FURTHER EXAMINING THE CONTAGION EFFECT OF LOW-QUALITY AUDITS: THE ROLE OF INDIVIDUAL AUDITORS

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Abstract

Francis and Michas (2013) discover that the occurrence of an audit failure actually signals a systematic problem with audit quality at the affected office. Using the Chinese setting where the identities of engagement auditors are revealed in audit reports, this study further explores whether the phenomenon of contagion is isolated to some specific auditors in an office or it indeed is an office-wide problem. We follow Francis and Michas (2013) to define an audit failure as an instance where a client firm subsequently makes a downward restatement of audited earnings. While there is similar evidence of contagion of low quality audits at audit offices experiencing audit failures, we find that the contagion effect actually is confined to the (other) audits performed by those specific auditors who are involved in audit failures, and it does not spread to same-office auditors not involved in failures. We further find that the contagion effect is attenuated among female auditors, and for auditors with an accounting degree, with longer auditing experience, and with industry expertise. Our results suggest that the documented contagion effect of low quality audits is an individual auditor-level, versus office-level, phenomenon. This underscores the importance of engagement auditor identification and the usefulness of disclosing auditors' personal characteristics.

Key words: contagion effect; individual auditors; audit failures; audit quality; auditor characteristics

1. Introduction

A recent study by Francis and Michas (2013) discovers that the occurrence of one or more audit failures actually indicates a more systematic problem with audit quality at the affected office location, which they refer to as the "contagion" effect of low quality audits. They attribute this effect to such factors as personnel and quality control procedures that have bearings on the general quality of audits performed at the office, consistent with previous findings that audit quality is related to office-level characteristics in addition to audit firm-level characteristics (Francis and Yu 2009; Choi, Kim, Kim, and Zang 2010; Francis, Michas, and Yu 2013).

However, in their study Francis and Michas (2013) do not distinguish between different auditors in an office. A question left unexplored is whether the documented contagion effect spreads along certain individual auditors – and hence is more of an isolated nature – or it indeed is a general problem at the office. According to several recent studies (Gul, Wu, and Yu 2013; Knechel, Vansraelen, and Zerni 2013), auditors have diverse educational backgrounds, expertise, risk preferences and so on, and these personal attributes can have significant consequences for the outcome of an audit engagement. If so, one would be curious as to the role of individual auditors in causing the contagion effect and how auditors' personal characteristics play out in this effect. The purpose of this study is to explore these further questions that are of importance for investors, policy makers and regulators.

In recent times, there is heightened interest in understanding the link between an auditor's personal characteristics and audit outcome. Financial Reporting Council (FRC) has put forward a framework identifying five drivers of audit quality, which include "skills and personal qualities of engagement auditors" (FRC, 2006). DeFond and Francis (2005) argue that the determinants of audit quality should be more significant at the individual level, and suggest that, if possible, the analysis of determinants of audit quality should be pushed to the engagement auditor level.

Francis (2011) similarly argues that individual auditors' knowledge of auditing theory and standards is very important to audit quality and the audits are of higher quality when undertaken by competent auditors.

However, stressing the importance of auditor-specific characteristics does not suggest that we can ignore office-level factors. It is true that auditors differ in competence, experience, risk profile, cognitive style and other attributes that can influence auditor outcomes, their practices are governed by the auditing standards and subject to the firm's quality-control procedures. Indeed, audit firms adopt centralized measures for risk and materiality criteria precisely to maintain consistency and reduce the influence of idiosyncratic aspects of individual auditors (Gul et al. 2013). Also, office-level factors should matter because the engagement office contracts with the client and has the primary responsibility for the work done on the audit (Choi et al. 2010; Francias et al. 2013). According to Wallman (1996), key decisions are primarily made by the audit office. Ultimately, therefore, how much influence auditor-specific, versus office-wide, factors have on audit outcome is an empirical issue. Our study thus aims to shed light on the relative importance of these factors in causing the contagion effect.

We conduct our study in the context of the Chinese capital market where audit reports bear the signatures of individual engagement auditors.[1] It is normal practice that two engagement auditors are required to sign their names on an audit report. The signatory auditors are those who lead the audit engagement team and take the primary responsibility for audit quality. The names of the signatory auditors are disclosed at the end of the audit report, and their personal profiles are made publicly available on the website of China Institute Certified Public Accountants

[1] The China Certified Public Accountants Auditing Standards (CCPAAS) No.7, The Audit Report (1996, 2003), requires that engagement auditors must sign their names on the audit report.

(CICPA).[2] Following Francis and Michas (2013), we use a downward restatement of a client firm's previously audited earnings to surrogate an audit failure. In examining the role of individual auditors, we seek evidence on "self-contagion" of low-quality audits in the sense that the presence of one or more audit failures by a specific auditor conveys a negative signal about the quality of other audits performed by the same auditor. We also examine the possibility of "cross-contagion" in the sense that an audit failure by a specific auditor conveys a negative signal about audit quality for other auditors at the same office location.

Our sample covers the period 1999-2010. For each year in the sample, we identify those auditors with one or more clients that subsequently restate that year's reported earnings downwards. We label them as "failed auditors" in that year; the complement is referred to as non-failed auditors in that year. Tests are conducted using both a pooled sample and a matched sample. The pooled sample is made up of 11,666 client firm-year (9,174 auditor-years) observations, of which 3,336 firm-years (1,224 auditor-years) represent audits performed by a failed auditor (but these audits themselves are not failed audits). In our matched sample, each auditor-year observation involving a failed auditor is matched with an observation involving a non-failed auditor on the dimensions of calendar year, audit office, gender, audit age, and physiological age. The matched sample consists of 5,234 firm-year (2,130 auditor-years) observations, of which 2,839 firm-years (1,065 auditor-years) involve failed auditors.

We explore auditor-level self-contagion of low-quality audits along both the longitudinal and lateral dimensions. We find that those auditors experiencing an audit failure in a given year will have a higher likelihood of further failures in the subsequent three years, indicating a longitudinal (over time) self-contagion effect of audit failures. We also find that client firms

[2] The website of CICPA discloses the personal characteristics of all CPAs in China, including name, gender, birthday, university of graduation, major, education level, starting time to work as an auditor, authority penalties, affiliated accounting firm, and Chinese Communist Party membership.

concurrently audited by a failed auditor have higher levels of abnormal accruals relative to firms audited by non-failed auditors (even though these audits themselves are not failed audits), suggesting the presence of lateral self-contagion of low-quality audits. These results show that self-contagion of low-quality audits exists for individual auditors experiencing audit failures, and that the effect spreads both in the cross section and over time.

To explore the possibility of contagion across different auditors in the same office, we compare audit quality between non-failed auditors who are in the same office as a failed auditor and those from offices that do not experience failures in a given year. We find no significant differences between these two groups of non-failed auditors either in the likelihood of audit failures in the subsequent years or in the quality of audited earnings of their clients.

Taken together, our empirical results indicate that the contagion effect of low-quality audits as documented by Francis and Michas (2013) is likely a reflection of poor audit quality owing to certain individual auditors in an office, but not a symptom of systematic quality problem at the affected office in general. Thus, although individual auditors are enrolled and trained by audit firms and follow the highly standardized audit procedures and standards, an audit failure performed by a specific auditor does not implicate his or her colleagues in the same office as to the quality of audits they undertake.

Having demonstrated self-contagion of low quality audits which spreads along failed auditors, we next explore whether the extent of contagion is dependent on an auditor's personal characteristics. Previously, Nelson and Tan (2005) and Nelson (2009) suggest that auditors' various judgment and decision-making (JDM) attributes (e.g., cognitive style, risk profile, capability, audit experience, and independence) can affect audit quality, and Gul et al. (2013) show that audit quality is partially explained by the auditor's educational background, rank in the

audit firm, Big-N firm experience, and political background. Our results show that in the context of the Chinese market, the personal characteristics of auditors do matter in determining the degree of contagion. Specifically, contagion of low-quality audits is more prevalent among male auditors, and for auditors who do not have an accounting degree, who possess less auditing experience, and who are not industry experts.

Our study makes several contributions to research on audit quality. First, it contributes to better understanding the underlying causes for the contagion effect of low quality audits documented by Francis and Michas (2013). We show that the contagion effect is attributed to certain individual auditors within an office and so is a relatively isolated phenomenon, rather than a general problem at an office location. Thus, this effect is likely attributed to deficiencies in professional competence and/or in independence in some individual auditors, rather than to general weaknesses in personnel and quality control at the office. Our finding is of relevance to auditing firms in their efforts to rectify quality problems upon observing audit failures.

Second, the study sheds further light on the importance of auditors' personal characteristics in influencing audit quality, which answers calls for more research on the role of auditor-level characteristics (e.g., DeFond and Francis 2005; Church, Davis, and McCraken 2008; Francis 2011; Gul et al. 2013). Previously, Gul et al. (2013) show that audit quality differs across individual auditors, and they identify specific factors that explain this inter-auditor quality variation. Using audit failures as a proxy for low audit quality, we pinpoint more exactly which particular auditors tend to suffer from quality problems. Furthermore, by demonstrating variations in the extent of contagion across individual auditors, the study shows how auditors' personal characteristics matter in determining the extent of contagion conditional on observing audit failures.

Relatedly, our study also adds to the policy debate on mandatory engagement auditor identification.[3] The PCAOB has issued "Concept Release on Requiring the Engagement Partner to Sign the Audit Report" on July 28, 2009, proposing to mandate that engagement auditors sign their names on the audit report beyond the existing requirement that the audit firm sign the audit report. There are two key issues concerned in the Concept Release: (1) whether audit quality varies with individual auditors in addition to firm level characteristics,[4] and (2) whether engagement auditors' individual characteristics convey information useful to shareholders with regard to audit quality? Our study suggests that for the purpose of assessing audit quality, it is useful to identify the engagement auditors of an audit and know their personal characteristics. Our study is among the few thus far that have provided evidence on the role of auditor-level factors in affecting audit quality, in particular on the importance of these factors relative to that of audit office-level factors.

