Consequences of Audit Office Reputation Shocks Due to Gains and Losses of Major Industry Clients*

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Draft Date: April 13, 2015

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ABSTRACT

Audit engagement offices of leading accounting firms that lose (gain) a major industry client experience a reputation shock resulting in more *same-industry* client losses (gains) during the next two years. There is also a shift in audit fees charged to other same-industry clients when a major client loss (gain) results in an office losing (gaining) city-level industry leadership, which is evidence of a causal relation between industry leadership and fee premia. A major client loss/gain also creates a short-term shock to an audit office's capacity to supply high-quality audits: specifically, offices that lose clients have excess capacity and earnings quality improves for the office's same-industry clients, while offices that gain clients have capacity constraints that lead to lower quality audited earnings for same–industry clients. There is no evidence of reputation/capacity spillovers to other industries in the office, or to other offices of the accounting firm.

JEL Codes: D40, L11, M20, M40

Keywords: Auditor Reputation; Auditor Changes; Audit Quality; Audit Fees; Earnings Quality

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I. Introduction

Audit contracting takes place between a client and an audit partner in a local engagement office of the accounting firm that administers the audit and which issues the audit report on the audit office's letterhead (Wallman [1996]). Audit office characteristics are important in understanding auditing and the city-specific nature of audit markets. We contribute to this body of research by examining the consequences of auditor-client realignments.[1] Specifically, we investigate the reputation effect of a voluntary auditor change by a major industry client on the audit office's future ability to retain/attract clients, the subsequent effect of these clientele shifts on audit pricing, and the quality of audited earnings for the office's other clients. Prior work has explored negative auditor reputation effects in three relatively rare events: a high-profile audit failure, regulator-identified accounting firm deficiencies, and an audit firm collapse.[2] In contrast, our investigation centers on the routine reputational shocks that occur, both positive *and* negative, when an engagement office loses or gains a major industry client due to a voluntary auditor change.

[1] A growing body of research documents audit office characteristics associated with audit quality. For example, auditors report more conservatively when a client is large relative to overall engagement office size (Reynolds and Francis [2000], Li [2009]); a fee premium exists for engagement offices with city-specific industry expertise (Ferguson et al. [2003]); larger engagement offices are more likely to issue going concern audit reports and have fewer client restatements, which are suggestive of higher quality audits (Francis and Yu [2009], Choi et al. [2010], Francis and Michas [2013], Francis et al. [2013]); and the quality of client's audited earnings is higher for offices with city-specific industry expertise (Reichelt and Wang [2010]).

[2] One stream of research examines the effect of a high-profile audit failure on the audit firm's ability to attract and retain clients. For example, Skinner and Srinivasan [2012] examine an audit failure in Japan (Kanebo) for the Japanese PWC affiliate ChuAoyama; and Weber, Willenborg and Zhang [2008] examine the effect of an audit failure (ComROAD AG) on the German practice of KPMG. A second research stream examines the effect of regulator-identified audit deficiencies on the audit firm's ability to attract/retain clients. For example, Wilson and Grimlund [1990] examine the effect of SEC enforcement actions; Hilary and Lennox [2005] examine the effect of negative reports from the AICPA's Public Oversight Board inspection program; and Lennox and Pittman [2010] and Boone, Khurana and Raman [2015] analyze the consequences of negative PCAOB inspection comments and reports. A third stream of research examines the effect of a major audit firm collapse on its clients' market value (Menon and Williams [1994], Chaney and Philipich [2002]), or the analysis of where the failed firm's clients went and why (Blouin, Grein and Rountree [2007]).

Our first research question asks if the loss or gain of a major client in an industry sector results in herding by other clients in that industry, consistent with economic theories of herding (Scharfstein and Stein [1990]). In other words, does the reputation shock from the loss of a major industry client lead to more same-industry client losses in the future, and does the gain of a major client increase the ability of the office to subsequently attract more clients? We refer to this as a "contagion." While our main focus is on "same-industry" effects, we also test for broader contagion and herding effects on the office's other-industry clientele and other offices of the accounting firm. In order to rule out the possibility that omitted audit office level effects drive our results, we conduct counter-factual tests of contagion in which we examine whether auditor changes by *non-major* clients also results in herding.

Our second research question examines if the reputation shocks of major client losses/gains affect future audit fees for an office's clientele. Do fees increase (decrease) for same-industry clients following a major client gain (loss) due to the office's enhanced (diminished) reputation for industry expertise? Lastly, our third research question examines how the quality of audited earnings for an office's clientele is affected following a major client loss/gain. A major client loss can result in short-term excess labor capacity that improves audit quality by eliminating workload compression and time-budget pressures widely believed to reduce audit quality (Panel on Audit Effectiveness [2000], Public Company Accounting Oversight Board [2010]). Correspondingly, a major client gain could create a short-term labor capacity constraint that harms audit quality by exacerbating the workload compression problem.

We analyze voluntary auditor changes by the largest firms in industry sectors as these firms represent the kind of "high profile clients" for which an auditor change is most likely to create a reputation shock to engagement offices and subsequent herding behavior by other

audit clients. Results are robust to alternative measures of the most prominent firms in industry sectors. In addition, major client auditor changes are limited to those that are voluntary and which are undertaken for positive reasons to obtain a better fit between the firm's needs and the auditor's expertise (Francis and Wilson [1988], Johnson and Lys [1990], DeFond [1992], Cahan et al. [2008]). To accomplish this we eliminate three types of major client changes that have unclear effects on auditor reputations: auditor resignations; auditor changes following the receipt of a going concern opinion (opinion shopping); and auditor changes where the switching client achieves both lower fees and reduced earnings quality in the year immediately following the switch (fee and quality shopping). These restrictions eliminate approximately 10 percent of the major industry client auditor changes in the sample, though results are unchanged if we include these auditor changes in the sample.[3]

We obtain firm financial data from Compustat and auditor data from Audit Analytics. The final sample consists of 31,262 total firm-year observations between 2001-2013 that receive an audit opinion from a Big 6 auditor (the Big 4 plus Grant Thornton and BDO Seidman). Results are robust to using just Big 4 auditors. The sample includes 257 major

[3] We also read the 8-K's to determine the reason for the auditor change. However, 8-K disclosures typically use generic boiler plate language and for most auditor changes the 8-K provides no explanation of the reason for an auditor change, which is why we use the approach described in the text to screen out suspect auditor changes potentially undertaken for opportunistic reasons and which have unclear implications for auditor reputations. Here is a representative example of boiler plate language in Apple's 8-K dated February 26, 2009:

"The Audit and Finance Committee of the Board of Directors (the "Audit Committee") of Apple Inc. (the "Company") has completed the process it undertook in accordance with its previously announced policy to review the appointment of the Company's independent registered public accounting firm every five years. Pursuant to this policy, the Audit Committee conducted a competitive process to select a firm to serve as the Company's independent registered public accounting firm for the remainder of fiscal 2009. The Audit Committee invited several firms to participate in this process, including KPMG LLP ("KPMG"), the Company's independent registered public accounting firm since fiscal 1997. As a result of this process and following careful deliberation, on February 26, 2009, the Audit Committee engaged Ernst & Young LLP ("EY") as the Company's independent registered public accounting firm for the remainder of the fiscal year ending September 26, 2009, and dismissed KPMG from that role. KPMG's audit reports on the Company's consolidated financial statements as of and for the fiscal years ended September 28, 2008 and September 29, 2007 did not contain an adverse opinion or a disclaimer of opinion and were not qualified or modified as to uncertainty, audit scope or accounting principles."

industry client gains and 237 major industry client losses for Big 6 offices. The major client switches in the study have an average increase in audit fees of 5.2 percent, and an average increase in earnings quality of 12.8 percent, which are consistent with these switches being undertaken for positive reasons rather than opportunistic opinion and fee/quality shopping, and therefore more likely to create a reputation shock and subsequent herding behavior.

The empirical findings are as follows. First, audit offices that lose (gain) a major client in an industry sector in period *t* are statistically more likely to have additional same-industry losses (gains) in the following two periods, consistent with reputation shocks and economic theories of herding. Importantly, this result holds for offices irrespective of whether an office is a city-specific industry leader or not, indicating that all audit offices that have major industry client shocks subsequently experience changes in their ability to retain/attract same-industry clients. In economic terms, when there is a major client loss (gain) in period *t* we find that same-industry firms are 66 percent (68 percent) more likely to dismiss (engage) the audit office in the next period *t+1*, compared to offices with no major client loss/gain. The effects appear to be limited to the office's same-industry clients as there is no evidence of broader herding spillover to other industries in the same office, or to the firm's other offices.

Findings from counter-factual tests provide no evidence that herding occurs following the gain/loss of clients that are *not* major industry clients, nor when an auditor switch is associated with auditor resignations or opinion and fee/quality shopping. This evidence suggests our findings are unlikely to be driven by unobserved office level effects.

The second set of tests focus on how auditor offices dynamically adjust audit fees following major client losses/gains. Auditors losing a major industry client subsequently decrease audit fees for the office's other same-industry clients (10.1 percent fee reduction),

but only when the client loss causes the office to lose its city-level industry leadership status. Similarly, audit offices gaining a major industry client subsequently increase audit fees for the office's other same-industry clients (9.5 percent fee increase), but only when the gain results in the office becoming the city-level industry leader. Thus by examining short-term shocks to a change in an office's leadership status and thus reputation, we are able to provide evidence of a causal relation between city-level industry leadership and audit fee premia. In contrast, the extant literature has mainly documented a statistical association between city-level industry leadership and audit fee premiums (e.g., Ferguson et al. [2003], Francis et al. [2005], Numan and Willekens [2012]).

Third, we analyze if major client losses/gains affect an office's level of resource utilization and capacity constraints, which consequently affect the quality of audited earnings for the office's same-industry clients. For offices that lose (gain) a major industry client, the quality of audited earnings improves (declines) for same-industry clients in the office in the next two periods. We corroborate the shift in earnings quality by documenting a corresponding shift in earnings persistence. Further analysis indicates that these results are driven by the smallest 75 percent of audit offices where the fees related to a major client loss (gain) represent approximately 26.5 (31.2) percent of the office's total audit fees, compared to only 7.4 (7.2) percent for the largest quartile of audit offices. Thus, capacity in larger offices is less likely to be affected by a major client loss/gain, whereas smaller offices will experience a more extreme capacity shock following a major client loss/gain.

Taken together, the evidence adds significantly to our understanding of the dynamic nature of city-level audit markets and the effects of reputation shocks to audit offices, as well as the consequence of a major client loss/gain on an audit office's capacity to conduct high-quality audits. To underscore the importance of this dynamic, in the majority of cases a major

client loss causes an audit office to lose its status as city-specific industry leadership, while a major client gain results in the office becoming the city-specific industry leader. Our findings are robust to alternative definitions of industry classifications, alternative proxies to identify leading firms in industries, the use of multiple measures of earnings quality from prior research, and the inclusion of industry, year and audit firm fixed effects, in addition to a standard set of control variables.

