives (DeFond and Zhang 2014, 301). For example, Van Tendeloo and Vanstraelen (2008) find that larger firms do not provide superior quality for mandatory private company audits when failure is unlikely to be detected. Further, Ke, Lennox, and Xin (2015) find that Big 4 auditors provide lower quality audits in a weaker institutional environment. Nevertheless, my tests indicate that larger audit firms provide higher quality audits. Specifically, BDs that change to larger (smaller) audit firms are more (less) likely to record a material audit adjustment. This finding adds to the relatively sparse evidence affirming that large firms provide higher quality audits for non-public companies. It does so by accessing pre-audit financial statements as suggested by Vanstraelen and Schelleman (2017). Interestingly, examining audit adjustments for first year engagements reveals that clients switching among large audit firms have higher pre-audit financial reporting quality, consistent with endogenous matching concerns (Lawrence, Minutti-Meza, and Zhang 2011; Li, McNichols, and Raghunandan 2022).

Next, industry specialization creates knowledge that facilitates better audits (Bédard 1989; Bonner 1990; Bonner and Walker 1994; Solomon, Shields, and Whittington 1999; Thibodeau 2003), and allows researchers to study competence variation within a firm's incentive environment (DeFond and Zhang 2014). Accordingly, archival research generally finds that industry specialists provide higher audit quality, whether studied at the firm, office, or partner level (e.g., Chin and

Chi 2009; Dunn and Mayhew 2004; Ferguson, Francis, and Stokes 2003; Gaver and Utke 2019; Ittonen, Johnstone, and Myllymäki 2015; Knechel, Naiker, and Pacheco 2007; Reichelt and Wang 2010). These studies typically proxy for industry specialization with market share or some other clientele-based measure (Audousset-Coulier, Jeny, and Jiang 2016). As client hiring preferences influence who is hired, clientele-based industry specialization measures should reflect these selection preferences.

Parsing the effect of client demand from industry knowledge is difficult where prevailing demand incentives and industry-specific knowledge both improve audit quality. Within the weak incentive setting of BD audits, however, a negative relationship between industry specialization and audit quality reflects the preferences that determine clientele-based industry specialization measures. Accordingly, my findings indicate that industry specialist partners perform lower quality audits. Interaction analyses show that partners from small firms drive this result. Additional analyses show that partner specialists charge less and work fewer hours per engagement, but do not increase the likelihood of correcting misstatements incremental to the cut in hours.[1] This finding suggests that lower effort reduces the specialist's audit quality. Client demand allows these low quality audit partners to thrive in the BD industry. Though the BD setting is useful, it is not singular. Other unwanted mandatory audits exist and identifying these audits for both privately- and publicly-owned companies, especially across time, will advance further study of related incentive questions.

By examining the generalizability of two primary predictions from the audit academic literature, this paper makes five primary contributions. This is the first audit adjustment dataset that covers every engagement in a U.S. audit market. Thus, the paper extends the existing literature

[1] I measure and refer to industry specialization based on clientele. For brevity, I frequently drop the industry modifier when referring to specialists or specialization.

on the determinants of audit adjustments by performing cross-sectional analyses on first-year audit engagements in the U.S. Second, this is the first study to explicitly describe and analyze U.S. audits in a setting with weak incentives to demand and supply quality audits. As the setting is subject to the same broader institutional environment of other U.S. companies, it permits relevant comparisons with studies that examine U.S. capital markets, including the same public accounting firms, legal system, accounting and auditing standards, and other institutional influences. Third, this study advances the literature on auditor size effects for non-public company audits and extends the literature to the U.S. setting.

Fourth, this study finds that smaller firms, and especially industry specialist partners at smaller firms, fail to adhere to the fundamental audit principle that BD financial statements are free of material misstatement. In addition to advancing the academic literature, these findings can inform regulators when applying risk-based oversight. Finally, this study presents evidence that client-based specialization measures also proxy for clientele incentives to demand audit quality. Although intuitive, this contrasts with the supply-side focus that many industry specialization studies employ, and emphasizes the importance of understanding how client preferences influence their audit. Consequently, this paper calls for more research that examines how audit demand affects auditors.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

Broker-Dealer Industry Background

Brokers execute trades for others, e.g., individual households or institutional investors. Dealers trade for their own accounts, underwrite securities, and make markets. Consequently, the BD industry executed U.S. security trades measured at 52.7 trillion dollars in 2018 (FINRA 2019). During a market downturn between 1968 and 1970, over one hundred illiquid and insufficiently

capitalized BDs failed. Customer losses and unsatisfied trade orders jeopardized public confidence in capital markets. The U.S. government response included creating new BD reporting rules to facilitate regulator monitoring, and expanded assurance to improve the reliability of this information. Accordingly, generally all BDs, public or private, must register with the Securities and Exchange Commission (SEC) and generally all registered BDs must annually file an audited report with regulators (SEC 2008; SEA Rule 17a-5), I refer to this filing requirement as the audit mandate. The report includes financial statements, notes, as well as industry-specific reports and regulatory calculations. Although the report becomes public, BD management can redact everything except for the statement of financial condition (balance sheet) from the public view. This permitted privacy signals that regulators are the primary users, and not those who access the redacted public version.

Permitted privacy for the public report creates difficulty for plaintiffs to establish reliance on the audit report. Indeed, a detailed review of LexisNexis, for all instances of BD auditor litigation in the US court system, yields only nine cases against a BD auditor with a court opinion, often procedural and favorable to the auditor. As the earliest case is from 1976, these nine cases span 43 years and over one hundred thousand audit reports. This sparse legal history reflects the limited litigation risk facing BD audits (Cook, Kowaleski, Minnis, Sutherland, and Zehms 2020).

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 charged the PCAOB with public oversight of all BD audits. This legislation made BD audits the only private company audits subject to PCAOB oversight. This change raised regulatory risk, an incentive to supply audit quality, but not reputation risk as the PCAOB aggregates and anonymizes inspection results despite reporting that, since its inception, over 80% of all inspected BD engagements have not been compliant with auditing standards (PCAOB 2016). Both anonymized inspection results

and permitted privacy for financial statements limit audit failure visibility. Therefore, auditors face limited reputation risk for low quality work.

Many mechanisms that protect audit quality for U.S. public companies are not required for the audits of privately owned BDs. For example, regulators do not require BDs to cede hiring responsibility to an audit committee, or periodically rotate the audit partner. Former auditors need not observe a "cooling off period" to protect auditor independence. Finally, BD auditors are not subject to the Sarbanes Oxley Act of 2002 (SOX) prohibition of certain partner compensation arrangements. Because this market includes over three thousand privately owned BDs that must annually file audited reports under one set of accounting principles and auditing standards, the U.S. BD industry provides a useful setting for studying predictions from audit theory under weak incentives.[2] [3]

Hypothesis Development

Auditor Size

A large literature finds that auditor size improves audit quality (e.g., DeAngelo 1981; DeFond and Zhang 2014; DeFond, Erkens, and Zhang 2017; Jiang et al. 2019), and existing BD evidence supports expectations. First, Schnader, Bedard, and Cannon (2019) examine BD auditor reporting of internal control disclosures and related severity judgments and observe that control attestation is better for larger firms. Second, the PCAOB reports that audit firms with (no) issuer clients receive inspection findings on 76 (96) percent of inspected engagements and on 28 (49) percent of in-scope areas (PCAOB 2016). As firm size correlates with auditing issuers, this suggests that larger firms perform more compliant BD audits. Yet, private company audit partners

[2] Following Armstrong et al. (2022), I use the term theory as being "more general than the inference one draws from any single empirical test...[and] broader than formal analytical models."

[3] For a more detailed description of the industry, standards, and changes, refer to Bedard, Cannon, and Schnader (2014) and Kowaleski, Cannon, Schnader, and Bedard (2018).

argue that compliance does not indicate high quality (Brivot, Roussy, and Mayer 2018); instead, a quality audit requires tailored judgment that gives their client a better understanding of their financial situation.

Moreover, DeFond and Lennox (2011) find that, following SOX, low quality auditors leave the public company audit market rather than register with the PCAOB. Bedard, Cannon, and Schnader (2017) find similar behavior for BD auditors. These studies suggest that registered audit firms provide higher quality than size-matched, non-registered firms. This should weaken the average effect of auditor size on audit quality.