The rest of the paper is organized as follows. Section 2 reviews the literature and presents the research questions. Section 3 describes the data and research design. Sections 4 and 5 report the empirical results. We conclude the paper in Section 6.

2. Literature Review and Research Questions

2.1 Roles of Audit Firm-, Office- and Client-Level Characteristics in Determining Audit Quality

Early research on audit quality focuses on factors pertaining to audit firms, offices, and clients. DeAngelo (1981) argues that auditors in large audit firms have more to lose if they fail to report breaches in clients' accounting reports, so they have a stronger motivation to provide high

[3] The Public Accounting Oversight Board (PCAOB) issued "Concept Release on Requiring the Engagement Partner to Sign the Audit Report" (hereafter Concept) on July 28, 2009, proposing to mandate the engagement auditors to sign their names on the audit report in addition to the existing requirement for the firm to sign the audit report.

[4] In the Concept, the PCAOB states "Providing financial statement users, audit committees, and others with the name of the engagement partner might help them evaluate the extent of an engagement partner's experience on a particular type of audit and, to a degree, his or her track record." (PCAOB 2009, pp. 8-9).

quality audit services. Consistent with this argument, Becker, DeFond, Jiambalvo, and Subramanyam (1998) and Francis, Maydew, and Sparks (1999) document that Big-N audit firms help to constrain client firms' earnings management. Francis and Krishnan (1999) find that Big-6 audit firms are more conservative in issuing clean audit reports on their clients. Relatedly, Lennox (1999) shows that Big-4 auditors issue more accurate audit reports than do non-Big 4 audit firms.

In big audit firms with many city-based offices, audit quality can further depend on office-level characteristics pertaining to personnel and quality control procedures. Subsequent research turns attention to office-level factors that determine audit quality (Reynolds and Francis 2000; Krishnan 2005; Francis and Yu 2009; Choi et al. 2010; Reichelt and Wang 2010; Francis and Michas 2013; Francis et al. 2013). For example, Francis and Yu (2009) find that larger Big 4 audit offices are more likely to issue going-concern audit reports and are more able to constrain clients' aggressive earnings management, suggesting that larger offices provide higher audit quality.

In addition to the factors at audit firm and office levels, existing research has also related audit quality to client characteristics such as client firm size, operational complexity, business risk, and corporate governance. Carcello and Neal (2000) and Abbott, Parker, and Peters (2004) find that the independence of the client's audit committee has an effect on audit quality. Khan and Watts (2009) and Lu and Sapra (2009) show that high business risk of the client induces auditor conservatism, whereas low business risk induces auditor aggressiveness. Knechel, Rouse, and Schelleman (2009) find that audit quality is higher for larger clients, clients with more extensive system automation, and clients with a December fiscal year-end, whereas audit quality is lower for clients that receive tax services from the engagement auditor, clients that have

subsidiaries, and engagements where the auditor relies on internal control. Francis and Yu (2009) show that client operating and geographic segments increase audit complexity and therefore can affect audit quality. Finally, Lawrence, Minutti-Meza, and Zhang (2011) report that differences in audit quality are mainly attributed to client characteristics.

2.2 Individual Auditors and Audit Quality

While earlier research focuses on factors pertaining to audit firms, offices, and clients, more researchers are now paying attention to individual auditors as well. Carey and Simnett (2006) find that auditors with longer tenures have a lower propensity to issue going-concern opinions. In the Taiwan market, Chi and Huang (2005) show that auditors in either early or late stages of their tenures, rather than in the middle stage, are associated with lower audit quality, and Chi, Huang, Liao, and Xie (2009) find that investors perceive mandatory audit-partner rotations as audit quality enhancing. Wang, Yu, Zhang, and Zhao (2012) find that audit quality is positively related to an auditor's overall audit experience. Further, according to Chen, Sun, and Wu (2010), the impact of client importance on audit decisions appears to differ at the individual auditor level versus the office level.

Gul et al. (2013) show that there is more variation in audit quality across individual auditors than that across audit firms and offices, and such variation is partially explained by the demographic characteristics of individual auditors. Specifically, they find that auditors with a master degree or higher are more aggressive in the audit process, and auditors with Big N experiences and at the level of partners (as opposed to senior managers) tend to be less aggressive. Ittonen, Vähämaa, and Vähämaa (2013) find that client firms audited by female partners have higher financial reporting quality than do firms audited by male partners.

This emphasis on auditor-level characteristics echoes other research in accounting and in

other disciplines that demonstrates the importance of the personal characteristics of decision makers for decision quality. For example, in psychology, behavioral economics, and management literatures, respective research has shown that differences in leadership style, communicative skill, conservatism, risk aversion, and decision-making can be attributed to personal characteristics (Hambrick 2007). Furthermore, the accounting literature has related financial reporting quality to managers' personal characteristics such as age and gender. As pointed out by Kachelmeier (2010), Bamber, Jiang, and Wang (2010) and Dyreng, Hanlon, and Maydew (2010), people rather than firms make decisions and those decisions are influenced by personalities of the decision makers.

2.3 Research Questions

According to the audit production frameworks proposed by Knechel et al. (2009) and Francis (2011), engagement auditors input their labor in the audit process to gather evidence and make judgment that leads to audit outcome. Therefore, auditors' cognitive style, effort, experience, risk preference, and incentives should have bearings on audit outcome. Because these personal attributes are a function of observable personal characteristics, audit quality is expected to be associated with the observable characteristics of the auditor.

Consistent with this line of reasoning, our study explores the role of auditor-level factors in causing the contagion of low-quality audits within an office. We maintain that the auditing process is "primarily human endeavors and audit firms are very dependent upon the qualities of their professionals, including competence and decision-making skills" (Prawitt, Simth, and Wood 2009). Therefore, we posit that individual auditors are a major force driving the contagion of low quality audits.

However, prior research shows that office-level factors can also impact audit quality.

Despite their heterogeneous personal characteristics, auditors in the same office must follow the standardized audit procedures of the office as well as the auditing standards promulgated by regulatory authorities, and offices are the primary decision-making units in the audit firms (Wallman 1996; Francis, Maydew, and Sparks 1999; Francis and Yu 2009). Therefore, a priori, it is not clear how much discretion individual auditors have in judgment and decision making that has consequences for audit quality. In this study, we maintain that the importance of individual auditor-specific, versus office-level, characteristics is an empirical issue.

We pursue two specific questions in the study. First, to what extent is the documented contagion effect driven by specific auditors of the affected office, as opposed to being an office-wide phenomenon? Second, is this contagion effect more pronounced for certain auditors than others?

3. Research design

3.1 Identifying Audit Failures at the Individual Auditor Level

As in Francis and Michas (2013), we define an audit failure as an instance in which the audited income of a client firm for a given year is subsequently restated downwards. Under this definition, an audit failure is specific to a given auditor and for a given client firm in a given year. We use two alternative threshold criteria. The first criterion imposes no requirement on the magnitude of restatement. That is, any amount of downward statement of income is considered as an audit failure. The second one requires that the magnitude of downward restatement be at least 10 percent of the originally reported net income. Downward restatements indicate that the net income as originally reported was “too high”. Given that auditors are most concerned about overstatements of net income due to potential liability (Basu 1997; Skinner 1994), and given that income increasing accruals are more likely to induce auditor reporting conservatism (Francis and

Krishnan 1999), we consider overstatement, but not understatement, of income as an audit failure in our analyses.[5]

We explore possible contagion of low-quality audits in both the longitudinal (over time) and lateral (cross sectional) directions. To examine longitudinal contagion, we first identify individual auditors who are involved in audit failures at a given year. We refer to such auditors as failed auditors for that year, and the rest as non-failed auditors for that year. We set the indicator variable *AUD_FAIL_X* to 1 for the audit-years involving a failed auditor (but excluding failed audits), where *X* is either 0 or 10, corresponding to the materiality thresholds of 0 percent or 10 percent respectively. Thus, our treatment group comprises non-failed audits in any year performed by failed auditors. The comparison group consists of audits in any year performed by non-failed auditors in that year; we set *AUD_FAIL_X* to 0 for this group.

To test for a lateral (cross sectional) contagion, we identify failures at the client level. For a client firm-year with at least one of the signatory auditors involved in an audit failure in that year, the test variable *FAIL_X* is set to 1, where $X = 0$ (10) corresponds to a materiality threshold of 0 percent (10 percent in defining an audit failure. The control group comprises those client-years with none of the signatory auditors involved an audit failure in that year; we set *FAIL_X* to 0 for these observations.

3.2 Additional Measures of Audit Quality

In addition to the above audit failure measures, we also adopt two additional measures of audit quality derived from abnormal accruals as have been used in prior studies (Francis and Krishnan 1999; Menon and Williams 2004; Francis and Michas 2013). The first is the absolute value of performance adjusted abnormal accruals, *ABS_ACC*, determined by the following regression (Kothari, Leone, Wasley 2005):

[5] Our results are similar if we also include understatements in the sample.

$$TACC_t/TA_{t-1} = \alpha_0 + \alpha_1(1/TA_{t-1}) + \alpha_2(\Delta SALES_t - \Delta AR_t)/TA_{t-1} + \alpha_3 PPE_t/TA_{t-1} + \alpha_4 ROA_t + \varepsilon_t \quad (1)$$

Where $TACC_t$ is a firm's total accruals in year t, calculated as the net income before extraordinary items less operating cash flow; TA_{t-1} is the total assets at the end of year t-1; $\Delta SALES_t$ is the growth in sales from year t-1 to t; ΔAR_t is the growth in net total receivables from year t-1 to t; PPE_t is the net property, plant and equipment (PPE) at the end of year t; and ROA_t is the net income in year t scaled by lagged total assets. The residuals of regression (1) proxy for abnormal accruals.