The study is likely to be of interest to regulators, accounting firms and audit clients. Furthermore, our findings contribute to multiple streams of auditing and accounting research. First, a key difference in our study relative to other auditor change studies is that we examine the effect of an auditor switch on the audit office's set of clients rather than the effect on the switching client, per se. Prior audit research has investigated the determinants and consequences of auditor-client realignments from the viewpoint of the switching client.[4] In contrast, we focus on the consequences of a "shock" to the audit office's reputation following a voluntary auditor change, and the office's ability to attract/retain clients as well as the effect of the shock on *changes* in the audit fees and *changes* in earnings quality of the office's other same-industry clients.[5]

[4] Determinants examined in prior studies include financial distress (Schwartz and Menon [1985]), audit fees (Barber et al. [1987]), negative audit opinions (Chow and Rice [1982], Carcello and Neal [2003]), signaling about quality, litigation risk (Krishnan and Krishnan [1997], DeFond and Subramanyam [1998], Shu [2000]), auditor and client demands for realignment (Johnson and Lys [1990], Landsman et al. [2009]), board and audit committee characteristics (Chen and Zhou [2007]), and responses to alleged audit failures or low-quality audits (Barton [2005], Landsman et al. [2009], Skinner and Srinivasan [2012]). Some of the consequences of auditor-client realignments include the effect on audit opinions (opinion shopping) (Lennox [2000]), initial engagement pricing of audits (Simon and Francis [1988]), earnings quality (Blouin et al. [2007]), and stock market reactions (Balsam et al. [2003], Knechel et al. [2007]).

[5] Our study is related to Bills et al. (forthcoming), who find that clients of offices that experience increases in workload over the prior year have greater absolute discretionary accruals as well as an increased likelihood of restatement, but the effect is transient and vanishes after one year. However, our study focuses on both office growth and contraction following a major client gain/loss, and examines contagion and fee effects as well as changes in earnings quality. In addition, we show the effect of increased (decreased) workload on earnings quality is confined to the office-industry level, and that the office-industry effect persists for two years, not just one year. In addition, a related study by Asthana and Kalelkar [2014] finds that average audit fees for an office's clients increase following another client's inclusion in the S&P 500 because the office's association with a

Second, our findings contribute to a body of work on auditor industry expertise. Extant research typically focuses on the *static* relation between auditor reputations and fee premiums, whereas our study provides evidence on the *dynamic* nature of the demand for industry expertise and fee premiums in response to short-term reputational shocks to an audit office, and how the effect is conditional on whether the office's status as the city-level industry leader alters due to the shock. Our evidence is suggestive of a causal relation, in contrast to prior research which is best described as associational in nature.

Third, our findings are relevant to understanding the determinants of earnings quality, and more specifically to auditor-related effects on earning quality (Balsam, Krishnan, and Yang [2003], Reichelt and Wang [2010], Francis and Yu [2009]). We document a new *dynamic* factor affecting earnings quality that links earnings quality to short-term shocks in the auditor's capacity due to the office's loss/gain of a major industry client. Finally, we also provide evidence that is likely to be of interest to investors: we document the existence of short-run abnormal returns from a trading strategy that shorts the clients of offices that win a major client and takes a long position in clients of offices that lose a major client. This finding suggests market participants do not appear to fully anticipate the short-term shift in earnings quality for these firms.

The remainder of the paper proceeds as follows. Section II describes the study's three hypotheses. Section III discusses the sample and research design. Section IV presents the results, and the study concludes in Section V.

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reputed client enhances the auditor's reputation and prestige and establishes a brand name for the office. Our paper is different to theirs in a number of ways. First, a key innovation in our study is that we focus on the consequences of changes in an auditor's reputation via major changes in the client portfolio, rather than auditor reactions to changes in the status of *existing* clients. Second, Asthana and Kalelkar [2014] do not examine the impact of capacity constraints because the S&P designation does not cause changes in office portfolios.

II. Empirical Predictions

Our first research question centers on the consequences of auditor changes by the largest clients in each industry sector. We argue that high-profile auditor changes create a reputation shock that results in contagion.[6] Our prediction is consistent with economic theories of herding, which is the phenomenon of following others and imitating group behavior. The theories have roots in Keynes (1930), which argues that herding occurs because people follow others that are perceived to be better informed. Subsequent models of herding are founded on Bayesian hypotheses: others' actions constitute information, which is used when adjusting probabilities and expectations. In updating their probabilities, individuals will use Bayes' rule, systematically revising their probabilistic judgments using information about others' actions, which in turn generates herding and "information cascades" (Scharfstein & Stein [1990]).

In addition to predictions from theories of herding, survey evidence indicates that CFOs value the engagement office's industry experience in selecting auditors (Carcello et al. [1992]), and empirical studies have documented the importance of industry experience and expertise in the auditor choice decision (Williams [1988], Haskins and Williams [1990], Cahan et al. [2008]). If auditor-client realignment creates a reputation shock for an audit office with respect to its industry reputation and expertise, a major client loss (gain) in period *t* will lead to further same-industry losses (gains) in the following period *t+1*. The arguments above lead to Hypothesis H1, which is stated in alternative form:

H1: An audit office that loses (gains) a major industry client in *t* is more likely to lose (gain) same-industry clients in the following period *t+1*.

[6] For example, the website "Going Concern" reported in 2011 on KPMG's New York office winning the audit of one of largest private hedge funds, Bridgewater Associates. As they noted it was a big win for New York office as "they're typically fighting for 3rd in those major bids." Available online at: http://goingconcern.com/2011/5/kpmg-lands-more-audit-work-from-bridgewater-associates.

While H1 predicts a same-industry reputation shock it is possible a major client loss/gain could have a broader herding spillover to other industry sectors in the office, or even to other offices of the accounting firm. For completeness, we test for these additional contagion effects, though we make no empirical predictions. We also undertake counterfactual tests to examine if auditor changes by non-top 30 industry clients result in contagion.

Next, we consider how audit offices adjust future audit fees for their *other same-industry clients* in reaction to a major client loss/gain. Economic theories of product differentiation (Klein and Leffler [1981]; Shapiro [1983]) suggests industry expertise is demanded and priced and are supported by empirical evidence from studies examining industry expertise in audit markets (Craswell et al. [1995], Ferguson et al. [2003], Cahan et al. [2008], Numan and Willekens [2012]). Thus, if the loss (gain) of a major industry client in period *t* diminishes (enhances) the perception of the auditor's industry expertise, then we expect that the auditor decreases (increases) fees to other same-industry clients.[7] Hypothesis H2 is stated in alternative form as follows:

H2: When an audit office loses (gains) a major industry client in *t*, the office decreases (increases) audit fees in *t+1* for same-industry clients.

As with H1, the focus in H2 is on audit offices that lose/gain a major industry client and the subsequent effect on the fees of the office's other same-industry clients. However, for completeness we also test for fee adjustment for clients in other industries in the office and in other offices of the accounting firm.[8]

[7] To illustrate, in 2012 KPMG's Philadelphia office won the audit for ViroPharma Inc (NASDAQ: VPHM; SIC 2-digit industry: 28), a major pharmaceutical company. KPMG Philadelphia had seven other clients in the same industry at the time it gained the ViroPharma audit. In the following year, audit fees for the seven other same-industry clients increased by an average of 7.9%.

[8] It is unclear if the predictions in H2 will hold. For example, if fee reductions are viewed as a signal of lower audit quality, then auditors might be reluctant to lower fees (Simunic [1980], Francis and Simon [1987]). Fee

Our third test examines how a major client loss/gain affects the quality of audited earnings for *other* clients in the auditor's portfolio. As we describe in detail in section IV below, the loss/gain of a major client results in a material change to an audit office's fee revenue and assets under audit. Our focus is not on the earnings quality of major clients that switch auditors, though our sample selection criteria dictates that switching client have an improvement in earnings quality under the new auditor. However, it is unclear what happens to audit quality for the office's *other clients* following the loss/gain of a major client. We argue that audit office capacity is significantly affected when an office loses/gains a major industry client. Offices losing a major client will have surplus capacity (excess labor) and can better avoid low-quality audits associated with the well-known workload compression and time-pressure problems (McDaniel [1990], Panel on Audit Effectiveness [2000], Public Company Accounting Oversight Board [2010], Lopez and Peters [2012]). In contrast, offices gaining a major client will experience a capacity constraint (labor shortage) that could exacerbate workload/time-pressure problem and lead to lower-quality audits for same-industry clients. Hypothesis H3 predicts the following in alternative form:

H3: When an audit office loses (gains) a major industry client in period *t*, audit quality increases (decreases) in *t+1* for the office's same-industry clients.

As with H1 and H2, the focus in H3 is on same-industry effects, but for completeness we also examine the effect on other industries in offices, as well as a national effect on other offices of the audit firm.

It is not obvious the prediction in H3 will hold. For example, offices that lose a major client may have a decrease (rather than increase) in earnings quality if auditors lower their

increases following the gain of a major client in an industry in period *t* may also be problematic. An auditor may risk losing some clients in the industry sector who are reluctant to pay a premium despite the auditor's enhanced reputation following the gain of a major industry client.

audit fees and are more accommodating of the client to ensure they do not have further client losses. For offices that gain a major client, audit quality could increase (rather than decrease) because the auditor will have more clients in an industry, which could enhance the auditor's industry expertise and thus improve the quality of audited earnings. The prediction in H3 is also dependent on the degree to which frictions reduce labor mobility, both within and between audit offices. For example, in offices that lose clients, audit quality may be unaffected if offices can reallocate their workforce to other industry sectors within the office, or to other offices, thus eliminating the short-term excess capacity. Similarly, offices that gain clients may not experience a short-term capacity constraint if they can reallocate their workforce from the audits of other industries within the office, or if they can obtain additional labor from other audit offices. The degree to which labor frictions exist or are mitigated is an empirical question, but if fully mitigated then the null hypothesis (no capacity effect) would not be rejected.

The change in audit quality is inferred from changes in the quality of audited earnings of the office's clientele, after controlling for other (non-audit) factors that may also affect earnings quality. A large body of prior work uses the statistical properties of earnings to make inferences about the quality of earnings and audits (Frankel et al. [2002], Ashbaugh et al. [2003], Chung and Kallapur [2003]).[9] The measures of earnings quality in our study are abnormal accruals and accrual estimation errors, and the findings are robust to the use of absolute total accruals to measure earnings quality (Dechow and Dichev [2002]). If an audit office has a capacity surplus (following a major client loss), then the auditor should have greater ability (and time) to detect and constrain aggressive discretionary accruals and to better identify accrual estimation error. Alternatively, if the audit office has a capacity

[9] See Francis [2011] and DeFond and Zhang [2014] for reviews of this literature.

constraint (following a major client gain), the opposite is likely to be the case and the client may succeed in exercising discretion which leads to larger abnormal accruals, or to the auditor's failure to detect accrual estimation errors.

III. Sample and Empirical Models

Sample Selection

The sample consists of all U.S. listed firms in the Audit Analytics *Audit Opinions* database from 2001 to 2013. For each firm-year observation, we identify the firm's auditor and audit office. We remove firms in the Financial Services and Utilities industries because different reporting requirements for firms in these industries affect inferences for the tests of earnings quality. We then merge firm-specific location, financial and industry data from the Compustat Annual file. To ensure the results are not driven by changes in the audit environment surrounding the collapse of Arthur Andersen, we drop all firm-year observations for Arthur Andersen's clients.[10] We also delete all firm-year observations that have missing values for the test variables, and also delete clients not audited by one of the Big 4 audit firms plus BDO Seidman and Grant Thornton, because over three-quarters of firms in top 30 percent across all 2-digit SIC industries are audited by one of these six large accounting firms. Finally, a few cases involve a client moving to another offices of the same audit firm and these are not treated as a major industry loss/gain as we believe such changes represent an internal arrangement within the client's audit firm.

