

The Contagion Effect of Office-Level Audit Failures*

by

Jere R. Francis and Paul Michas
School of Accountancy
University of Missouri-Columbia
303 Cornell Hall
Columbia, MO 65211

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Contact Author:

Jere R. Francis

Phone: +01 573 882 5156

Email: francis@missouri.edu

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Abstract

We investigate if the presence of an audit failure (client restatement) in an auditor office location in a given fiscal year indicates the presence of a *contagion effect* on the quality of other concurrent audits conducted by the office. We find that the presence of one client restatement increases the likelihood of multiple restatements in an office-year, and that offices with restatements have a significant likelihood of additional client restatements in each of the subsequent five fiscal years, suggesting that certain offices have systemic audit quality problems that persist over time. We also test if earnings quality, measure by abnormal accruals, is lower for clients in offices with audit failures compared to a control sample of offices with no audit failures. We find that the presence of at least one audit failure (defined as a downward restatement of net income by a client) is indicative of contagion within the office. Specifically, for office-years with one or more client restatements, earnings quality is lower: that is, abnormal accruals of clients are significantly larger (on average) than in those offices with no restatements, and this result holds for non-Big Four auditors and all but the largest quartile of Big Four offices.

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I. INTRODUCTION

We investigate if the existence of at least one audit failure in an auditor office location indicates a more systematic problem in office-level audit quality for publicly-traded client companies.¹ A “contagion effect” could occur in auditor office location due to office-specific characteristics including personnel and quality-control procedures. By contagion we mean that the presence of one low-quality audit in an office conveys information about the quality of other concurrent audits in the office. In a different accounting research setting, Gleason et al. (2008, footnote 8) define contagion as follows: “Contagion effects are present when an adverse event at one firm also conveys negative information about the valuation of other firms ...” In our audit setting, contagion effects occur if an adverse audit with respect to one engagement in an office conveys negative information about the quality of other concurrent audits in the office.

Prior research provides evidence that differences in characteristics across offices of accounting firms are an important determinant of audit quality. This literature shows that differences in audit quality can exist even within the same firm, depending on office-level characteristics. For example, Francis and Yu (2009) and Choi et al. (2010) show that audit quality is higher in relatively large Big Four auditor offices. Research also shows that industry expertise within an office is positively associated with engagement-specific audit quality and audit pricing (Francis et al. 2005; Reichelt and Wang 2010). Choi et al. (2010) suggest that regulators’ focus should be shifted towards auditor office size and away from a simple Big Four/non-Big Four dichotomy. In sum, this research highlights the importance of investigating

¹ Throughout the paper we define an audit failure as a material downward restatement of net income made by a client company subsequent to the audit opinion date. Such a restatement is indicative that the audit conducted was of low quality (Palmrose and Scholz 2004). we discuss this in detail in section 3. The results are robust to a more restrictive measurement of audit failures based on SEC enforcement actions against auditors.

auditor office-level characteristics and their effects on audit quality, and is consistent with the view that offices are the primary decision-making units in accounting firms (Wallman 1996).

Different stakeholders could benefit from being able to infer audit quality at the auditor office level. For example, regulators can benefit from such knowledge as it provides a way to focus on auditor office locations that are more likely to be problematic from a quality-control perspective. Audit standard setters can benefit as they may be able to formulate auditing standards that are better able to address the determinants of audit quality at the auditor office level. Audit firms can benefit by better identifying specific offices that may not be implementing the firm's quality-control procedures appropriately.² Consequently, audit firms will be able to more effectively use finite resources to improve the firm's overall audit quality and reduce litigation risk exposure by focusing on offices that are more likely to be conducting audits of lower overall quality. Finally, investors may be able to use the results to assess current earnings quality based on the auditor office that performs the audit, and the office's prior history of audit failures..

The results indicate that in auditor offices where at least one audit failure in a year is identified, there are likely to be other concurrent audit failures as well. In addition, offices with an audit failure are likely to have additional audit failures in subsequent years. These results suggest a contagion of audit failures at a point in time and longitudinally over time. We also examine the earnings quality of clients in offices with auditor failures, and find that these clients have a higher level of discretionary accruals compared to offices with zero audit failures. These higher levels of discretionary accruals are indicative of overall lower earnings, consistent with prior research (Francis et al. 1999a; Francis and Yu 2009; Reichelt and Wang 2010). These

² While audit failure information has obviously been available to national offices in the past, mine is the first study that empirically investigates whether any party, including the national office of audit firms, can infer something about an office's overall audit quality by identifying a specific audit failure as having occurred in an office.

results hold for all offices of non-Big Four auditors, and for all but the largest quartile of Big Four office size. Our results are robust to assessing restatement materiality at two and 10 percent, as well as measuring the frequency of audit failures within an office as a percentage of total audit engagements.

The remainder of the paper proceeds as follows. We discuss the motivation for the paper, and develop our hypotheses in section II, while section III presents the sample, research design and descriptive statistics. Section IV reports the main results and we conclude the paper in section V.

II. BACKGROUND AND HYPOTHESES

Background and Motivation

Prior research argues that offices are the primary decision-making units in accounting firms (Wallman 1996; Francis et al. 1999b; Francis and Yu 2009). However, the extant literature that investigates the determinants of audit quality at the auditor office-level is relatively scant. Francis and Yu (2009; 2011) and Choi et al. (2010) are the only studies that currently provide a way to distinguish *overall* audit quality at the office level by providing evidence that the size of an auditor office is positively associated with audit quality.³ While these studies attempt to look into the “black box” of auditor offices to investigate office-level characteristics associated with differential audit quality, office size is a somewhat crude tool that may not be as useful to outsiders as a measure that is more specific. Further, given that auditor office size is likely to be very stable from year to year, this measure is not able to discern yearly variations in office-level audit quality. Given the relatively high amount of turnover within audit firms (Hiltebeitel et al.

³ As discussed below, research also investigates the impact of industry expertise on audit quality. However, given that auditor offices conduct audits for clients both within and outside of the office’s industry of expertise, these studies do not provide evidence on audit quality for all engagements in an auditor office.

2000), a measure that provides an indication of overall audit quality within an office in a particular year is likely to be more useful compared to office size alone. Further, our measure can be used in conjunction with auditor office size and, consequently, provides an important contribution to the literature as well as a more refined way to assess office-level audit quality. Our study also investigates differences in offices of both Big Four and non-Big Four audit firms. This is important as the non-Big Four firms now conduct audits for about 30 percent of public-traded companies, and their market share has grown steadily since the collapse of Arthur Andersen in 2002.

Prior research also indicates there are differences in engagement-level audit quality based on the auditor's industry expertise (Choi et al. 2010; Francis et al. 2005; Francis and Yu 2009; Reichelt and Wang 2010; Francis and Yu 2011). However, while an auditor office is often classified as an expert in a particular industry, that office will typically audit many clients outside of its areas of industry expertise. For example, consider an office that is expert in the banking sector and that this represents 40 percent of the office clientele. Assume the office is not an expert in the other industry sectors that represent the other 60 percent of office clientele. Therefore, industry-based studies that investigate the quality of audits at the *engagement level* do not assess the overall level of audit quality in an office as they do not combine the 60 percent of non-specialist audit engagements with the 40 percent that are specialist bank audits. Rather, these studies compare the entire group of industry expert audit engagements (regardless of the specific office) with the group of non-industry expert engagements (regardless of office). In other words, the unit of analysis is engagement-specific industry expertise, not an office-wide measure of expertise. In contrast, we compare the quality of all audits within offices where an audit failure is identified, to all audits in those offices where no audit failures are identified. Therefore, we are

investigating variation in overall office-level characteristics instead of variation in the type of specific audit engagement (industry expert vs. non-industry expert). Our study makes an important contribution to the literature as it provides a way to assess audit quality at the office-level in a new and more refined manner compared to those found currently in the literature based on office size and engagement-specific industry expertise.

Hypotheses Development

As discussed above, cross-sectional differences in audit quality at the office level have been attributed to industry expertise that resides with the unique personnel of an office location, and thus is not captured by the audit firm as a whole (Ferguson et al. 2003). Under this perspective, it is the human capital of the audit office that is important in determining audit quality based on the industry expertise of engagement personnel. This perspective can be widened beyond industry expertise to argue that the overall quality and amount of human capital possessed by personnel in an office location is the main determinant of office-level audit quality. This suggests that, in addition to industry-specific expertise, auditor office locations likely exhibit differences in overall audit quality based on differences in human capital and quality control procedures. Francis and Yu (2009) and Choi et al. (2010) provide evidence of this by showing that average audit quality is higher for clients of auditor office locations that are larger in size. Francis and Yu (2009) argue that this is the case because larger offices possess more collective human capital due to more extensive experience dealing with public companies.⁴

However, the use of auditor office size to infer overall audit quality within the office is somewhat limited. For example, office size is very similar from year-to-year which limits the ability to identify variation in audit quality within the same office across different years. Given the relatively high turnover rate of office personnel in the audit field (Hiltebeitel et al. 2000),

⁴ Choi et al. (2010) attribute this finding to larger offices being less economically dependent on any one client.

audit quality may vary from year-to-year based on the specific human capital characteristics of office personnel in a specific year, even though office size remains relatively constant over time. Thus, the identification of an audit failure can potentially provide outsiders with a way to “peer into” the office in a way that is more specific from year-to-year compared to a general measure of office size.⁵

The existence of a specific audit failure within an auditor office may indicate one of two possibilities. First, it may simply indicate that a one-off audit engagement was of low quality for engagement-specific or idiosyncratic reasons. The second possibility, and the one that we investigate, is that one audit failure may *reveal* a more systemic problem, due to the characteristics of office personnel, that affects the quality of other concurrent audits conducted by the office. We term this a *contagion*. Specifically, it is possible that more general characteristics of office-level personnel including the level of expertise and knowledge (or overall human capital), or the lack of robust office-level quality-control procedures, lead to the audit failure and to other low quality audits in the office as well. If this is the case, and assuming that one can objectively identify the existence of at least one audit failure as having occurred within an office, then audit failures may also provide useful information about the quality of other audits performed in that office.⁶

⁵ Krishnan (2005) also analyzes office-level audit quality and finds that the clients of the Houston office of Arthur Andersen, which audited Enron, exhibit less timely reporting of bad news compared to a sample of Houston-based clients audited by other Big Six audit firms, as well as clients of Andersen’s Atlanta office, in the same year as the Enron audit failure. Krishnan (2005) concludes that the Houston office of Arthur Andersen provided a lower level of audit quality for its clients compared to another Andersen office (Atlanta) and other Big Six offices in Houston. Krishnan’s study provides evidence that office-level characteristics within the same audit firm may lead to varying audit quality. However, he does not investigate what these office-level characteristics might be.

⁶ Gunny and Zhang (2010) investigate whether audit quality is lower for the clients of auditors in which the Public Company Accounting Oversight Board (PCAOB) audit inspection report indicates there was a failure in the enforcement of generally accepted accounting principles. While they do find a negative association between the receipt of such a report and the earnings quality of that audit firm’s client base, they are only able to conclude this for clients of the audit firm (as a whole) because the PCAOB report does not identify the specific office or engagement where the problem occurred, nor does the report provide an overall assessment of an accounting firm’s

We test whether a contagion effect exists at the office-level based on the identification of one or more audit failures as having occurred in a specific audit office in a given fiscal year. This requires us to devise a way to identify and measure audit failures. Palmrose and Scholz (2004) and Kinney et al. (2004) argue that a material restatement of originally audited financial statements is a strong indication that a particular audit may have been of low quality. A company may have restatements for various reasons. Plumlee and Yohn (2010) identify four main reasons for restatements: internal company error, intentional manipulation, transaction complexity, and characteristics of accounting standards. They conclude that the majority (57 percent) of restatements are caused by internal company error followed by characteristics of the accounting standard used (37 percent), including lack of clarity in the standard and the need to use judgment during application of the standard. We believe that a company's external auditor bears some responsibility for allowing a company to issue financial statements that are misstated by a material amount due to any of these four determinants of restatements. This is the case because auditors have "a responsibility to plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud," (SAS No. 1 1972). Consequently a high quality audit should, *ceteris paribus*, detect possible misstatements due to any of the reasons above at a higher rate compared to a low quality audit. This in turn suggests that the existence of a restatement is indicative that a relatively low quality audit was performed.

We predict that for auditor offices where at least one client subsequently restates net income downward by a material amount (an audit failure), audit quality is lower, on average, for all clients audited by that office in the same year in which the misstatement originally occurred.

audit quality. Furthermore, the name of client companies where audit deficiencies are noted remains confidential making it impossible to infer the specific audit office where the low quality audit occurred.

That is, the presence of one audit failure reveals a contagion within the office that affects the quality of other concurrent audits. Consequently, we state our first hypothesis in alternative form:

H1: The existence of an audit failure in an auditor office is indicative of a contagion effect which results in other concurrent low quality audits in the office.

There also exists a large literature on differences in audit quality between Big Four and non-Big Four auditors. It is clear from this literature that differences in audit quality exist when comparing Big Four and non-Big Four accounting firms, with Big Four auditors exhibiting higher audit quality (Francis 2004; Francis 2011). Of importance to our study are specific differences in the training of audit personnel and quality-control procedures between Big Four and non-Big Four accounting firms. Specifically, larger Big Four accounting firms possess stronger incentives to implement in-house personnel training and quality-control monitoring procedures to protect against a reputation-damaging audit failure (DeAngelo 1981). They also possess greater resources with which to implement training and monitoring procedures given their size. Consequently, it is less likely that any one specific audit failure within a Big Four office is indicative of a contagion effect of poor audit quality for other concurrent clients of the same office. This in turn makes it *more likely* that any one specific audit failure in a Big Four office is due to engagement-specific or idiosyncratic characteristics of a specific audit rather than a systemic contagion effect throughout the auditor office. This leads to our second hypothesis, stated in alternative form:

H2: There is less contagion in Big Four offices than in non-Big Four offices when an audit failure occurs.