The other measure is the standard deviation of abnormal working capital accruals (*STD_WCA*), derived from the modified version of the Dechow and Dichev (2002) model as suggested by McNichols (2002). According to Jones, Krishnan, and Melendrez (2008) and Dechow, Ge, Larson, and Sloan (2011), this model is more powerful than other accrual-based models in detecting accounting frauds and misrepresentation. Essentially, the model, which is given in (2), captures the degree to which accruals fail to map into past, current, and future cash flows as well as sales growth and PPE:

$$WCA_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta SALES_t + \beta_5 PPE_t + \varepsilon_t, \quad (2)$$

Where WCA_t is working capital accruals in year t, calculated as net income before extraordinary items plus depreciation, amortization and financial expenses, minus cash flows from operations. CFO_{t-1}, CFO_t, and CFO_{t+1} are cash flows from operations in years t-1, t, and t+1, respectively. All the variables in (2) are scaled by total assets at the end of year t-1. Variable STD_WCA_t is constructed as the standard deviation of regression residuals estimated from (2) over the preceding three years.[6]

The models in (1) and (2) are estimated separately by industry-year. We require at least 10

[6] Because lagged and future cash flows are used as independent variables and we require a three-year time series of the residual term to compute the standard deviation, the number of observations becomes smaller for *STD_WCA* than for *ABS_ACC*.

observations in an industry-year group to estimate the regression. Industry classification follows the approach of the China Securities Regulatory Commission (CSRC), and firms are grouped by 2-digit SICs in the manufacturing sector and by 1-digit SIC for the other sectors. For both accrual-based measures, a higher value represents lower audited earnings quality. While *ABS_ACC* and *STD_WCA* are correlated (with a correlation of 0.50), they capture somewhat different dimensions of accrual quality.

3.3 Empirical Models

To test whether contagion of low-quality audits takes place along individual auditors, we estimate the OLS regression in equation (3) for both the pooled and matched samples:

$$\begin{aligned} ABS\_ACC \text{ (or } STD\_WCA) = {} & \beta_0 + \beta_1 FAIL\_X + \beta_2 CI\_OFFICE + \beta_3 SIZE\_OFFICE \\ & + \beta_4 CI\_AUDITOR + \beta_5 SIZE\_AUDITOR + \beta_6 LAG\_ACC + \beta_7 SIZE + \beta_8 LEV \\ & + B_9 SALES\_GROWTH + \beta_{10} MTB + \beta_{11} RETURN + \beta_{12} CFO + \beta_{13} Z\text{-}SCORE \\ & + \beta_{14} LOSS + \beta_{15} SOE + \beta_{16} M\&A + \beta_{17} PARTNER + \beta_{18} FEMALE + \beta_{19} DEGREE \\ & + \beta_{20} MAJOR + \beta_{21} EXPERIENCE + \beta_{22} IND\_EXPERT + Year\ Fixed\ Effects \\ & + Industry\ Fixed\ Effects + Audit\ Firm\ Fixed\ Effects + \varepsilon, \end{aligned} \tag{3}$$

Where the dependent variable is an accrual-based measure of audit quality, proxied by *ABS_ACC* or *STD_WCA*. If an audit failure by an auditor in a given year also signals lower quality for other audits performed by the same auditor relative to audits conducted by non-failed auditors in the same year, we expect the coefficient on *FAIL_X* to be positive.

Regression (3) includes a number of control variables, which are defined in Appendix A. We control for auditor rank (*PARTNER*), experience (*EXPERIENCE*), and the education level (*DEGREE*), which are associated with audit quality (Gul et al. 2013). We also control for gender (*FEMALE*), given prior findings of gender differences in risk averseness, conservatism, and

ethical behavior as well as gender differences in earnings quality and earnings management (Srinidhi, Gul, and Tsui 2011; Gavious, Segev, and Yosef 2012). We also differentiate audits with at least one of the signatory auditors holding a degree in accounting versus non-accounting (*MAJOR*).

We further control for audit office size (*SIZE_OFFICE*), following Francis and Yu (2009) and Choi et al. (2010), and client importance (*CI_OFFICE*), following Reynolds and Francis (2000). Because Balsam, Krishnan, and Yang (2003) and Francis, Reichelt, and Wang (2005) find that industry expertise enhances audit quality, we thus include *IND_EXPERTISE* to indicate whether or not an individual auditor is an industry expertise.

In addition, we also control for the following client firm-level variables that can affect the level of abnormal accruals: size (*SIZE*), lagged accruals (*LAG_ACC*), cash flow from operations (*CFO*), negative earnings (*LOSS*), government ownership (*SOE*), bankruptcy risk (*Z-SCORE*), sales growth (*SALE_GROWTH*), market-to-book ratio of equity (*MTB*), and whether the client firm is involved in mergers & acquisitions (*M&A*), financial leverage (*LEV*), stock return during the year (*RETURN*), and sales scaled by assets (*SALES*).

4. The sample

4.1 Sample Selection

There are two channels for public firms to disclose financial restatements in China: (i) in the annual financial reports where firms disclose financial restatement information in the section of "The causes for and effects of significant accounting errors," and (ii) on the website "China Information" (http://www.cninfo.com.cn) where public firms promptly disclose financial restatement reports throughout a fiscal year. Both sources cover information on the reasons for restatement, the originally released as well as the subsequently restated accounting amounts, and

the exact periods affected by the restatement. We manually collect financial restatement data (note that standard databases on restatements by Chinese companies such as Audit Analytics are not available). Specifically, we download annual financial statements and restatement reports from the website China Information, and manually collect the reasons for restatements, restated RMB amounts, and the periods for restatements from these reports. Based on the restatement reasons and the affected time periods, we retroactively adjust the RMB amounts of the originally released accounting items.[7]

We obtain individual auditors' identities from the "China Security Markets & Accounting Research" (CSMAR). All the financial data for computing our dependent variables and control variables are also obtained from the CSMAR. We obtain auditors' personal information from the website of China Institute of Certified Public Accountants (CICPA, http://www.cicpa.org.cn).

Our sample period is from 1999 through 2010. We choose 1999 as the starting year which is the time when audit firms became separated from the Chinese government both financially and operationally.[8] We cut off the sample at year 2010 as Cheffers, Whalen, and Usvyatsky (2010) have shown that the average time lag between the original financial statement releases and restatements is about two fiscal years. Panel A of Table 1 describes the sample selection process. We start with 18,061 client firm-year observations available from the CSMAR with no missing values on total assets. We then sequentially delete (i) 2,608 client firm-year observations due to the firm issuing B shares, H shares or shares in overseas markets which are subject to different regulatory regimes,[9] (ii) 179 observations that are in the financial industries, (iii) 880 observations with missing auditor signatures; (iii) 1,097 observations whose reported numbers

[7] In some instances where several restatements are subsequently made for a period's financial report, we retroactively adjust the original accounting items for the combined restatement RMB amount.

[8] Prior to 1999, audit firms in China were affiliated to local governments, and their operations were heavily intervened by local governments.

[9] B shares were originally issued to overseas investors and are traded on the Chinese market, and H shares are listed in the Hong Kong Stock Exchange. There are also shares issued in the markets in the US, Japan, and Europe.

are subsequently restated downwards (this step is vital for avoiding spurious results); (iv) 1,542 observations with insufficient data for computing firm-level variables, and (v) 89 observations with missing information on a signatory auditor's personal characteristics. We arrive at 11,666 client firm-year (9,174 auditor-years) observations in the pooled sample. Among them, 8,830 client firm-years (7,950 auditor-years) are audited by non-failed auditors, i.e., auditors with no clients in that year that subsequently make a downward restatement of that year's earnings, and 3,336 client firm-years (1,224 auditor-years) are audited by failed auditors, i.e., auditors with at least one of the clients that subsequently make a downward restatement of that year's earnings.

For the 3,336 client firm-years (1,224 auditor-years) involving a failed auditor, we construct a one-to-one matched sample without a replacement as follows. For each failed auditor in a year, we locate an observation involving a non-failed auditor that is matched on fiscal year, audit office, and gender, and also has the closest audit age and physiological age. In performing this step, we lose 497 firm-years (159 auditor-years) involving a failed auditor for which no match observations can be found. Our procedure yields a matched sample comprising 5,234 firm-year (2,130 auditor-years) observations, of which 2,839 firm-years (1,065 auditor-years) involve failed auditors, and 2,404 firm-years (1,065 auditor-years) involve non-failed auditors.

Panel B reports the distribution of the sample by the number of signatory auditors. More than 97 percent of the observations have exactly two signatory auditors, about 2 percent of the observations have three signatory auditors, and only 0.15 percent of the observations have just one signatory auditor.

Panel C shows the distribution of auditor-year observations by the number of clients. In the pooled sample, slightly more than half (52.82 percent) of the auditors have two or more clients, with the rest having only one client, In the matched sample, 77.14 percent of audit teams have

two or more clients. Penal D shows the distribution of auditor-year observations by year for the subsamples of audit failures (*AUD_FAIL_X=1*) and non-failures (*AUD_FAIL_X=0*) respectively. The number of audit failures arises from 1999 to 2004, and then falls afterwards.

[Table 1 Here]

4.2 Descriptive Statistics

Table 2, Panel A, reports the descriptive statistics of the variables for the pooled sample. *ABS_ACC* has a mean (median) value of 0.062 (0.043), and *STD_WCA* has a mean (median) of 0.035 (0.024). The means of *AUD_FAIL_0* and *AUD_FAIL_10* are 0.133 and 0.054, respectively, showing that 13.3 percent of the auditor-year observations involve at least one auditor who performed a failed audit in that year if we apply a 0 percent materiality threshold, and this rate drops to 5.4 percent if we apply a 10 percent materiality threshold. The means of *FAIL_0* and *FAIL_10* are 0.286 and 0.125, respectively. That is, 28.6 percent of the client-year observations involve at least one failed auditor in that year at the 0 percent materiality threshold, and this rate drops to 12.5 percent at the 10 percent threshold.

PARTNER has a mean of 0.519, indicating that 51.9 percent of client firm-year observations involve at least one signatory auditor who is a partner. *FEMALE* has a mean of 0.516, indicating that 51.6 percent of the client-years involve at least one female signatory auditor. *DEGREE* has a mean of 0.263, meaning that for 26.3 percent of the client-years, at least one signatory auditor has a master degree or higher. The mean of *MAJOR* is 0.783, indicating that for 78.3 percent of the client-years, at least one signatory auditor holds a degree in accounting.