In addition, we drop those major industry client gains/losses where the reputation motivation for the change is unclear: major client losses due to auditor resignation (23 major

[10] As our sample begins in 2001, the removal of all Andersen client changes in 2001 and 2002 around the firm's collapse effectively deletes all Andersen-related observations from our sample. In untabulated robustness tests, we find that our results are qualitatively similar after we remove all 2001 and 2002 observations to account for the possibility that our results are affected by second-order effects stemming from the Andersen collapse.

clients), auditor changes that result in a decline in audit fees and/or earnings quality (152 major clients), and auditor changes due opinion shopping following a going concern opinion (18 major clients). After these deletions there are 257 major industry client gains and 237 major industry client losses (two numbers differ due to movements to/from non-Big 6 auditors). The final sample consists of 31,262 firm-year observations and 5,139 unique firms, audited by 424 unique offices of Big 6 auditors. The results are qualitatively the same if we restrict the sample to those companies audited by Big 4 audit firms, or if we use all companies (and all audit firms) in the Compustat and Audit Analytics databases. Table 1 Panel A presents the sampling procedure that yields the final sample for the empirical tests.

For each year in our sample period, we identify all audit offices that experience a loss or gain of a major industry client, defined as a firm in the top 30 percent of each SIC 2-digit industry based on total assets for that year. In untabulated sensitivity tests, the results are robust to the following alternative definitions of a major industry client: (1) firms with greater than $500 million in total revenue (assets); (2) firms with assets (revenues) that are more than one standard deviation above the mean industry assets (revenues); (3) Fortune 500 firms only; (4) Fortune 1000 firms only; and (5) use of 3-digit industry classifications or Fama-French industry groups.

Empirical Models

The following logit model tests the prediction in H1 that a reputation shock occurs in period *t* when an audit office loses/gains a major industry client, and will lead to contagion in the subsequent period *t+1*:

$$\textit{Client Gain (Loss)}_{k,r,t+1} = \beta_0 + \beta_1\, \textit{Local\_Client}_{k,r,t} + \beta_2\, \textit{Local\_Client\_OtherInd}_{\neg k,r,t} + \beta_3\, \textit{National\_Client}_{k,\neg r,t} + \Sigma_m\, \theta_m\, \text{Control Variables}_t + \xi \quad (1)$$

Standard errors are Huber-White Sandwich estimators clustered by firm and audit office to

control for heteroscedasticity and serial correlation. All specifications include year, industry, and audit firm fixed effects as additional controls for the systematic effects of time period, industries and audit firms. While there may be a selection threat in any auditor choice study, the potential for selection bias is unlikely to exist in our analysis since 1) we are analyzing auditor changes and thus use the firm as its own control; and 2) we are studying the incremental effect of a client loss/gain on an audit office's next-period clientele (Minutti-Meza [2013]).

To facilitate a clear interpretation of the results, we drop the offices that obtain (lose) major industry clients in the client loss (gain) test in equation (1). We follow the same practice when we examine the effect of major client loss (gain) on audit fees and audit quality. This mechanically results in slightly different sample sizes for tests of client gains and losses. We estimate equation (1) separately for major client loss (gain) cases, and in both cases the control sample is the set of observations from offices that experience no major industry client losses/gains in the test year.

The dependent variable $Client\ Gain\ (Loss)_{k,r,t+1}$ is set to 1 if a firm in industry k changes to (from) audit office r, in period $t+1$, and 0 otherwise. $Client\ Gain\ (Loss)_{k,r,t+1}$ captures all auditor changes in period $t+1$ for an office-year, including firms in the top 30 percent of an industry, as well as other changes not in the top 30 percent. There are three audit office test variables. The primary test variable, $Local\_Client_{k,r,t}$ is set to 1 if a major industry client in industry k switches to (from) audit office r, in period t. This variable captures same-industry contagion in an office following a major client loss/gain in industry k. The second variable, $Local\_Client\_OtherInd_{\neg k,r,t}$ is set to 1 if a major industry client in another industry (not industry k), switches to (from) audit office r, in period t. This variable tests if there is a contagion effect on clients in other industries in the office following a major

client loss/gain in industry *k*. The third variable, $National\_Client_{k,\neg r,t}$ is a dummy variable set to 1 if a major industry client in industry *k*, switches to (from) another audit office of the firm (not office *r*), in period *t*. The third variable tests if there is broader contagion to other offices of the auditor following a major client loss/gain in industry *k* for office *r*.

We predict a positive coefficient for *Local_Client*, which would indicate local office contagion for same-industry clients. We make no predictions for *Local_Client_OtherInd* and *National_Client,* but we expect a larger coefficient for *Local_Client,* which would indicate a stronger contagion effect for same-industry clients at the local office relative to a broader contagion in other industries or other offices of the accounting firm.

We include a number of variables from prior literature to control for determinants of the auditor switching decision. The control variables are defined in Appendix A, and are measured at period *t*. Results are unchanged if the control variables are measure at period *t+1* instead of period *t*. Landsman et al. [2009] suggest that audit risk and financial risk of the clients are important determinants of the auditor-client alignment decisions. We capture audit risk using sales growth (Stice [1991]), the magnitude of discretionary accruals (DeFond and Subramanyam [1998]), the sum of client inventory and accounts receivable scaled by total assets (Krishnan [1994], Dao et al. [2012]), and auditor tenure (Stice [1991], Krishnan and Krishnan [1997]). We control for whether the client CEO or CFO was replaced during the three years prior to the auditor change. To the extent that the CEO/CFO turnover reflects internal control issues and potential litigation risk, auditor turnover is likely to be influenced by executive turnover. For instance, Palmrose [1987] finds that many litigation cases brought against large auditing firms involved financial reporting irregularities, including management fraud. We control for the potential litigation risk using the metric in Kim and Skinner [2012] who suggest that a firm's industry affiliation and other characteristics can

predict the likelihood of security litigation risk.[11]

Next, we control for audit client financial risk using ZScore (Lys and Watts [1994], Schwartz and Menon [1985]),[12] firm leverage, ROA, and cash holdings (Johnstone and Bedard [2004]). We include a prior year loss indicator variable as Barton [2005] suggests that poorly performing clients are likely to engage in and benefit from auditor switches. Finally, we also control for client size, the audit firm's national market share of industry assets audited (Hogan and Jeter [1999]),[13] and the issuance of significant long-term debt or equity during the three-year period prior to auditor turnover (Whisenant et al. [2003]).

The following OLS regression model tests the prediction in H2 that audit fees of other clients will change in period *t+1* after an office's major industry client lose/gain in period *t*:

$$\Delta Audit\ Fee_{k,r,t,t+1} = \beta_0 + \beta_1\ Local\_Client_{k,r,t} + \beta_2\ Local\_Client\_OtherInd_{\neg k,r,t} + \beta_3\ National\_Client_{k,\neg r,t} + \Sigma_m\ \theta_m\ \Delta\text{Control Variables}_{t+1} + \xi \quad (2)$$

Robust standard errors are Huber-White Sandwich estimators clustered by firm and office, and all models have year, industry, and auditor fixed effects.

The dependent variable $\Delta Audit\ Fee_{k,r,t,t+1}$ measures the change in logged audit fees from *t* to *t+1* for a client in industry *k* at office *r*. The fee changes are measured as the change from the end of period *t* after the office has a major client loss/gain, to the end of period *t+1* because it would most likely be the next period before the reputation shock would flow through and first affect audit fees of the office's same-industry clients. The test variables *Local_Client, Local_Client_OtherInd* and *National_Client* are as previously defined.

[11] More specifically, we use model 3 in their Table 3 (p. 302), which they conclude is "probably the most cost effective solution for researchers interested in measuring litigation risk".
[12] We find similar results if we use the probability of bankruptcy measure from Zmijewksi [1984].
[13] Prior studies show that the industry expertise of the auditor helps to reduce auditor's business risk because specialists have the requisite resources and knowledge to detect errors (Cenker and Nagy [2008], Carcello and Nagy [2002], Johnstone [2000]). Balsam et al. [2003] find that industry-specialist auditors supply higher quality services.

Regressions include controls for new clients (first-time audits), and year-over-year changes in controls for audit firm national industry share, auditor tenure, client firm size, leverage, market-to-book ratio, and return on assets.

Hypothesis H3 tests if major industry client losses/gains affect the quality of audited earnings for other clients in the office, using the following OLS regression model:[14]

$$\Delta Earnings\ Quality_{k,r,t-1,t} = \beta_0 + \beta_1\ Local\_Client_{k,r,t} + \beta_2\ Local\_Client\_OtherInd_{\neg k,r,t} + \beta_3\ National\_Client_{k,\neg r,t} + \Sigma_m\ \theta_m\ \Delta\text{Control Variables}_t + \xi \quad (3)$$

Standard errors are Huber-White Sandwich estimators clustered by firm and audit office to control for heteroscedasticity and serial correlation. All specifications include year, industry, and auditor fixed effects.

The dependent variable in equation (3) is the change in the quality of audited earnings from period *t-1* (the last period before the major client loss/gain) to period *t* when the loss/gain occurred, for a client in industry *k* serviced by audit office *r*. The change in earnings quality is measured as the change from the end of period *t-1* (before the office has a major client loss/gain) and the end of period *t*, because the capacity of the office is affected during period *t* when the client loss/gain occurs. Note that the test sample excludes major industry clients that changed auditors because our goal is to examine the effect of the major client losses (gains) on the earnings quality of the auditor's *other* clients.

All earnings quality measures are coded such that larger values indicate higher earnings quality. The first earnings quality measure (EQ1) is the change in the absolute value of abnormal accruals (Hribar and Nichols [2007]). The second measure (EQ2) is the change in performance-matched signed discretionary accruals (Ashbaugh et al. [2003], Kothari et al.

[14] DeFond and Zhang (2013) note that audit quality is an elusive concept because financial statement users can never perfectly observe the amount of assurance the auditor actually provides.

[2005]). The third measure (EQ3) is accruals estimation error and defined as the change in the industry-adjusted absolute value of the Dechow and Dichev [2002] residual, based on the cross-sectional adaptation of the model in Dechow et al. [2011]. We measure the change in each of the earnings variables from *t* to *t+1*. Details of the earnings variable definitions are discussed in Appendix B.[15]

The auditor test variables *Local_Client, Local_Client_OtherInd,* and *National_Client* are as previously defined. We employ a number of auditor-specific and firm-specific controls defined in Appendix A that are potentially correlated with the earnings quality metrics: specifically, the audit firm's national market share of industry clients (Weber et al. [2008]), auditor tenure, client firm size, leverage, market-to-book ratio, and ROA. We also include controls for innate firm-specific factors that need to be isolated from earnings quality (Francis et al. [2005]), specifically, the standard deviation of cash flow from operations for *t-4* to *t*, the standard deviation of sales for *t-4* to *t*; and the firm's operating cycle, measured in period *t*.

Sample Descriptive Statistics

Table 1 presents summary statistics. Panel A reports information about the sample selection process and descriptive data about offices that lose/gain a major industry client. A very small number of offices experience multiple major industry client losses/gains in the same year (23/28), or both the loss and gain of a major industry client in the same year (4). Results are unchanged when these observations are dropped.