Given the results in Francis and Yu (2009) and Choi et al. (2010) that audit quality is higher for larger Big Four auditor offices, it is likely that the existence of an audit failure in a

relatively large Big Four office is less indicative of a contagion effect of lower overall audit quality compared to a small auditor office. The logic leading to this hypothesis is the same as that for H2 in that larger offices of Big Four auditors possess more resources to ensure that high audit quality is implemented for all engagements. This leads to our third hypothesis, stated in alternative form:

H3: There is less contagion in large Big Four offices than in small Big Four offices when an audit failure occurs.

Finally, the literature on auditor industry expertise finds that office-specific industry expertise is an important determinant of engagement-level audit quality (Reichelt and Wang 2010). However, audits at the office level are conducted for clients that operate both within the office's areas of industry expertise as well as in other industries. Furthermore, the number of audits where the office is an industry expert, as a percentage of the total number of audits in the office, likely varies across offices. In offices where the vast majority of audits are in the office's areas of industry expertise, engagement personnel are more able to apply their industry-specific knowledge and human capital to the office's overall client portfolio which should result in high quality audits. In contrast, in offices where relatively few audits are conducted within the office's areas of industry expertise, audit personnel cannot make use of their industry-specific knowledge as often. This leads to our fourth and final hypothesis stated in alternative form:

H4: There is less contagion in a Big Four office where relatively more audits are in the office's areas of industry expertise, compared to Big Four offices where relatively fewer audits are conducted in the office's areas of industry expertise.

We test for a contagion effect by comparing the quality of clients' audited earnings in those office-years with an audit failure (treatment sample), with the quality of clients' earnings in those office-years with no audit failures (control sample). The results are robust to a more

restrictive definition of an audit failure using SEC enforcement actions against auditors to identify office-years with one or more low-quality audits over the period 2000-2008.

Earnings are jointly produced by the client and the auditor (Antle and Nalebuff 1991). Clients are responsible for preparing the financial statements in accordance with GAAP (generally accepted accounting principles), and the auditor's role is to enforce compliance with GAAP and to require changes be made if necessary to conform to GAAP. If the client refuses, then a qualified audit report is required. However, since the SEC does not accept an audit report with a GAAP qualification, the client and auditor must resolve disagreements through a negotiation process that results in the final audited earnings number.

The research design linking statistical properties of earnings with audit characteristics is described as follows by Francis (2011):

$$\text{Earnings Quality} = f(\text{Audit Attributes} + \text{Controls})$$

Earnings quality is measured by cross-sectional variation in statistical properties of earnings. Following prior research, we examine systematic variation in abnormal or discretionary accruals, and earnings are assumed to be of higher quality when abnormal/discretionary accruals are smaller in magnitude, *ceteris paribus*. In our study, the audit attribute tested is whether the engagement office has an audit failure as evidenced by a client restatement. A contagion effect is evidenced if earnings quality is lower on average (larger accruals) for clients in offices with an audit failure, compared to clients in offices with no audit failures. To summarize, earnings quality metrics are not a direct measure of audit quality. But given that earnings are jointly produced by clients and auditors, systematic cross-sectional differences in the statistical properties of earnings can be used to infer differences in the underlying quality of audits based on differential auditor characteristics.

III. RESEARCH DESIGN AND DESCRIPTIVE STATISTICS

Sample

As described in detail in the next sub-section, we define an audit failure as occurring in an office when there is a material downward restatement of net income by a client subsequent to the statutory audit. The year of the audit failure is the year in which the misstated earnings were *originally* issued. We use the Compustat Unrestated U.S. Quarterly file to obtain originally released as well as subsequently restated accounting data in order to identify restatements and the year of the original misstatement.⁷ This database provides originally-reported quarterly financial statement data, including net income, and many of the data items available in the Compustat Fundamentals Quarterly and Annual Files. The Unrestated Quarterly file also includes the most current restated values for each data item. Therefore, one can compile quarterly data, both for the original unrestated data as well as the currently reported restated data (if any restatement was made) alongside each other to determine whether a company has issued a restatement subsequent to its statutory audit. For companies where no restatement took place, the data value is exactly the same in both the unrestated and restated item columns. A company's annual earnings (both unrestated and restated) is computed by summing the four quarters of the fiscal year. The database does not indicate when the restatement was subsequently made. However, for our purpose this does not matter since we are only interested in determining the year in which the restated earnings were *originally* issued as this is the point in time when the audit failure historically occurred. To summarize, our treatment observations are those concurrent firm-year observations in offices where there was an audit failure, and the control sample comprises those firm-year observations in offices where there was no audit failure.

⁷ Studies that use the Compustat Unrestated Quarterly file to obtain originally released accounting data include Bronson et al. (2010), Price et al. (2010) and Comprix et al. (2010), among others.

The sample period begins in the year 2000 as data on the specific auditor office location that performed the external audit for a company is not available in the Audit Analytics database until this year. We cut off the sample in 2008 because Cheffers et al. (2010) show that the average time lag between the original financial statement release and a restatement during the years 2005 to 2007 is about 700 days, or roughly two years. Therefore, cutting off the sample in 2008 provides confidence we are correctly classifying the vast majority of restating and non-restating companies.

Table 1, Panel A summarizes the sample selection. There are 87,890 annual firm-year observations in the Compustat Fundamentals file for the years 2000 through 2008 with non-missing assets or income. We delete 25,019 financial and utility companies due to the specific operating and accounting characteristics of these firms. CIK numbers used to merge accounting data with auditor office location information drawn from Audit Analytics are missing for 7,081 observations, while the specific auditor office location data is missing in Audit Analytics for 11,637 observations. Finally 15,721 observations are deleted due to missing information necessary to compute firm-level accounting variables, including discretionary accruals and stock price based variables. The final sample is comprised of 28,432 firm-year observations of 5,073 unique companies during the 2000 through 2008 time period.

[Insert Table 1 Here]

Table 1, Panel B presents the sample of auditor office locations for Big Four and non-Big Four accounting firms during each sample year. The totals indicate that roughly half of the auditor offices are from each auditor type with some variation from year to year. There are a total of 2,660 (2,543) office-years of non-Big Four (Big Four) accounting firms over the entire sample

period and an average of 296 (283) offices per year. As discussed next, audit failures are measured at the auditor office level for each fiscal year using the Compustat year convention.

Office-Level Audit Failures

We test if an audit failure in an auditor office during a particular fiscal year is indicative of a contagion effect on concurrent clients within that same office/year. Our specific measure of an audit failure involves identifying whether one or more clients of a specific auditor office in a given year restate net income by a material amount subsequent to the audit. We calculate the percentage restatement of a company's annual net income by measuring the dollar value difference in net income between the originally released financial information and the most recent, restated net income number. We then scale this by the absolute value of the originally released net income number to obtain a restatement percentage, either positive or negative.⁸ We do *not* consider restatements of net income due to a merger or acquisition to be an audit failure, and these firm-year observations are deleted from the treatment sample.⁹

It is also important to note that to the extent a client restatement is the result of something other than a low quality audit, we are biasing against finding a significant result because our definition will increase noise in the measure of audit failures. It is, of course, also possible that some low quality audits, or audit failures, are not being identified under our definition because the client company does not subsequently issue a restatement even in the presence of an

⁸ Scaling by the absolute value of the originally release net income value ensures that all decreases (increases) in net income due to the restatement are calculated to be a negative (positive) percentage restatement.

⁹ We identify mergers and acquisitions using the Compustat Fundamental Annual file variables Acquisition Method (ACQMETH), the measurement the sum of all special items after taxes that correspond to an Acquisition or Merger (AQA), and the measurement of cash outflow of funds used for and/or the costs relating to the acquisition of a company in the current fiscal year (AQC). If the field for ACQMETH contains an acquisition method code, or if either AQA or AQC contain a non-zero value, this indicates the presence of a merger or acquisition for a company during a fiscal year. We classify such observations as an M&A and do not consider such restatements to be an audit failure.

(unobservable) low quality audit. This also adds noise to the measurement of audit failures and biases against finding a statistically significant association between the existence of an audit failure in an auditor office and a contagion effect throughout that office, compared to those offices classified as having no audit failures.

We define an audit failure as having occurred when a client company restates net income *downward* by at least two percent of the originally reported value.¹⁰ The audit failure is attributed to the year in which the restated earnings were *originally* issued. We also consider a minimum restatement threshold 10 percent in addition to the two percent threshold to ensure that our results are robust to these different materiality levels. It turns out the results are consistent across both materiality thresholds. Downward restatements indicate that the company's originally released net income was "too high" as originally audited. Given that auditors are concerned with overstatements of net income much more than understatements due to liability concerns (Basu 1997; Kothari et al. 1989; Skinner 1994), and that the existence of income-increasing compared to income-decreasing accruals is more likely to result in auditor reporting conservatism (Francis and Krishnan 1999), we consider only an overstatement of originally reported net income as an audit failure. We note that while we consider only negative, or downward, restatements to be an audit failure in our main analyses, all results are qualitatively the same, and often stronger, if we consider both downward and upward restatements of net income to be an audit failure.

Auditor office locations that have one or more clients with a downward restatement in net income for a particular year are coded one for the variable AUD_FAIL_X, where X indicates the

¹⁰ A restatement may have occurred for any of the company's four fiscal quarters for a fiscal year. Quarter-end financial statements for the first three quarters are often reviewed instead of audited. However, given that a public company's fiscal year-end financial statements are always audited, and given that fiscal year-end net income includes cumulative net income for all four fiscal quarters, each quarter is, in effect, audited at year-end. Furthermore, given that we analyze restatements that occur subsequent to a company's original fiscal year-end audit, a restatement of net income for any of the company's fiscal quarters can be considered a restatement of *audited* (instead of merely reviewed) financial statement numbers.

particular percentage restatement threshold being used in a particular model: i.e. $X = 2$ for a two percent downward restatement of net income and $X=10$ for 10 percent downward restatement of net income. Auditor offices where zero clients restate net income downward by the threshold amount in a particular year are coded zero ($AUD_FAIL_X = 0$). Importantly, the results in the study are robust to an alternative measure of office failure in which the number of office-year audit failures (client restatements) is scaled by the total number of listed-company clients in the office-year. This alternative metric considers the frequency of restatements within an auditor office relative to its clientele, and demonstrates that the study's results are not driven by large offices which are likely to have a larger absolute number of client restatements. .

The year of an audit failure is recorded as the Compustat fiscal year in which the client's restated net income was *originally* reported in the 10K. This is important as we are testing whether the existence of an audit failure in a given year for an auditor office is indicative of other lower quality audits throughout that office for the same fiscal year (i.e. a contagion effect).

Table 2, Panel A presents the number of downward restatements at threshold levels of two, and 10 percent of original net income for auditor office-years. At the two percent threshold, 16 percent (34 percent) of non-Big Four (Big Four) auditor office-years have one or more clients that restate net income downward, indicating that this is not an unusual occurrence. At the 10 percent threshold, 12 percent of non-Big Four offices have client restatements and 24 percent of Big Four offices.

[Insert Table 2 Here]

Table 2, Panel B presents descriptive statistics on the distributions of both the number of client restatements and the total number of audits for auditor office-years. Only restatements at the 10 percent threshold are reported for brevity. The first two columns show that the mean

number of client restatements in non-Big Four (Big Four) offices is 0.15 (0.37), while the maximum number is 4 (10) per office. The third and fourth columns show that the mean number of SEC registrants for non-Big Four (Big Four) offices is 7.25 (14.72), while median values for each are 4.00 (8.00). The interquartile range is 2 to 8 audits for non-Big Four offices, and 4 to 17 for Big Four offices. Finally, the last two columns present the distribution for the number of restatements as a percentage of total audits within an office. On average, 1.6 (2.3) percent of non-Big Four (Big Four) client companies restate earnings subsequent to the original audit, which is consistent with prior research on restatements. The 90th percentile values are 4.0 (8.3) percent. The maximum values of 100 percent reflect extremely small offices where all clients subsequently restate earnings. These extremely small offices are deleted in analyses that are described in more detail in the sensitivity analysis section of the study.