[Table 2 about here]

For the matched sample, *AUD_FAIL_0* has a mean (median) value of 0.500 (0.500), and *AUD_FAIL_10* has a mean (median) of 0.225 (0.000). *FAIL_0* has a mean (median) value of

0.541 (1.000), and *FAIL_10* has a mean (median) of 0.266 (0.000). The other variables have descriptive statistics similar to those for the pooled sample.

In Panels B and C, we compare the mean and median values of *ABS_ACC* and *STD_WCA* between audits performed by failed auditors and those by non-failed audits. Panel B shows the results for the pooled sample. The mean (median) values of *ABS_ACC* for the groups of *FAIL_0*=0, *FAIL_0*=1, and *FAIL_10*=1 are 0.061 (0.043), 0.064 (0.044), and 0.066 (0.045), respectively. The mean (median) values of *STD_WCA* for these groups are 0.034 (0.023), 0.037 (0.025), and 0.038 (0.026), respectively. Based on t-tests (rank-sum tests), at the both threshold levels, the mean and median values of *ABS_ACC* and *STD_WCA* are significantly greater for the audits performed by failed auditors than for the audits performed by non-failed auditors. The results from the matched sample, shown in Panel C, are similar. Thus, the preliminary evidence here based on univariate tests is consistent with the existence of a contagion effect along failed auditors.

5. Empirical Results: Self-Contagion of Low Quality Audits

In this section, we test whether there exists contagion of low audit quality in both the longitudinal and lateral directions.

5.1 Longitudinal Contagion

Longitudinal contagion exists if an audit failure performed by a given auditor is associated with an increased likelihood of audit failures in the subsequent years for the same auditor. Panel A of Table 3 shows the evolution of audit quality from one year to the next for auditors in the pooled sample. To do this analysis, we require observations of the same auditor-client combinations to appear in two consecutive years. We obtain 5,754 such observations in our pooled sample. Among these, 84.48 percent (i.e., 4,861 auditor-clients) involve non-failed

auditors (*AUD_FAIL_0=0*) whereas 15.52 percent (893) involve failed auditors (*AUD_FAIL_0=1*). If no longitudinal contagion of low quality audits exists, evolutionary rates similar to these for the whole group should be expected also for the subgroups of *AUD_FAIL_0=0* and *AUD_FAIL_0=1*, respectively.

However, we find that in the subgroup of observations with non-failed auditors in year t (*AUD_FAIL_0*=0), 88.48 percent (4,301) remain in the group of non-failed auditors in year t+1, whereas 11.52 percent switch to the group of failed auditors in year t+1. In contrast, in the subgroup of observations involving failed auditors in year t (*AUD_FAIL_0*=1), 43.11 percent (385) are in the group of non-failed auditors in year t+1 whereas 56.89 percent are in the group of failed auditors. The differences between these rates for the subgroups are significantly different from the rates for the overall group. Thus, the likelihood of experiencing an audit failure in year t+1 is significantly higher for an auditor who has experienced in an audit failure in year t than for an auditor who has not experienced in a failure in year t.

The results are similar from the matched sample, which are showed in Panel B. In the overall group, the (unconditional) likelihood of non-failure is 42.43 percent. For the group of non-failed auditors in year t (*AUD_FAIL_0*=0), the evolutionary rate of non-failures is 66.76 percent in year t+1, which is significantly higher than the unconditional rate (42.43 percent). In the group of failed auditors in year t (*AUD_FAIL_0*=1), the evolutionary rate of failures in year t+1 is 77.08 percent, which is significantly higher than the unconditional rate of failure (57.57 percent).

These results indicate that failed auditors are more likely to perform an audit failure in a subsequent year, and vice versa. The evidence is thus consistent with the presence of longitudinal self-contagion of low quality audits.

[Table 3 about here]

Panel C of Table 3 reports the PROBIT regression results on longitudinal contagion based on the 0 percent materiality threshold, after controlling for auditor personal characteristics that can affect audit quality (Gul et al. 2013). For both the pooled sample and matched samples, the coefficients on *Aud_Fail_0_LAGk*, k=1, 2, 3, are all significantly positive in the respective columns. The coefficient becomes insignificant for *Aud_Fail_0_LAG4*. This shows that an auditor is more likely to experience an audit failure in a year if he or she performed a failed audit in one of the preceding three years. Thus, self-contagion of low-quality audits is present along the longitudinal dimension for individual auditors once they experience an audit failure, and this effect lasts for up to three years.[10]

However, the above results could be driven by some client-level characteristics such as the client firm's poor internal controls, undetected frauds, or weak financial reporting oversight, rather than factors rooted in individual auditors. To address this concern, we remove client firms that restate reported earnings for two or more consecutive years from our sample, and then re-run the PROBIT regression. We obtain results similar to those in Panel C of Table 3, which makes our evidence more reassuring. Our results suggest that audit firms should utilize client firms' restatements as a source of information to detect and mitigate audit quality problems that are attributable to individual auditors.

5.2 Lateral Contagion

We now test whether the contagion effect of low quality audits is also present in the lateral (cross-sectional) dimension, that is, whether an audit failure performed by a given auditor indicates lower quality of audited earnings for the other clients concurrently audited by the same

[10] We also examine the effect of lagged failures (*FAIL_0*) using the current year's performance-adjusted abnormal accruals to proxy for audit quality. Again, we find evidence of longitudinal self-contagion for up to three years.

auditor. Table 4 shows the results of regression (3) where the dependent variable is either *ABS_ACC* or *STD_WCA*.

[Table 4 about here]

Panel A of Table 4 presents the results for the pooled sample where columns (1) through (4) correspond to dependent variable *ABS_ACC*, and columns (5) through (8) corresponds to *STD_WCA*. In column (1), the coefficient on *FAIL_0* is positive and significant at the 0.01 level. In column (2), the coefficient on *FAIL_0* remains positive and is significant at the 0.05 level after controlling for auditors' personal characteristics. In columns (3) and (4) where we use *FAIL_10* as the main explanatory variable, its coefficient is also positive and significant at the 0.01 level. These results show that the clients concurrently audited by a failed auditor have lower quality of reported earnings as measured by performance-adjusted absolute abnormal accruals, relative to those clients concurrently audited by non-failed auditors.

Likewise, the results in columns (5) through (8) show that clients concurrently audited by a failed auditor exhibit lower earnings quality in terms of the variability of abnormal working capital accruals. Overall, the evidence here suggests that audit quality is lower for those clients audited by a failed auditor (although these audits themselves are not failed audits) than those audited by non-failed auditors, pointing to a lateral contagion of low quality audits.

The coefficients on the control variables pertaining to auditor-level characteristics also reveal interesting patterns. The coefficient on *FEMALE* is negative and significant at the 0.05 level, indicating that female auditors can better constrain managers' discretion in financial reporting compared to their male counterparts; this result corroborates recent findings on the impact of female directors on earnings quality (Srinidhi et al. 2011; Abbott et al. 2012; Gavious et al. 2012). The coefficient on *MAJOR* is negative and significant at the 0.05 level, indicating

that auditors with an education background in accounting are more capable of constraining managers' reporting discretions. The coefficients on *EXPERIENCE* and *IND_EXPERT* are negative and significant at the 0.01 level, indicating that auditors who have more auditing experience or are industry experts are more capable of constraining earnings manipulation behavior. To our surprise, the coefficients on *PARTNER* and *DEGREE* are not statistically significant.

Table 4, Panel B, reports the results for the matched sample. In columns (1), (2), (5), and (6), the coefficients on *FAIL_0* are positive and significant at the 0.05 level or better. In columns (3), (4), (7), and (8), the coefficients on *FAIL_10* are positive and significant at the 0.05 level or better. These results indicate that in the same audit office, the quality of (non-failed) audits is significantly lower if performed by a failed auditor than if performed by their counterparts who are not involved in audit failures, thus indicating the existence of self-contagion in the cross-section for auditors experiencing one or more audit failures.

5.3 Comparison between Non-Failed Auditors in Failed Offices and Those in Non-Failed Offices

The evidence from the preceding analysis shows the existence of self-contagion of low quality audits for those auditors experiencing one or more audit failures. This result per se does not rule out the possibility of cross-contagion between auditors in the same office. To explore the latter possibility, we now make a further distinction between non-failed auditors in a failed office, i.e., those who are colleagues of a failed auditor in the same office, and those in a non-failed office. This distinction is important for the purpose of ascertaining the extent to which the previously documented contagion effect of low-quality audits is an office-wide (versus an individual auditor-level) effect.

Table 5 shows the OLS regression results based on a subsample comprising all observations involving non-failed auditors. Variable *FAIL_0_SAME_OFF* is set to 1 if a client firm is audited by non-failed auditors who have one or more failed auditors as colleagues in the same office, and 0 otherwise. In all the columns, the coefficient on *FAIL_0_SAME_OFF* is not statistically significant, indicating that audit quality is not significant different between the two groups of non-failed auditors.

[Table 5 about here]

Taken together, the results in Table 4 and Table 5 suggest that the contagion effect of low quality audits is isolated to failed auditors, and this effect does not spread to other auditors in the same office. This means that the presence of a downward restatement by a client firm is an indication of low audit quality for the audits performed by the same auditors involved in audit failures. However, audit quality is not lower for non-failed auditors simply because they are in the same office as failed auditors.

6. Auditor Personal Characteristics and the Contagion Effect

In the preceding sections, we establish evidence of self-contagion of low-quality audits those auditors experiencing audit failures. Furthermore, the results in Table 4 also show that this contagion effect is associated with auditors' personal characteristics such as gender, major, experience, and industry expertise. In this section, we conduct further analysis to show that the contagion effect exists primarily among certain types of auditors.

Panels A and B of Table 6 report the results of regression (3) for the pooled sample where audit quality is proxied by *ABS_ACC* and *STD_WCA*, respectively. As the results are similar for the two alternative proxies, our discussion below is based on the former proxy. In columns (1) and (2) of Panel A, we test self-contagion for male and female auditors. The coefficient on

FAIL_0 (0.006, t=3.00) is positive and significant at the 0.01 level for subsample of male auditors (*FEMALE*=0), indicating the presence of self-contagion of low quality audits. In contrast, this coefficient (0.001, t=0.66) is insignificant for female auditors (*FEMALE*=1), indicating that self-contagion is not present among female auditors. The results suggest that female auditors as a group can better prevent the contagion effect of low-quality audits than their male counterparts. In other words, audit failures are mainly of an isolated nature if they are performed by female auditors, but are an indication of a wider problem if this occurs for male audits.