[Insert Table 1 Here]

Table 1, Panel B reports audit office clientele data. The median audit office in the

[15] Because EQ1 and EQ2 are both based on abnormal accruals, as a robustness we also test the absolute value of total accruals, scaled by average assets. Results for absolute total accruals are significant and consistent with all three earnings metrics, and are reported in Section IV.

sample has 14 (4) publicly-listed clients (major industry clients), with a maximum of 138 (27). The fact that the median audit office has only four major industry clients, underscores that the gain or loss of a single major client is, on average, likely to be an important event affecting the office's reputation. There are 257 major client gains and 237 major client losses in the final sample (the two differ depending on movement to/from non-Big 6 auditors). To further underscore the importance of a major client loss/gain to an audit office, there are 424 unique audit offices in the study of which 135 had a major client gain, and 123 had a major client loss. Thus more than half of the unique offices in the study experienced at least one major client gain and one major client loss over the sample period. Further, 152 of the 257 major industry client gains (59 percent) caused audit offices to become city-specific industry leaders, and the 237 client losses caused 131 offices (55 percent) to go from the city-industry leader to a non-leader in year *t*. In other words, in a majority of cases the major client loss/gain changed the office's status as the city-specific industry leader, which again illustrates the potential impact of a major client loss/gain on audit office reputations.

Table 1, Panel C reports descriptive information on model variables for the 31,262 firm-year observations in the sample. The audit office test variables indicate that 3 percent of observations are same-industry observations in offices with a major industry client loss/gain (Local_Client). Another 10.6 percent of observations are other industries in offices with a major industry client loss/gain (*Local_Client_OtherInd*), and 19 percent of observations are major industry client losses/gain in another audit office of the accounting firm (*National_Client*).

For the control variables, the average firm has $3,448 million in *Total Assets* with a median value of $436 million. The average *ZScore* is 4.32 and the portion of new clients (first-year audits) in the sample is 8.8 percent. The mean audit firm national industry market

share is 20.6 percent. The average auditor tenure is roughly 14 years, and 16.6 percent of the firms in the sample experience a CEO/CFO change during the sample period. The unsigned absolute discretionary accruals on average are 0.123 and the median is 0.070. About 24.3 percent of sample firms experience a loss each year. The average 5-year sales growth rate is 16.2 percent and mean leverage is 17.7 percent. About 26.8 percent of total assets are represented by inventory and accounts receivable. Average ROA is -5.2 percent and the median is 3 percent. The average firm holds about 15.6 percent of its total assets in cash, and 49.1 percent of sample firms issue equity. Standard deviation of cash flow during the last 5 years is 0.107, while the standard deviation of sales is 0.341. Sample firms have an average (log) operating cycle of 4.466 or 87 days.

IV. Results

Test of H1: Major Client Losses/Gains and Next-Period Contagion

Table 2 presents the test of H1 for next-period contagion following a major industry client loss/gain. As we drop the offices that gain (lose) major industry clients in the client loss (gain) tests, the sample sizes for tests of client gains and losses differ slightly. All models in Table 2 are significant at $p < .01$, with Pseudo R-squared of around 16 percent. In all models there is evidence of same-industry contagion. However, there is no statistical evidence that contagion extends to other industries in the audit office, or to other offices of the accounting firm as the coefficients are insignificant at the .10 level for Local_*Client_OtherInd* and *National_Client*.

[Insert Table 2 Here]

The model in Column 1 reports coefficients from the estimation of equation (1) which predicts that contagion occurs following major client losses (Panel A) and major client gains (Panel B). In Panel A, for major client losses, the coefficient on *Local_Client* in Column 1

is positive (1.588) and statistically significant (z = 2.89, p < .01), supporting the prediction that further losses are likely to occur in the next period after a major client loss. In economic terms, an office losing a client in period *t* is 66 percent more likely to lose another same-industry client in the next period, relative to offices with no major client losses.[16]

In Column 1 of Panel B there is also evidence of contagion following a major client gain. The coefficient on *Local_Client* is positive (1.665) and statistically significant (z = 3.18, p < .01), which supports the prediction in H1 that further gains are likely after a prior-period major client gain. In economic terms, offices that gain an industry leader client in *t* have a 68 percent greater likelihood of obtaining more clients from the same industry in *t+1*, relative to auditor offices that do not gain a major industry client in the prior year.[17]

As a sensitivity analysis, a second model specification is reported in Column (2) of Panels A and B. The purpose is to determine if contagion differs between offices that are city-specific industry leaders versus non-leader offices. Loss contagion may be greater for leader offices than for non-leader offices, since the former arguably have more reputation at risk if they were to lose a major industry client. By the same logic, gain contagion may be greater for non-leader offices relative to leader offices since the former potentially have a greater incremental reputation shock relative to offices that are already the city-specific industry leader. The measurement of city-specific industry leadership is based on an audit office's clientele at the end of period t, after the effect of major client gains/losses during period t. For both client losses and gains, the test variable *Local_Client* is partitioned into two variables as follows: *Local_Client_Leader* is defined as offices that are city-specific

[16] We calculate this probability for industry leader peer firms as e^1.588/(1+e^1.588) = 0.83, and 0.5 for non-peer firm industry leaders. As such, the probability difference is (0.83-0.5)/0.5 = 66%. Alternatively, the odds ratio of the two scenarios is e^1.588/e^0 = 4.89, indicating that the former case has 4.89 times greater odds of dismissing the auditor than the latter case.

[17] We calculate the probability of following leader as e^1.665/(1+e^1.665) = 84%. The probability of not following a leader is 50%. So the probability difference is (84%-50%)/50% = 68%.

industry leaders at the end of t; and *Local_Client_Non-leader* are offices that are not city-specific industry leaders at the end of period t.

Estimation of this alternative model specification is reported in Column 2 of Panels A and B. Both of the "local office" test variables (leader/non-leader offices) are significant at $p < .01$. F-tests indicate that there are no differences between the two coefficients for either major client losses (Panel A) or major client gains (Panel B). We conclude that the reputation shock and contagion following a major client loss/gain does not differ between leader and non-leader audit offices.

In sum, the results are consistent with a large literature documenting the importance of audit offices in understanding city-specific audit markets. A new and important implication from our study is the finding that a short-term reputation shock to an audit office has a same-industry contagion from the loss/gain of a major industry client due to a voluntary auditor change, and this result holds for all offices irrespective of their industry expertise or their status as city-specific industry leader.

Control variables are largely consistent with prior studies. Landsman et al. [2009] find that in the post-Enron era firm risk factors generally lose explanatory power except for auditor tenure, loss, auditor market share, firm size, and merger activity. This is also true in Table 2 in our study, with the exception of merger activity. The coefficient on size is negative and significant, consistent with the notion that bigger clients are less likely to dismiss their auditor due to transaction costs. Coefficients on *Auditor_Share* indicate auditors with greater national-level industry market share are more likely to lose clients. Coefficients on *Auditor_Tenure* are negative and significant for client losses, and positive and significant for client gains, which suggest an auditor's firm-specific expertise develops over time and reduces the chance of dismissal and may help gain new clients in the industry (Knechel et al.

[2007]). In addition there are two other significant control variables. Top executive changes in the period prior to an auditor dismissal are positively related to the auditor dismissal (Panel A), and the level of cash holdings of the client is negatively related to auditor changes, consistent with Landsman et al. [2009].

We extend the analysis of contagion by reporting results from two counter-factual tests. The first counter-factual test centers on voluntary auditor changes undertaken by smaller firms not in the top 30 percent in industry sectors. The rationale for using firms in the top 30 percent in our main tests is that these larger clients are the ones most likely to create reputation shocks for audit offices. In contrast, we do not expect auditor changes by smaller non-top 30 firms to create a shock to an audit office's reputation (and thus would not result in contagion). We present the results in Table 3, Panel A. Our priors are confirmed, as none of the auditor test coefficients is significant at the 10 percent level when auditor changes in period *t* are restricted to non-top 30 percent industry clients.

Next we examine contagion for the sample of excluded major client gains and losses. Recall we deleted 85 major client losses and 98 major client gains due to auditor resignation, opinion shopping, and fee/quality shopping (changes that result in both lower fees and lower earnings quality). These auditor changes were deleted because the changes are involuntary in the case of an auditor resignation, or the possibility that such changes are undertaken for opportunistic reasons and thus the effect on an auditor's reputation is unclear. The deletion of these 85 major client losses and 98 major client gains in the sample results in the exclusion of 3,489 firm-year observations from the Primary sample. However, to test if there is contagion related to these particular client losses/gains, we add the 3,489 firm-year observations to the control sample of audit offices (and clienteles) where there are major client gains/losses. Table 3 Panel A reports the estimation of equation (1) for this sample.

We suppress the reporting of control variables in the interests of brevity. The results indicate no evidence of contagion for any of the auditor test variables. This also holds true if we partition *Local_Client* into leader/non-leader offices. The analysis in Table 3, Panel B indicates that contagion is not a systematic phenomenon that always occurs following a major client loss/gain; that is, there is not always a shock to the audit office's reputation, which reinforces that the findings in Table 2 are more likely to be the result of a shock to an office's reputation when the switch is voluntary and motivated for positive reasons (rather the opinion shopping and fee/quality shopping).

[Insert Table 3 Here]

In sum, the evidence in Tables 2 and 3 support three findings: (1) a contagion effect in which major client losses/gains in one period persists to the next period, consistent with voluntary auditor-client realignments creating a reputation shock that affects the demand for particular audit offices in city-specific audit markets; (2) evidence that contagion occurs for both city-specific industry leader offices, and for non-leader offices; and (3) evidence that contagion is limited to same-industry clients and does not appear to spread to other industries in the office, or to other offices of the accounting firm. The results are consistent with reputation shocks following major client gains/losses and herding behavior by audit clients in response to these reputation effects.

Finally, we examine if the reputation shocks documented in Tables 2 and 3 extend beyond one year by testing for contagion persistence to the second and third years. Untabled results indicate that there is significant second-year contagion for both major client gains and major client losses. Coefficients on *Local_Client_Leader*$_t$ and Local*_Client_Non-leader*$_t$ are significant at $p<.05$ and are comparable in magnitudes to those reported in Tables 2 and 3. However, there is no evidence of contagion in third year. Therefore we conclude there is

two-period contagion following the reputation shock of a major client gain or loss. Consistent with this finding, we also document that by the third year those audit offices with a major client loss in period *t* are statistically more likely to re-gain a client in the same industry, relative to offices with no major client losses, suggesting that the negative consequences of the initial reputation shock have worn off by the third year.

Test of H2: Major Client Losses/Gains and Changes in Audit Fees

Table 4 reports the next-period adjustment of audit fees following a major client loss/gain. H2 predicts that following the loss of a major industry client auditors will subsequently lower their fees for same-industry clients due to a negative shock to the office's reputation for industry expertise (therefore a lower industry premium). Conversely, following the gain of a major industry client in period t, H2 predicts auditors will increase same-industry fees due to the positive shock to the office's reputation for industry expertise (therefore a higher fee premium). All models in Table 4 are significant at $p < .01$, with adjusted R-squared of around 10 percent. In all models there is evidence of significant audit fee changes for the office's same-industry clients. However, there is no evidence audit fees are affected in other industries in the audit office, or to other offices of the accounting firm as the coefficients are insignificant at the .10 level for *Local_Client_OtherInd* and *National_Client*.