Finally, it is not clear that auditor size improves audit quality without corresponding incentives. Along these lines, Ke et al. (2015) find that the Big 4 firms provide lower-quality audits to companies listed only in China's weak institutional environment relative to those cross-listed in Hong Kong. Though Ke et al. do not test whether the Big 4 outperform smaller firms, Van Tendeloo and Vanstraelen (2008) find that larger firms provide superior audit quality for mandatory European private company audits when misstatements are more likely to be detected. Their paper could suggest that PCAOB oversight increases auditor scrutiny and would improve audits. Yet, the PCAOB's focus on audit process rather than financial misstatements and the permitted anonymity for audit firms that receive inspection findings both obscure this prediction. Further, DeFond, Wong, and Li (1999) find that government regulation is ineffective without demand side incentives. Still, I expect changing to a larger auditor to be associated with higher audit quality.

> *H1: BDs that change to larger (smaller) auditor are more (less) likely to record material audit adjustments.*

Industry Specialization

Experiments find that industry specialization develops domain-specific knowledge through repetition of similar tasks, and domain-specific knowledge is associated with improved auditor judgment (Bédard 1989; Bonner 1990; Bonner and Walker 1994; Solomon et al. 1999; Thibodeau 2003). Firm, office, and partner-level archival evidence shows industry specialists perform better across a variety of audit quality measures (Dunn and Mayhew 2004; Ferguson et al. 2003; Knechel et al. 2007; Reichelt and Wang 2010; Chin and Chi 2009; Ittonen et al. 2015). Other studies document where industry specialization improves efficiency without reducing audit quality (e.g., Bills, Jeter, and Stein 2015). Industry specialization seems more useful in regulated industries (Danos and Eichenseher 1982; Hogan and Jeter 1999), and those with greater accounting complexity (Bills et al. 2015). As the BD industry is regulated, has a dedicated AICPA guide and its own PCAOB attestation standards, industry-specific knowledge should differentiate BD auditors and support superior audit quality, as seen in other studies.

As research proxies for industry specialization with market share or some other clientele-based measure (Audousset-Coulier et al. 2016), client hiring preferences should influence clientele-based industry specialization measures. This intuition provides important building blocks for the theoretical framework developed by studies of industry specialization. Craswell, Francis, and Taylor (1995) link client demand for higher audit quality to the auditor's ability to charge a fee premium for developing greater competence. DeFond, Francis, and Wong (2000) replicate this finding and also show that some clients prefer small firm specialists who use scale to generate fee minimizing efficiencies. Other studies build upon this intuition without directly addressing the variation in client demand for audit quality. For example, Cahan, Jeter, and Naiker (2011) show that industry specialists who tend to serve smaller clients use their scale to develop efficiencies rather than to develop greater capacity for effectiveness. Their supply-side interpretation does not

preclude a demand-side argument as they quote a practitioner opining that "larger, more dominant firms in an industry are more concerned about [audit] quality." Although supply and demand factors should both affect behavior, parsing the effect of industry knowledge from client demand is difficult in settings where clients demand higher levels of audit quality.

Within the weak incentive setting of BD audits, however, the effects of industry knowledge and client demand move in opposite directions. Consequently, a positive relationship between industry specialization and audit quality suggests the dominance of industry knowledge and a negative relationship suggests the importance of client preferences for clientele-based industry specialization measures. Suggesting the importance of client demand, Schnader et al. (2019) find that small audit firms with large BD portfolios provide substandard control attestation reporting.[4] Further, regulators banned multiple partners with large BD portfolios for performing non-compliant audits (PCAOB 2017; 2018a; 2018b; SEC 2016; 2017).[5] As the incentive environment contrasts with prior literature, I make a non-directional prediction.

> *H2: Conditional on auditor change, BDs that select partner specialists are more or less likely to record material audit adjustments than non-specialists.*

III. RESEARCH DESIGN

Data

Table 1 references 27,119 yearly reports spanning 2010 through 2015 from the *Audit Analytics* BD database,[6] which compiles company, financial statement, and audit report data from the SEC's EDGAR database. I drop 342 observations missing total assets, and eight that are

[4] Whereas Schnader et al. (2019) study BD internal control reporting under shifting regulatory oversight, my study uses a financial statement measure of audit quality. I introduce specialization variation within the large firms by studying partners, and finally, I advance a novel institutional argument that emphasizes the importance of supply and demand side effects on industry specialization.
[5] Reported results are robust to dropping each of these partners and their firms from the sample.
[6] This sample window coincides with my proprietary data access.

missing information despite efforts to hand collect.[7] I then remove 68 observations where the BD reports multiple fiscal year-ends. As most BDs file on a calendar year-end, I keep the latter of the two observations in the same year.[8] Next, I remove 134 remaining observations that appear to be exact duplicate filings across all balance sheet, audit report, and attestation report variables. For the remaining 1,044 BDs that file multiple times in a year, I retain all balance sheet, audit report, and attestation report data as additional variables, leaving 25,523 BD-year observations.

INSERT TABLE 1 HERE

I merge this population of publicly available data with unaudited, non-public Financial and Operational Combined Uniform Single Report Part II or IIA (FOCUS) reports as accessed in December 2016. These financial reports include a balance sheet, income statement, and several regulatory calculations.[9] Managers periodically file these reports throughout the year. I merge the FOCUS data for the month or quarter matching the audited annual report. As FINRA removes FOCUS data when a company terminates operations, and not all designated examining authorities permitted data access, 754 *Audit Analytics* observations are unusable. I also remove 1,834 publicly owned BD observations.[10] After removing 5,114 records with missing variables, my sample includes 17,821 BD-year observations covering 3,807 unique BDs and 880 unique audit firms. For

[7] When BDs omit required forms or disclosures from their SEC submission, BDs either refile that form or the full report. As the SEC often posts these re-submissions in separate EDGAR files, Audit Analytics records each filing separately. As the SEC does not allow any BD to redact the statement of financial condition (balance sheet), observations missing total assets are incomplete filings (e.g., a previously omitted form). If *Audit Analytics* presents total liabilities, I hand-collect total assets (16 observations).

[8] Results are not sensitive to dropping the latter of the fiscal year-ends.

[9] In the BD industry, the statement of financial condition and the statement of income refer to the balance sheet and income statement, respectively. I refer to the computation of net capital and the computation of reserve requirements as regulatory calculations. Refer to SEC forms X-17A-5 Part II and X-17A-5 Part IIA for details.

[10] Including public BDs does not change the inferences drawn from my tests. Public company auditor changes are too infrequent for cross-sectional analysis.

H1 audit firm size tests, I only use observations where the BD changes audit firms, leaving 1,774 observations from 1,451 unique BDs and 417 audit firms.

For H2 partner specialization tests, I further limit my sample to BDs who change to an audit firm that the PCAOB selects for inspection in the year of the change.[11] This allows me to group BD audits by signing partner and measure specialization.[12] The remaining sample has 568 observations from 515 unique BDs, 304 audit partners, and 136 audit firms.

Variables and Models

Managers must file the unaudited FOCUS reports within 17 business days of the closing date (SEA Rule 17a-5(a)(2)). This requirement and timeline also applies for the fiscal year end when, absent an extension, the BD must also file an audited annual report by the 60th calendar day. I use these reports to identify pre-audit and audited net capital and set ADJUST equal to one for each BD with a Net Capital difference between the two reports that is at least five percent.[13] The Net Capital calculation starts with net assets and then applies risk and liquidity adjustments following SEA Rule 15c3-1. This measure supports regulator identification of BDs with insufficient amounts of safe and liquid assets. Informal conversations with practitioners support this materiality benchmark as similar to those used by auditors. Refer to Online Appendix section I for detail on how I select the pre-audit and audited reports.

[11] Annually inspected audit firms submit all BD client information every year. Triennially inspected audit firms under the issuer inspection program submit all BD client information at least every third year. Firms that do not also audit issuers are under no requirement to be inspected on a regular schedule. "The selection of firms for inspection took into consideration the number of broker or dealer audits performed by the firms, whether they also issued audit reports for issuers, risk characteristics based on previous inspection results, as well as other risk characteristics, to obtain a cross section of firms that perform audit and attestation engagements of brokers and dealers and of the brokers and dealers" (PCAOB 2016). Oxford defines cross-section as "typical of a larger group."

[12] Unlike public company audits, PCAOB Form AP does not publicly reveal BD partner identities

[13] I set the minimum audit adjustment threshold at 5% of the lowest required net capital ($5,000 * 5% = $250). Results are not sensitive to this minimum. All variables are summarized in Appendix A.