[Table 6 about here]

In columns (3) and (4), we compare auditors having a degree majoring in accounting (*MAJOR=1*) and those not having a degree in accounting (*MAJOR*=0). For non-accounting majors, the coefficient on *FAIL_0* (0.012, t=4.06) is positive and significant at the 0.01 level, indicating the presence of contagion of low quality audits. In contrast, for accounting majors, the coefficient on *FAIL_0* (0.001, t=0.50) is positive but not statistically significant. The results thus suggest that auditors with a formal education in accounting have better ability to prevent contagion of low-quality audits, relative to auditors without having a formal education in accounting. Perhaps because auditors with an accounting degree have gone through systematic and rigorous accounting training, they better understand audit risk and are more able to make a correct judgment.

In columns (5) and (6), we examine the effect of auditing experience. We measure *EXPERIENCE* as the decile rank of the combined auditing age of the auditors for a client-year observation. For observations in the top decile of *EXPERIENCE*, the coefficient on *FAIL_0* (0.004, t=0.89) is positive but insignificant, suggesting no significant self-contagion of low

quality audits in this group. In contrast, for the subsample with *EXPERIENCE* below the top decile, the coefficient on *FAIL_0* (0.003, t=2.26) is positive and significant at the 0.05 level, indicating that the occurrence of an audit failure is indicative of generally low quality for less experienced auditors. The results suggest that for most experienced auditors, the occurrence of an audit failure is more of an isolated nature, but it indicates a wider problem with audit quality if performed by less experienced auditors.

Finally, in columns (7) and (8), we investigate the effect of industry expertise on the self-contagion effect. For auditors with industry expertise in the top-decile, the coefficient on *FAIL_0* (0.002, t=0.43) is not significant, indicating no evidence of self-contagion. In contrast, for auditors with industry expertise below the top-decile, the coefficient on *FAIL_0* (0.004, t=2.80) is positive and significant, suggesting the presence of self-contagion. The results here show that the occurrence of an audit failure is more of an isolated nature for auditors who are industry experts.

We also perform these analyses using the matched sample, and the results as presented in Table 7 are qualitatively the same as in Table 6. Taken together, the results in Table 6 and Table 7 indicate that the extent of self-contagion of low quality audits varies across individual auditors, and the effect is mainly concentrated on male auditors and auditors without an accounting degree, with less auditing experience, and possessing less industry expertise.

[Table 7 about here]

7. Conclusions

Francis and Michas (2013) discover a contagion effect of low quality audits that exists at the audit office level. In this study, we further examine this effect in order to uncover the role of auditor-level factors versus that of office-level factors in driving this phenomenon. The study is

conducted in the Chinese setting where individual engagement auditors are required to sign their names on the audit report.

We find that contagion of low audit quality primarily spreads along individual auditors, and there is little evidence of contagion spreading from one auditor to another within an office. Specifically, we find that auditors who experience audit failures in a given year are more likely to have further failures in the subsequent years, and this longitudinal contagion lasts for up to three years. Furthermore, auditors who experience audit failures in a given year are associated with lower quality of reported earnings for the client firms that they concurrently audit, indicating lateral contagion of low quality audits that spreads along individual auditors. In contrast, among auditors who are not involved in audit failures in a given year, we find no significant difference in client earnings quality between those who are same-office colleagues of failed auditors and those who are not, suggesting that the contagion effect does not spread across different auditors in the same office. In other words, the contagion effect previously documented is a case of self-contagion along failed auditors, and not cross-contagion between different auditors in an office.

We also find considerable variations in the extent of self-contagion for auditors with different personal characteristics. Specifically, self-contagion of low quality audits are mainly concentrated on male auditors, auditors who do not have an accounting degree, auditors who are less experienced, and auditors who are not industry experts.

Our findings underscore the importance of individual auditor identification in audit reports and demonstrate the relevance of auditors' personal characteristics – beyond the factors at the audit firm, office, and client levels – to assessing audit quality. Our results have useful implications for financial information users, regulators, and policy makers.

Research into the role of auditor-level characteristics in influencing audit quality is constrained by the availability of relevant data. While our study provides evidence from the Chinese market which in itself is informative, the generalizability of the results is largely an open question, given the special characteristics of the Chinese auditing market. It will be useful to conduct further research using data from other economies, especially those with distinct market environments.

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Appendix

Variable		Definition
Dependent variables:		
ABS_ACC	=	the absolute value of performance-adjusted abnormal accruals as estimated from equation (1)
STD_WCA	=	the standard deviation of abnormal working capital accruals as estimated from equation (2)
Firm characteristic variables:		
SIZE	=	The nature logarithm of a firm's market value of equity at the end of year t
LAG_ACC	=	A firm's total accruals scaled by total assets in year t-1
LEV	=	A firm's total debt in year t scaled by lagged total assets
SALES_GROWTH	=	The one-year percentage growth in a firms' sales from year t-1 to year t
MTB	=	A firm's market value of equity scaled by book value of equity at the end of year t
RETURN	=	Buy-and-hold return on a firm's stock over year t-1
SALES	=	A firm's sales scaled by total assets in year t
CFO	=	A firm's cash flow from operations in year t scaled by lagged total assets
Z-SCORE	=	A firm's Altman-Z score in year t, calculated as [(0.717 × net working capital + 0.847 × retained earnings + 3.107 × earnings before interest and taxes +0.998 × sales)/ total assets + 0.42 × book value of equity / liabilities]
LOSS	=	1 if a firm records negative net income in year t, and 0 otherwise
SOE	=	1 if a firm is ultimately controlled by China's central government in year t, and 0 otherwise
M&A	=	1 if a firm is involved in a merger or acquisition during year t, and 0 otherwise
Auditor characteristic variables:		
AUD_FAIL_X	=	1 if one or more audit failures occur to a signatory auditor in year t and 0 otherwise. An audit failure occurs in the year if, subsequent to an audit, the client firm restates the audited net income downwards by an amount exceeding a given materiality threshold. X indicates the materiality threshold for the restated amount, which is either 0 or 10, corresponding to 0% or 10% of the reported net income
FAIL_X	=	1 if one or more signatory auditors of a client firm are involved in an audit failure in year t and 0 otherwise. An audit failure occurs in the year if, subsequent to an audit, the client firm restates the audited net income downwards by an amount exceeding a given materiality threshold. X indicates the materiality threshold for the restated amount, which is either 0 or 10, corresponding to 0% or 10% of the reported net income
PARTNER	=	1 if one or more signatory auditors of a client firm is a partner in year t, and 0 otherwise
FEMALE	=	1 if one or more signatory auditors of a firm is female in year t, and 0 otherwise
DEGREE	=	1 if one or more signatory auditors of a firm has obtained a master's degree or higher in year t, and 0 otherwise
MAJOR	=	1 if one or more signatory auditors of a firm i majored in accounting in college education in year t, and 0 otherwise.
EXPERIENCE	=	The decile rank of auditing experience of a firm's signatory auditors' in year t, with signatory auditors' auditing experience calculated as the total auditing age (i.e. from the year of qualification to year t) of all the signatory auditors.

IND_EXPERT	=	The decile rank of industry expertise of a firm's signatory auditors in year t, with industry expertise calculated as $\sum_{j=1}^{M}\sum_{i=1}^{L} Qurt(TA_i) / \sum_{i=1}^{S} Qurt(TA_i)$, where $Qurt(TA_i)$ is the square root of total assets of firm *i* audited by auditor *j* in a particular industry *k* at the end of year t, *L* is the number of clients audited by auditor *j* in year t, *M* is the number of individual auditors who sign the auditing report for firm *i* in year t, and *S* is the number of firms in industry *k* in year t
CI_OFFICE	=	Client importance at the audit firm level in year t, calculated as $Ln(TA_i) / \sum_{i=1}^{C} Ln(TA_i)$, where $Ln(TA_i)$ is the nature logarithm of total assets of firm *i* at the end of year t, and *C* is the number of clients audited by this audit office
SIZE_OFFICE	=	The size of a client firm's audit firm in year t, calculated as $\sum_{i=1}^{C} Ln(TA_i)$, where $Ln(TA_i)$ is the nature logarithm of total assets of firm *i* at the end of year t, and *C* is the number of clients audited by this audit office
CI_AUDITOR	=	Client importance at the individual auditor level, calculated as $Ln(TA_i) / \sum_{j=1}^{K}\sum_{i=1}^{L} Ln(TA_i)$, where $Ln(TA_i)$ is the nature logarithm of total assets of firm *i* at the end of year t, *L* is the number of clients audited by individual auditor *j* in year t, and *K* is the number of individual auditors who sign the auditing report of firm *i* in year t
SIZE_AUDITOR	=	The total size of a client firm's auditor(s) in year t, calculated as $\sum_{j=1}^{K}\sum_{i=1}^{L} Ln(TA_i)$, where $Ln(TA_i)$ is the nature logarithm of total assets of firm *i* at the end of year t, *L* is the number of clients audited by individual auditor *j* in year t, and *K* is the number of individual auditors who sign the auditing report of firm *i* in year t

Table 1 Sample

Panel A: Sample Selection

	Number of client firm-years	Number of auditor-years
Observations available in the CSMAR database over period 1999-2011 with non-missing total assets	18,061	
Less:		
Observations with B, H or overseas shares	(2,608)	
Observations in the financial section	(179)	
Observations with missing auditor signatures	(880)	
Observations with restatements	(1,097)	
Observations with missing data necessary to calculate firm-level variables	(1,542)	
Observations with missing signatory auditor's identity data	(89)	
Pooled sample	**11,666**	**9,174**
Include:		
Observation with non-failed auditor(s)	8,830	7,950
Observations with failed auditor(s)	3,336	1,224
Less:		
Observations with missing matched non-failed auditor(s)	(497)	(1,59)
Observations with failed auditors in the matched sample	2,839	1,065
Plus:		
Observations audited by matching non-failed auditors	2,404	1,065
Matched sample	**5,243**	**2,130**