Empirical Model

The following model is estimated to test if a contagion effect exists in auditor offices:

$$\begin{aligned}
 \text{ABS_DISC_ACC or DISC_ACC} = & \beta_0 + \beta_1 \text{B4} + \beta_2 \text{AUD_FAIL_X} + \beta_3 \text{B4*AUD_FAIL_X} \\
 & + \beta_4 \text{OFFICE_SIZE} + \beta_5 \text{RISK_PORT} + \beta_6 \text{CITY_IND_EXP} + \beta_7 \text{NAT_IND_EXP} \\
 & + \beta_8 \text{INFLUENCE} + \beta_9 \text{SIZE} + \beta_{10} \text{LAG_TOT_ACC} + \beta_{11} \text{CFO} + \beta_{12} \text{CFO_VOL} \\
 & + \beta_{13} \text{SALES_GROWTH} + \beta_{14} \text{SALES_VOL} + \beta_{15} \text{PPE_GROWTH} + \beta_{16} \text{LEV} + \beta_{17} \text{MB} \\
 & + \beta_{18} \text{RETURN} + \beta_{19} \text{RET_VOL} + \beta_{20} \text{SHARE_ISSUE} + \beta_{21} \text{LOSS} + \beta_{22} \text{LITIGATE} \\
 & + \beta_{23} \text{BANKRUPTCY} + \beta_{24} \#_ \text{OPER_SEGS} + \beta_{25} \#_ \text{GEO_SEGS} + \text{Industry Fixed Effects} \\
 & + \text{Year Fixed Effects} + \varepsilon
 \end{aligned} \tag{1}$$

where ABS_DISC_ACC (DISC_ACC) is the absolute value (signed value) of a company's abnormal accruals in year t, controlling for concurrent performance using a modified Jones model (Jones 1991; Dechow et al. 1995; Kothari et al. 2005). We infer audit quality based on client companies' audited earnings quality, measured as a company's level of discretionary

accruals (ABS_DISC_ACC and DISC_ACC), as in prior research (Becker et al. 1999; Frankel et al. 2002; Francis and Yu 2009; Reichelt and Wang 2010). The calculation of the discretionary accruals variables is detailed in the next sub-section. We analyze both absolute discretionary accruals and income-increasing discretionary accruals because Hribar and Nichols (2007) demonstrate that the analysis of absolute accruals may be problematic.¹¹

Other auditor office characteristics are controlled for as prior research shows these to be important. For example, office size is controlled for because Francis and Yu (2009) and Choi et al. (2010) show that Big Four office size is negatively associated with client discretionary accruals. Consistent with their measurement, the variable OFFICE_SIZE is the natural log of the total dollar value of audit fees charged by an auditor office in a year. A dichotomous version of this variable is also used as a test variable in Table 8 to investigate whether auditor office size affects the extent to which an audit failure is indicative of a contagion effect in Big Four offices (test of H3).¹²

We control for the overall client portfolio risk within an auditor office (RISK_PORT) to mitigate the concern that client-specific characteristics may be driving either the likelihood that at least one restatement occurs within an office, or the level of discretionary accruals of those clients, or both. We compute an office's client portfolio risk by first calculating the mean level of client assets, leverage, and return on assets within each office-year, similar to prior research

¹¹ Hribar and Nichols (2007) show that tests of absolute discretionary accruals are subject to a correlated omitted variable problem that signed accruals are not. They also find that both absolute and signed accruals are correlated with companies' sales volatility and cash flow volatility. Therefore, we control for both of these variables in all analyses.

¹² we note that OFFICE_SIZE is often not significant in Tables 4 through 7, which is not consistent with Francis and Yu (2010). However, they do not include the variable RISK_PORT in their models, which shows an untabulated correlation of -.54 with OFFICE_SIZE. If RISK_PORT is left out of our analyses, OFFICE_SIZE is often negative and significant, which is consistent with Francis and Yu (2010). This suggests that the high correlation between the two variables may be driving the insignificant coefficient on OFFICE_SIZE in our analyses.

(Johnstone and Bedard 2004).¹³ We then standardize these values which results in a mean of zero and standard deviation of one (for each variable) so as to not under/over-weight any individual variable. Finally, we add together the standardized mean values of assets and return on assets, and subtract the mean value of leverage, and then multiply this sum by -1 (so that a higher value reflects a riskier portfolio) to obtain the final value of RISK_PORT. We note that results are very similar if median values are used to standardize instead of mean values. We do not make a prediction for the sign on this variable.

We also include an additional auditor variable for the test of H4 which examines if the percentage of audits conducted within an auditor office where that office is the city-level industry expert has an impact on the contagion effect (test of H4). The variable OFFICE_EXP_% is measured as the number of audits conducted in a Big Four office in a year where the Big Four office is the city-level industry leader, scaled by the total number of audits conducted by the office in the year. A dichotomous version of this variable is created by splitting the sample at the median value for the test of H4 in Table 9.

Engagement-specific auditor industry expertise is controlled using both city- and national-level measures in which the auditor with the largest dollar amount of audit fees in an industry (either at the city-level or nationally) is considered the industry expert (Francis et al. 2005; Reichelt and Wang 2010). Consistent with Francis et al. (2005) only Big Four auditors are considered to be city and/or national industry experts. City industry expertise is based on each audit firm's market share of audit fees within a two-digit SIC category within a specific city. Following Francis et al. (2005) and Reichelt and Wang (2010), we define a city using the

¹³ Johnstone and Bedard (2004) include additional variables in calculating their risk portfolio measure. However, these variables were obtained through a questionnaire specific to their study. we use variables that are available in Compustat. Further, Johnstone and Bedard (2004) do not include client assets as a risk variable, although they do include it as a control variable in their analyses.

Metropolitan Statistical Area (MSA) as classified by the U.S. Census Bureau. Auditor cities are collected from Audit Analytics and are then categorized by MSA using the U.S. Census Bureau's MSA cross-map.¹⁴ The national industry expertise variable is based on each audit firm's market share of audit fees in the United States within a two-digit SIC category. Both city and national industry expertise are recalculated each year.

The variable CITY_IND_EXP is coded one if the auditor on a specific client engagement is the city-specific market share leader in terms of audit fees in a given year and NAT_IND_EXP is coded one if the auditor is the national market share leader in terms of audit fees in a given year. Based on prior research we expect CITY_IND_EXP will be negatively associated with discretionary accruals (Reichelt and Wang 2010). Results on national industry expertise are mixed in prior research so we do not make a prediction for NAT_IND_EXP.

Firm-level variables are included in all analyses to control for the various characteristics that affect a company's level of discretionary accruals. The variable INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t , scaled by the total fees charged by the auditor office in a year. Francis and Yu (2009) include this variable to control for the possibility that a specific client that provides a relatively high percentage of total fees to an auditor office may affect auditor objectivity, and thus, audit quality for that client. In most of their analyses this variable is not significant so we do not predict a sign for the coefficient on INFLUENCE.

The variable SIZE is the natural log of a company's total assets in year t while the variable LAG_TOT_ACC is a company's total accruals scaled by total assets in year $t-1$. CFO is

¹⁴ The U.S. Census Bureau's MSA cross-map (2008 definition) is available at the following web-site: <http://www.census.gov/population/www/metroareas/metroarea.html>. For cities not listed on the cross-map, we hand-collect the closest MSA using the 2008 map available at the web-site listed above and Google Maps. we thank Brett Kawada and Sarah Stein for their help in this hand collection.

the company's cash flows from operations in year t scaled by total assets and CFO_VOL is the standard deviation of CFO from years t-2 through year t. SALES_GROWTH is the one year growth in sales from year t-1 to year t and SALES_VOL is the standard deviation of sales from year t-2 through year t. PPE_GROWTH is the one year growth in net property, plant and equipment from year t-1 to year t, and LEV is the company's total debt scaled by total assets in year t. MB is a company's market value of equity scaled by book value of equity in year t and RETURN is the company's one year stock price return, including dividends, during year t-1. RET_VOL is the standard deviation of the 12 monthly stock price returns during year t, and SHARE_ISSUE is a dichotomous variable that equals one if the company issues additional stock during year t, and zero otherwise. The variable LOSS equals one when a company's net income is below zero in year t, and equals zero otherwise. The variable LITIGATE equals one for companies in industries with a high threat of litigation (SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370) as in Francis and Yu (2009). The variable BANKRUPTCY is the Altman Z-score as used in Francis and Yu (2009) and is included to control for the possibility that a company may have problems continuing as a going-concern, which could affect discretionary accruals.¹⁵ Finally, #_OPER_SEGS (#_GEO_SEGS) is the total number of a company's operating (geographic) segments.¹⁶ Based on prior research we expect SIZE, LAG_TOT_ACC, CFO, LOSS and BANKRUPTCY will be negatively associated with discretionary accruals while we expect CFO_VOL, SALES_GROWTH, SALES_VOL, PPE_GROWTH, MB, RET_VOL and LITIGATE will be positively associated with

¹⁵ Francis and Yu (2009) calculate the Altman-Z score, based on Altman (1983) as $[(0.717 \cdot \text{net working capital} / \text{assets}) + (0.847 \cdot \text{retained earnings} / \text{assets}) + (3.107 \cdot \text{earnings before interest and taxes} / \text{assets}) + (0.42 \cdot \text{book value of equity} / \text{liabilities}) + (0.998 \cdot \text{sales} / \text{assets})]$.

¹⁶ We use the Compustat Segments file to calculate these variables. When segment data does not exist in the file for a company we assign a segment value of one. Results that exclude these two variables are very similar to those presented.

discretionary accruals (Choi et al. 2010; Francis and Yu 2009; Hribar and Nichols 2007; Reichelt and Wang 2010). We do not predict a sign for LEV, RETURN, SHARE_ISSUE #_OPER_SEGS and #_GEO_SEGS due to absent or conflicting results in prior literature (Francis and Yu 2009).¹⁷

Discretionary Accruals

Firm-year discretionary accruals are calculated with a modified Jones model (Dechow et al. 1995; Jones 1991) controlling for concurrent performance (Kothari et al. 2005) within industry-year groups for separate samples of Big Four and non-Big Four clients, where industries are defined by a company's 2-digit SIC code. We require a minimum of 10 observations within an industry-year grouping and estimate the following model separately for each industry-year group:¹⁸

$$\text{TOT_ACC} = \alpha_0 + \alpha_1(1/\text{ASSETS}) + \alpha_2(\Delta\text{SALES} - \Delta\text{AR}) + \alpha_3\text{PPE} + \alpha_4\text{ROA} + \varepsilon \quad (2)$$

The variable TOT_ACC is calculated as a company's net income before extraordinary items less cash flows from operations. ASSETS is a company's total assets at the end of year t-1, SALES is a company's sales in year t and t-1 scaled by lagged total assets, AR is a company's net total receivables at the end of year t and t-1 scaled by lagged total assets, PPE is net property, plant and equipment at the end of year t scaled by lagged total assets, ROA is net income in year t

¹⁷ Francis and Yu (2009) also include a variable TENURE that indicates whether a company has been audited by the same audit firm for at least three years, based on Johnson et al. (2002). They are able to include this variable for their entire sample because they begin their analysis in the year 2003. However, given that this variable requires two years of lagged data to compute, its inclusion would force us to eliminate observations in the years 2000 and 2001 because specific auditor information is not available in Audit Analytics prior to this date. Given the effect on sample size, we do not present analyses including TENURE. However, we note that all results are qualitatively the same when TENURE is included and the sample size is correspondingly reduced.

¹⁸ Observations for which any value of the variables in equation (2) is above the .99 value or below the .01 value of all companies are excluded from the calculation of parameter values for equation (2) to mitigate the effect of these extreme values on the calculation of expected accruals. However, these companies are included in the final sample of 22,808 company-year observations.

scaled by lagged total assets. We estimate equation (2) separately for clients of Big Four and non-Big Four accounting firms (for separate industry-year subsamples) as these clients exhibit different operating and accounting characteristics (Francis et al. 1999a).

We initially estimate equation (2) using a sample of firm-year observations for companies that *do not* restate their originally reported net income subsequent to the financial statement audit. In other words, in calculating the coefficient parameters for equation (2) we exclude those firm-year observations that subsequently restate net income by any amount because the restatement is evidence that overall accruals included in the originally audited net income number were either over- or under-stated.¹⁹ Including companies with misstated earnings could bias the calculation of the coefficient parameters. We then apply these parameter values to the treatment and control firm-year observations to derive expected accruals. Abnormal accruals are the difference between expected and actual accruals. Note that we calculate abnormal accruals for restatement firms based on these firms' originally released financial statement numbers that are available in the Compustat Unrestated Quarterly file. For non-restatement companies, we use data from the Compustat Fundamental Annual file.

Descriptive Statistics

Table 3, Panel A presents the distribution of all variables used in the study. ABS_DISC_ACC has a mean (median) value of .083 (.051) which is similar to other studies (Reichelt and Wang 2010; Reynolds and Francis 2000). The mean value of DISC_ACC for all observations is zero by construction (Kothari et al. 2005), and the median value is also close to zero (.001). The dichotomous variable AUD_FAIL_2 equals one when at least one client restates

¹⁹ It is of course also possible that cash flows were incorrectly recorded in some way by the company that led to the subsequent restatement. However, Cheffers et al. (2010) show that the percentage of restatements that are due to cash considerations averages 4.8 percent from 2001 to 2006, indicating that this is a relatively uncommon occurrence.

net income downward by two percent or more within an auditor-office in a year, and zero otherwise. The mean value of .251 indicates that 25.1 percent of office-years have an audit failure at the two percent materiality threshold). At the 10 percent threshold (AUD_FAIL_10), 17.9 percent of office years have an audit failure at the 10 percent threshold.

[Insert Table 3 Here]

Approximately 75 percent of companies in the sample use a Big Four auditor, which is consistent with prior research (Francis et al. 1999a). OFFICE_SIZE is presented in Table 3 in raw form and is the total dollar amount of audit fees charged by an auditor office in a year in \$thousands. The mean (median) value of audit fees charged is about \$7.1 million (\$904,000). The mean (median) values of the variable that measures an office's risk portfolio (RISK_PORT) are .637 (-.121). The variable OFFICE_EXP_% is the percentage of total audits conducted by an office in a year where the auditor is the city-specific industry leader. Therefore, OFFICE_EXP_% is a continuous variable that is specific to each auditor-office-year observation. The mean (median) values for OFFICE_EXP_% over the 2,038 Big Four auditor-office-year observations is .682 (.727). This indicates that in the average Big Four office, the auditor is the city-level industry expert on a little over two-thirds of its audit engagements. Non-Big Four offices are excluded from this calculation, as well as the auditor industry expertise calculations, as in prior research (Francis et al. 2005).

The variable CITY_IND_EXP is a firm-year specific variable that takes on a value of one when a company is audited by the city-level industry leader in a year, and zero otherwise. The mean value of CITY_IND_EXP is .525, indicating that about half of all Big Four audit engagements in the sample are conducted by a city-level industry leader. The mean value of

NAT_IND_EXP is .179 indicating that for about 18 percent of Big Four audits, the auditor is classified as the national industry leader.