I enhance audit quality identification by (1) controlling for a manager's propensity to misstate by structuring research around auditor changes, and (2) using material adjustments. Although the decision to change auditors is endogenous, these design choices reduce risk.[14] Related concerns are further reduced because audit firms manage their risk exposure, and selectively avoid risky clients with poor reporting quality (Bedard et al. 2017; Johnstone and Bedard 2004). This makes it less likely that large audit firms will associate with clients that misstate their pre-audit reports, inviting audit adjustments. Further, using only material adjustments addresses the concern that a larger audit firm's reputation and relative negotiation power could push BDs to record detected misstatements. This choice effectively removes the influence of manager preferences as an auditor who does not qualify their opinion when management reports a known material misstatement is not providing high audit quality, regardless of prior effectiveness in finding the uncorrected misstatements.[15]

The following OLS specification tests H1:

$$ADJUST_{it} = \beta_1 \times \Delta AUDSIZE_{it} + \alpha_t + \gamma \times Controls_t + \varepsilon_{it} \quad (1)$$

AUD_CHANGE equals one when Audit Analytics shows a change in auditor and I limit the sample to these observations.[16] Audit researchers often use Big N to proxy for auditor size (e.g., DeFond et al. 2017; Lennox and Pittman 2010; Zang 2012). As the Big N audit only 11 percent of private BDs, and the incentives and competencies should increase monotonically with firm size, I code AUD_SIZE as the number of CPAs working for a firm, in thousands, as reported in the PCAOB's Registration, Annual and Special Reporting (RASR) database. I calculate the

[14] Refer to discussion of AUD_SIZE in the H1 Results section for further discussion of endogenous matching.
[15] In the sample period, *Audit Analytics* reports every BD audit opinion as unqualified.
[16] I manually review audit firm mergers, acquisitions, and name changes as described in Online Appendix section II.

difference between the current AUD_SIZE and the BD's previous auditor as ΔAUD_SIZE. A positive coefficient on β_1 supports H1.

In addition to year fixed effects (α_t) that absorb temporal trends in ADJUST, I employ a set of controls. First, I use AUD_SIZE as described above. The natural log of grossed up revenue from the FOCUS report (LN_BD_SIZE) proxies for BD size.[17] GROWTH is the difference between current and prior year BD_SIZE divided by the prior year. Profitability (ROS) is pre-audit net income divided by revenue. LEVERAGE is pre-audit liabilities divided by assets, and ΔLEVERAGE is the difference from the prior year.[18] As new owners could change auditors and affect management misstatement, ΔMAJ_OWN equals one when the majority owner's interest began during the year as described in Online Appendix section III. BDs that maintain custody of customer assets, or clear trades, must follow the SEC's Customer Protection Rule, both reflecting and increasing their complexity. Therefore, NON_EXEMPT BD equals one when the BD either does not claim an exemption provision,[19] or submits a reserve requirement computation (SEA Rule 15c3-3).[20] Suggesting greater business complexity, LN_ BUS_TYPES is the natural log of authorized lines of businesses recorded on FINRA's BrokerCheck as accessed in August 2015. Two variables control for the company's propensity to both misstate on the 17th business day and subsequently correct the misstatement. First, UNAUD_CORR equals one for BDs that correct any

[17] LN_BD_SIZE is effective for several reasons. First, as BDs often redact revenue from public disclosure, other archival studies use firm assets, number of employees, or both to proxy for size (e.g., Charoenwong et al. 2022, Cook et al. 2020, Kowaleski et al. 2020, 2022, and Schnader et al. 2019). Still, many BDs generate revenue with off-balance customer assets rather than firm assets. Thus, making use of proprietary FOCUS data allows a revenue-based size control. Next, the standardized FOCUS reports net certain losses from revenue and reduces the size proxy. I assert that greater size allows greater gains and losses. Therefore, I apply the uniform decision to gross-up all main revenue lines, i.e., 3940, 3950, 3952, 3955, 3960, 3970, 3975, 3980, 3985, 3990, and 3995. I use the greater of the grossed-up calculation or the reported total revenue to avoid aggregation or omission issues.

[18] I winsorize select variables following their distribution as described in Appendix A. Results are robust to winsorizing at 1st and 99th percentiles or not at all.

[19] i.e., FOCUS Part II lines 4550, 4560, 4570, and 4580 are all false.

[20] i.e., any one of FOCUS Part II lines 4430, 4472, 4490, 4510, or 4520 is non-zero.

unaudited FOCUS report during the year, except when that correction relates to the audited year-end or is submitted within 21 days of the audit report, acknowledging potential auditor involvement.[21] Second, PY_ADJUST equals one when the BD recorded a prior year adjustment. Standard errors are clustered by audit firm and by BD. Using OLS facilitates easy interpretation of coefficient magnitudes and reported results are not sensitive to this choice.

I test H2 by adding PSPEC to Equation (1). PSPEC is the natural log of BDs audited by a single partner in a given year. A positive (negative) coefficient on this measure suggests that when BDs select partner specialists, they are more (less) likely to record material audit adjustments. For this test, I cluster standard errors by audit firm and by partner.[22] Prior literature lags the partner client count measure (Ittonen et al. 2015; Zerni 2012). As I lack complete panel data for partner identification, I measure concurrent specialization and maintain sample size. Using prior year partner data does not affect inferences but does drop most of the sample.

IV. RESULTS

Summary Statistics

Table 2 panel A presents summary statistics for the samples used to test H1 and H2. Variables are winsorized but not transformed or deflated to ease interpretation. On average, the H2 sample includes larger audit firms with more and bigger BD clients. Panel B presents an auditor change matrix summarizing audit adjustments across predecessor and successor auditors.[23] This matrix shows preliminary evidence that BDs that change to larger (smaller) audit firms are more

[21] 21 days reflects the average midpoint between the initial FOCUS filing and the audit report date used to classify FOCUS corrections as audit adjustments in audit periods.
[22] Less than ten percent of BDs appear in the sample twice. Dropping the earlier or the latter observation does not change reported results.
[23] ANNUAL includes BDO, Crowe Horwath, Deloitte & Touche, Ernst & Young, Grant Thornton, KPMG, MaloneBailey, Marcum, RSM, and PricewaterhouseCoopers. TRIENNIAL (NO_ISSUERS) includes all other audit firms with (no) issuer clients.

(less) likely to record material audit adjustments than they were with the predecessor audit firm, e.g., in the 254 instances where a BD changed from a TRIENNIAL to a NO_ISSUER audit firm, 28.3 (18.9) percent of BDs recorded audit adjustments under the predecessor (successor) audit firm. Bold font emphasizes that the current year percentage is higher when switching to a larger firm and the prior year percentage is higher when switching to a smaller firm. Finally, Table 3 presents Pearson moment correlations. The matrix reports a positive and significant correlation between ΔAUD_SIZE and ADJUST, and a negative and significant correlation with PSPEC, supporting H1 and H2 respectively. Variable (18) reports correlations using 568 observations; all others use 1,774.

INSERT TABLES 2 AND 3 HERE

H1: Auditor Size and Audit Quality

Table 4 tests H1, that changing to a larger or smaller auditor impacts audit adjustment likelihood. Column 1 finds BDs that change to a larger (smaller) audit firm are more (less) likely to record a material audit adjustment with no controls or fixed effects in the model. Column 2 adds the full vector of controls. The main specification, column 3, adds year fixed effects. Finally, column 4 changes the functional form from OLS to a logit model. Results are consistent across specifications. I examine economic significance by interpreting the coefficient from column 3, which suggests that if the previous audit firm had one thousand fewer CPAs, a material audit adjustment would be one percent more likely. As one standard deviation for ΔAUD_SIZE is 3,125 CPAs and the sample mean is 22 percent, this effect is economically significant. Online Appendix Table A1 shows that this relationship is robust to different variables, including logarithmically transformed and discrete size variables, and a narrower set of negative audit adjustments.

Collectively, analyses show the relationship between ΔAUD_SIZE and ADJUST is economically significant and robust to both model and variable design.