Panel B: Distribution of Firm-year observations by Number of Signatory Auditors

	Pooled sample		Matched sample	
Number of signatory auditors	**Freq.**	**%**	**Freq.**	**%**
1	18	0.15%	6	0.11%
2	11,365	97.57%	5,089	97.18%
3	283	100.00%	148	100.00%
Total firm-years	11,666		5,243	

Panel C: Distribution of Auditor-year observations by Number of Clients

	Pooled sample		Matched sample	
Number of clients	**Freq.**	**%**	**Freq.**	**%**
1	4,328	47.18%	487	22.86%
2	2,269	71.91%	731	57.18%
3	1,094	83.83%	286	70.61%
4	605	90.43%	254	82.54%
5	348	94.22%	114	87.89%
6	186	96.25%	130	93.99%
7	124	97.60%	48	96.24%
8	82	98.50%	29	97.61%
9	42	98.95%	17	98.40%
≥10	96	100.00%	34	100.00%
Total auditor-years	9,174		2,130	

Panel D: Distribution of Signatory Auditors by Year

	Pooled sample				Matched sample			
		AUD_FAIL_X=1				*AUD_FAIL_X*=1		
Year	***AUD_FAIL_X*=0**	**>0%**	**(10%)**	**Total**	***AUD_FAIL_X*=0**	**>0%**	**(10%)**	**Total**
1999	369	9	(4)	378	9	9	(4)	18
2000	417	28	(9)	445	28	28	(9)	56
2001	416	95	(30)	511	85	85	(30)	170
2002	418	125	(38)	543	113	113	(36)	226
2003	455	151	(76)	606	124	124	(76)	248
2004	541	156	(70)	697	126	126	(70)	252
2005	675	130	(59)	805	108	108	(52)	216
2006	741	126	(44)	867	112	112	(42)	224
2007	787	138	(56)	925	104	104	(56)	208
2008	913	108	(44)	1,021	106	106	(44)	212
2009	1,011	97	(39)	1,108	90	90	(39)	180
2010	1,207	61	(22)	1,268	60	60	(22)	120
Total auditor-years	7,950	1,224	(491)	9,174	1065	1,065	(480)	2,130
Mean auditor-years	663	102	765	41	89	89	40	178

AUD_FAIL_X is coded 1 if one or more audit failures occur to the signatory auditor in year t, and 0 otherwise. See the Appendix for variable definitions.

Table 2 Descriptive Statistics

Panel A: Distributional Properties of Variables

	Pooled sample				Matched sample			
	N	**Mean**	**Median**	**Std.**	**N**	**Mean**	**Median**	**Std.**
ABS_ACC	11,666	0.062	0.043	0.059	5,243	0.064	0.044	0.062
STD_WCA	10,686	0.035	0.024	0.038	4,846	0.037	0.025	0.040
AUD_FAIL_0	9,174	0.133	0.000	0.340	2,130	0.500	0.500	0.500
AUD_FAIL_10	9,174	0.054	0.000	0.225	2,130	0.225	0.000	0.418
FAIL_0	11,666	0.286	0.000	0.452	5,243	0.541	1.000	0.460
FAIL_10	11,666	0.125	0.000	0.331	5,243	0.266	0.000	0.462
CI_OFFICE	11,666	0.047	0.022	0.070	5,243	0.042	0.024	0.053
SIZE_OFFICE	11,666	25.175	24.916	1.402	5,243	24.983	24.799	1.044
CI_AUDITOR	11,666	0.375	0.277	0.303	5,243	0.317	0.227	0.267
SIZE_AUDITOR	11,666	23.345	23.372	1.009	5,243	23.397	23.438	0.882
LAG_ACC	11,666	-0.020	-0.016	0.096	5,243	-0.024	-0.018	0.096
SIZE	11,666	21.672	21.591	0.949	5,243	21.499	21.419	0.906
LEV	11,666	0.095	0.036	0.532	5,243	0.088	0.035	0.256
SALES_GROWTH	11,666	0.245	0.146	0.649	5,243	0.252	0.151	0.702
MTB	11,666	1.068	0.705	1.104	5,243	0.901	0.583	0.909
RETURN	11,666	0.368	0.039	0.923	5,243	0.296	-0.097	0.950
SALES	11,666	0.636	0.524	0.469	5,243	0.619	0.504	0.470
CFO	11,666	0.050	0.048	0.083	5,243	0.049	0.048	0.084
Z-SCORE	11,666	1.557	1.399	1.422	5,243	1.450	1.338	1.386
LOSS	11,666	0.158	0.000	0.365	5,243	0.166	0.000	0.372
SOE	11,666	0.273	0.000	0.445	5,243	0.278	0.000	0.448
M&A	11,666	0.367	0.000	0.482	5,243	0.359	0.000	0.480
PARTNER	11,666	0.519	1.000	0.500	5,243	0.546	1.000	0.498
FEMALE	11,666	0.516	1.000	0.500	5,243	0.487	0.000	0.500
DEGREE	11,666	0.263	0.000	0.440	5,243	0.301	0.000	0.459
MAJOR	11,666	0.783	1.000	0.413	5,243	0.783	1.000	0.412
EXPERIENCE	11,666	4.323	4.000	2.857	5,243	4.727	5.000	2.769
IND_EXPERT	11,666	4.741	5.000	2.820	5,243	4.505	5.000	2.871

Panel B: Univariate Tests of Abnormal Accruals for the Pooled Sample

	ABS_ACC			***STD_WCA***		
	Mean	**Median**	**N**	**Mean**	**Median**	**N**
FAIL_0=0	0.061	0.043	8330	0.034	0.023	7,579
FAIL_0=1	0.064**	0.044	3336	0.037***	0.025***	3,091
FAIL_10=1	0.066***	0.045**	1461	0.038***	0.026***	1,344

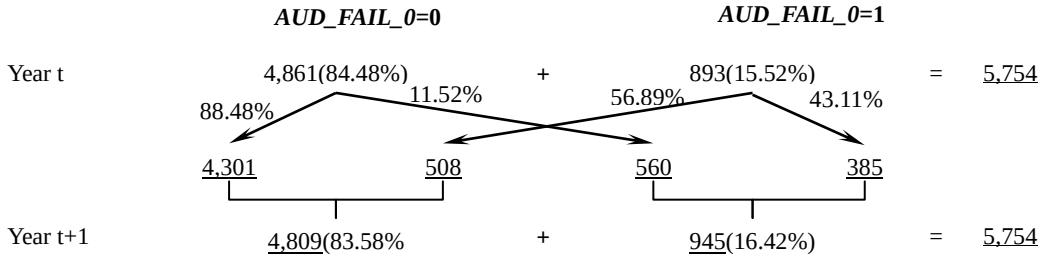
Panel C: Univariate Tests of Abnormal Accruals for the Matched Sample

	ABS_ACC			*STD_WCA*		
	Mean	**Median**	**N**	**Median**	**Mean**	**N**
FAIL_0=0	0.062	0.043	2404	0.034	0.022	2,265
FAIL_0=1	0.064*	0.044	2839	0.038***	0.027***	2,581
FAIL_10=1	0.067***	0.046**	1016	0.040***	0.027***	9,76

ABS_ACC is the absolute value of performance-adjusted abnormal accruals. *STD_WCA* is the standard deviation of abnormal working capital accruals. *FAIL_X* equals 1 if at least one signatory auditor of a client firm is involved in audit failure(s) in the year, and 0 otherwise. See the Appendix for variable definitions. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively, in comparing the mean (median) values between *FAIL_X*=1 and *FAIL_0*=0.

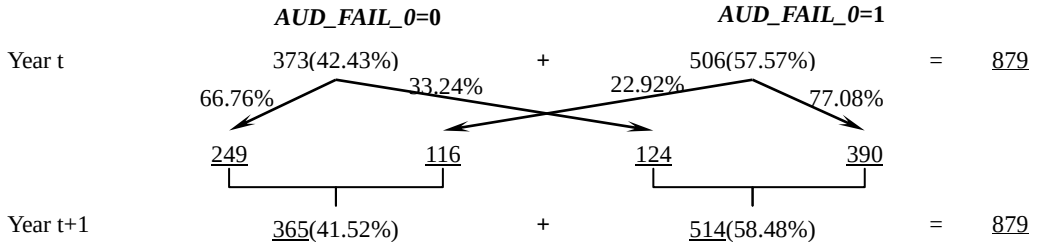
Table 3 Self-Contagion of Audit Failures along the Longitudinal Dimension

Panel A: Evolution of Individual Auditors' Audit Quality from Year t to Year t+1 in the Pooled Sample



	Evolutionary rate		Original rate		Difference	z-value
Non-failed group	88.48%	-	84.48%	=	4.00%	5.973***
Failed group	43.11%	-	15.52%	=	27.59%	19.468***

Panel B: Evolution of Individual Auditors' Audit Quality from Year t to Year t+1 in the Matched Sample



	Evolutionary rate		Original rate		Difference	z-value
Non-failed group	66.76%	-	42.43%	=	24.33%	7.872***
Failed group	77.08%	-	57.57%	=	19.51%	7.315***

Note: Panel A and B are used to explain the longitudinal contagion effect of low quality audits. If no longitudinal contagion of low quality audits exists, evolutionary rates in year t+1 and the original rates in year t should not significantly different from each other for the non-failed group and failed group, respectively.