The variable INFLUENCE has a mean (median) value of .238 (.068) indicating that the average client company represents 23.8 percent of the total fees charged to all clients of an office. The median value is only 6.8 percent which indicates that this variable is skewed and that some particularly highly influential clients are driving the mean. The company-level variable SIZE is also presented in raw form in \$millions and the mean (median) value of companies' total assets is about \$1.4 billion (\$190 million). LAG_TOT_ACC has a mean (median) value of -.188 (-.057). The mean (median) value of CFO, a company's cash flows from operations, is -.060 (.056), while the same values for CFO volatility (CFO_VOL) are .172 (.090). Companies exhibit a mean (median) growth in sales over the previous year (SALES_GROWTH) of about 18 percent (7 percent) while the same values for sales volatility (SALES_VOL) are 1.085 (.171). The mean (median) values for growth in net property, plant and equipment from the previous year (PPE_GROWTH) is about 11 (1) percent, while companies are levered at a mean (median) value of 23.4 (15.9) percent of total assets. Companies' mean (median) market-to-book ratio (MB) is about 2.2 (1.3), while the stock price return including dividends (RETURN) during year t-1 shows values of 24.6 (3.2) percent. The mean (median) value for the standard deviation of a company's twelve monthly stock returns (RET_VOL) is .169 (.130), and about 73 percent of companies issue new shares (SHARE_ISSUE) during year t. Net losses are recorded by about 41 percent of companies while about 30 percent of companies are in high litigation industries. The mean (median) value of the Altman Z-score (BANKRUPTCY) is .344 (1.770). Finally, on average companies operate in 1.24 operating segments and 2.395 geographic segments.

Table 3, Panels B and C present univariate results comparing the mean and median values of companies' absolute and income-increasing discretionary accruals in offices with at least one audit failure compared to offices with zero audit failures. Panel B presents t-tests (rank-sum tests) for differences in means (medians) for non-Big Four offices. The values for AUD_FAIL_X=0 are the mean and median levels of client company absolute discretionary accruals (ABS_DISC_ACC) and income-increasing discretionary accruals (DISC_ACC > 0) audited by auditor offices with no audit failures in a year. AUD_FAIL_2 and AUD_FAIL_10 present the same values for office-years with at least one audit failure at the two and 10 percent threshold levels, respectively. Results at both thresholds indicate that the mean and median level of client discretionary accruals (both absolute and income-increasing) are significantly larger in non-Big Four offices with at least one audit failure compared to non-Big Four offices with no audit failures. Panel C presents mean/median values for Big Four offices and shows results that are very similar to Panel B. Taken together, the results in both panels provide preliminary univariate evidence that a contagion effect exists in both non-Big Four and Big Four offices.

Untabulated (for brevity) Pearson and Spearman correlations indicate that the correlations among the independent variables are all below .50 indicating that multicollinearity is not likely to be of concern. This conclusion is supported by the VIF's in the regression model estimations which are less than 6.5, well below the threshold of 10 suggested in Kennedy (1992).

IV. RESULTS

Before reporting the primary tests, we begin with an analysis of whether the presence of one client restatement increases the likelihood that there are two or more concurrent client restatements. To do this we regress NUM_FAIL_X which is the number of audit failures in an

office, where $X=2$ and 10 for the two materiality thresholds. We use all of the control variables in equation (1). This is a strong test of contagion and the results show that the presence of one audit failure (restatement) makes the likelihood of two or more concurrent audit failures significantly more likely than random chance ($p < .01$).

[Insert Table 4 Here]

We next ask the question of whether an audit failure in a prior office-year, increases the likelihood of observing an audit failure (client restatement) in a subsequent office-year. Table 5 reports this analysis at the 10 percent materiality threshold. For non-Big Four offices, an audit failure in office-year t is more likely to occur (than random chance) if there were also prior office-year failures in $t-2$ and $t-1$. For Big Four auditors, an audit failure is more likely to occur in office-year t if there were prior failures in $t-1$, $t-2$, $t-3$ and $t-4$. In other words, there are some offices that are clearly experiencing “serial problems” with audit quality. This is another test of contagion: in this case, the contagion of audit failures across time. That is, when we observe an audit failure in an office, there is a significant likelihood we will observe future audit failures for up to four subsequent years for Big Four offices, and two subsequent years for non-Big Four offices.

[Insert Table 5 Here]

Together, the results in Tables 4 and 5 indicate a contagion of audit failures in offices both cross-sectionally at a point in time and longitudinally over time. Next we examine if there is a broader contagion effect on the quality of the audited earnings of client in offices with an audit failure. That is, does an audit failure signal the presence of low earnings quality for clients even for those clients that do not necessarily have restatements?

Tests of H1 and H2 – Contagion in non-Big Four and Big Four Auditor Offices

The p-values on the test variable of interest (AUD_FAIL_X) are reported conservatively as two-tail values, even though directional predictions are being made with respect to contagion effects. Table 6, Panel A presents the first set of regression results testing H1 and H2, where the dependent variable is a company's level of absolute discretionary accruals (ABS_DISC_ACC).²⁰ All models are significant at $p < .01$ with r-squares around 47 percent for clients of Big Four offices, and 28 percent for clients of non-Big Four offices. This is similar to prior research that investigates the determinants of discretionary accruals (e.g., Reichelt and Wang 2010). These and all subsequent models include industry (2-digit SIC codes) and year fixed effects, and t-statistics which are based on standard errors clustered at the auditor-office level.²¹ Auditor and company-level control variables are generally consistent with predictions.

[Insert Table 6 Here]

In Table 6, Panel A, the positive and significant ($p < .10$, two-tail) coefficients on AUD_FAIL_X in in both thresholds indicate that clients audited by both non-Big Four and Big Four auditor offices where at least one audit failure occurs, have higher absolute discretionary accruals, on average, compared to non-Big Four/Big Four offices where no audit failures

²⁰ All models exclude some observations compared to the full sample of 28,432 firm-year observations. The reason for this is that, for example, in the first model that considers restatements at the two percent or greater threshold level, we drop offices where client restatements greater than zero but less than two percent exist, but where no restatements over the two percent threshold exist. Therefore, AUD_FAIL_X in the first model tests whether client absolute discretionary accruals are higher in offices with at least one audit failure of two percent or greater compared to offices with zero audit failures, *after excluding offices with client restatements only between zero and two percent*. Including these offices with between zero and two percent restatements would effectively consider these very low threshold restatements (between zero and two percent) as not being a restatement at all, which is obviously not appropriate. The same exclusion applies for the second model considering the 10 percent threshold (i.e. offices with *only* restatements between zero and 10 percent are excluded).

²¹ We cluster standard errors at the auditor-office level instead of the company level because our variables of interest vary at the office level, not the company level. Therefore, standard errors that are not clustered may be inflated due to including multiple observations of the same auditor office in the sample. However, we note that if standard errors are clustered at the company level instead, all results are very similar in terms of the statistical significance on all variables.

occurred. These results support H1 and provide evidence that a contagion effect exists in non-Big Four auditor offices. The coefficients on AUD_FAIL_X are slightly larger for non-Big Four clients (columns 1 and 3) compared to Big Four clients (columns 2 and 4). However, the coefficients are not significantly different, which indicates that the contagion effect is no different, on average, in Big Four offices compared to non-Big Four auditor offices. Thus, H2 is not supported and there is no difference in contagion effects between the two groups of auditors.

Table 6, Panel B analyzes whether these results hold when looking only at companies that exhibit positive, or income-increasing, discretionary accruals. Results for non-Big Four and Big Four auditors are similar to Panel A, with the coefficients on AUD_FAIL_X being significant at the .10 level (two-tail). Taken together the results in both panels of Table 6 indicate that contagion occurs in the offices of both non-Big Four and Big Four accounting firms. These results are robust to alternative definitions of an audit failure based on restatement thresholds of two and 10 percent. We conclude that the presence of a downward material client restatement of net income provides a method for assessing the quality of earnings of clients in an auditor office by analyzing very simple, publicly-available information.

The results in Table 6 are also economically significant. Given that AUD_FAIL_X is an indicator variable that takes on a value of either zero or one, the results in the first model of Panel A indicate that a non-Big Four client company's level of absolute discretionary accruals is higher by a magnitude of .008 when audited by an office where at least one audit failure occurs. This magnitude represents an increase of 5.2 and 11.1 percent over non-Big Four client companies' *mean* values of absolute discretionary and total accruals, respectively.²² Similarly, the .008 magnitude represents a 9.4 and 9.9 percent increase over the *median* values of absolute

²² The untabulated mean/median values of *absolute* discretionary and (total) accruals for non-Big Four client companies are .1550/.0852 and (-.0718/-.0809).

discretionary and total accruals. For Panel B, the magnitude of the coefficient on AUD_FAIL_X in the first model of .007 represents a 5.2 and 9.7 percent increase over non-Big Four client companies' mean values of income-increasing discretionary and total accruals, respectively.²³ Similarly, the .007 magnitude represents a 7.8 and 8.7 percent increase over the median values of income-increasing discretionary and total accruals.

Finally, we calculate economic significance for Big Four auditor offices in both Panels A and B as well. The .002 magnitude on the coefficient in both models in Panel A represents an increase of 9.1 percent over Big Four client companies' mean values of absolute discretionary and total accruals, respectively.²⁴ For Panel B, the magnitude of the coefficient on in the first model of .004 represents a 6.5 and 7.0 percent increase over Big Four client companies' mean values of income-increasing discretionary and total accruals, respectively.²⁵ Similarly, the .005 magnitude in the second model represents a 10.7 and 8.1 percent increase over the untabulated median values of income-increasing discretionary and total accruals.

Tests of H3 – Contagion Effect Based on Big Four Office Size

Table 7 investigates whether the contagion effect in Big Four offices is affected by the size of the office (H3), and is motivated by the findings in Francis and Yu (2009, 2010) and Choi et al. (2010) that Big Four office size affects audit quality. Table 7 presents results on a sub-sample of Big Four clients of very large auditor offices compared to a sub-sample of Big Four clients in smaller offices. For this analysis we create an indicator variable LARGE_OFFICE.

This variable is coded one for Big Four offices that are larger than the 75th percentile value of

²³ The untabulated mean/median values of *income-increasing* discretionary accruals for non-Big Four client companies are .1336/.0902. See footnote 26 for mean and median values of total accruals for non-Big Four clients.

²⁴ The untabulated mean/median values of *absolute* discretionary and (total) accruals for Big Four client companies are .0770/.0467 and (-.0716/-.0616).

²⁵ The untabulated mean/median values of *income-increasing* discretionary accruals for Big Four client companies are .0768/.0469. See footnote 28 for mean and median values of total accruals for Big Four clients.

Big Four OFFICE_SIZE (audit fees of \$11.8 million), and is coded zero otherwise. Therefore, we are comparing the largest quartile of Big Four auditor office size with the other 75 percent of offices. Partitioning at the 75th instead of the 50th percentile classifies fewer offices as being large and biases against finding a contagion effect in smaller offices.

In Table 7, Panels A and B, the variable AUD_FAIL_X tests if a contagion effect exists in the small Big Four offices. The interaction coefficient AUD_FAIL_X * LARGE_OFFICE tests the incremental difference within the largest offices (test of H3) and the F-statistic on AUD_FAIL_X + LARGE_OFFICE*AUD_FAIL_X tests if a contagion effect exists at all in the larger set of offices. The positive and significant ($p < .05$) coefficients on AUD_FAIL_X in Panel A (absolute abnormal accruals) indicates that a contagion effect exists in “smaller” Big Four offices. The results on AUD_FAIL_X are significant at $p < .10$ (two-tail) and $p < .05$ in Panel B for income-increasing abnormal accruals. It is worth noting again that this set of “small” offices comprises 75 percent of all Big Four offices in the sample, suggesting that a contagion effect occurs in most Big Four offices.

The coefficients on the interaction terms are insignificant in three of the four models in Panels A and B. On balance there does not seem to be a significant incremental difference between small and large Big Four offices in Table 6. However, the insignificant F-statistics on the sum of the coefficients (AUD_FAIL_X + LARGE_OFFICE*AUD_FAIL_X) in all four models in Table 7 indicate that no contagion occurs in the largest Big Four offices. This indicates that larger Big Four offices not only conduct audits of higher quality as shown by Francis and Yu (2009) and Choi et al. (2010), but also that a contagion effect does not occur in the largest quartile of Big Four offices.

Tests of H4 – Contagion Effect Based on Big Four Office-Level Industry Expertise

Table 8 presents the results of testing if a contagion effect in a Big Four office depends on the percentage of audits performed in the office's areas of city-level industry leadership (H4). We analyze only city-level industry expertise because prior research shows that city-level rather than national-level leadership is the main determinant of auditor industry expertise (Francis et al. 2005; Reichelt and Wang 2010). For brevity, Table 8 only tests income-increasing discretionary accruals. Results are robust to testing absolute discretionary accruals.

The indicator variable HIGH_OFFICE_EXPERTISE in Table 8 is coded one when the value of OFFICE_EXP_% for a Big Four office is greater than the median value of 0.727.²⁶ Therefore, the variable AUD_FAIL_X in all models tests if a contagion effect occurs in offices where the auditor conducts a relatively *low* percentage of audits in its areas of city-level of industry leadership, relative to the sample median. The F-statistic on the sum of the coefficients (AUD_FAIL_X + AUD_FAIL_X * HIGH_OFFICE_EXPERTISE) tests if a contagion effect exists in offices where the auditor conducts a relatively *high* percentage of audits in its areas of city-level of industry expertise, relative to the sample mean.

Table 8, Panel A analyzes all Big Four offices. The positive and significant ($p < .05$) coefficients on AUD_FAIL_X in all models indicates that a contagion effect exists in the Big Four auditor offices that conduct a relatively low percentage of audits in its areas of industry expertise. In contrast, the F-statistics on the sum of AUD_FAIL_X and AUD_FAIL_X x , HIGH_OFFICE_EXPERTISE, are not significant, indicating no contagion when for offices

²⁶ we exclude all offices with less than 10 clients in the analyses in Table 7 to avoid the possibility that very small offices are significantly influencing the calculation of OFFICE_EXP_%. This is possible because a very small denominator (total number of clients) for this variable calculation could create very large expertise percentages and possibility bias results.

which have a larger percentage of audits in their areas of industry expertise. Thus, H4 is supported.