INSERT TABLE 4 HERE

I begin examining control variables by noting that columns 2 and 4 report that larger audit firms are negatively associated with audit adjustments at moderate significance. Corroborating evidence, however, suggests the negative relationship does not mean low audit quality: Table 2 Panel B reports the lowest current year ADJUST rate for BDs with an annually-inspected-firm predecessor (16.5 vs. 22.4 and 24.1 percent for TRIENNIAL and NO_ISSUER firms, respectively). This association also exists in a sample that includes recurring engagements (r = -0.053). This pattern reveals that companies that hire large audit firms often have superior pre-audit reporting quality as prior literature would predict (e.g., Johnstone and Bedard 2004). Consequently, using audit adjustments both shows the pattern described by the endogenous matching argument and also helps address the threat (e.g., Lawrence et al. 2011; Li et al. 2022). That is, the companies that hire large audit firms are less likely to misstate the financials subject to audit and therefore less likely to encounter audit adjustments. This pattern biases against the reported finding, an insight revealed by studying first year audit and adjustments.

I interpret other control variables that associate with ADJUST with statistical significance. Unsurprisingly, the recent misstatement and correction of unaudited Net Capital (UNAUD_CORR, PY_ADJUST), provides the strongest predictor of audit adjustments. Higher GROWTH also predicts more audit adjustments. Aside from a positive and moderately significant coefficient on ΔMAJ_OWN in column 3, effects of other control variables are not statistically significant.

H2: Partner Specialization and Audit Quality

Table 5 tests H2, examining whether partner specialists perform different audit quality. Column 1 finds BDs that change to a partner specialist are less likely to record a material audit adjustment with no controls or fixed effects in the model. Column 2 adds the full vector of controls. The main specification, column 3, adds year fixed effects. Finally, column 4 changes the functional form to a logit model. Results are consistent across specifications. I examine the economic significance of this logarithmically transformed variable by using the column 4 logistic regression. I fix all independent variables at their logit sample means from column 4. I then compare the 25th to the 75th percentile of PSPEC (ln(3 CPAs) vs ln(16 CPAs). This predicts an audit adjustment is 5.5 percent less likely when changing to a specialist auditor, as opposed to a non-specialist (15.2 vs. 20.7 percent). Other control variables behave similar to the auditor size tests, discussed above.

INSERT TABLE 5 HERE

Online appendix Table A2 shows that this relationship is robust to different specialization measures. Column 1 shows that following extant literature by artificially imposing a discrete distribution at the 95th percentile by partner-year does not affect inferences. Untabulated analyses repeat this approach using the 90th percentile of PSPEC with slightly stronger t-stats. Using a continuous measure behaves like market share when set to one industry. Because market size varies by year, I also test sensitivity in untabulated analyses by calculating the share by year and show unchanged results. To follow prior literature that lags specialization measures while also maintaining sample size under data constraints, column 2 uses lagged PSPEC for the most recent prior year with available data, and not necessarily the previous year. This drops half the sample but results remain. Column 3 uses only the prior year lagged PSPEC. Though the relationship remains statistically significant, the PSPEC coefficient nearly doubles from those reported in Table 5 and raises sample risk concerns from dropping nearly three-quarters of observations.

I measure specialization with each partner's log client count to align with client demand effects and also with prior literature (Ittonen et al. 2015; Zerni 2012). Still, Aobdia, Siddiqui, and Vinelli (2019) measure partner specialization with audit fee market share and this is also true for a plurality of firm- and office-level studies (Audousset-Coulier et al. 2016). Though BDs do not publicly report audit fees, using summed log-sales for each partner's clientele reflects the positive but concave relationship between fees and client size. The untabulated association between each partner's summed log-sales and audit quality is also negative and statistically significant. In summary, the relationship between specialization and ADJUST is economically significant and robust to model and variable design.

Audit Firm Size and Partner Specialization

Table 6 column 1 examines whether the relationship between ADJUST and specialization varies with audit firm size. The positive and statistically significant coefficient on the interaction variable suggests that specialists from larger firms provide higher audit quality than specialists from small firms. This pattern follows a client demand explanation, i.e., clients with greater demand for audit quality tend to hire larger audit firms (Francis and Wilson 1988; Lennox 2005; Guedhami, Pittman, and Saffar 2009), and it appears that clients with weak demand for auditing hire low quality auditors, who in turn gain industry market share.

INSERT TABLE 6 HERE

To more directly consider whether PSPEC improves audit quality in large firms, I compute the inflection point for the negative relationship between PSPEC and ADJUST. Imputing specialization at the 95th percentile suggests that audit quality increases with partner specialization in firms with more than 6,370 CPAs. To examine this inference, columns 2 and 3 split the sample at audit firms larger and smaller than 6,370 CPAs, respectively. Column 3 shows a negative and

statistically significant coefficient on PSPEC in small firms, but not in large firms. Noting the unequal cell sizes, columns 4 and 5 repeat the tests splitting on the sample median (audit firms with 368 CPAs). Again, a negative and statistically significant coefficient exists in the small firms, and not the large firms. Untabulated analyses find the same pattern when bifurcating with (non) Big 4 firms and those that (do not) audit issuers. As no regressions report a positive coefficient on PSPEC, analyses do not suggest that large-firm partner specialists outperform their non-specialist peers.

Additional Analysis

Role of Audit Fees and Hours

I use audit fees and hours to examine how auditor size and partner specialization affect audit quality. I access this non-public audit hour and fee data for all of a firm's BD engagements in years when the PCAOB selects an audit firm for inspection. ΔAUD_FEES% and ΔAUD_HOURS% equal the difference between current and prior year fees and hours divided by the prior year amount. From the H2 sample, I drop observations missing current or prior year fee or hour data. This leaves 246 observations spanning 235 unique BDs, 164 partners and 73 audit firms.

Equation (2) modifies (1) by replacing ADJUST with ΔAUD_FEES% and adding PSPEC. For (3), ΔAUD_FEES% becomes a predictor variable and ΔAUD_HOURS% the new dependent variable. In (4) ΔAUD_FEES% and ΔAUD_HOURS% are predictor variables and ADJUST is the dependent variable. Each model, shown below, clusters standard errors by audit firm and partner. Table 7 presents test results.

$$\Delta AUD\_FEES_{it} = \beta_1 \times \Delta AUDSIZE_{it} + \beta_2 \times PSPEC_{it} + \alpha_t + \gamma \times Controls_{it} + \varepsilon_{it} \quad (2)$$

$$\Delta AUD\_HOURS_{it} = \beta_1 \times \Delta AUDSIZE_{it} + \beta_2 \times PSPEC_{it} + \beta_3 \times \Delta AUD\_FEES_{it} + \alpha_t + \gamma \times Controls_{it} + \varepsilon_{it} \quad (3)$$

$$ADJUST_{it} = \beta_1 \times \Delta AUDSIZE_{it} + \beta_2 \times PSPEC_{it} + \beta_3 \times \Delta AUDFEES_{it} + \beta_4 \times \Delta AUDHOURS_{it} + \alpha_t + \gamma \times Controls_{it} + \varepsilon_{it} \quad (4)$$

INSERT TABLE 7 HERE

As expected, increasing fees correlates with increasing hours (column 2). Furthermore, increasing hours correlates with more audit adjustments (column 3). To consider whether the relationship between audit hours and adjustments is mechanical, I explore the Pearson moment correlation between ADJUST and ΔAUD_HOURS% in all recurring audit relationships. As both winsorized and unadjusted correlations are insignificant (r = -.018, p = .4177, n=2,090),[24] I infer that the significant correlation when changing audit firms reflects different audit processes, and not solely increased time spent documenting detected misstatements.

Changing to a larger audit firm correlates with increased fees (column 1), increased hours after controlling for fees (column 2), and more audit adjustments after controlling for fees and hours (column 3). These results illustrate the H1 finding by showing associations consistent with an argument that larger audit firms improve audit quality through increasing fees and hours. Furthermore, findings suggest that changing to a larger audit firm improves audit quality incremental to the effect through audit hours. These incremental effects suggest that larger firms use their time more effectively. It is not clear that this results from better quality control systems, firm knowledge resources, greater auditor independence, or some other explanation.

Column 1 shows that partner specialists charge lower fees and decrease hours even after controlling for the decrease in fees, as shown in column 2. Finally, column 3 shows no evidence that partner specialists use their time more effectively after cutting hours. Because decreasing

[24] In untabulated analyses of all recurring engagements, regressing ADJUST on ΔAUD_HOURS% with all Equation (1) control variables shows no evidence of a positive relationship (b=-0.065, p=.384, n=1,980).

hours predictably correlates with fewer audit adjustments, analyses suggest that partners have achieved greater market share by prioritizing BD preferences for fee reduction over the fundamental professional principle that auditors assure financial statements are free of material misstatement

Restatements

Although restatements can indicate low audit quality, BDs restate only one percent of all audited reports. In fact, only 21 BDs that change auditors restate that year's report.[25] Therefore, these analyses abandon the auditor change design in favor of a levels model, adapting Equation (1) by dropping ΔAUD_SIZE and substituting RESTATE for ADJUST. RESTATE equals one when a BD restatement changes Net Capital by greater than five percent, as detailed in Online Appendix section I.