[Insert Table 4 Here]

Table 4, Panel A presents the results of estimating equation (2): columns 1 and 2 report the effect on fees following major client losses, and Columns 3 and 4 the fee effects following major client gains. The evidence in Column 1 confirms the prediction in H2 and indicates that next-period audit fees are significantly lower for the office's same-industry clients. The coefficient on *Local_Client* is negative and significant (t = -2.32, $p < .05$).

Column 3 confirms the prediction in H2 that audit fees increase for an office's same-industry clients, due to the office's positive reputation shock following a major industry client gain. The coefficient on *Local_Client* is positive and significant ($t = 2.39$, $p < .05$).

In Column 2 and 4, we present results of an alternative model specification in which the test variable *Local_Client* is partitioned into two variables denoted *Local_Client_Leader* and *Local_Client_Non-leader*, analogous to the contagion test in Table 2, Panel B. In Column 2, the coefficient on *Local_Client_Non-leader* is negative and significant ($t = -2.62$, $p < .01$), indicating that following a major client loss, non-leader offices reduce fees for same-industry clients. However, we find no evidence that leader offices adjust fees for same-industry clients following a major client loss. In Column 4, for offices with major client gains, the coefficient on *Local_Client_Leader* is positive and significant ($t = 2.66$, $p < .01$), indicating that leader offices increase fees for same-industry clients following a major client gain, which is consistent with a fee premium due to the office's increased reputation following a major client gain. In addition, non-leader offices have insignificant fee changes ($t = 1.55$).

In Table 4, Panel B we report an additional test to determine if the audit fee results in Panel A are driven by those audit offices that experience a change in the status of their city-level industry leadership following the loss/gain of a major industry client. We expect that such offices are likely to experience the largest incremental shocks to their reputation, and are thus more likely to have the largest audit fee adjustments. We create four indicator variables that capture the set of possible year-over-year change in an office's leadership status from period *t-1* to *t* (leader to non-leader; non-leader to leader; leader to leader; and non-leader to non-leader) and use these as alternative test variables. The coefficient estimates of this re-specification are reported in Table 4, Panel B. The empirical models include the

same set of control variables as used in Panel A, but we suppress the presentation of those coefficients in the interests of brevity.

The results indicate that the fee adjustments observed in Panel A are significant only in those audit offices that experience a change in their leader status following a major client loss/gain. Specifically, in Column 1 for the client loss sample, the only audit office variable that is significantly associated with a fee decrease is for those offices that lose their office industry-leader status following a major client loss. This finding is consistent with downward fee adjustments being driven by the office's loss of city-level industry leadership and its inability to maintain a fee premium for industry leadership/expertise. The coefficient is -1.330 and significant at $p < .01$, and the magnitude represents an average fee decrease of 10.1 percent, all else equal.[18] None of the other office industry leadership change variables is statistically significant.

In Column 2 of Panel B, the results are reported for the client gain sample. The results indicate that it is only those offices which become industry leaders following the gain of a major industry client that have increased fees, consistent with a fee premium for offices with city-specific industry leadership. The coefficient is 1.328 and significant at $p < .05$, and the magnitude represents an average fee increase of 9.5 percent, all else equal.[19]

The results in Table 4, Panel B highlight the rapid audit fee adjustments in response to a change in audit office's status as the city-level industry leader. The fee change tests in Table 4 reinforce the finding in prior research that auditors earn a fee premium for their city-level industry reputation and expertise. What is unique in our study is that we provide

[18] The fee magnitude is the coefficient divided by the average logged audit fees of the loss sample (13.12), i.e., 1.330/13.12 = 10.1 percent.
[19] For the gain sample the fee magnitude is 1.328/13.95 (average logged fees of the gain sample) = 9.5 percent increase in audit fees.

evidence of a causal (rather than associational) relation by documenting that the industry premium is dynamic and can change in just one period after an office becomes (or ceases to be) the city-level industry leader following the gain/loss of a major industry client.

Finally, as with the contagion test of H1, untabled results indicate that the audit fee adjustments documented in Table 4 persist for a second period and are of similar magnitude and significance. However, there is no evidence of further fee adjustments in the third period following a major client gain or loss.

Test of H3: Changes in Earnings Quality Following Major Client Losses/Gains

Hypothesis H3 predicts a major industry client loss (gain) will lead to a short-term increase (decrease) in earnings quality due to its effect on an audit office's capacity to conduct high-quality audits. The test of H3 is reported in Table 5. All models in Table 5 are significant at $p < .05$, and adjusted R-squared range from 7 to 11 percent. As in all prior tests, coefficients on *Local-Client_OtherInd* and *National_Client* are not significant at the .10 level for all models in Table 5 and are not discussed further.

[Insert Table 5 Here]

Consistent with our predictions, the evidence in Table 5, Panel A indicates that earnings quality increases for same-industry clients in offices that experience a major client loss (more capacity). The coefficients on all three earnings change metrics are positive and significant ($p < .05$) for both leader and non-leader offices, and an F-test indicates no differences in coefficients for the two types of offices. H3 also predicts a decrease in earnings quality for offices with a major client gain (capacity constraint), and the evidence in Panel A supports this prediction as well. The coefficients are negative and significant for both leader and non-leader offices. While the coefficients are somewhat smaller for leader offices, and significant at only the .10 level compared to the .05 level for non-leader offices, an F-test

indicates there is no statistically significant difference between the coefficients. In untabulated tests, we find qualitatively similar results if we use interaction terms instead of partitions for office type.

The above evidence is suggestive of the capacity story underlying the prediction in H3. However, in order to better identify if the change in the quality of audited earnings is driven by audit office capacity, we partition audit offices each year into the largest quartile versus all other offices based on the office's total yearly audit fees, consistent with recent studies (Francis and Michas [2013], Francis et al. [2013]). The reason for this partition is that short-term capacity surplus/constraints are more likely to affect smaller offices than larger offices. Compared to smaller office, large audit offices will be better able to absorb new clients, and larger audit offices are more likely to have greater flexibility in responding to client losses/gains due to greater organizational slack, and therefore more flexibility in dealing with the effects of short-term clientele changes.

These partitions are reported in Table 5, Panels B and C, and indicate that the full sample results presented in Panel A are driven by the 75 percent of smaller (non-largest) audit offices. More specifically, we find that all but the top quartile of Big 6 audit offices experience an increase in earnings quality following a major client loss, and a decrease in earnings quality following a major client gain. This result holds across both leader and non-leader offices, and an F-test indicates no difference between the two coefficients. In contrast, none of the auditor test variables is significant in the partition of the largest quartile of audit offices. Economically, in Panel B, for small offices that lose major clients, leader offices (*Local_Client_Leader*) observe an average increase in earnings quality ranging from 14.7 percent to 33.9 percent, while non-leader offices (*Local_Client_Non-leader*) experience an average increase in earnings quality ranging from 19.5 percent to 48.4 percent. Finally, in

Panel C for small offices with major client gains, *Local_Client_Leader* is associated with an average 16.5 percent decrease in earnings quality and *Local_Client_Non-leader* is associated with an average 20.7 percent decrease in earnings quality.[20]

While percentage increases in coefficient values are significant, they do not provide an intuitive understanding of the magnitude of the effect on earnings quality. To better gauge this we compute the change in absolute value of total accruals (scaled by average assets) for the office's same-industry clients from period *t* and to period *t+1*. For offices with a major client loss, same-industry clients have average accruals of 18.6 percent in *t*, and 17.0 percent in period *t+1,* a decrease of 1.6 percentage points or an 8.6 percent decrease. For offices with a major client loss, same-industry clients have average accruals of 18.3 percent in period *t*, and 19.2 percent in period *t+1*, an increase of 0.9 percentage point (a 4.9 percent increase). Magnitudes of these accrual changes are large enough to have a material effect on earnings per share and key financial ratios, and indicate that clients audited by offices with a major client gain have a decrease in earnings quality (larger accruals), and clients audited by offices with a major client loss experience an increase in earnings quality (smaller accruals).[21]

This is strongly suggestive of a capacity effect, and is reinforced by the magnitude of fees that these major client losses/gains contribute to total office audit fees. Table 5, Panel D reports that a major client loss represents 26.5 percent of a small office's total audit fees in the year prior to the loss, while a major client gain represents 31.2 percent of a small office's

[20] In Panel B, we calculate the magnitude as the coefficient of test variables divided by the average EQ measures for small offices (EQ1 is 0.19, EQ2 0.077, and EQ3 0.062). In Panel C, for small offices, the average EQ1 is 0.175, EQ2 is 0.074, and EQ3 is 0.066.

[21] Since most firms have sales and assets that are similar in magnitude (the correlation is over .90), a 1 percentage point increase in accruals (scaled by average assets) effectively equals around a 1 percentage point increase in accruals scaled by sales, which would correspondingly shift a firm's net profit margin by 1 percentage point, i.e., one cent of earnings per dollar of sales. Given that the average firm's net profit margin is around 5 percent, an increase or decrease in the net profit margin by one percentage point is effectively a 20 percent change in the ratio.

fees in the year of the gain. These are quite large shifts compared to large offices where major client losses and gains are rather inconsequential and represent only 7.4 percent and 7.2 percent of office fees, respectively.

In untabulated results, we also test if the effects on earnings quality documented in Table 5 persist for a second and third year. The second-year results are similar to those reported in Panel A, with an increase in earnings quality following a client loss, and a decrease in earnings quality following a client gain. As before, this result is driven by the smaller offices and is consistent for leader/non-leader offices. By the third year, none of the auditor test variables is significant. These multi-period tests on the change in earnings quality are consistent with the evidence in Table 3 for a two-year contagion effect, and in Table 5 for two-year fee adjustments following major client losses/gains.

In sum, Table 5 indicates that auditor-client realignments from voluntary auditor changes affect earnings quality for same-industry clients in the audit office for all but the largest quartile of audit office size, consistent with recent studies documenting large-small audit office differences (Francis and Michas [2013], Francis et al. [2013]). The results in Table 5 are consistent with a capacity explanation in which offices that lose a major client are able to reallocate labor resources to provide higher quality audit services for its remaining same-industry clients, and offices that gain major clients are constrained and unable to maintain audit quality in the short run. Our findings are important and extend prior research which finds that an auditor change can have consequences on the earnings quality of the firm that changes its auditor (e.g., DeFond and Subramanyam [1998]). What our evidence demonstrates is that there is also a significant spillover on earnings quality for all of the other same-industry clients in an audit office that loses/gains a major client, that the effect persists

for two years, and that the effect can either increase or decrease earnings quality, depending on whether the office loses or gains a major industry client.

Analysis of Earnings Persistence

To further substantiate the shift in earnings quality reported in Table 5, we test if there is a corresponding change in earnings persistence. For the smaller 75 percent of offices with a major client loss, the improved earnings quality documented in Table 5 should lead to an increase in earnings persistence for the office's same-industry clients, while the opposite will occur for these offices having a major client gain (reduced earnings persistence due to lower earnings quality).