[Insert Table 8 Here]

As a further analysis, Table 8 Panel B investigates just the largest 25 percent of Big Four offices, and tests if contagion occurs in those offices which have a relatively smaller percentage of audits in office's areas of industry expertise. The results indicate no contagion effect for any of these large offices, which means that office size drives audit quality rather than the degree to which an office conduct audits in its areas of industry expertise.

Sensitivity Analyses

We test if there is persistence in low quality client earnings over time for those offices with an audit failure. To do this we regress the current level of client discretionary accruals in period t on lagged values of AUD_FAIL_X . Results indicate that clients in offices with an audit failure in periods $t-1$, $t-2$ and $t-3$ continue to have low quality earnings period t . This analysis provides more evidence that a contagion effect persists over time, and that this persistence provides useful information about the quality of current audits and current earnings quality. This suggests that audit firms can benefit by using our findings to direct additional quality-control resources to those offices that exhibit a contagion effect because there appears to be a persistent problem of low quality audits across time in these offices.

Many non-Big Four accounting firms are comprised of only a few office locations. For example, untabulated analysis shows that out of the total of 2,660 non-Big Four offices in the sample, 971 are from single-office audit firms. Therefore, it is possible that these very small audit firms are driving the results for non-Big Four auditors. In order to test whether the main results are sensitive to this we delete all observations where a company is audited by a non-Big

Four audit firm with only one office location. We repeat this by deleting all audit firms with less than five offices. In both cases, all tabulated results are very similar, and often stronger, using this reduced sample.

Similarly, it is possible that auditor offices with very few clients are driving the results. To address this concern we delete all companies audited by a non-Big Four (Big Four) auditor office where the total number of clients of the office in a year is less than 2 (4). These client number values represent the 25th percentile level for each auditor type (i.e. 25 percent of non-Big Four and Big Four auditor offices have less than two and four clients, respectively). Results are qualitatively the same compared to tabulated results.

There are instances where firms restate earnings due to an updated interpretation of an accounting standard. In this case, the restatement may not reflect an audit failure, *per se*, and multiple concurrent restatements are likely to occur. One way to mitigate this concern is to delete those offices that exhibit a high number of client restatements in a particular year. We do this by deleting all observations from offices with more than two restatements, and these results are qualitatively the same as those reported in the tables.

V. CONCLUSION

We investigate if the presence of an audit failure in an office suggests the likelihood of “contagion effect” that results in other low quality audits in the office. We test this by determining if the presence of at least one audit failure, measured as a downward restatement of net income by a client subsequent to the audit, indicates a systemic problem in the average quality of concurrent audits performed in the same office for the same year that the misstated earnings were originally reported. We first show that offices are more likely than chance to have

multiple client restatements, given a single restatement, and that offices with client restatements in past are more likely than chance to have client restatements in the future. These results suggest that a contagion of audit failures exists both at a point in time and longitudinally over time, and that accounting firms do not seem to quickly remediate the quality control problems in these offices.

Next we examine if the earnings quality of clients in offices with audit failures are lower, on average, than clients in those offices with no audit failures. We measure earnings quality based on cross-sectional differences in clients' discretionary accruals. Our findings indicate that in auditor offices where at least one audit failure in a year is identified, other clients of that office (for the same year) have a higher level of abnormal accruals compared to offices with zero audit failures. Higher accruals imply lower quality earnings. These results hold for offices of non-Big Four auditors, and for all but the largest quartile of Big Four offices.

Our findings should be of interest to those outside the auditor office such as regulators, standard setters, accounting firms and investors because we provide a method to infer the overall audit quality of an auditor office location through the use of easily obtainable and publicly-available information. Further, we show that the contagion persists for multiple years in auditor offices, which also indicates the usefulness of our findings to outsiders. Regulators can use this to identify offices where audits are more likely to be of lower quality (and perhaps even below minimum standards). Standard setters may be able to use this information to implement auditing standards that better address the determinants of audit quality at the auditor office location. Accounting firms can benefit from this method as those in charge of quality-control processes in a firm's national office can use it to identify specific offices that may not be implementing the firm's quality-control procedures appropriately. Finally, investors may be able to use it as one

piece of additional information with which to infer something about the earnings quality of a particular company based on the auditor office which performs the audit.

The study also has some limitations. First, our measure of an audit failure within an auditor office relies on the assumption that every company that “should” restate earnings actually does so. This is not likely to be the case. However, we note that in cases where an audit engagement is misclassified as not being an audit failure (no restatement is issued) when it may in fact be a poor quality audit (that is unobservable) biases against finding a statistically significant result. Secondly, our sample is limited to audits of publicly-traded companies. To the extent that a particular auditor office also performs audits of smaller, private companies, our results cannot be generalized to this client base.

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Appendix A – Variable Definitions

<u>Variable</u>	<u>Definition</u>
<u>Dependent Variables:</u>	
ABS_DISC_ACC	= the absolute value of a company's discretionary accruals as calculated in Kothari et al. (2005).
DISC_ACC	= the signed value of a company's discretionary accruals as calculated in Kothari et al (2005). Analyses using DISC_ACC investigate only income-increasing discretionary accruals.
<u>Test Variables:</u>	
B4	= 1 if the company hires a Big 4 auditor in year t, and 0 otherwise.
AUD_FAIL_X	= 1 when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when a client company restates net income downward by a material amount subsequent to the audit. X refers to the materiality level of the restatement (i.e. 2 for a two percent or greater downward restatement of net income, 5 for a five percent or greater downward restatement of net income and 10 for a ten percent or greater downward restatement of net income). Company-year observations with a restatement due to a merger/acquisition are not considered to be an audit failure. Auditor office locations are taken from Audit Analytics.
LARGE_OFFICE	= 1 for Big Four auditor offices that are larger than the 75 th percentile value of OFFICE_SIZE (see below), and 0 otherwise. The 75 th percentile value for Big Four offices is \$11.8 million in audit fees. This variable is used only in Tables 6 and 7.
HIGH_OFFICE_EXPERTISE	= 1 when the percentage of audits conducted within an auditor office in a year where the auditor is the city-level industry expert is greater than the median value of .75 for all Big Four auditor-offices-year observations and 0 when it is below the median value. The percentage is calculated for each office-year by scaling the number of audits conducted within an office in a year where the auditor is the city-level industry expert by the total number of audit engagements in the office in the same year. An auditor is the city-level industry expert when it has the highest market share of audit fees within a Metropolitan Statistical Area in an industry defined by 2-digit SIC codes (see the variable definition for CITY_IND_EXP below). This variable is used only in Table 7.
<u>Auditor Office-Level Control Variables:</u>	
OFFICE_SIZE	= the natural log of the total dollar amount of audit fees charged to all audit clients within an auditor office in year t. Auditor office locations are taken from Audit Analytics.
RISK_PORT	= the mean value of the average of client assets, leverage and return on assets for an auditor office in year t. The average is calculated by taking the mean level of client assets, leverage and return on assets. These mean level are then standardized so that each has a mean of zero and a standard deviation of one. These standardized values are then averaged together to form the overall risk client risk portfolio for the auditor office in a year.
<u>Firm-Level Control Variables:</u>	
CITY_IND_EXP	= 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise where industry expertise is calculated based on total audit fees charged by the audit firm to clients within a particular metropolitan statistical area and industry (similar to Francis et

al. 2005). The audit firm with the highest amount of audit fees within an industry in a city is classified as the city-level industry expert. Industries are defined at the 2-digit SIC code level.

NAT_IND_EXP	= 1 if the company's auditor is the national-level industry expert auditor, and 0 otherwise where industry expertise is calculated based on total audit fees charged by the audit firm to clients in a particular industry within the U.S. The audit firm with the highest amount of audit fees within an industry is classified as the national industry expert. Industries are defined at the 2-digit SIC code level.
INFLUENCE	= the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year.
SIZE	= the natural log of a company's total assets in year t.
LAG_TOT_ACC	= a company's total accruals scaled by total assets in year t-1.
CFO	= a company's cash flows from operations in year t scaled by lagged total assets.
CFO_VOL	= the standard deviation of a company's cash flows from operations from year t-2 through year t.
SALES_GROWTH	= the one-year growth in a company's sales from year t-1 to year t.
SALES_VOL	= the standard deviation of a company's sales from year t-2 through year t.
PPE_GROWTH	= the one-year growth in a company's net property, plant and equipment from year t-1 to year t.
LEV	= a company's total debt, scaled by lagged total assets.
MB	= a company's market value of equity scaled by book value of equity at the end of year t.
RETURN	= a company's 12-month stock return during year t-1.
RET_VOL	= the standard deviation of a company's monthly stock returns during year t.
SHARE_ISSUE	= 1 if the company issued additional shares in year t, and 0 otherwise.
LOSS	= 1 if the company records net income below zero in year t, and 0 otherwise.
LITIGATE	= 1 if a company is within the following SIC codes: 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise.
BANKRUPTCY	= the probability of bankruptcy using the Altman-Z score $[(0.717 \cdot \text{net working capital} / \text{assets}) + (0.847 \cdot \text{retained earnings} / \text{assets}) + (3.107 \cdot \text{earnings before interest and taxes} / \text{assets}) + (0.42 \cdot \text{book value of equity} / \text{liabilities}) + (0.998 \cdot \text{sales} / \text{assets})]$.
#_OPER_SEGS	= the number of operating segments the company operates in.
#_GEO_SEGS	= the number of geographic segments the company operates in.

TABLE 1
Sample

Panel A: Sample Selection

	<u>N</u>
Observations available in the Compustat Fundamentals Annual File from the years 2000-2008 with non-missing assets or income	87,890
Less:	
Financial and Utility Companies (SIC 4400-4999 and 6000-6999)	(25,019)
Observations with missing CIK number to merge with Audit Analytics	(7,081)
Observations with missing auditor location data in Audit Analytics	(11,637)
Observations with missing data necessary to calculate firm-level variables	(15,721)
Final Sample	<u>28,432</u>

Panel B: Number of Unique Auditor Office Locations by Year

<u>Year</u>	<u>Non-Big Four</u>	<u>Big Four</u>	<u>Total</u>
2000	149	320	469
2001	249	348	597
2002	299	304	603
2003	318	285	603
2004	356	273	629
2005	380	267	647
2006	352	254	606
2007	284	249	533
2008	<u>273</u>	<u>243</u>	<u>516</u>
Total	<u>2,660</u>	<u>2,543</u>	<u>5,203</u>
Mean Number per year	<u>296</u>	<u>283</u>	<u>578</u>

Big Four indicates that the auditor office is that of a Big Four audit firm in year t. Non-Big Four indicates that the auditor office is that of a non-Big Four audit firm in year t.

TABLE 2
Descriptive Statistics for the Number of Restatements and Audits per Year

Panel A: Total Number of Restatements per Office per Year

Number of Restatements	Restatement Threshold			
	> 2%		> 10%	
	Non-Big 4	Big 4	Non-Big 4	Big 4
0	2,222	1,671	2,340	1,928
1	343	535	266	426
2	72	179	43	121
3	11	87	7	37
4	11	32	4	14
5	1	16	-	7
6	-	13	-	8
> 6	-	10	-	2
Total	<u>2,660</u>	<u>2,543</u>	<u>2,660</u>	<u>2,543</u>

Panel B: Distribution of Number of Restatements and Audits per Office-Year

	Restatement Threshold is > 10% in all cases					
	Number of Restatements		Number of Audits		Restatements as a Percentage of Audits	
	Non-Big 4	Big 4	Non-Big 4	Big 4	Non-Big 4	Big 4
10 %	0	0	1.00	2.00	0	0
25 %	0	0	2.00	4.00	0	0
Mean	.15	.37	7.57	14.72	.016	.023
Median	0	0	4.00	8.00	0	0
75 %	0	0	8.00	17.00	0	0
90 %	1.00	1.00	17.00	34.00	.040	.083
Max	4.00	10.00	408.00	567.00	1.000	1.000

The figures in this table are for all auditor office locations over all years of the sample from 2000 to 2008 (i.e. observations are at the office-year level). “Number of Restatements” is the number of client companies that restate net income by at least the audit failure threshold listed (i.e. 2 or 10 percent). “Number of Audits” is the number of audits performed by an office in a year. Panel B includes only the ten percent restatement threshold level for brevity. Big Four indicates that the auditor office is that of a Big Four audit firm in year t. Non-Big Four indicates that the auditor office is that of a non-Big Four audit firm in year t.