INSERT TABLE 8 HERE

Table 8 column one shows that AUD_SIZE is significantly and negatively associated with restatements, as expected. Column 2 finds the same relationship among the narrower set of BDs that change audit firms. Next, columns 3 and 4 substitute PSPEC for AUD_SIZE and observe no evidence of an effect in the full or auditor change samples.[26] Collectively, these results provide evidence consistent with H1, but results should be interpreted cautiously as the levels model does not adequately control for the management reporting quality that H1 analyses show is correlated with auditor selection.

Uncorrected Misstatements

[25] Note that each restatement is linked to a smaller audit firm, i.e., not Big 4 or other annually-inspected audit firms. Therefore, the inferences drawn from this sample match those drawn from the levels model described here.
[26] For these tests, I cluster standard errors by BD and audit firm. Because the partner findings are not significant, I perform no further control by partner.

This study develops the first audit adjustment dataset for privately owned companies spanning hundreds of audit firms in the U.S. To my knowledge, I am the first to use an auditor change design for an audit adjustment study. This design reduces susceptibility to management reporting quality and also facilitates a useful contrast of the successor and predecessor auditors. Because my analyses find that audit adjustments increase when switching from smaller audit firms, I conclude that smaller audit firms sign unqualified opinions on more misstated financial statements than do large firms. To support this conclusion, I assume some base rate of material misstatements that recur when left uncorrected. In this way, I estimate that the clients of firms who audit no issuers materially misstate 5.5 percent more of their audited financials than do the firms that also audit issuers.[27] Conversely, only 1.2 percent of these BDs restate their audited financials. This provides an estimate of the number of materially misstated financial statements that are never corrected. This estimate understates total uncorrected misstatements because not all misstatements recur and auditors do not design their audits to detect 100% of material misstatements, but instead to provide reasonable assurance.

V. CONCLUSIONS

I study whether predictions based on incentives and competence generalize to a weak audit incentive setting, the US BD market. I find that industry specialist partners provide lower audit quality than non-specialists. As this result contrasts with the industry specialization literature, differences in incentives and auditor selection likely explain the disparity. That is, extant literature often measures specialization using clientele-based proxies that require the auditor to be hired. To be hired, an auditor must provide a service that appeals to potential clients at an acceptable price.

[27] I compute these estimates by comparing the 314 changes from an audit firm with no issuer clients to a firm that also audits issuers. Specifically, I compare the new auditor's audit adjustment rate to the prior year (.255-.200), as presented in Table 2 Panel B.

In this industry, where BDs have weak incentives to demand audit quality, low quality auditors are able to thrive. This reveals that client-based specialization measures also proxy for clientele incentives to demand audit quality.

Results also suggest that larger audit firms provide higher audit quality, even under weak demand and supply incentives. Had there been no detectable auditor size effect, results would have suggested that competence does not develop without sufficient incentives. This study does not, however, say that competence develops without incentives for several reasons. First, one expects that BDs who hire larger audit firms have greater demand for audit quality than other BDs. Second, though supply incentives are weak, there remains some level of reputation, litigation, and regulatory risk. As PCAOB oversight increases regulatory risk, future research could study whether the BD auditor size effect exists before PCAOB entry. More broadly, one expects weak incentives exist in other settings among otherwise unwanted mandatory audits. Identifying these audits for both privately- and publicly-owned companies, especially across time, would advance further study of related incentive questions.

Finally, by studying audit quality using audit adjustments, this paper tests the fundamental principle that auditors assure financial statements are free of material misstatement. In this way, the paper advances a wider look at BD audit quality that includes control attestation quality (Schnader et al. 2019), two-sided matching in the BD audit market (Cook et al. 2020), and regulatory changes (Bedard et al. 2014; Bedard et al. 2017; Kowaleski et al. 2018). Broad evidence supports an argument that weak demand and supply incentives reduce BD audit quality. This argument's foundation lies in the SEC mandate that all BDs undergo an annual audit with limited incentives for the BD to hire a quality auditor. Recognizing audit quality problems, the U.S. government created a costly, dedicated inspection program operated and overseen by the PCAOB.

Although demand problems remain, some evidence suggests BD accounting and audit quality has improved under PCAOB oversight (Ballew 2019; Bedard et al. (2017); Kowaleski et al. 2018).[28] Still, regulators and legislators propose limiting PCAOB oversight to reduce costs (FINRA 2018; U.S. Congress 2018a; 2018b). This study recommends considering audit incentives when evaluating the merits of potential changes.

[28] Ballew (2019) shows improved accounting quality at commercial banks with BD affiliates after the PCAOB initiates inspections of BD audits, suggesting improvements at the BD as well.

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APPENDIX A

Variable	Definition	Source
ADJUST	= 1 if audited net capital minus pre-audit net capital > 5 percent of pre-audit net capital; 0 otherwise. Refer to text for expanded description.	AA/SEC/ FOCUS
ANNUAL	= 1 if audit firm is inspected annually under the PCAOB's public company inspection program.	RASR
AUD_CHANGE	=1 if BD changed audit firm.	AA
AUD_SIZE	= total CPAs in firm, in thousands (PCAOB Form 2; part 6.1b).	RASR
GROWTH	= current minus prior year BD_SIZE divided by prior year amount. Winsorize at 95th pctl.	FOCUS
LEVERAGE	= pre-audit: total liabilities / total assets. Winsorize at 1st and 99th pctl.	FOCUS
LN_BD_SIZE	= natural log of pre-audit gross revenue, as described in text.	FOCUS
LN_BUS_TYPES	= natural log count of authorized lines of business.	BCHECK
NEG_ADJ	= 1 if ADJUST reduces net capital; 0 otherwise.	
NO_ISSUERS	= 1 if audit firm reports having no issuer clients in annual registration.	RASR
NON_EXEMPT	= 1 if BD maintains custody of customer assets; 0 otherwise. Refer to text for expanded description.	FOCUS
PY_ADJUST	= ADJUST from prior year.	
ROS	= pre-audit: net income / revenue. Winsorize at 5th and 99th pctl.	FOCUS
PSPEC	= natural log count of BDs audited by partner.	PCAOB
TRIENNIAL	= 1 if audit firm reports having issuer clients in annual registration but is not annually inspected under the PCAOB's public company inspection program.	RASR
UNAUD_CORR	=1 if any BD corrected FOCUS filing for a non-audit period and not within 21 days of audit report; 0 otherwise.	FOCUS
ΔAUD_FEES%	= current minus prior year audit fees divided by prior year amount.	PCAOB
ΔAUD_GROUP	= -1 when the BD makes a downward change among annual, triennial, and no issuer auditors; 1 when upward.	AA/RASR
ΔAUD_HOURS%	= current minus prior year audit hours divided by prior year amount.	PCAOB
ΔAUD_SIZE	= new minus previous AUD_SIZE, if BD changes auditor; 0 otherwise	RASR
ΔLEVERAGE	= current minus prior year LEVERAGE. Winsorize at 1st and 99th pctl.	FOCUS
ΔMAJ_OWN	= 1 when owner with >50 percent ownership has a “position start” or “relationship established” date within year preceding audit report.	BCHECK
i and t	= BD and year indicators, respectively.	

Appendix A presents variable definitions and sources. AA = Audit Analytics. SEC indicates manual collection of audited reports that receive confidential treatment from the SEC. FOCUS indicates non-public, unaudited report. BCHECK is FINRA's public BrokerCheck database as accessed in Aug 2015. RASR indicates the PCAOB's public Registration, Annual, and Special Reporting database. PCAOB indicates non-public data reported by inspected audit firms.