To test this we compare earnings persistence for the last two periods before the loss/gain in period *t* (*t-3* to *t-2,* and *t-2* to *t-1*), with the persistence after the loss/gain (*t* to *t+1*, and *t+1* to *t+2*), where earnings are defined as income before extraordinary items. For smaller offices with a major client loss, earnings persistence is 0.650 before the loss, and 0.762 after the loss, an increase of 0.112 which is significant at $p < .01$. For offices with a major client gain, earnings persistence is 0.775 before the loss, and 0.611 after the loss, a decrease of 0.164 which is significant at $p < .01$. Thus the change in earnings persistence for same-industry clients after the office's loss/gain of a major industry client is consistent with the shift in earnings quality reported in Table 5.

Francis et al. [2005] argue that higher quality earnings provide a better signal of firm performance, and the evidence in Table 5, along with the persistence analysis repotted above, indicate a short-term change in earnings quality for an office's same-industry clients following a major client loss/gain. Next we examine if the stock market anticipates the short-term shift in the quality of the earnings quality when audit offices lose/gain a major industry client. To test this we examine market returns from a hedge portfolio in which a long position

is taken in the same-industry clients of offices that lose a major client and which experience improved earnings quality, and a short position is taken in the same-industry clients of small offices that gain a major client and which experience decreased earnings quality. The Fama-French and momentum risk-adjusted returns of an equal-weighted long-short portfolio generate an average annual return of +13.3 percent, which is significant at p = 0.079 (two-tail).[22]

To validate this analysis we conduct a counter-factual test in which a short position is taken in all clients of offices with a major client gain (not just same-industry clients), and a long position in all clients of offices with a major client loss. In this analysis the hedge portfolio has a mean return of only +3.2 percent which is not significant at the .10 level, validating that the returns for same-industry clients are distinctly different from the analysis of all clients in the office. A second counter-factual test uses the same long-short strategy for the largest quartile of audit offices that lose/gain a major client, and this yields an average return of -7.7 percent, but is not significant at the .10 level. Thus the arbitrage portfolio analysis suggests that investors may be able to realize short-term abnormal returns based on the consequences of a major client loss/gain on the quality of the earnings signal for same-industry clients of smaller audit offices due to capacity effects.

Additional Robustness Checks

In addition to the robust checks reported in previous sections of the paper, the study's results are robust to a number of additional sensitivity analyses. In the test of H1, we re-estimate equation (1) separately for each Big 6 audit firm in order to determine if the contagion results are driven by a subset of accounting firms. Unreported regression results

[22] Alternatively, if we restrict the analysis to those offices that lose or gain city-level industry leadership due to a major client loss/gain, the hedging returns are +9.8 percent and significant at p = .055.

show that the coefficient for *Local_Client* for each Big 6 firm is positive and statistically significant at the 5 percent level or less, which suggests that the contagion effect from a major client loss/gain exists for offices of each Big 6 audit firm. In addition, as already noted, the study's results are robust to using only Big 4 offices/clients, and to using all auditors/clients in the Audit Analytics database.

In untabulated sensitivity tests, the empirical results are qualitatively similar when we impose the following restrictions on the definition of major industry clients: (1) industries in which the top 30 percent of firms do not comprise at least 75 percent of total industry assets are excluded; (2) industry leaders are set to the top 15, top 20, or top 25 percent of firms in the industry based on total assets; (3) industry leaders are classified based on total revenues (rather than total assets). In addition, our empirical results are qualitatively similar if we restrict the sample to those industries where the top 30 percent firms (based on assets) represent no more than 30, 25, or 10 firms respectively in the industry, to further limit those firms classified as major industry clients. Although we use SIC 2-digit industry categories to define major clients, results are robust to using Fama-French classifications and 3-digit SIC codes to define industry sectors.

The test of changes in earnings quality is robust to the use of three different measures as reported in Table 5: two measures of abnormal accruals (EQ1 and EQ2), and a measure of accruals estimation error (EQ3). In addition to these measures we also use the absolute value of total accruals scaled by average assets as a test variable. This avoids the econometric issues associated with deriving abnormal accruals, and Dechow and Dichev [2002] document that the magnitude of accruals is a good proxy for the quality of accruals and earnings. Results using absolute total accruals are statistically significant at $p < .05$ and are consistent with all of the three measures of earnings quality reported in Table 5.

V. Conclusion

Prior research has examined the effect of a negative reputation shock from relatively rare events such as an audit firm collapse, high-profile audit failures, and regulator-identified audit deficiencies (Hilary and Lennox [2005], Weber et al. [2008], Lennox and Pittman [2010], Skinner and Srinivasan [2012], Boone et al. [2015]). We extend this stream of research by investigating the more routine and frequent reputation shocks to audit offices, *both* positive and negative, that occur when there are voluntary auditor changes by major clients in industry sectors.

We report three pieces of related evidence. First, offices of Big 6 accounting firms that lose (gain) a major industry client are likely to have further losses (gains) during the following two years. This result holds for offices that are city-specific industry leaders as well as for offices that are non-leaders. In other words, all offices experience the effects of a reputation shock and subsequent audit client behavior consistent with herding. Second, offices that lose their status as city-level industry leaders have a significant reduction in audit fees for same-industry clients over the next two period, while offices that become city industry leaders have significant fee increases for same-industry clients. These results are consistent with prior evidence of an association between city-level industry leadership and audit fee premia, but our evidence is supportive of a casual relation in which audit fee adjustments take place very quickly following a change in the office's industry leadership status, and which is indicative of highly dynamic city-specific audit markets. Third, all but the top size quartile of audit office display evidence of a "capacity shock" following the loss/gain of a major industry client that affects the quality of same-industry audits. Specifically, smaller offices that lose a major client have excess capacity that reduces adverse effects of workload compression and time-pressure on audit quality, and the same-industry

clients of these offices exhibit an increase in the quality of audited earnings for the next two years. In contrast, smaller offices that gain a major client have a capacity constraint that exacerbates workload compression and time-pressure problems, and we observe lower-quality audited earnings for same-industry clients in these offices for the following two years. Interestingly, as noted before, earnings quality of an office's "new" major industry client improves (relative to the prior auditor), but this appears to come at the expense of the office's other same-industry clients. In other words, our findings suggest that the major new client draws resources away from the office's other same-industry clients and results in lower quality audits for these other clients.

Our findings contribute to an understanding of (1) the impact of major industry client gains and losses for all audit offices, and their ability to attract and retain same-industry clients; (2) local audit market dynamics and the rapid fee adjustment that occurs when a major client loss/gain changes an office's status as the city-specific industry leader/non-leader; and (3) the implications on earnings quality due to short-term capacity effects following the loss or gain of a major industry client. Our results are likely to be of interest to accounting firms and regulators, particularly as the findings suggest a limitation to the ability of audit offices to maintain audit quality (in the short run) following the gain of a major client. More broadly, the results are of interest in understanding the determinants of earnings quality, and the role played by auditing in the production of high-quality earnings. Finally, our evidence suggests the stock market may not fully understand the short-term shift in the quality of the earnings signal due to capacity effects following an audit office's loss/gain of a major industry client.

Appendix A: Variable Definitions

Client Gain/Loss$_{k,r,t+1}$: an indicator variables set to 1 if a firm in industry *k* changes to (from) audit office *r*, in period *t+1*, and 0 otherwise, using SIC 2-digit industry categories.

Local_Client$_{k,r,t}$: an indicator variable set to 1 if a firm is in the top 30 percent of industry k (based on assets) and switches to (from) audit office *r*, in period *t*, using SIC 2-digit industry categories. Note that the variable Local_Client is partitioned into two separate variables for some tests, Local_Client_Leader and Local_Client_Non-Leader, as explained below.

Local_Client_Leader$_{k,r,t}$: an indicator variable set to 1 if a firm is in the top 30 percent of industry k (based on assets) and switches to (from) audit office *r*, in period *t*, using SIC 2-digit industry categories, and if the office is the city-specific industry leader at the end of period t (taking into account all client gains/losses for period t).

Local_Client_Non-leader$_{k,r,t}$: an indicator variable set to 1 if a firm is in the top 30 percent of industry k (based on assets) and switches to (from) audit office *r*, in period *t*, using SIC 2-digit industry categories, and if the office is not the city-specific industry leader at the end of period t (taking into account all client gains/losses for period t).

Local_Client_OtherInd$_{\neg k,r,t}$: an indicator variable set to 1 if a firm is in the top 30 percent of another industry (not industry *k*) and switches to (from) audit office *r*, in period *t*, using SIC 2-digit industry categories.

National_Client$_{k,\neg r,t}$: an indicator variable set to 1 if a firm is in the top 30 percent of industry k and switches to (from) another audit office of the firm (not office *r*), in period *t*, using SIC 2-digit industry categories.

New Client: A dummy variable set to 1 if the first-time audit of a new client.

Size: log (total assets).

ZScore: Altman's measure of bankruptcy risk, which is calculated as 1.2*(Working Capital/Total Assets) + 1.4*(Retained Earnings/Total Assets) + 3.3*(Earnings Before Interest & Tax/Total Assets) + 0.6*(Market Value of Equity/Total Liabilities) + 1.0*(Sales/Total Assets).

Auditor_Share: the auditor's national industry share, measured by the proportion of the total assets of all firms in the same SIC 2-digit industry.

Auditor_Tenure: the number of consecutive years the auditor has been engaged.

CEOCFO_Change: a dummy variable set to 1 if the target firm experiences a CEO/CFO change within 365 days of the auditor dismissal, and set to 0 otherwise.

Litigation Risk: the predicted value based on Model (3) of Table 3 in Kim and Skinner (2012, p. 302), calculated as -7.883 + 0.566 x FPS_t + 0.518 x $Assets_{t-1}$ + 0.982 x Sales $Growth_{t-1}$ + 0.379

x Returnt-1 - 0.108 x $Returnskewness_{t-1}$ + 25.635 x $Returnstddev_{t-1}$ + 0.00007 x $Turnover_{t-1}$. ROA, loss, and cash FPS = 1 if the firm is in the biotech (SIC codes 2833–2836 and 8731–8734), computer (3570–3577 and 7370–7374), electronics (3600–3674), or retail (5200–5961) industry, and 0 otherwise; Assets = log of total assets; Return = Market-adjusted 12-month stock return; Returnskewness = skewness of the firm's 12-month return; Returnstddev = standard deviation of the firm's 12-month returns. Sales Growth is current year sales less last year sales scaled by beginning of current year total assets; Turnover = daily trading volume accumulated over the fiscal year scaled by beginning of the year's shares outstanding (in thousands).

Loss: an indicator variable set to 1 if the firm experiences a loss in the prior year.

Merger: acquisitions cash flow divided by investing activity net cash flow.

Growth: geometric growth rate of sales over the prior 5 years from *t-6* to *t-1*.

Leverage: Long-term Debt divided by Total Assets.

INV+ACR: Inventory plus Accounts Receivables divided by Total Assets.

ROA: Income before Extraordinary Items divided by Total Assets.

Cash: Cash and Short-term Investments divided by Total Assets.

Issuance: a dummy variable set to 1 if the target firm issued new long-term debt or common equity greater than 10 percent of prior year's long-term debt or common equity in the three years preceding the audit switch, and set to 0 otherwise.

Market-to-book: Market value of common equity divided by the book value of common equity.

ΔAudit Fee: the change in audit fees between t and t+1.

EQ1: earnings quality metric based on absolute abnormal accruals (Hribar and Nichols 2007). See Appendix B.

EQ2: earnings quality metric based on absolute value of performance adjusted abnormal accruals (Kothari et al. 2005).See Appendix B.