Panel C: Predicting Audit Failures of Signatory Auditors based on Past Audit Failures (Dependent variable = *AUD_FAIL_0*)

	Pooled sample				**Matched sample**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
AUD_FAIL_0_LAG1	1.623***				1.775***			
	(17.97)				(10.70)			
AUD_FAIL_0_LAG2		0.797***				0.680***		
		(7.66)				(3.40)		
AUD_FAIL_0_LAG3			0.492***				0.539**	
			(3.94)				(2.33)	
AUD_FAIL_0_LAG4				0.010				-0.021
				(0.06)				(-0.08)
AUD_PARTNER	0.264***	0.204**	0.098	-0.003	-0.381**	-0.107	-0.318	-0.356
	(3.19)	(2.01)	(0.86)	(-0.02)	(-2.29)	(-0.51)	(-1.17)	(-1.12)
AUD_FEMALE	-0.048	-0.113	-0.059	-0.164	0.051	-0.063	-0.145	0.195
	(-0.54)	(-1.07)	(-0.49)	(-1.15)	(0.28)	(-0.27)	(-0.52)	(0.60)
AUD_DEGREE	0.228*	0.280*	0.268*	0.307	0.408*	0.455	0.380	0.620
	(1.95)	(1.92)	(1.66)	(1.59)	(1.75)	(1.55)	(0.97)	(1.42)
AUD_MAJOR	-0.068	-0.076	-0.178	-0.192	-0.001	-0.424**	-0.622**	-0.271
	(-0.79)	(-0.73)	(-1.52)	(-1.37)	(-0.01)	(-2.01)	(-2.40)	(-0.86)
AUD_SIZE	0.187***	0.189***	0.209***	0.184***	0.185***	0.205***	0.179***	0.115**
	(11.24)	(9.93)	(9.40)	(7.58)	(5.95)	(5.33)	(4.00)	(2.30)
AUD_EXPERIENCE	-0.103***	-0.143***	-0.147***	-0.153***	-0.041	-0.032	-0.051	-0.023
	(-7.38)	(-8.46)	(-7.75)	(-6.75)	(-1.35)	(-0.87)	(-1.18)	(-0.44)
_cons	-2.619***	-2.022***	-1.954***	-1.594***	-1.299***	-0.632*	-0.131	-0.035
	(-22.18)	(-13.37)	(-10.82)	(-7.29)	(-4.87)	(-1.88)	(-0.33)	(-0.07)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,754	4,253	3,267	2,511	879	559	397	284
Pusedo R^2	12.68%	7.58%	6.93%	5.63%	18.73%	9.36%	8.12%	3.92%

AUD_FAIL_X is set to 1 if at least one audit failure (defined as a downward restatement of income) occurs to the auditor in year t and 0 otherwise. *AUD_FAIL_0_LAGk* (k = 1,2,3) refers to an auditor who experienced an audit failure k years ago. See the Appendix for other variable definitions. Panel A and Panel B show the z-statistics from two-tailed proportion tests. Panel C shows t-statistics (in parentheses) based on robust standards errors clustered at the audit firm level. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively.

Table 4. Self-Contagion of Low Quality Audits along the Lateral Dimension

Panel A: Regression Results from the Pooled Sample

	ABS_ACC				*STD_WCA*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FAIL_0	0.004***	0.003**			0.003***	0.003***		
	(2.58)	(2.56)			(3.53)	(3.63)		
FAIL_10			0.007***	0.006***			0.003**	0.003**
			(2.83)	(2.60)			(2.05)	(2.07)
CI_OFFICE	-0.022	-0.012	-0.022	-0.012	-0.002	-0.001	-0.001	-0.001
	(-1.58)	(-0.95)	(-1.59)	(-0.96)	(-0.16)	(-0.09)	(-0.15)	(-0.09)
SIZE_OFFICE	-0.002**	-0.002***	-0.002**	-0.002***	-0.004***	-0.004***	-0.004***	-0.004***
	(-2.35)	(-3.40)	(-2.47)	(-3.45)	(-4.60)	(-4.30)	(-4.60)	(-4.29)
CI_AUDITOR	-0.012***	-0.008**	-0.013***	-0.008**	-0.008**	-0.006*	-0.008**	-0.007**
	(-3.48)	(-2.23)	(-3.60)	(-2.31)	(-2.16)	(-1.80)	(-2.33)	(-1.99)
SIZE_AUDITOR	-0.004***	-0.002	-0.004***	-0.002	-0.002*	-0.002	-0.002*	-0.002
	(-3.37)	(-1.33)	(-3.47)	(-1.42)	(-1.90)	(-1.39)	(-1.91)	(-1.42)
LAG_ACC	0.012	0.013	0.012	0.013	-0.022***	-0.022***	-0.022***	-0.022***
	(1.41)	(1.55)	(1.44)	(1.57)	(-3.80)	(-3.75)	(-3.76)	(-3.71)
SIZE	0.003**	0.005***	0.003**	0.005***	0.002**	0.003**	0.002**	0.003**
	(2.43)	(3.68)	(2.47)	(3.72)	(2.11)	(2.52)	(2.14)	(2.53)
LEV	0.001	0.001	0.001	0.001	0.006***	0.006***	0.006***	0.006***
	(0.80)	(1.21)	(0.81)	(1.21)	(8.60)	(8.66)	(8.62)	(8.68)
SALES_GROWTH	0.005***	0.005***	0.005***	0.005***	0.004***	0.004***	0.004***	0.004***
	(4.48)	(4.12)	(4.47)	(4.12)	(5.24)	(5.20)	(5.19)	(5.15)
MTB	0.005***	0.004***	0.005***	0.004***	0.006***	0.005***	0.006***	0.005***
	(6.11)	(4.03)	(6.11)	(4.01)	(6.10)	(5.34)	(6.07)	(5.32)
RETURN	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001*	-0.001	-0.001
	(-1.61)	(-1.01)	(-1.60)	(-1.00)	(-1.64)	(-1.68)	(-1.59)	(-1.62)
SALES	0.009***	0.009***	0.009***	0.009***	0.009***	0.009***	0.009***	0.009***
	(5.29)	(5.11)	(5.28)	(5.10)	(8.68)	(8.70)	(8.69)	(8.72)
CFO	-0.080***	-0.073***	-0.079***	-0.073***	0.005	0.005	0.005	0.005
	(-6.35)	(-5.79)	(-6.32)	(-5.75)	(0.86)	(0.90)	(0.91)	(0.95)
Z-SCORE	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***
	(-8.50)	(-8.94)	(-8.50)	(-8.92)	(-9.19)	(-9.30)	(-9.22)	(-9.32)
LOSS	0.021***	0.021***	0.021***	0.021***	0.024***	0.024***	0.024***	0.024***

	(10.14)	(10.39)	(10.14)	(10.39)	(18.43)	(18.36)	(18.38)	(18.31)
SOE	-0.004**	-0.002	-0.004**	-0.002	-0.003***	-0.003***	-0.003***	-0.003***
	(-2.35)	(-1.57)	(-2.34)	(-1.57)	(-2.93)	(-2.91)	(-2.89)	(-2.88)
M&A	0.004***	0.004***	0.004***	0.004***	-0.001	-0.001	-0.001	-0.001
	(3.38)	(2.82)	(3.42)	(2.87)	(-0.59)	(-0.61)	(-0.55)	(-0.56)
PARTNER		0.001		0.001		0.001		0.001
		(0.01)		(0.03)		(0.69)		(0.73)
FEMALE		-0.002**		-0.002**		-0.001		-0.001
		(-2.09)		(-2.05)		(-1.39)		(-1.38)
DEGREE		-0.001		-0.001		0.001		0.001
		(-0.75)		(-0.74)		(0.82)		(0.84)
MAJOR		-0.004**		-0.004**		0.001		0.001
		(-2.31)		(-2.33)		(0.10)		(0.06)
EXPERIENCE		-0.001***		-0.001***		-0.001		-0.001
		(-2.63)		(-2.65)		(-1.33)		(-1.40)
IND_EXPERT		-0.002***		-0.002***		-0.001**		-0.001**
		(-5.89)		(-5.90)		(-2.56)		(-2.46)
_cons	0.136***	0.074***	0.140***	0.077***	0.162***	0.146***	0.164***	0.149***
	(6.04)	(3.51)	(6.21)	(3.64)	(10.20)	(8.36)	(10.26)	(8.43)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	11,666	11,666	11,666	11,666	10,686	10,686	10,686	10,686
Model p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
adj. R^2	8.85%	10.57%	8.90%	10.61%	20.50%	21.58%	20.47%	21.54%

Table 4 Continued

Panel B: Regression Results from the Matched Sample

	ABS_ACC				*STD_WCA*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FAIL_0	0.004**	0.004**			0.004***	0.004***		
	(2.38)	(1.95)			(3.00)	(3.00)		
FAIL_10			0.007**	0.006**			0.006***	0.006***
			(2.28)	(2.04)			(3.45)	(3.49)
CI_OFFICE	0.004	0.006	0.031	0.037	0.017	0.035	0.053	0.055
	(0.12)	(0.18)	(0.65)	(0.79)	(0.77)	(1.49)	(1.41)	(1.44)
SIZE_OFFICE	-0.002	-0.001	-0.001	-0.001	0.001	-0.001	-0.001	-0.001
	(-1.19)	(-0.83)	(-0.33)	(-0.21)	(0.14)	(-0.72)	(-0.44)	(-0.28)
CI_AUDITOR	-0.012	-0.011	-0.019	-0.014	-0.008	-0.008	-0.018**	-0.018**
	(-1.61)	(-1.47)	(-1.50)	(-1.01)	(-1.16)	(-1.31)	(-2.07)	(-2.17)
SIZE_AUDITOR	-0.003	-0.003	-0.010**	-0.007*	-0.003	-0.002	-0.006***	-0.006***
	(-1.26)	(-1.18)	(-2.52)	(-1.69)	(-1.38)	(-1.30)	(-2.59)	(-2.67)
LAG_ACC	0.012	0.013	0.005	0.008	-0.020**	-0.021**	0.003	0.004
	(0.84)	(0.92)	(0.26)	(0.40)	(-2.06)	(-2.11)	(0.20)	(0.21)
SIZE	0.002	0.003	0.001	0.003	0.002	0.002	0.002	0.002
	(0.76)	(1.20)	(0.43)	(1.18)	(1.24)	(1.28)	(1.10)	(1.15)
LEV	0.010	0.011	-0.002	-0.005	0.008	0.008	-0.003	-0.004
	(1.39)	(1.41)	(-0.12)	(-0.37)	(1.06)	(0.91)	(-0.34)	(-0.39)
SALES_GROWTH	0.003**	0.003*	0.001	0.001	0.005**	0.004**	0.006**	0.006**
	(1.99)	(1.74)	(0.46)	(0.37)	(2.50)	(2.40)	(2.10)	(2.21)
MTB	0.009***	0.008***	0.006**	0.005*	0.010***	0.009***	0.010***	0.010***
	(5.04)	(4.29)	(2.18)	(1.70)	(6.21)	(5.84)	(5.40)	(4.55)
RETURN	-0.002	-0.002	0.001	0.001	-0.002*	-0.002**	-0.002	-0.003*
	(-1.12)	(-1.14)	(0.12)	(0.20)	(-1.76)	(-1.97)	(-1.37)	(-1.72)
SALES	0.013***	0.014***	0.011***	0.012***	0.013***	0.013***	0.014***	0.014***
	(4.82)	(5.20)	(3.09)	(3.52)	(7.00)	(6.84)	(4.54)	(4.38)
CFO	-0.071**	-0.071**	-0.104***	-0.106***	0.009	0.013	0.007	0.008
	(-2.38)	(-2.35)	(-2.84)	(-2.82)	(0.85)	(1.19)	(0.59)	(0.59)
Z-SCORE	-0.007***	-0.007***	-0.006***	-0.006***	-0.008***	-0.008***	-0.008***	-0.009***
	(-5.97)	(-6.03)	(-3.09)	(-3.27)	(-7.55)	(-7.49)	(-4.50)	(-4.58)
LOSS	0.024***	0.023***	0.018***	0.018***	0.025***	0.025***	0.027***	0.026***
	(7.29)	(7.23)	(3.61)	(3.59)	(9.79)	(9.94)	(6.06)	(5.85)
SOE	-0.005*	-0.006**	-0.005	-0.005	-0.002	-0.002	-0.005*	-0.005*