TABLE 3
Descriptive Statistics

Panel A: Distributional Properties of Variables

Variable	N	Mean	Std.	25%	Median	75%
<i>ABS_DISC_ACC</i>	28,432	.083	.089	.022	.051	.105
<i>DISC_ACC</i>	28,432	0	.259	-.051	.001	.051
<i>AUD_FAIL_2</i>	5,203	.251	.434	0	0	1.000
<i>AUD_FAIL_10</i>	5,203	.179	.383	0	0	0
<i>B4</i>	28,432	.753	.431	1.000	1.000	1.000
<i>OFFICE_SIZE</i> (<i>n=office-years</i>)	5,203	7,095	18,300	169	904	4,942
<i>RISK_PORT</i> (<i>n=office-years</i>)	5,203	.637	3.009	-1.081	-.121	1.339
<i>OFFICE_EXP_%</i> (<i>Big 4 only</i>)	2,543	.682	.326	.400	.727	1.000
<i>CITY_IND_EXP</i> (<i>Big 4 only</i>)	21,421	.525	.499	0	1.000	1.000
<i>NAT_IND_EXP</i> (<i>Big 4 only</i>)	28,432	.179	.383	0	0	0
<i>INFLUENCE</i>	28,432	.238	.476	.020	.068	.231
<i>SIZE</i>	28,432	1,421	3,602	39	190	885
<i>LAG_TOT_ACC</i>	28,432	-.188	5.349	-.117	-.057	-.014
<i>CFO</i>	28,432	-.060	.521	-.101	.056	.152
<i>CFO_VOL</i>	28,432	.172	.241	.045	.090	.188
<i>SALES_GROWTH</i>	28,432	.175	.655	-.045	.073	.218
<i>SALES_VOL</i>	28,432	1.085	3.018	.037	.171	.763
<i>PPE_GROWTH</i>	28,432	.110	.573	-.110	.008	.171
<i>LEV</i>	28,432	.234	.292	.009	.159	.342
<i>MB</i>	28,432	2.186	3.365	.091	1.306	2.629
<i>RETURN</i>	28,432	.246	1.004	-.285	.032	.414
<i>RET_VOL</i>	28,432	.169	.145	.086	.130	.201
<i>ISSUE</i>	28,432	.729	.443	0	1.000	1.000
<i>LOSS</i>	28,432	.410	.491	0	0	1.000
<i>LITIGATE</i>	28,432	.300	.458	0	0	1.000
<i>BANKRUPTCY</i>	28,432	.344	5.942	.487	1.770	2.803
<i>#_OPER_SEGS</i>	28,432	1.240	1.035	1.000	1.000	1.000
<i>#_GEO_SEGS</i>	28,432	2.395	2.048	1.000	2.000	3.000

TABLE 3 (Continued)
Descriptive Statistics

Panel B: Differences in Means/Medians of Abnormal Accruals in non-Big Four Auditor Offices

	ABS_DISC_ACC			DISC_ACC > 0		
	Mean	Median	N	Mean	Median	N
AUD_FAIL_X = 0	.116	.075	4,339	.100	.078	2,265
AUD_FAIL_2 = 1	.131 ***	.087 ***	2,251	.109 ***	.088 ***	1,148
AUD_FAIL_10 = 1	.134 ***	.089 ***	1,704	.111 ***	.089 ***	865

Panel C: Differences in Means/Medians of Abnormal Accruals in Big Four Auditor Offices

	ABS_DISC_ACC			DISC_ACC > 0		
	Mean	Median	N	Mean	Median	N
AUD_FAIL_X = 0	.065	.042	6,310	.062	.041	3,151
AUD_FAIL_2 = 1	.073 ***	.047 ***	13,091	.069 ***	.046 ***	6,469
AUD_FAIL_10 = 1	.075 ***	.048 ***	10,214	.071 ***	.048 ***	5,091

ABS_DISC_ACC is the absolute value of a company's discretionary accruals as calculated per Kothari et al. (2005). DISC_ACC is the signed value of a company's discretionary accruals as calculated per Kothari et al. (2005). AUD_FAIL_X equals one when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when at least one of the auditor's client companies within an auditor office subsequently restates net income downward in the future by threshold level X. X refers to the threshold level of the restatement (i.e. 2 (10) for a two (ten) percent or greater restatement of net income). OFFICE_SIZE (in this table only) is total dollar amount of fees charged to all audit clients within an auditor office in year t (it is log-transformed in all subsequent analyses). RISK_PORT is the mean value of the average of client assets, leverage and return on assets for an auditor office in year t. The average is calculated by taking the mean level of client assets, leverage and return on assets. These mean levels are then standardized so that each has a mean of zero and a standard deviation of one. These standardized values are then averaged together to form the overall risk client risk portfolio for the auditor office in a year. OFFICE_EXP_% is the percentage of Big 4 audits conducted within an auditor office in a year where the Big 4 auditor is the city-level industry expert. CITY_IND_EXP equals 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise. NAT_IND_EXP equals 1 if the company's Big 4 auditor is the national industry expert auditor, and 0 otherwise. Industries are defined at the 2-digit SIC code level for all expertise variables. Expertise is based on market share of audit fees. INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year. SIZE (in this table only) is a company's total assets in year t (it is log-transformed in all subsequent analyses). LAG_TOT_ACC is a company's total accruals scaled by total assets in year t-1. CFO is a company's cash flows from operations in year t scaled by lagged total assets. CFO_VOL is the standard deviation of a company's cash flows from operations from year t-2 through year t. SALES_GROWTH is the one-year growth in a company's sales from year t-1 to year t. SALES_VOL is the standard deviation of a company's sales from year t-2 through year t. PPE_GROWTH is the one-year growth in a company's net property, plant and equipment from year t-1 to year t. LEV is a company's total debt in year t, scaled by lagged total assets. MB is a company's market value of equity scaled by book value of equity at the end of year t. RETURN is a company's 12-month stock return during year t-1. RET_VOL is the standard deviation of a company's monthly stock returns during year t. SHARE_ISSUE equals one if the company issued additional shares in year t, and 0 otherwise. LOSS equals one if the company records net income below zero in year t, and 0 otherwise. LITIGATE equals one if a company is within the following SIC codes: (2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise. The sample sizes for CITY_IND_EXP and NAT_IND_EXP are smaller as these values are calculated across only clients of Big Four auditors. BANKRUPTCY is the probability of bankruptcy using the Altman-Z score $[(0.717 * \text{net working capital} / \text{assets}) + (0.847 * \text{retained earnings} / \text{assets}) + (3.107 * \text{earnings before interest and taxes} / \text{assets}) + (0.42 * \text{book value of equity} / \text{liabilities}) + (0.998 * \text{sales} / \text{assets})]$. #_OPER_SEGS is the number of operating segments the company operates in. #_GEO_SEGS is the number of geographic segments the company operates in. Descriptive statistics for AUD_FAIL_X, OFFICE_SIZE and RISK_PORT are based on a sample of 4,105 auditor-office-year observations. Descriptive statistics for OFFICE_EXP_% are calculated based on a sample of 2,038 Big Four auditor-office-year observations. Descriptive statistics for industry expertise variables (CITY_IND_EXP and NAT_IND_EXP) are calculated over only client companies of Big Four auditors, which results in a reduced sample size of 17,408 observations.

TABLE 4
Multiple Audit Failures in an Office Predicted by the Existence of At Least One Failure Auditor Office-Level Analysis

Dependent Variable = NUM_FAIL_X

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)			
		> 2 %		> 10 %	
		Non-B4	B4	Non-B4	B4
<i>Test Variable:</i>					
AUD_FAIL_X	+	1.265 ***	1.417 ***	1.202 ***	1.308 ***
p-value		(.000)	(.000)	(.000)	(.000)
<i>Control Variables:</i>					
OFFICE_SIZE	+	.026 **	.274 ***	.017 **	.147 ***
M_CITY_IND_EXP	-		-.065		-.026
M_NAT_IND_EXP	?	-.036	.009	-.014	.040
M_INFLUENCE	?	-.003	.374 ***	.006	.192 ***
M_AB_ACC	+	.054 **	.226	.011	.127
M_SIZE	?	-.007	-.121 ***	-.009 **	-.067 ***
M_LAG_TOT_ACC	?	-.058 *	.086	-.004	.116
M_CFO	?	-.033 *	.020	.003	.024
M_CFO_VOL	?	.016	-.052	.016	-.014
M_SALES_GROWTH	?	-.001	.108 ***	.010 *	.054 **
M_SALES_VOL	?	.020	.008	.022	.005 *
M_PPE_GROWTH	?	-.002	.087 **	-.001	.039 *
M_LEV	?	-.006	-.145	.001	-.081
M_MB	?	.000	-.011	-.001 **	-.006
M_RETURN	?	.002	.009	-.001	.022
M_RET_VOL	?	.004	.334	.018	.279 *
M_SHARE_ISSUE	?	.000	.040	.006	.037
M_LOSS	?	-.004	.003	-.001	.008
M_LITIGATE	?	-.022 *	.039	-.019 **	.015
M_BANKRUPTCY	?	.002 **	.007	.001	.004
M_#_OPER_SEGS	?	.001	-.025 *	-.001	-.017 **
M_#_GEO_SEGS	?	-.005 *	-.004	-.001	-.004
INTERCEPT	?	.405 **	-3.046 ***	-.397	-1.641 ***
Audit Firm Fixed Effects		YES	YES	YES	YES
Year Fixed Effects		YES	YES	YES	YES
N (treatment)		438	872	320	615
N (control)		2,089	1,440	2,089	1,440
Model p-value		<.001	<.001	<.001	<.001
R ²		76.7 %	57.9 %	81.9 %	62.1 %

***, ** and * indicate significance at the .01, .05 and .10 respectively using two-tailed tests. T-statistics are calculated based on robust standards errors clustered at the auditor-office level. B4 (NB4) indicates a sample of Big Four (non-Big Four) auditor offices. NUM_FAIL_X is the number of client restatements within an auditor office in year t at materiality level X. AUD_FAIL_X equals one when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when at least one of the auditor's client companies within an auditor office subsequently restates net income downward in the future by threshold level X. X refers to the threshold level of the restatement (i.e. 2 (10) for a two (ten) percent or greater restatement of net income). OFFICE_SIZE is the natural log of the total dollar amount of fees charged to all audit clients within an auditor office in year t. CITY_IND_EXP equals 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise. NAT_IND_EXP equals 1 if the company's Big 4 auditor is the national industry expert auditor, and 0 otherwise. Industries are defined at the 2-digit SIC code level for all expertise variables. Expertise is based on market share of audit fees. INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year. SIZE is a the natural log of a company's total assets in year t. LAG_TOT_ACC is a company's total accruals scaled by total assets in year t-1. CFO is a company's cash flows from operations in year t scaled by lagged total assets. CFO_VOL is the standard deviation of a company's cash flows from operations from year t-2 through year t. SALES_GROWTH is the one-year growth in a company's sales from year t-1 to year t. SALES_VOL is the standard deviation of a company's sales from year t-2 through year t. PPE_GROWTH is the one-year growth in a company's net property, plant and equipment from year t-1 to year t. LEV is a company's total debt in year t, scaled by lagged total assets. MB is a company's market value of equity scaled by book value of equity at the end of year t. RETURN is a company's 12-month stock return during year t-1. RET_VOL is the standard deviation of a company's monthly stock returns during year t. SHARE_ISSUE equals one if the company issued additional shares in year t, and 0 otherwise. LOSS equals one if the company records net income below zero in year t, and 0 otherwise. LITIGATE equals one if a company is within the following SIC codes: (2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise. The sample sizes for CITY_IND_EXP and NAT_IND_EXP are smaller as these values are calculated across only clients of Big Four auditors. BANKRUPTCY is the probability of bankruptcy using the Altman-Z score $[(0.717 \cdot \text{net working capital} / \text{assets}) + (0.847 \cdot \text{retained earnings} / \text{assets}) + (3.107 \cdot \text{earnings before interest and taxes} / \text{assets}) + (0.42 \cdot \text{book value of equity} / \text{liabilities}) + (0.998 \cdot \text{sales} / \text{assets})]$ #_OPER_SEGS is the number of operating segments the company operates in. #_GEO_SEGS is the number of geographic segments the company operates in. "M_" before a variable indicates that it is the office-year median or mean value of that variable across all company-level observations. Median values are used for all continuous company-level variables and mean values are used for all dichotomous company-level variables.

TABLE 5
Current Audit Failures in an Office Predicted by Past Audit Failures
Auditor Office-Level Analysis
Dependent Variable = AUD_FAIL_10

Variable	Pred.	Non-B4	B4	Non-B4	B4	Non-B4	B4	Non-B4	B4	Non-B4	B4
<i>Test Variables:</i>											
LAG_1_AUD_FAIL_10	+	.039 ***	.089 ***								
LAG_2_AUD_FAIL_10	?			.043 ***	.059 **						
LAG_3_AUD_FAIL_10	?					.003	.058 **				
LAG_4_AUD_FAIL_10	?							.030	.039 *		
LAG_5_AUD_FAIL_10	?									.054 **	-.011
(p-value)		(.006)	(.000)	(.004)	(.021)	(.824)	(.014)	(.127)	(.099)	(.025)	(.661)
<i>Control Variables:</i>											
OFFICE SIZE	+	.058 ***	.176 ***	.069 ***	.201 ***	.070 ***	.184 ***	.075 ***	.178 ***	.103 ***	.174 ***
M CITY IND EXP	-		-.020		-.048		-.062		-.087		-.119 **
M NAT IND EXP	?	-.041	-.100	-.052	-.113	-.056	-.098	-.046	-.102	.319	-.141
M INFLUENCE	?	-.182 ***	-.268 ***	-.207 ***	-.253 ***	-.209 ***	-.289 ***	-.229 ***	-.262 ***	-.202 ***	-.277 **
M_AB_ACC	+	.025	-.306	.021	-.106	.002	-.206	-.011	-.572	-.042	-.175
M SIZE	?	-.029 ***	-.012	-.035 ***	-.016	-.043 ***	-.011	-.051 ***	-.006	-.070 ***	.000
M LAG TOT ACC	?	-.049 *	.385	-.058 *	.285	-.041	.273	-.039	.467	.016	.511
M CFO	?	-.008	.355 ***	-.002	.603 ***	-.002	.505 ***	-.000	.626 ***	.000	.605 ***
M CFO VOL	?	.035	-.005	.054 *	-.297	.062 *	.092	.057	.206	.079	.143
M SALES GROWTH	?	-.001	.046	-.009	.090	-.007	.062	-.001	.104	.005	.072
M_SALES_VOL	?	.103 **	-.021	.148 ***	-.024 *	.215 ***	-.016	.217 ***	-.016	.329 ***	-.017
M PPE GROWTH	?	-.015	-.074	-.017	-.120	-.024	-.130	-.021	-.334 **	-.010	-.319 **
M LEV	?	.021	.138	.019	.190	-.004	.171	.026	.107	.104 **	.125
M MB	?	.001	-.008	.002	-.010	.002	-.005	.001	-.005	-.007	-.002
M RETURN	?	.001	.104 ***	.003	.098 **	.009	.120 ***	.012	.137 **	.017	.151 *
M RET VOL	?	-.008	.538 **	-.009	.735 *	-.051	.720	-.105	.648	-.086	.819
M_SHARE_ISSUE	?	.013	.101 *	.025	.112 *	-.005	.110 *	-.035	.128 *	-.006	.096
M LOSS	?	.024	.150 **	.052 *	.195 **	.075 **	.163 *	.105 ***	.068	.147 ***	.126
M LITIGATE	?	.009	.089	.003	.094	-.015	.134 *	-.049	.129 *	-.078 *	.117
M BANKRUPTCY	?	.002	.005	.003 *	.021	.002	.017	.002	.005	.005 **	.008
M # OPER SEGS	?	-.019	-.051 *	.015	-.058 **	.009	-.068 *	.012	-.095 **	.010	-.085 **
M # GEO SEGS	?	-.021 **	-.027 *	-.029 ***	-.032 *	-.033 ***	-.023	-.036 ***	-.016	-.041 **	-.010
INTERCEPT	?	.692 ***	-.028	.567 *	-.328 ***	.738 ***	-.148	.494 **	-.149	.233	-.037
Audit Firm Fixed Effects		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N (treatment)		284	469	242	438	192	384	137	325	93	275
N (control)		1,932	1,509	1,573	1,204	1,228	970	922	772	642	590
Model p-value		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Pseudo R ²		25.5 %	34.1 %	26.7 %	33.9 %	27.8 %	31.5 %	30.3 %	32.9 %	31.2 %	29.6 %