EQ3: earnings quality metrics based on the adaption of the Dechow and Dichev (2002) models of accruals by Dechow et al. (2011). See Appendix B.

Σ(CFO): standard deviation of operating cash flow, measured over the previous 10 years.

σ(SALES): standard deviation of Total Sales, measured over the previous 10 years.

OperCycle: log(Days in Account Receivables + Days Sales in Inventory).

Appendix B: Earnings Quality Measures

All three measures of earnings quality (EQ) are defined such that EQ increased with larger values.

EQ1: Unsigned Abnormal Accruals (Hribar and Nichols, 2007)

We first estimate the following regression for each year and SIC 2-digit industry:

$$TACC = \alpha + \beta_1 \Delta REV + \beta_2 PPE + \xi$$

where TACC is total accruals, defined as defined as income before extraordinary items minus cash from operations divided by lagged total assets. ΔREV is the change in sales adjusted for the change in receivables, divided by lagged total assets. PPE is gross property, plant, and equipment, scaled by lagged total assets. We then calculate the abnormal accruals as the residual term in the regression, i.e., $TACC - (\alpha + \beta_1 \Delta REV + \beta_2 PPE)$, and EQ1 is the absolute value of the residual (abnormal accruals).

EQ2: Performance-Matched Discretional Accruals (Kothari et al., 2005).

We estimate abnormal accruals for each firm-year and subtract the value from the discretionary-accruals of the performance-matched firm. The modified Jones model of abnormal accruals model is estimated cross-sectionally each year using all firm-year observations in the same SIC 2-digit industry.

$$TA_{it} = \beta_0 + \beta_1 (1/ASSETS_{it-1}) + \beta_2 (\Delta SALES_{it} - \Delta AR_{it}) + \beta_3 PPE_{it} + \xi_{it}$$

where TA (total accruals) is the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization, scaled by lagged total assets; $\Delta SALES_{it}$ is change in sales; ΔAR_{it} is change in account receivable; and PPE_{it} is gross property, plant and equipment, all scaled using lagged total assets, $ASSETS_{it-1}$. Use of assets as the deflator is intended to mitigate heteroscedasticity in the residuals.

Residuals from the annual cross-sectional industry regression model in the modified Jones model are used to measure estimated abnormal accruals. We then match each firm-year observation with another firm from the same SIC 2-digit industry and year with the closest return on assets in the current year, ROA_{it} (net income divided by total assets). We define the EQ2 for firm i in year t as the abnormal accrual in year *t* minus the performance-matched abnormal accrual for year *t*.

EQ3: Mean-Adjusted Absolute Value of DD Residual (Dechow et al. 2011)

We first regress working capital accruals (WC_ACC) on operating cash flows in the current year (CFO_t), the preceding year (CFO_{t-1}), and the following year (CFO_{t+1}):

$$WC\_ACC_{i,t} = \alpha_{0,i} + \beta_{1,i} CFO_{i,t-1} + \beta_{2,i} CFO_{i,t} + \beta_{3,i} CFO_{i,t+1} + \nu_{i,t}$$

where WC_ACC = ΔCA - ΔCL - ΔCASH + ΔSTDEBT + ΔTAXES, where ΔCA = change in current assets between year *t-1* and *t*, ΔCL = change in current liabilities between year *t-1* and *t*, ΔCASH = change in cash and Short-Term Investments between year *t-1* and *t*, ΔSTDEBT = change in short-term debt between year *t-1* and *t,* and ΔTAXES = change in taxes payable between year *t-1* and *t*.

All variables are scaled by average total assets and winsorized at the 1 percent and 99 percent levels. We estimate equation (6) by year for each of the two-digit SIC industry groups. EQ3 is the absolute value of each firm's residual less the average absolute value for the corresponding industry.

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Table 1: Descriptive Statistics

Panel A presents details about the sample selection. Panel B reports data on auditor office clientele. Panel C reports descriptive statistics for sample firms, and Panel F presents industry characteristics for SIC 2-digit industries. Variable definitions are in Appendix A.

Panel A: Sample Selection

	N
Initial Sample from 2001-2013	103,978
Less:	
Observations with non-Big 6 auditors	(28,927)
Observations with Arthur Andersen	(1,274)
Observations with missing data for variables	(18,694)
Observations with foreign firms/auditors	(9,292)
Observations with clients in financial/utility industries	(11,040)
Major industry client changes due to auditor resignations	(491)
Major industry client changes following a going concern opinion	(372)
Major industry client changes with decreases in both audit fees and earnings quality	(2,626)
Final Firm-Year Sample	**31,262**
Final Sample represents:	
Unique clients	5,139
Unique audit offices	424
Auditor office-years	3,969
Number of auditor office-years in which an office has more than one major industry client loss (gain) in period t-1	23 (28)
Number of auditor office-years in which an office has both a major industry client loss and client gain in period t-1	4

Panel B: Audit Office Clientele Data

	Minimum	Bottom Quartile	Median	Top Quartile	Maximum
Total Clients in Office	1	7	14	26	138
# Major Industry Clients in Audit Office	0	1	4	8	27

Major Industry Client Losses in the Study	
Unique major client losses in final sample (and # of unique offices experiencing losses), after deleting losses due to 23 auditor resignations, 18 opinion shopping, and 152 lower fees/quality.	237 (123)
Average percentage of total office audit fees represented by a major client loss in the last period audited:	15.4%
Major Industry Client Gains in the Study	
Unique major client gains in final sample (and # of unique offices experiencing gains), after deleting 27 gains related to auditor resignations, opinion shopping, and lower fees/quality	257 (135)
Average percentage of total office audit fees represented by a major client gain in the first period audited:	16.7%

Panel C: Variables Used in Model Estimations, n = 31,262 Firm-Year Observations (See Appendix A for Variable Definitions).

	Mean	Median	Std. Dev.
Audit Office Test Variables			
Local_Client (percent coded 1)	0.030	0.000	0.172
Local_Client_OtherInd (percent coded 1)	0.106	0.000	0.308
National_Client (percent coded 1)	0.190	0.000	0.392
Control Variables			
Total Assets ($m)	3,448.11	435.87	19,103.76
ZScore	4.322	3.128	6.993
New Client (percent coded 1)	0.088	0.000	0.292
Auditor Share	0.206	0.204	0.155
Auditor Tenure	14.029	17.000	6.332
CEOCFO Change (percent coded 1)	0.166	0.000	0.285
Litigation risk	-2.117	-2.229	1.792
Discretionary Accruals	0.123	0.070	0.142
Loss (percent coded 1)	0.243	0.000	0.267
Merger (percent coded 1)	0.420	0.000	0.259
Growth	0.162	0.082	0.426
Leverage	0.177	0.120	0.211
INV+ACR	0.268	0.240	0.195
ROA	-0.052	0.030	0.276
Cash	0.156	0.097	0.173
Issuance (percent coded 1)	0.491	0.000	0.500
Market-to-book	2.810	2.010	4.083
σ(CFO)	0.107	0.072	0.105
σ(SALES)	0.341	0.267	0.217
OperCycle	4.466	4.540	0.715

Table 2: New Client Losses/Gains Following Prior-Year Major Client Losses/Gains

We present results from logit regressions that examine the effect of major industry client losses/gains in t on next-period client losses/gains in *t+1*. The dependent variable is an indicator variable set to 1 if a client dismisses (engages) their auditor in year *t+1*, and 0 otherwise. All variables are defined in Appendix A. Standard errors are Huber-White Sandwich estimators (clustered by firm and audit office). All specifications include year, auditor, and SIC 2-digit industry fixed effects. The t-statistics are reported in parentheses. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% two-tail levels, respectively.

Panel A: Contagion Effect of n = 237 Major Client Losses

	(1)	(2)
Dependent variable:	**Client Loss**	
Constant	-2.233***	-2.307***
	(-3.02)	(-3.05)
Local_Client$_t$	**1.588*** **	**-**
	(2.89)	
Local_Client_Leader$_t$	**-**	**1.413*** **
		(2.62)
Local_Client_Non-leader$_t$	**-**	**1.272** **
		(2.52)
Local_Client_OtherInd$_t$	0.220	0.172
	(1.13)	(1.33)
National_Client$_t$	0.172	0.139
	(1.16)	(0.94)
Size	-0.188***	-0.182***
	(-8.52)	(-8.50)
Zscore	0.001	0.001
	(0.33)	(0.33)
Auditor_Share	0.719***	0.752***
	(3.27)	(3.55)
Auditor_Tenure	-0.362***	-0.361***
	(-6.29)	(-6.29)
CEOCFO_Change	0.196***	0.197***
	(2.66)	(2.67)
Litigation risk	0.075	0.079
	(1.11)	(1.19)
Discretionary Accruals	0.330	0.295
	(0.90)	(0.92)
Loss	0.159**	0.156**
	(2.11)	(2.10)
Merger	0.073	0.075
	(1.18)	(1.15)
Growth	0.018	0.019
	(0.52)	(0.55)
Leverage	-0.347	-0.345
	(-1.22)	(-1.23)
INV+ACR	0.172	0.176
	(1.17)	(1.17)
ROA	0.129	0.128
	(0.80)	(0.85)
Cash	-0.252**	-0.293**
	(-2.12)	(-2.17)
Issue	0.035	0.038
	(0.58)	(0.55)
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*
Observations	26,950	26,950
Pseudo R^2	0.172	0.173

Panel B: Contagion Effect of n = 257 Major Client Gains

	(1)	(2)
Dependent variable:	**Client Gain**	
Constant	1.336***	1.321***
	(2.82)	(2.85)
Local_Client$_t$	**1.665*** **	-
	(3.18)	
Local_Client_Leader$_t$	**-**	**1.820*** **
		(3.25)
Local_Client_Non-leader$_t$	**-**	**1.452*** **
		(3.11)
Local_Client_OtherInd$_t$	0.228	0.255
	(0.88)	(0.78)
National_Client$_t$	0.155	0.162
	(1.22)	(1.21)
Size	0.135***	0.138***
	(5.01)	(5.05)
Zscore	-0.005	-0.005
	(-0.90)	(-0.91)
Auditor_Share	0.326	0.329
	(1.36)	(1.37)
Auditor_Tenure	0.241***	0.243***
	(2.82)	(2.83)
CEOCFO_Change	-0.015	-0.013
	(-0.60)	(-0.40)
Litigation risk	-0.037**	-0.033**
	(-2.11)	(-2.15)
Discretionary Accruals	-0.128	-0.119
	(-0.60)	(-0.58)
Loss	-0.342*	-0.327*
	(-1.91)	(-1.88)
Merger	0.081	0.081
	(0.59)	(0.58)
Growth	-0.035	-0.035
	(-1.09)	(-1.11)
Leverage	0.092	0.101
	(1.00)	(1.01)
INV+ACR	-0.306	-0.229
	(-0.60)	(-0.55)
ROA	-0.355*	-0.322
	(-1.90)	(-1.60)
Cash	-0.410*	-0.421*
	(-1.70)	(-1.72)
Issue	-0.055	-0.055
	(-0.80)	(-0.85)
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*
Observations	26,833	26,833
Pseudo R^2	0.165	0.168

Table 3: Counter-Factual Tests

This table reports two counter-factual tests. Panel A presents the result based on non-top industry clients switching auditors. Panel B reports the test based on the major client losses/gains that are deleted in the sample due to auditor resignations, opinion shopping, and those realignments which result in lower fees and lower earnings quality. We present results from logit regressions that examine the effect of major client losses/gains in period *t* on client losses/gains in *t+1*. The dependent variable is an indicator variable set to 1 if a client dismisses (engages) their auditor in year *t+1*, and 0 otherwise. All variables are defined in Appendix A. Standard errors are Huber-White Sandwich estimators (clustered by firm and audit office). All specifications include year, auditor, and SIC 2-digit industry fixed effects. The t-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% two-tail levels, respectively.