TABLE 1
Sample Selection

Total entries in Audit Analytics, 2010 - 2015	27,119
Less: Missing total assets (Net of 16 manually collected)	(342)
Less: Missing from EDGAR or wrong entity report (e.g., subsidiary)	(8)
Less: Multiple fiscal year ends for same BD	(68)
Less: Exact match duplicates	(134)
Less: Multiple entries for BD, same fiscal year end	(1,044)
Full Population	25,523
Less: Missing FOCUS Part II or IIA report	(754)
Less: Publicly owned BD	(1,834)
Less: Missing in-year or lag variables: revenue, auditor size, net capital, etc.	(5,114)
BD-Year obs (3,807 unique BDs, 880 auditors)	17,821
Auditor changes among BD-Year obs (1,451 unique BDs, 417 auditors)	1,774
Auditor changes with partner data (515 BDs, 304 partners, 136 firms)	568

Table 1 presents the sample selection process, summarized for H1 and H2 tests.

TABLE 2
Summary Statistics

Panel A: Descriptive Statistics

	(1) *N = 1,774*			(2) *N = 568*		
Variable	*Mean*	*Median*	*Std Dev*	*Mean*	*Median*	*Std Dev*
ADJUST	0.22	0.00	0.41	0.21	0.00	0.40
NEG_ADJ	0.15	0.00	0.36	0.14	0.00	0.35
AUD_SIZE	1,002	16	2,740	2,497	368	4,068
ΔAUD_SIZE	-300	-3	3,125	148	3	4,475
PSPEC				16	6	24
TRIENNIAL	0.43	0.00	0.49	0.37	0.00	0.48
NO_ISSUERS	0.42	0.00	0.49	0.26	0.00	0.44
ΔAUD_GROUP	-0.03	0.00	0.69	0.10	0.00	0.72
BD_SIZE	4,149,840	382,369	25,800,000	9,670,682	702,780	44,400,000
GROWTH	0.60	0.03	1.76	0.52	0.02	1.64
ROS	-0.77	0.00	3.13	-0.70	0.01	3.04
LEVERAGE	0.29	0.22	0.26	0.32	0.26	0.27
ΔLEVERAGE	0.01	0.00	0.18	0.02	0.00	0.17
NON_EXEMPT	0.04	0.00	0.19	0.07	0.00	0.25
M&A	0.04	0.00	0.20	0.07	0.00	0.25
BUS_TYPES	5.95	5.00	4.34	6.33	5.00	4.46
UNAUD_CORR	0.28	0.00	0.45	0.28	0.00	0.45
PY_ADJUST	0.21	0.00	0.41	0.18	0.00	0.39

Panel B: Audit Adjustments by Predecessor and Successor Auditor

	From ANNUAL			*From TRIENNIAL*			*From NO_ISSUERS*			*Total*		
		ADJUST			ADJUST			ADJUST			ADJUST	
To:	n	PY	CY	n	PY	CY	n	PY	CY	n	PY	CY
ANNUAL	137	16.1%	14.6%	81	14.8%	**22.2%**	46	19.6%	**30.4%**	264	16.3%	19.7%
TRIENNIAL	137	**19.7%**	16.8%	354	23.7%	24.9%	268	20.1%	**24.6%**	759	21.7%	23.3%
NO_ISSUERS	65	**23.1%**	20.0%	254	**28.3%**	18.9%	432	19.9%	23.1%	751	23.0%	21.4%
Total	339	18.9%	16.5%	689	24.4%	22.4%	746	20.0%	24.1%	1,774	21.5%	22.0%

Table 2 panel A presents descriptive statistics for all variables described in Appendix A for the full audit firm changes sample and those with partner identification. Variables are winsorized, but not transformed or deflated. Panel B shows the mean prior year (PY) and current year (CY) ADJUST by predecessor and successor auditor group when there is an auditor change. Bold font described in text.

TABLE 3
Correlations

Num	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	ADJUST	1.00																
(2)	NEG_ADJ	***0.79***	1.00															
(3)	AUD_SIZE	-0.02	-0.02	1.00														
(4)	ΔAUD_SIZE	***0.06***	***0.05***	***0.48***	1.00													
(5)	TRIENNIAL	0.03	0.00	***-0.25***	***-0.18***	1.00												
(6)	NO_ISSUERS	-0.01	0.01	***-0.31***	-0.04	***-0.74***	1.00											
(7)	ΔAUD_GROUP	***0.05***	***0.04***	***0.19***	***0.44***	***0.25***	***-0.48***	1.00										
(8)	LN_BD_SIZE	0.03	0.01	***0.28***	0.02	0.00	***-0.19***	***0.04***	1.00									
(9)	GROWTH	***0.06***	***0.06***	***-0.05***	0.02	0.00	***0.04***	0.02	***0.10***	1.00								
(10)	ROS	***0.04***	0.02	0.01	0.02	-0.02	0.02	-0.01	***0.60***	***0.14***	1.00							
(11)	LEVERAGE	***0.06***	0.02	***0.12***	0.04	-0.02	***-0.06***	0.02	***0.34***	-0.04	***0.06***	1.00						
(12)	ΔLEVERAGE	0.04	-0.01	-0.01	0.03	0.01	0.01	0.04	0.00	***0.09***	***-0.04***	***0.39***	1.00					
(13)	NON_EXEMPT	-0.03	-0.03	***0.16***	0.00	0.00	***-0.10***	0.03	***0.18***	-0.04	0.03	***0.21***	0.02	1.00				
(14)	M&A	-0.02	-0.02	***0.15***	***0.09***	-0.03	***-0.07***	***0.08***	***0.07***	***0.08***	0.01	***0.06***	0.03	***0.05***	1.00			
(15)	LN_BUS_TYPES	***0.06***	***0.06***	0.04	0.01	0.03	***-0.06***	0.02	***0.30***	***-0.14***	***0.13***	***0.25***	0.01	***0.09***	0.04	1.00		
(16)	UNAUD_CORR	***0.10***	***0.07***	-0.01	0.03	0.01	0.00	***0.04***	***0.06***	-0.01	0.03	***0.08***	0.01	***0.06***	***0.06***	***0.12***	1.00	
(17)	PY_ADJUST	***0.26***	***0.23***	***-0.06***	-0.02	0.01	0.04	***-0.06***	0.03	0.01	***0.07***	***0.07***	-0.01	***-0.06***	-0.01	***0.07***	***0.11***	1.00
(18)	PSPEC	***-0.11***	-0.06	***-0.35***	***-0.21***	***-0.10***	***0.58***	***-0.36***	***-0.19***	0.03	-0.01	-0.03	0.05	***-0.11***	***-0.07***	***-0.11***	-0.01	-0.05

Table 3 presents Pearson moment correlations. Variable 18 shows correlations using 568 observations; all others use 1,774. Bold and italicized font marks two-tailed 10 percent significance. Variables presented are defined in Appendix A.

TABLE 4
The Effect of Audit Firm Size on Audit Quality

	(1) ADJUST	(2) ADJUST	(3) ADJUST	(4) ADJUST
ΔAUD_SIZE	0.746**	0.997***	0.942***	0.071***
	[2.55]	[3.16]	[2.95]	[2.68]
AUD_SIZE		-0.539*	-0.455	-0.044*
		[-1.67]	[-1.39]	[-1.82]
LN_BD_SIZE		-0.145	-0.095	-0.006
		[-0.26]	[-0.17]	[-0.15]
GROWTH		1.339**	1.256**	0.080**
		[2.16]	[2.06]	[2.35]
ROS		0.165	0.208	0.014
		[0.39]	[0.50]	[0.42]
LEVERAGE		6.06	6.148	0.385
		[1.41]	[1.42]	[1.47]
ΔLEVERAGE		3.116	3.44	0.17
		[0.46]	[0.50]	[0.42]
NON_EXEMPT		-5.296	-5.641	-0.387
		[-1.04]	[-1.10]	[-0.95]
ΔMAJ_OWN		-5.673	-6.789*	-0.401
		[-1.39]	[-1.67]	[-1.36]
LN_BUS_TYPES		1.791	1.816	0.111
		[1.36]	[1.38]	[1.31]
UNAUD_CORR		6.360***	6.486***	0.377***
		[2.79]	[2.82]	[2.87]
PY_ADJUST		24.234***	23.630***	1.236***
		[8.08]	[7.95]	[8.69]
Year FEs	No	No	Yes	Yes
BD-Years	1,774	1,774	1,774	1,774
R-sq. (Col 4: pseudo R-sq.)	0.003	0.083	0.089	0.076

Table 4 column 1 models ADJUST as a function of ΔAUD_SIZE when a BD changes its audit firm. Columns 2 and 3 follow Eq. (1) by adding controls and year fixed effects, respectively. Reported below the coefficients are t-statistics calculated with standard errors clustered by BD and audit firm. Column 4 adjusts the functional form using logistic regression and reports z-statistics below the coefficients. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively. See Appendix A for variable definitions.