***, ** and * indicate significance at the .01, .05 and .10 respectively using two-tailed tests. T-statistics are calculated based on robust standard errors clustered at the auditor-office level. B4 (NB4) indicates a sample of Big Four (non-Big Four) auditor offices. AUD_FAIL_10 equals one when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when at least one of the auditor's client companies within an auditor office subsequently restates net income downward in the future by ten percent or more. Lagged values of AUD_FAIL_X indicate whether at least one audit failure occurs in an audit office in years t-1, t-2, t-3, t-4 and t-5. OFFICE_SIZE is the natural log of the total dollar amount of fees charged to all audit clients within an auditor office in year t. CITY_IND_EXP equals 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise. NAT_IND_EXP equals 1 if the company's Big 4 auditor is the national industry expert auditor, and 0 otherwise. Industries are defined at the 2-digit SIC code level for all expertise variables. Expertise is based on market share of audit fees. INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year. SIZE is the natural log of a company's total assets in year t. LAG_TOT_ACC is a company's total accruals scaled by total assets in year t-1. CFO is a company's cash flows from operations in year t scaled by lagged total assets. CFO_VOL is the standard deviation of a company's cash flows from operations from year t-2 through year t. SALES_GROWTH is the one-year growth in a company's sales from year t-1 to year t. SALES_VOL is the standard deviation of a company's sales from year t-2 through year t. PPE_GROWTH is the one-year growth in a company's net property, plant and equipment from year t-1 to year t. LEV is a company's total debt in year t, scaled by lagged total assets. MB is a company's market value of equity scaled by book value of equity at the end of year t. RETURN is a company's 12-month stock return during year t-1. RET_VOL is the standard deviation of a company's monthly stock returns during year t. SHARE_ISSUE equals one if the company issued additional shares in year t, and 0 otherwise. LOSS equals one if the company records net income below zero in year t, and 0 otherwise. LITIGATE equals one if a company is within the following SIC codes: (2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise. The sample sizes for CITY_IND_EXP and NAT_IND_EXP are smaller as these values are calculated across only clients of Big Four auditors. BANKRUPTCY is the probability of bankruptcy using the Altman-Z score $[(0.717 \times \text{net working capital} / \text{assets}) + (0.847 \times \text{retained earnings} / \text{assets}) + (3.107 \times \text{earnings before interest and taxes} / \text{assets}) + (0.42 \times \text{book value of equity} / \text{liabilities}) + (0.998 \times \text{sales} / \text{assets})]$ #_OPER_SEGS is the number of operating segments the company operates in. #_GEO_SEGS is the number of geographic segments the company operates in. "M_" before a variable indicates that it is the office-year median or mean value of that variable across all company-level observations. Median values are used for all continuous company-level variables and mean values are used for all dichotomous company-level variables.

TABLE 6
Audit Failures within an Auditor Office and Discretionary Accruals
Client Company-Level Analysis

Panel A: Dependent Variable = ABS_DISC_ACC

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)			
		> 2 %		> 10 %	
		Non-B4	B4	Non-B4	B4
<i>Test Variable:</i>					
AUD_FAIL_X	+	.007 **	.002 *	.009 **	.002 *
(p-value)		(.033)	(.093)	(.017)	(.081)
<i>Control Variables:</i>					
OFFICE_SIZE	-	.000	-.000	.000	-.001
RISK_PORT	?	-.001	.000	-.000	.000
CITY_IND_EXP	-		.000		.001
NAT_IND_EXP	?	.006	-.001	.009	-.002
INFLUENCE	?	.006 *	.000	.006	.000
SIZE	-	-.008 ***	-.007 ***	-.007 ***	-.007 ***
LAG_TOT_ACC	-	-.016 ***	-.014 ***	-.018 ***	-.015 ***
CFO	-	-.023 ***	-.017 ***	-.022 ***	-.017 ***
CFO_VOL	+	.051 ***	.048 ***	.056 ***	.045 ***
SALES_GROWTH	+	.008 ***	.008 ***	.010 ***	.007 ***
SALES_VOL	+	.007 *	.001 ***	.008 *	.001 ***
PPE_GROWTH	+	.003 *	.012 ***	.003 *	.013 ***
LEV	?	-.011 **	-.007 **	-.013 ***	-.008 ***
MB	+	-.000	.001 ***	-.000	.001 ***
RETURN	?	.002 **	.001 *	.002 **	.001 *
RET_VOL	+	.042 ***	.052 ***	.040 ***	.057 ***
SHARE_ISSUE	?	.006 **	.000	.004	-.000
LOSS	-	-.012 ***	.001	-.012 ***	.002
LITIGATE	+	-.002	.006 ***	-.001	.006 ***
BANKRUPTCY	-	-.002 ***	-.002 ***	-.003 ***	-.002 ***
#_OPER_SEGS	?	-.003 *	.000	-.004 **	.000
#_GEO_SEGS	?	-.001	-.001 ***	-.001 *	-.001 ***
INTERCEPT	?	.064 *	.099 ***	.146 ***	.101 ***
Auditor Office Fixed Effects		YES	YES	YES	YES
Year Fixed Effects		YES	YES	YES	YES
Industry Fixed Effects		YES	YES	YES	YES
N (treatment)		2,251	13,091	1,704	10,214
N (control)		4,339	6,310	4,339	6,310
Model p-value		<.001	<.001	<.001	<.001
R ²		46.5 %	27.5 %	47.5 %	28.5 %

TABLE 6 (Continued)
Audit Failures within an Auditor Office and Discretionary Accruals
Client Company-Level Analysis

Panel B: Dependent Variable = DISC_ACC (> 0)

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)			
		> 2 %		> 10 %	
		Non-B4	B4	Non-B4	B4
<i>Test Variable:</i>					
AUD_FAIL_X	+	.006 *	.004 *	.008 **	.005 *
(p-value)		(.074)	(.061)	(.030)	(.089)
<i>Control Variables:</i>					
OFFICE_SIZE	-	-.003	.000	-.002	.000
RISK_PORT	?	.000	.002	.000	-.001
CITY_IND_EXP	-		.000		.002
NAT_IND_EXP	?	.012	-.003	.015	-.004 *
INFLUENCE	?	.006	.004	.006	.004
SIZE	-	-.008 ***	-.011 ***	-.008 ***	-.012 ***
LAG_TOT_ACC	-	.001	-.022 **	-.002	-.024 **
CFO	-	-.009 ***	-.020 **	-.008 ***	-.019 *
CFO_VOL	+	.029 ***	.052 ***	.032 ***	.039 ***
SALES_GROWTH	+	.008 ***	.014 ***	.008 ***	.015 ***
SALES_VOL	+	.011 *	.002 ***	.012 *	.002 ***
PPE_GROWTH	+	-.000	.012 ***	-.000	.014 ***
LEV	?	-.008 *	-.006	-.008	-.008
MB	+	.000	.001 *	.000	.001 *
RETURN	?	.002	.003	.002	.002
RET_VOL	+	.023 ***	.086 ***	.028 ***	.098 ***
SHARE_ISSUE	?	.007 **	.002	.005	.002
LOSS	-	-.012 ***	-.019 ***	-.013 ***	-.018 ***
LITIGATE	+	-.001	-.003	-.000	-.002
BANKRUPTCY	-	-.002 ***	.005 ***	-.001 ***	-.006 ***
#_OPER_SEGS	?	-.002	.001 **	-.003	.002 ***
#_GEO_SEGS	?	.000	-.001	.000	-.001
INTERCEPT	?	.188 ***	.159 ***	.171 ***	.145 ***
Auditor Office Fixed Effects		YES	YES	YES	YES
Year Fixed Effects		YES	YES	YES	YES
Industry Fixed Effects		YES	YES	YES	YES
N (treatment)		1,148	6,469	865	5,091
N (control)		2,265	3,151	2,265	3,151
Model p-value		<.001	<.001	<.001	<.001
R ²		42.7 %	32.0 %	43.9 %	33.0 %

***, ** and * indicate significance at the .01, .05 and .10 respectively using two-tailed tests. T-statistics are calculated based on robust standard errors clustered at the auditor-office level. B4 (NB4) indicates a sample of Big Four (non-Big Four) client companies. ABS_DISC_ACC is the absolute value of a company's discretionary accruals as calculated per Kothari et al. (2005). DISC_ACC is the signed value of a company's discretionary accruals as calculated per Kothari et al. (2005). AUD_FAIL_X equals one when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when at least one of the auditor's client companies within an auditor office restates net income downward, subsequent to the financial statement audit, by materiality level X. X refers to the threshold level of the restatement (i.e. 2 (10) for a two (ten) percent or greater restatement of net income). OFFICE_SIZE is the natural log of the total dollar amount of fees charged to all audit clients within an auditor office in year t. RISK_PORT is the mean value of client assets, leverage and return on assets for an auditor office in year t. This value is calculated by taking the median level of client assets, leverage and return on assets within an auditor office in a year. These median levels are then standardized so that each has a mean of zero and a standard deviation of one. These standardized values are then averaged together to form the overall client risk portfolio for the auditor office in a year. CITY_IND_EXP equals 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise (non-Big Four auditors are never considered the city-level industry expert). NAT_IND_EXP equals 1 if the company's Big 4 auditor is the national industry expert auditor, and 0 otherwise. Industries are defined at the 2-digit SIC code level for all expertise variables. Expertise is based on market share of audit fees. INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year. SIZE is the natural log of a company's total assets in year t. LAG_TOT_ACC is a company's total accruals scaled by total assets in year t-1. CFO is a company's cash flows from operations in year t scaled by lagged total assets. CFO_VOL is the standard deviation of a company's cash flows from operations from year t-2 through year t. SALES_GROWTH is the one-year growth in a company's sales from year t-1 to year t. SALES_VOL is the standard deviation of a company's sales from year t-2 through year t. PPE_GROWTH is the one-year growth in a company's net property, plant and equipment from year t-1 to year t. LEV is a company's total debt in year t, scaled by lagged total assets. MB is a company's market value of equity scaled by book value of equity at the end of year t. RETURN is a company's 12-month stock return during year t-1. RET_VOL is the standard deviation of a company's monthly stock returns during year t. SHARE_ISSUE equals one if the company issued additional shares in year t, and 0 otherwise. LOSS equals one if the company records net income below zero in year t, and 0 otherwise. LITIGATE equals one if a company is within the following SIC codes: (2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise. BANKRUPTCY is the probability of bankruptcy using the Altman-Z score $[(0.717 * \text{net working capital} / \text{assets}) + (0.847 * \text{retained earnings} / \text{assets}) + (3.107 * \text{earnings before interest and taxes} / \text{assets}) + (0.42 * \text{book value of equity} / \text{liabilities}) + (0.998 * \text{sales} / \text{assets})]$ #_OPER_SEGS is the number of operating segments the company operates in. #_GEO_SEGS is the number of geographic segments the company operates in.