Panel A: Test Based on Non-Top Industry Clients Voluntarily Switching Auditors

	(1)	(2)
Dependent variable:	**Client Loss**	**Client Gain**
Constant	-2.129***	1.880***
	(-2.67)	(2.58)
Local_Client_Leader$_t$	0.152	0.285
	(1.25)	(0.85)
Local_Client_Non-leader$_t$	0.133	0.212
	(0.99)	(1.06)
Local_Client_OtherInd$_t$	0.113	0.149
	(0.67)	(0.63)
National_Client$_t$	0.043	0.043
	(0.50)	(0.52)
Control Variables	*Yes*	*Yes*
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*
Observations	26,950	26,833
Pseudo R^2	0.037	0.053

Panel B: Test based on Deleted Major Industry Clients Voluntarily Switching Auditors

	(1)	(2)
Dependent variable:	**Client Loss**	**Client Gain**
Constant	-2.332***	1.557**
	(-3.48)	(2.39)
Local_Client_Leader$_t$	0.755	1.109
	(1.33)	(1.40)
Local_Client_Non-leader$_t$	0.452	0.836
	(0.88)	(0.93)
Local_Client_OtherInd$_t$	0.117	0.209
	(0.77)	(0.76)
National_Client$_t$	0.222	0.555
	(0.61)	(0.82)
Control Variables	*Yes*	*Yes*
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*
Observations	24,236	24,135
Pseudo R^2	0.057	0.095

Table 4: Strategic Fee Adjustments Following Major Client Losses/Gains

This table presents report regressions examining auditor fee changes in response to client losses/gains in the prior period. The dependent variable is the change in log of audit fees, measured from period *t* to *t+1*. All variables are detailed in Appendix A. Panel A presents results based on auditor leader offices at the end of year *t,* and Panel B presents results including interactions representing effects for changes in office leader status as a result of the major industry client switch. Standard errors are Huber-White Sandwich estimators (clustered by firm and audit office). All specifications include year, auditor, and SIC 2-digit industry fixed effects. The t-statistics are reported in parentheses. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% two-tail levels, respectively.

Panel A: Audit Fee Change after Major Client Loss/gain

	(1)	**(2)**	**(3)**	**(4)**
	Client Loss		**Client Gain**	
Dependent variable:	**ΔAudit Fee$_{t,t+1}$**			
Constant	0.160***	0.165***	0.188*	0.190*
	(4.33)	(4.95)	(1.85)	(1.83)
Local_Client$_t$	**-0.611****	**-**	**0.729****	**-**
	(-2.32)		**(2.39)**	
Local_Client_Leader$_t$	**-**	**-0.118**	**-**	**0.772*****
		(-1.15)		**(2.66)**
Local_Client_Non-leader$_t$	**-**	**-0.825*****	**-**	**0.111**
		(-2.62)		**(1.55)**
Local_Client_OtherInd$_t$	-0.035	-0.047	0.035	0.032
	(-1.22)	(-1.11)	(0.96)	(0.88)
National_Client$_t$	-0.012	-0.011	0.033	0.027
	(-1.10)	(-0.75)	(0.68)	(0.80)
New Client	0.072	0.060	0.075	0.077
	(1.18)	(1.09)	(0.91)	(0.69)
ΔAuditor_Share	0.160	0.161*	0.211*	0.215*
	(1.59)	(1.75)	(1.77)	(1.85)
ΔAuditor_Tenure	-0.255**	-0.252**	-0.202*	-0.210*
	(-2.11)	(-2.15)	(-1.80)	(-1.87)
ΔSize	0.088*	0.091*	0.065*	0.057*
	(1.88)	(1.82)	(1.85)	(1.90)
ΔLeverage	-0.075	-0.077	-0.102	-0.103
	(-1.55)	(-1.49)	(-1.42)	(-1.50)
ΔMarket-to-book	0.066**	0.065**	0.062*	0.061*
	(2.05)	(2.15)	(1.92)	(1.90)
ΔROA	-0.012*	-0.013*	0.011*	0.012*
	(-1.80)	(-1.80)	(1.82)	(1.89)
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*
Observations	15,818	15,818	15,698	15,698
Adjusted R^2	0.091	0.091	0.091	0.091

Panel B: Office Status Change and Audit Fee Effect of Major Client Loss/Gain

	(1)	(2)
	Client Loss	**Client Gain**
Dependent variable:	**ΔAudit Fee$_{t,t+1}$**	
Lead$_{t-1}$_to_Nonlead$_t$	**-1.330*** **	**-0.070**
	(-2.88)	**(-1.05)**
Nonlead$_{t-1}$_to_Lead$_t$	**0.112**	**1.328** **
	(1.16)	**(2.50)**
Lead$_{t-1}$_to_Lead$_t$	**-0.129**	**0.217**
	(-1.30)	**(1.10)**
Nonlead$_{t-1}$_to_Nonlead$_t$	**0.231**	**0.096**
	(1.46)	**(1.36)**
Controls	*Yes*	*Yes*
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*
Observations	15,818	15,698
Adjusted R^2	0.107	0.078

Table 5: Office Size and Capacity Effects on Clients' Earnings Quality

We examine the effect of contagion on the change in earnings quality of other clients of the auditor, following a major client loss/gain. Panel A present the full sample results, and Panels B and C present the results partition by the size of the audit office. Large offices are those in the upper quartile of yearly size based on total audit fees, and small offices are those in the bottom three quartiles. The dependent variables are changes in earnings quality – ΔEQ1, ΔEQ2, and ΔEQ3 –which are defined in Appendix B. All other variables are described in Appendix A. Standard errors are Huber-White Sandwich estimators (clustered by firm and audit office). All specifications include year, auditor, and SIC 2-digit industry fixed effects. The t-statistics are reported in parentheses. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% two-tail levels, respectively.

Panel A: Change in Earnings Quality for Other Clients After a Major Client Loss/Gain

	(1)	(2)	(3)	(4)	(5)	(6)
	Client Loss			Client Gain		
Dependent variable:	**ΔEQ1**	**ΔEQ2**	**ΔEQ3**	**ΔEQ1**	**ΔEQ2**	**ΔEQ3**
Constant	0.027	0.022	0.016	-0.017	-0.050	-0.040
	(0.90)	(0.81)	(0.99)	(-0.73)	(-1.14)	(-0.85)
Local_Client_Leader$_t$	**0.026****	**0.012****	**0.017****	**-0.008***	**-0.005***	**-0.012***
	(2.22)	**(2.41)**	**(2.40)**	**(-1.92)**	**(-1.85)**	**(-1.89)**
Local_Client_Non-leader$_t$	**0.021****	**0.015****	**0.017****	**-0.014****	**-0.010****	**-0.015****
	(2.11)	**(2.28)**	**(2.22)**	**(-2.16)**	**(-2.33)**	**(-2.22)**
Local_Client_OtherInd$_t$	0.007	0.007	0.013	-0.005	-0.004	-0.005
	(0.88)	(0.89)	(1.08)	(-1.00)	(-0.89)	(-0.85)
National_Client$_t$	0.004	0.004	0.004	-0.003	-0.002	-0.002
	(1.11)	(1.34)	(1.02)	(-0.88)	(-0.89)	(-0.70)
Control Variables	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	10,870	9,669	10,826	13,572	13,810	13,945
Adjusted R^2	0.081	0.085	0.091	0.099	0.111	0.105

Panel B: Auditor Office Size and Change Earnings Quality After a Major Client Loss

	(1)	(2)	(3)	(4)	(5)	(6)
	Small Office			Large Office		
Dependent variable:	**ΔEQ1**	**ΔEQ2**	**ΔEQ3**	**ΔEQ1**	**ΔEQ2**	**ΔEQ3**
Constant	-0.052	-0.052	-0.050	-0.052	-0.045	-0.055
	(-1.18)	(-1.33)	(-1.09)	(-1.11)	(-1.15)	(-0.95)
Local_Client_Leader$_t$	**0.028****	**0.016****	**0.021****	0.005	0.007	0.006
	(2.25)	**(2.32)**	**(2.30)**	(1.16)	(1.33)	(1.22)
Local_Client_Non-leader$_t$	**0.037****	**0.030****	**0.030****	0.016	0.012	0.011
	(2.40)	**(2.22)**	**(2.33)**	(1.42)	(1.42)	(1.30)
Local_Client_OtherInd$_t$	0.011	0.010	0.010	0.005	0.006	0.010
	(1.12)	(1.09)	(1.30)	(0.70)	(0.95)	(0.80)
National_Client$_t$	0.006	0.004	0.005	0.003	0.003	0.002
	(0.92)	(0.88)	(1.03)	(0.83)	(0.97)	(1.20)
Control Variables	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	7,790	6,955	7,750	3,090	2,757	3,075
Adjusted R^2	0.105	0.098	0.110	0.077	0.071	0.074

Panel C: Auditor Office Size and Change in Earnings Quality After a Major Client Gain

	(1)	(2)	(3)	(4)	(5)	(6)
	Small Office			Large Office		
Dependent variable:	**ΔEQ1**	**ΔEQ2**	**ΔEQ3**	**ΔEQ1**	**ΔEQ2**	**ΔEQ3**
Constant	-0.043	-0.060	-0.030	-0.076	-0.025	-0.023
	(-0.65)	(-0.90)	(-1.01)	(-1.08)	(-1.20)	(-1.06)
Local_Client_Leader$_t$	**-0.016****	**-0.012****	**-0.016****	-0.003	-0.005	-0.006
	(-2.30)	**(-2.23)**	**(-2.35)**	(-1.25)	(-1.33)	(-1.28)
Local_Client_Non-leader$_t$	**-0.023****	**-0.015****	**-0.019****	-0.006	-0.006	-0.006
	(-2.15)	**(-2.22)**	**(-2.30)**	(-1.15)	(-1.20)	(-1.20)
Local_Client_OtherInd$_t$	-0.004	-0.004	-0.004	-0.002	-0.001	-0.001
	(-0.90)	(-1.33)	(-1.30)	(-1.19)	(-1.05)	(-1.22)
National_Client$_t$	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001
	(-0.90)	(-0.92)	(-0.90)	(-0.49)	(-0.49)	(-0.50)
Control Variables	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year, Industry, & Audit Firm Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	9,718	9,889	9,886	3,855	3,922	3,960
Adjusted R^2	0.117	0.139	0.129	0.077	0.077	0.074

Panel D: Impact of a Major Client Loss/Gain on Fees of Small and Large Audit Offices

	Industry Leader Loss (Industry Leader Fees as a % of Total Office Fees)	**Industry Leader Gain (Industry Leader Fees as a % of Total Office Fees)**
Small Leader Office	26.5%	31.2%
Large Leader Office	7.4%	7.2%
t-test of difference (Small – Large)	*5.17****	*6.39****