TABLE 5
The Effect of Partner Specialization on Audit Quality

	(1) ADJUST	(2) ADJUST	(3) ADJUST	(4) ADJUST
PSPEC	-3.500***	-3.402***	-3.307**	-0.227***
	[-2.74]	[-2.67]	[-2.58]	[-2.63]
ΔAUD_SIZE		1.127***	1.072***	0.086**
		[3.03]	[2.78]	[2.56]
AUD_SIZE		-0.542	-0.513	-0.048
		[-1.26]	[-1.10]	[-1.57]
LN_BD_SIZE		-0.485	-0.454	-0.031
		[-0.65]	[-0.59]	[-0.63]
GROWTH		0.438	0.498	0.031
		[0.48]	[0.56]	[0.57]
ROS		0.384	0.403	0.029
		[0.75]	[0.77]	[0.76]
LEVERAGE		4.577	3.546	0.338
		[0.78]	[0.61]	[0.87]
ΔLEVERAGE		8.292	8.588	0.476
		[0.74]	[0.77]	[0.63]
NON_EXEMPT		-9.929	-10.172	-0.866
		[-1.54]	[-1.57]	[-1.37]
ΔMAJ_OWN		-11.914**	-12.382***	-0.809**
		[-2.57]	[-2.76]	[-2.30]
LN_BUS_TYPES		1.18	1.226	0.071
		[0.49]	[0.51]	[0.43]
UNAUD_CORR		10.768**	10.594**	0.663**
		[2.22]	[2.20]	[2.18]
PY_ADJUST		24.609***	24.558***	1.321***
		[4.58]	[4.66]	[5.11]
Year FEs	No	No	Yes	Yes
BD-Years	568	568	568	568
R-sq. (Col 4: pseudo R-sq.)	0.012	0.110	0.113	0.106

Table 5 column 1 models ADJUST as a function of PSPEC when a BD changes its audit firm. Columns 2 and 3 follow Eq. (1) by adding controls and year fixed effects, respectively. Reported below the coefficients are t-statistics calculated with standard errors clustered by BD and audit firm. Column 4 adjusts the functional form using logistic regression and reports z-statistics below the coefficients. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively. See Appendix A for variable definitions.

TABLE 6
The Effect of Partner Specialization on Audit Quality

	(1) ADJUST	(2) ADJUST	(3) ADJUST	(4) ADJUST	(5) ADJUST
SPEC X SIZE	0.633***				
	[3.11]				
PSPEC	-4.032***	-1.136	-3.345**	-1.668	-4.523**
	[-2.89]	[-0.41]	[-2.23]	[-0.67]	[-2.54]
AUD_SIZE	-1.344**	2.614	2.13	-0.536	-11.358
	[-2.53]	[1.47]	[1.05]	[-1.07]	[-0.23]
Year FEs	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
BD-Years	568	114	454	291	277
R-sq.	0.116	0.226	0.15	0.147	0.194

Table 6 column 1 shows that the relationship between ADJUST and specialization varies with audit firm size, suggesting that specialists in larger audit firms perform better. To examine whether PSPEC improves audit quality in large firms, column 2 (3) partitions on large (small) firms as described in the text. Column 4 (5) partitions on above (below) median firms. Reported below the coefficients are t-statistics calculated with standard errors clustered by BD and audit firm. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

TABLE 7
Audit Firm Size, Partner-Specialization and Audit Quality: The Role of Fees and Hours

	(1) ΔAUD_FEES%		(2) ΔAUD_HOURS%		(3) ADJUST	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
ΔAUD_FEES%			0.778***	[6.15]	-0.846	[-0.23]
ΔAUD_HOURS%					4.644*	[1.80]
ΔAUD_SIZE	0.077***	[7.45]	0.062***	[3.60]	1.168*	[1.75]
AUD_SIZE	-0.001	[-0.09]	0.041**	[2.31]	-0.928	[-1.14]
PSPEC	-0.107**	[-2.40]	-0.165***	[-3.61]	-1.113	[-0.49]
LN_BD_SIZE	0.059**	[2.30]	0.004	[0.12]	-0.9	[-0.56]
GROWTH	0.087***	[3.45]	0.03	[0.75]	-1.129	[-0.83]
ROS	-0.017	[-0.76]	0.009	[0.45]	0.792	[0.72]
LEVERAGE	-0.07	[-0.28]	0.293	[1.04]	-5.468	[-0.52]
ΔLEVERAGE	0.728*	[1.97]	0.704	[1.26]	13.103	[0.74]
NON_EXEMPT	-0.159	[-0.83]	-0.572*	[-1.76]	-9.448	[-1.19]
ΔMAJ_OWN	0.666**	[2.03]	-0.119	[-0.48]	-14.479	[-1.65]
LN_BUS_TYPES	0.067	[1.04]	0.036	[0.55]	5.788	[1.43]
UNAUD_CORR	0.365**	[2.43]	0.085	[0.71]	9.086	[1.20]
PY_ADJUST	0.096	[0.66]	0.054	[0.28]	26.010***	[3.01]
YEAR FE	Yes		Yes		Yes	
BD-Years	246		246		246	
R-sq.	0.3673		0.6127		0.1803	

Table 7 examines BDs who change auditors with fee and hour data available both preceding and following in the change. Column 1 fits Eq. 2 on dependent variable ΔAUD_FEES%. Column 2 fits Eq. 3 on dependent variable ΔAUD_HOURS%. Column 3 fits Eq. 4 on dependent variable ADJUST. Reported below the coefficients are t-statistics calculated with standard errors clustered by audit firm and partner. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively. Appendix A shows variable definitions.

TABLE 8
Audit Firm Size, Partner-Specialization and Restatements

	(1) RESTATE	(2) RESTATE	(3) RESTATE	(4) RESTATE
AUD_SIZE	-0.061***	-0.154***		
	[-5.93]	[-3.23]		
PSPEC			-0.053	-0.044
			[-0.59]	[-0.29]
Year FEs	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
BD-Years	17,821	1,774	5,888	568
R-sq.	0.006	0.009	0.005	0.036

Table 8 column 1 (3) models RESTATE as a function of AUD_SIZE (PSPEC) using the full sample with available data. Columns 2 and 4 repeat these tests using only years when a BD changes its audit firm. Reported below the coefficients are t-statistics calculated with standard errors clustered by BD and audit firm. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively. See Appendix A for variable definitions.

Online Appendix to:

Weak Incentives for Audit Quality: Evidence from Broker-Dealers

November 2022

This online appendix describes how certain variables are designed, and tabulates additional procedures and analyses not reported in the paper.

I. Audit adjustments and restatements

As stated in the text, I exploit the timing difference between the unaudited FOCUS report that must be filed 17 business days from the closing date and the audited report that is not due until the 60th calendar day following fiscal year-end to identify audit adjustments. As BDs may submit multiple unaudited FOCUS or audited reports, I examine the timeline and compare contents to reduce the number of changes improperly coded as adjustments or restatements.

INSERT FIGURE A1 HERE

The FOCUS report is due by the 17th business day. I count days between this due date and the first submitted audited annual report and then calculate the midpoint.[29] I classify the latest submission before the midpoint as the pre-audit report (*Base_FOCUS* in Figure 1) due to the greater likelihood the correction was identified by management. Any correction submitted after the midpoint would be attributable to the auditor. I also run my analysis without considering re-submission timing and note that my results are not sensitive to this design choice.

As noted in Table 1, I only remove exact match duplicate observations. I retain the rest for comparison to FOCUS reports to inform selection in a way that reduces the likelihood of improperly coding an *Audit Analytics* data error as an audit adjustment. Multiple BD submissions do not always reflect an update as, for example, many re-submissions include a previously forgotten form, or even a report for an improperly labeled BD affiliate or subsidiary. To reduce this noise, I select the latest FOCUS report filed up to one day after the first SEC submission, compare to all SEC reports filed within seven days of each other, and pick the SEC report that is most similar to FOCUS across total assets, total liabilities, net capital, and minimum required net capital. I designate this report as the initial audited report.

[29] I winsorize this calculation at the 95th percentile to allow similar auditor entry in spite of seriously delayed reports.