TABLE 7
Audit Failures within an Auditor Office and Discretionary Accruals
Dependent on Auditor Office Size – Only Big Four Client Companies

Panel A: Dependent Variable = ABS_DISC_ACC

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)	
		> 2 %	> 10 %
<i>Test Variables:</i>			
LARGE_OFFICE	?	.000	-.001
AUD_FAIL_X	+	.005 **	.004 **
(p-value)		(.023)	(.042)
AUD_FAIL_X * LARGE_OFFICE	-	-.005 **	-.003
(p-value)		(.045)	(.183)
<i>Control Variables:</i>			
RISK_PORT	?	-.000	-.000
CITY_IND_EXP	-	-.000	.000
NAT_IND_EXP	?	-.002	-.002
INFLUENCE	?	.000	.000
SIZE	-	-.007 ***	-.006 ***
LAG_TOT_ACC	-	-.014 ***	-.016 ***
CFO	-	-.017 ***	-.018 ***
CFO_VOL	+	.048 ***	.045 ***
SALES_GROWTH	+	.008 ***	.008 ***
SALES_VOL	+	.001 ***	.001 ***
PPE_GROWTH	+	.012 ***	.013 ***
LEV	?	-.007 **	-.008 **
MB	+	.001 ***	.001 ***
RETURN	?	.002 *	.001 *
RET_VOL	+	.052 ***	.056 ***
SHARE_ISSUE	?	-.000	-.000
LOSS	-	.002	.002
LITIGATE	+	.006 ***	.006 ***
BANKRUPTCY	-	-.003 ***	-.003 ***
#_OPER_SEGS	?	.000	.000
#_GEO_SEGS	?	-.001 ***	-.001 ***
INTERCEPT	?	.097 ***	.090 ***
F-test [AUD_FAIL_X + AUD_FAIL_X*LARGE_OFFICE]		0.1	0.4
(p-value)		(.753)	(.548)
Auditor Office Fixed Effects		YES	YES
Year Fixed Effects		YES	YES
Industry Fixed Effects		YES	YES
N		19,401	18,031
Model p-value		<.001	<.001
R ²		27.5 %	28.2 %

TABLE 7 (Continued)
Audit Failures within an Auditor Office and Discretionary Accruals
Dependent on Auditor Office Size – Only Big Four Client Companies

Panel B: Dependent Variable = DISC_ACC (> 0)

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)	
		> 2 %	> 10 %
<i>Test Variables:</i>			
LARGE_OFFICE	?	.003	.002
AUD_FAIL_X	+	.004 *	.005 **
(p-value)		(.082)	(.040)
AUD_FAIL_X * LARGE_OFFICE	-	-.004	-.004
(p-value)		(.136)	(.139)
<i>Control Variables:</i>			
RISK_PORT	?	.001	.000
CITY_IND_EXP	-	-.001	-.001
NAT_IND_EXP	?	-.003 *	-.002
INFLUENCE	?	.003	.003
SIZE	-	-.008 ***	-.009 ***
LAG_TOT_ACC	-	-.008 *	-.009 *
CFO	-	-.012 ***	-.012 ***
CFO_VOL	+	.032 ***	.029 ***
SALES_GROWTH	+	.007 ***	.007 ***
SALES_VOL	+	.001 ***	.001 ***
PPE_GROWTH	+	.008 ***	.008 ***
LEV	?	.004	.005
MB	+	.000	.000
RETURN	?	.001	.001
RET_VOL	+	.051 ***	.057 ***
SHARE_ISSUE	?	.003 **	.003 *
LOSS	-	-.006 ***	-.006 ***
LITIGATE	+	-.000	.000
BANKRUPTCY	-	-.002 ***	-.002 ***
#_OPER_SEGS	?	.001	.001
#_GEO_SEGS	?	-.001	-.001 *
INTERCEPT	?	.100 ***	.094 ***
F-test [AUD_FAIL_X + AUD_FAIL_X*LARGE_OFFICE]		0.1	0.2
(p-value)		(.767)	(.636)
Auditor Office Fixed Effects		YES	YES
Year Fixed Effects		YES	YES
Industry Fixed Effects		YES	YES
N		9,620	8,185
Model p-value		<.001	<.001
R ²		31.4 %	31.9 %

***, ** and * indicate significance at the .01, .05 and .10 respectively using two-tailed tests. T-statistics are calculated based on robust standard errors clustered at the auditor-office level. ABS_DISC_ACC is the absolute value of a company's discretionary accruals as calculated per Kothari et al. (2005). AUD_FAIL_X equals one when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when at least one of the auditor's client companies within an auditor office restates net income downward, subsequent to the financial statement audit, by materiality level X. X refers to the threshold level of the restatement (i.e. 2 (10) for a two (ten) percent or greater restatement of net income). DISC_ACC is the signed value of a company's discretionary accruals as calculated per Kothari et al. (2005). LARGE_OFFICE equals one when the size (in total audit fees) of an auditor office is above the 75th percentile value of all Big Four auditor-office observations (the 75th percentile value is \$11.8 million in audit fees). RISK_PORT is the mean value of client assets, leverage and return on assets for an auditor office in year t. This value is calculated by taking the median level of client assets, leverage and return on assets within an auditor office in a year. These median levels are then standardized so that each has a mean of zero and a standard deviation of one. These standardized values are then averaged together to form the overall client risk portfolio for the auditor office in a year. CITY_IND_EXP equals 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise. NAT_IND_EXP equals 1 if the company's Big 4 auditor is the national industry expert auditor, and 0 otherwise. Industries are defined at the 2-digit SIC code level for all expertise variables. Expertise is based on market share of audit fees. INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year. SIZE is the natural log of a company's total assets in year t. LAG_TOT_ACC is a company's total accruals scaled by total assets in year t-1. CFO is a company's cash flows from operations in year t scaled by lagged total assets. CFO_VOL is the standard deviation of a company's cash flows from operations from year t-2 through year t. SALES_GROWTH is the one-year growth in a company's sales from year t-1 to year t. SALES_VOL is the standard deviation of a company's sales from year t-2 through year t. PPE_GROWTH is the one-year growth in a company's net property, plant and equipment from year t-1 to year t. LEV is a company's total debt in year t, scaled by lagged total assets. MB is a company's market value of equity scaled by book value of equity at the end of year t. RETURN is a company's 12-month stock return during year t-1. RET_VOL is the standard deviation of a company's monthly stock returns during year t. SHARE_ISSUE equals one if the company issued additional shares in year t, and 0 otherwise. LOSS equals one if the company records net income below zero in year t, and 0 otherwise. LITIGATE equals one if a company is within the following SIC codes: (2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise. BANKRUPTCY is the probability of bankruptcy using the Altman-Z score $[(0.717 * \text{net working capital} / \text{assets}) + (0.847 * \text{retained earnings} / \text{assets}) + (3.107 * \text{earnings before interest and taxes} / \text{assets}) + (0.42 * \text{book value of equity} / \text{liabilities}) + (0.998 * \text{sales} / \text{assets})]$. #_OPER_SEGS is the number of operating segments the company operates in. #_GEO_SEGS is the number of geographic segments the company operates in.

TABLE 8
Audit Failures in Big Four Offices and Income-Increasing Abnormal Accruals
Dependent on City-Level Industry

Panel A: All Big Four Auditor Offices

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)	
		> 2 %	> 10 %
<i>Test Variables:</i>			
<i>HIGH_OFFICE_EXPERTISE</i>	?	.006	.005
<i>AUD_FAIL_X</i>	+	.005 **	.005 **
(p-value)		(.033)	(.026)
<i>AUD_FAIL_X * HIGH_OFFICE_EXPERTISE</i>	-	-.002	-.002
(p-value)		(.391)	(.507)
<i>Control Variables:</i>			
<i>OFFICE_SIZE</i>	-	.003	.002
<i>RISK_PORT</i>	?	.001	.000
<i>CITY_IND_EXP</i>	-	.003	.003
<i>NAT_IND_EXP</i>	?	-.002	-.001
<i>INFLUENCE</i>	?	.004	.004
<i>SIZE</i>	-	-.008 ***	-.008 ***
<i>LAG_TOT_ACC</i>	-	-.004	-.005
<i>CFO</i>	-	-.013 ***	-.013 ***
<i>CFO_VOL</i>	+	.032 ***	.029 ***
<i>SALES_GROWTH</i>	+	.007 ***	.007 ***
<i>SALES_VOL</i>	+	.001 ***	.001 ***
<i>PPE_GROWTH</i>	+	.007 ***	.008 ***
<i>LEV</i>	?	.004	.005
<i>MB</i>	+	.000	.000
<i>RETURN</i>	?	.001	.001
<i>RET_VOL</i>	+	.054 ***	.062 ***
<i>SHARE_ISSUE</i>	?	.003 **	.002
<i>LOSS</i>	-	-.007 ***	-.007 ***
<i>LITIGATE</i>	+	.001	.001
<i>BANKRUPTCY</i>	-	-.002 ***	-.002 ***
<i>#_OPER_SEGS</i>	?	.001	.001
<i>#_GEO_SEGS</i>	?	-.000	-.000
<i>INTERCEPT</i>	?	.058	.057
F-stat [AUD_FAIL_X + AUD_FAIL_X*HIGH_OFFICE_EXPERTISE]		0.7	1.3
(p-value)		(.389)	(.263)
Auditor Office Fixed Effects		YES	YES
Year Fixed Effects		YES	YES
Industry Fixed Effects		YES	YES
N		7,910	7,338
Model p-value		<.001	<.001
R ²		30.5 %	31.1 %

TABLE 8 (Continued)
Audit Failures in Big Four Offices and Income-Increasing Abnormal Accruals
Dependent on City-Level Industry

Panel B: Largest Big Four Offices (LARGE_OFFICE = 1)

Variable	Pred.	Audit Failure Threshold (AUD_FAIL_X)	
		> 2 %	> 10 %
<i>Test Variables:</i>			
HIGH_OFFICE_EXPERTISE	?	.010	.009
AUD_FAIL_X	+	.003	.003
(p-value)		(.298)	(.228)
AUD_FAIL_X * HIGH_OFFICE_EXPERTISE	-	-.003	-.002
(p-value)		(.363)	(.552)
<i>Control Variables:</i>			
OFFICE_SIZE	-	.002	.001
RISK_PORT	?	.000	-.001
CITY_IND_EXP	-	.005	.006
NAT_IND_EXP	?	-.002	-.001
INFLUENCE	?	.020 ***	.020 ***
SIZE	-	-.008 ***	-.009 ***
LAG_TOT_ACC	-	.001	.001
CFO	-	-.019 ***	-.018 ***
CFO_VOL	+	.030 ***	.028 ***
SALES_GROWTH	+	.006 ***	.006 ***
SALES_VOL	+	.001 ***	.001 ***
PPE_GROWTH	+	.008 ***	.009 ***
LEV	?	.007	.008
MB	+	.000	.000
RETURN	?	.000	.000
RET_VOL	+	.068 ***	.078 ***
SHARE_ISSUE	?	.001	.001
LOSS	-	-.008 ***	-.008 ***
LITIGATE	+	.001	.001
BANKRUPTCY	-	-.002 ***	-.002 ***
#_OPER_SEGS	?	.001	.001
#_GEO_SEGS	?	-.001	-.001
INTERCEPT	?	.058	.065
F-stat [AUD_FAIL_X + AUD_FAIL_X*HIGH_OFFICE_EXPERTISE]		0.0	0.1
(p-value)		(.862)	(.765)
Auditor Office Fixed Effects		YES	YES
Year Fixed Effects		YES	YES
Industry Fixed Effects		YES	YES
N		5,542	5,140
Model p-value		<.001	<.001
R ²		29.1 %	29.8 %

***, ** and * indicate significance at the .01, .05 and .10 respectively using two-tailed tests. T-statistics are calculated based on robust standards errors clustered at the auditor-office level. LARGE_OFFICE equals one when the size (in total audit fees) of an auditor office is above the 75th percentile value of all Big Four auditor-office observations (the 75th percentile value is \$11.8 million in audit fees). AUD_FAIL_X equals one when at least one audit failure occurs within the same office of a company's external auditor during year t, and 0 otherwise. An audit failure is defined as existing when at least one of the auditor's client companies within an auditor office restates net income downward, subsequent to the financial statement audit, by materiality level X. X refers to the threshold level of the restatement (i.e. 2 (10) for a two (ten) percent or greater restatement of net income). OFFICE_EXP_% is the percentage of Big 4 audits conducted within an auditor office in a year where the Big 4 auditor is the city-level industry expert. HIGH_OFFICE_EXPERTISE equals one when the value of OFFICE_EXP_% is above its mean value of .75, and zero otherwise. DISC_ACC is the signed value of a company's discretionary accruals as calculated per Kothari et al. (2005). RISK_PORT is the mean value of client assets, leverage and return on assets for an auditor office in year t. This value is calculated by taking the median level of client assets, leverage and return on assets within an auditor office in a year. These median levels are then standardized so that each has a mean of zero and a standard deviation of one. These standardize values are then averaged together to form the overall client risk portfolio for the auditor office in a year. CITY_IND_EXP equals 1 if the company's auditor is the city-level industry expert auditor, and 0 otherwise. NAT_IND_EXP equals 1 if the company's Big 4 auditor is the national industry expert auditor, and 0 otherwise. Industries are defined at the 2-digit SIC code level for all expertise variables. Expertise is based on market share of audit fees. INFLUENCE is the total dollar value of both audit and non-audit fees charged to a specific client in year t, scaled by the total audit fees charged by the auditor office in the same year. SIZE is the natural log of a company's total assets in year t. LAG_TOT_ACC is a company's total accruals scaled by total assets in year t-1. CFO is a company's cash flows from operations in year t scaled by lagged total assets. CFO_VOL is the standard deviation of a company's cash flows from operations from year t-2 through year t. SALES_GROWTH is the one-year growth in a company's sales from year t-1 to year t. SALES_VOL is the standard deviation of a company's sales from year t-2 through year t. PPE_GROWTH is the one-year growth in a company's net property, plant and equipment from year t-1 to year t. LEV is a company's total debt in year t, scaled by lagged total assets. MB is a company's market value of equity scaled by book value of equity at the end of year t. RETURN is a company's 12-month stock return during year t-1. RET_VOL is the standard deviation of a company's monthly stock returns during year t. SHARE_ISSUE equals one if the company issued additional shares in year t, and 0 otherwise. LOSS equals one if the company records net income below zero in year t, and 0 otherwise. LITIGATE equals one if a company is within the following SIC codes: (2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7370), and 0 otherwise. BANKRUPTCY is the probability of bankruptcy using the Altman-Z score $[(0.717 \times \text{net working capital} / \text{assets}) + (0.847 \times \text{retained earnings} / \text{assets}) + (3.107 \times \text{earnings before interest and taxes} / \text{assets}) + (0.42 \times \text{book value of equity} / \text{liabilities}) + (0.998 \times \text{sales} / \text{assets})]$ #_OPER_SEGS is the number of operating segments the company operates in. #_GEO_SEGS is the number of geographic segments the company operates in.