I then employ targeted procedures to reduce data errors. First, I check if a difference between FOCUS and SEC reports can be explained by failing to adjust for financial statements reported "in thousands" or "in millions" and adjust accordingly.[30] If not, I explore whether missing a single digit from the reported number can explain the difference. As this data error could trigger improper classification as an audit adjustment or restatement, I review all annual reports with a decrease of 90 percent or more, unless also supported by *FOCUS_SEC1*, and manually change all incorrect fields.[31]

Finally, an audit adjustment cannot be identified if *Audit Analytics* misses recording the variable or the BD requests that net capital receive confidential treatment from the SEC. Therefore, I note all observations missing net capital and hand collect missing variables from either the public or confidential SEC reports, when available.

As stated above, multiple BD submissions do not always reflect an update as many include a partial re-submission for a previously forgotten form, or even a report for an affiliate of the BD. Therefore, when BDs submit multiple SEC reports within seven days of each other, I assume insufficient time has passed to suggest restatement. After discarding other reports filed in the same week as *SEC1*, I designate the final SEC submission as *SEC2*. I set RESTATE equal to one when any difference between *SEC1* and *SEC2* is greater than 5 percent of net capital. BDs can also restate through a FOCUS submission. Therefore, I designate the final FOCUS report, if submitted more than seven days after *SEC1*, as *Final_FOCUS*. Mirroring the process above, I set RESTATE equal to one when *Final_FOCUS* differs by greater than 5 percent of net capital. Each design choice in this appendix reduces the likelihood of false positives for ADJUST and RESTATE.

[30] I multiply the SEC number by 1,000 (1M) and check if the difference is less than 2,000 (2M) of the FOCUS number. If yes, I correct the *Audit Analytics* data.
[31] I set 90 percent based on trial supported criteria (e.g., 59 is 10 percent of 590; 100 – 10 = 90).

II. Audit Firm Changes

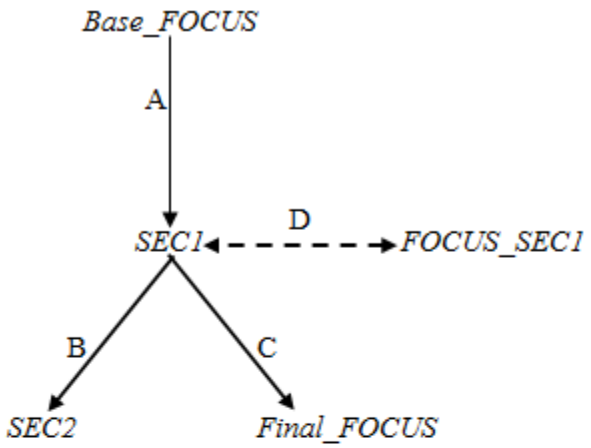
Audit Analytics records the name of the signing audit firm. If the audit firm name is different than the previous year, AUD_CHANGE would be coded as one. This difference could be attributable to the client changing audit firms, or it could be a continuing client relationship with an audit firm that was acquired, merged, or simply changed its name. I perform manual procedures to reduce the noise in these measures.

First, I use year over year changes in a BD's Audit Analytics "Auditor - PCAOB Registration Number" to identify audit firm changes. This field links with the public PCAOB Form 2 filings obtainable by firm on the PCAOB Registration, Annual and Special Reporting database. A firm that changes its name will continue to use its registration, but an acquired firm will adopt the acquirer's registration. To identify these acquired or merged firms and their eventual registration number, I perform targeted procedures over firms that exit the market. If a firm with more than two clients exits the market during my analysis phase, 2010-2015, I look at the next year's auditor using Audit Analytics data for each former BD client. If a critical mass moves to the same audit firm, I explore the possibility that this firm was acquired by or merged with the new firm. To conclude, I use some combination of the old audit firm's website, the new audit firm's website, a google news search or judgment using the old and new firm names (e.g., if the previous auditor is "John, Paul, George, and Pete LLP", the new auditor is "John, Paul, George, and Ringo LLP", and if the latter firm did not previously exist, I consider this a recurring engagement). If I determine the firm was acquired, merged, or simply changed its name, I do not code AUD_CHANGE as one.

III. Ownership Information

I obtain information from FINRA's BrokerCheck as accessed in August 2015. BrokerCheck discloses direct and indirect owners (own through an intermediary) with their ownership range. Ownership range is disclosed as one of six options: (A) Less than 5%, (B) > 5% but less than 10%, (C) > 10% but less than 25%, (D) > 25% but less than 50%, (E) > 50% but less than 75%, and (F) > 75%. To assign specific ownership values, I adapt the Dimmock, Gerken, and Marietta-Westberg (2015) process that considers range disclosures of all owners. Starting with group F (>75%), I count the number of owners within each other range and multiply that count by the high and low constraints. I then select the midpoint of that calculation and ensure it is within the disclosed range. Using this assigned value, I repeat the process for each smaller group until I have assigned values for all groups. I verify assignments by checking that ownership sums to 100 percent for each BD. I peer through the ownership structure and assign values to the ultimate indirect owner using this same algorithm at each intermediary. For any majority owner (>50 percent ownership) with a "position start date" or "relationship established" within the year preceding the audited report, ΔMAJ_OWN equals one.

FIGURE A1
Audit Adjustments and Restatements Visual



Base_FOCUS - Either initial unaudited FOCUS Report (17th Business Day) or FOCUS Correction soon thereafter

SEC1 - Audited Annual Report (by 60th calendar day if not granted extension)

SEC2 - Amended Audited Annual Report (> 7 days after *SEC1*)

Final_FOCUS - Final submitted FOCUS Correction

FOCUS_SEC1 - I select the latest FOCUS report before SEC1 filing + 1 day, OR subsequent FOCUS report that is more similar to SEC1

I compare net capital across submissions, as follows:

A - If $|SEC1 - Base\_FOCUS| \geq |Base\_FOCUS * .05|$, $ADJUST = 1$

B - If $|SEC2 - SEC1| \geq |SEC1 * .05|$, $RESTATE = 1$

C - If $|Final\_FOCUS - SEC1| \geq |SEC1 * .05|$, $RESTATE = 1$

D - Used to identify questionable *ADJUST* for further manual review

TABLE A1
Robustness of Audit Firm Size on Audit Quality

	(1) ADJUST	(2) ADJUST	(3) NEG_ADJ
LN_AUD_SIZE	-0.829*		
	[-1.69]		
LN_ΔAUD_SIZE	1.164***		
	[3.00]		
TRIENNIAL		2.572	
		[0.79]	
NO_ISSUERS		2.539	
		[0.68]	
ΔAUD_GROUP		4.154***	
		[2.62]	
AUD_SIZE			-0.297
			[-0.95]
ΔAUD_SIZE			0.741**
			[2.53]
Year FEs	Yes	Yes	Yes
Controls	Yes	Yes	Yes
BD-Years	1,774	1,774	1,774
R-sq.	0.09	0.09	0.072

Table A1 investigates the robustness of the Table 4 results. Column 1 logarithmically transforms AUD_SIZE and then calculates the difference between predecessor and successor LN_AUD_SIZE as LN_ΔAUD_SIZE; column 2 uses discrete size variables including ΔAUD_GROUP, which equals one when the BD makes an upward switch, negative one when the BD makes a downward switch, e.g., from TRIENNIAL to NO_ISSUERS, and zero otherwise; and column 3 uses dependent variable NEG_ADJ to be sure the ADJUST is consequential. Reported below the coefficients are t-statistics calculated with standard errors clustered by BD and audit firm. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

TABLE A2
Robustness of Partner Specialization on Audit Quality

	(1) ADJUST	(2) ADJUST	(3) ADJUST
PSPEC (95TH PCTL)	-9.572***		
	[-2.86]		
PSPEC (MOST RECENT)		-4.448**	
		[-2.45]	
PSPEC (LAGGED)			-7.261**
			[-2.14]
Year FEs	Yes	Yes	Yes
Controls	Yes	Yes	Yes
BD-Years	568	222	125
R-sq.	0.115	0.209	0.239

Table A2 provides robustness analyses for the partner specialization measure. The dependent variable is ADJUST. Column 1 uses a dichotomous measure of PSPEC set at the 95th percentile. Column 2 uses PSPEC measured in the most recent year. Column 3 requires the lagged PSPEC comes from year t-1. Standard errors clustered by audit firm and partner. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively. Appendix A defines PSPEC and other control variables.