	(-1.77)	(-2.03)	(-1.30)	(-1.39)	(-1.39)	(-1.20)	(-1.83)	(-1.93)
M&A	0.002	0.003	0.004	0.004	-0.001	-0.001	-0.001	-0.001
	(0.86)	(0.98)	(1.02)	(1.14)	(-0.32)	(-0.10)	(-0.62)	(-0.62)
PARTNER		-0.001		-0.001		-0.001		-0.003
		(-0.14)		(-0.36)		(-0.84)		(-1.03)
FEMALE		-0.005*		-0.006*		-0.003*		-0.003
		(-1.70)		(-1.70)		(-1.72)		(-1.02)
DEGREE		-0.001		-0.002		0.002		0.001
		(-0.21)		(-0.61)		(1.18)		(0.15)
MAJOR		-0.008***		-0.009*		-0.001		-0.001
		(-3.14)		(-1.84)		(-0.29)		(-0.22)
EXPERIENCE		-0.001*		-0.002**		-0.001*		-0.001
		(-1.75)		(-2.36)		(-1.70)		(-0.49)
IND_EXPERT		-0.001*		-0.003***		-0.001*		-0.001
		(-1.72)		(-2.77)		(-1.74)		(-0.32)
_cons	0.160***	0.128***	0.340***	0.307***	0.081**	0.116***	0.166***	0.166**
	(3.63)	(2.66)	(3.66)	(3.25)	(2.45)	(3.62)	(3.15)	(2.45)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,243	5,243	2,107	2,107	4,846	4,846	1,931	1,931
Model p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
adj. R^2	12.55%	13.11%	15.81%	16.80%	24.49%	25.10%	28.03%	28.89%

ABS_ACC is the absolute value of performance-adjusted abnormal accruals, and *STD_WCA* is the standard deviation of abnormal working capital accruals. See the Appendix for variable definitions. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively. T-statistics (in parentheses) are calculated based on robust standard errors clustered at both the year and firm levels.

Table 5. Comparison of Accrual Quality for Non-failed Auditors between Offices with and without Audit Failures

	ABS_ACC		*STD_WCA*	
	(1)	(2)	(3)	(4)
FAIL_0_SAME_OFF	0.002	0.001	-0.001	-0.001
	(1.41)	(0.37)	(-1.03)	(-1.04)
CI_OFFICE	-0.028*	-0.016	-0.002	-0.001
	(-1.92)	(-1.19)	(-0.18)	(-0.12)
SIZE_OFFICE	-0.002**	-0.002***	-0.004***	-0.004***
	(-2.19)	(-3.11)	(-4.73)	(-4.32)
CI_AUDITOR	-0.011**	-0.007*	-0.008**	-0.007**
	(-2.53)	(-1.69)	(-2.34)	(-1.98)
SIZE_AUDITOR	-0.004***	-0.002	-0.002*	-0.002
	(-2.84)	(-1.33)	(-1.83)	(-1.34)
LAG_ACC	0.013	0.014	-0.022***	-0.022***
	(1.31)	(1.46)	(-3.78)	(-3.73)
SIZE	0.003*	0.005***	0.002**	0.003**
	(1.95)	(2.92)	(2.06)	(2.44)
LEV	0.001	0.001	0.006***	0.006***
	(0.76)	(1.11)	(8.53)	(8.59)
SALES_GROWTH	0.006***	0.005***	0.004***	0.004***
	(4.24)	(3.90)	(4.94)	(4.92)
MTB	0.005***	0.003***	0.006***	0.005***
	(4.77)	(3.29)	(6.01)	(5.27)
RETURN	-0.000	0.000	-0.001	-0.001
	(-0.39)	(0.55)	(-1.55)	(-1.58)
SALES	0.008***	0.008***	0.009***	0.009***
	(3.82)	(3.76)	(8.69)	(8.75)
CFO	-0.104***	-0.097***	0.005	0.005
	(-7.84)	(-7.16)	(0.92)	(0.96)
Z-SCORE	-0.005***	-0.006***	-0.006***	-0.006***
	(-7.71)	(-8.10)	(-9.17)	(-9.28)
LOSS	0.014***	0.015***	0.024***	0.024***
	(6.77)	(7.01)	(18.27)	(18.20)
SOE	-0.003	-0.002	-0.003***	-0.003***
	(-1.54)	(-0.76)	(-2.82)	(-2.82)
M&A	0.005***	0.004***	-0.000	-0.000
	(3.25)	(2.76)	(-0.56)	(-0.56)
padt_px				
PARTNER		-0.001		0.001
		(-0.78)		(0.87)
FEMALE		-0.002*		-0.001

		(-1.72)		(-1.31)
DEGREE		-0.002		0.001
		(-1.11)		(1.12)
MAJOR		-0.002*		0.000
		(-1.67)		(0.07)
EXPERIENCE		-0.001**		-0.000
		(-1.99)		(-1.54)
IND_EXPERT		-0.002***		-0.001**
		(-4.96)		(-2.43)
_cons	0.141***	0.088***	0.145***	0.130***
	(5.95)	(4.10)	(8.78)	(7.01)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes
N	8330	8330	7546	7546
adj. R^2	8.68%	10.08%	19.44%	19.52%

FAIL_X_SAME_OFF is equal to 1 if a client firm is audited by auditors who are not involved in an audit failure in the year but have one or more failed colleagues in the same office, and 0 otherwise. *ABS_ACC* is the absolute value of performance-adjusted abnormal accruals, and *STD_WCA* is the standard deviation of abnormal working capital accruals. See the Appendix for variable definitions. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively. T-statistics (in parentheses) are calculated based on robust standard errors clustered at both the year and firm levels.

Table 6. Individual auditors' Personal Characteristics and the Self-contagion Effect: the Pooled Sample

Panel A: Dependent Variable = *ABS_ACC*

	FEMALE		*MAJOR*		*EXPERIENCE*		*IND_EXPERT*	
	=0	=1	=0	=1	=Top decile	<Top decile	=Top decile	<Top decile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FAIL_0	0.006***	0.001	0.012***	0.001	0.004	0.003**	0.002	0.004***
	(3.00)	(0.66)	(4.06)	(0.50)	(0.89)	(2.26)	(0.43)	(2.80)
CI_OFFICE	-0.017	-0.030	-0.048*	-0.015	0.019	-0.024	0.008	-0.026*
	(-0.95)	(-1.40)	(-1.81)	(-0.89)	(0.35)	(-1.58)	(0.31)	(-1.67)
SIZE_OFFICE	-0.003**	-0.001	-0.003**	-0.001*	-0.003**	-0.001	0.001	-0.002**
	(-2.51)	(-1.26)	(-2.06)	(-1.77)	(-2.12)	(-1.49)	(0.39)	(-2.38)
CI_AUDITOR	-0.019***	-0.006	-0.006	-0.015***	-0.010	-0.013***	-0.019*	-0.012***
	(-3.87)	(-1.33)	(-0.69)	(-3.49)	(-0.87)	(-3.38)	(-1.87)	(-2.97)
SIZE_AUDITOR	-0.006***	-0.003*	-0.002	-0.005***	-0.001	-0.005***	-0.003	-0.005***
	(-3.42)	(-1.68)	(-0.63)	(-3.64)	(-0.29)	(-3.33)	(-0.74)	(-3.34)
LAG_ACC	-0.001	0.027**	-0.006	0.018*	0.007	0.014	0.015	0.011
	(-0.02)	(2.47)	(-0.35)	(1.81)	(0.25)	(1.62)	(0.57)	(1.31)
SIZE	0.005***	0.002	0.004	0.003**	-0.001	0.004***	0.001	0.003**
	(2.65)	(0.96)	(1.59)	(2.01)	(-0.14)	(3.02)	(0.16)	(2.28)
LEV	0.008**	-0.001***	0.005	0.001	-0.001	0.004*	-0.027	0.001
	(2.10)	(-4.83)	(0.67)	(0.66)	(-0.99)	(1.71)	(-1.47)	(0.93)
SALES_GROWTH	0.006***	0.005***	0.001	0.007***	0.009***	0.005***	0.004	0.006***
	(3.49)	(3.11)	(0.30)	(4.65)	(2.78)	(3.76)	(1.04)	(4.54)
MTB	0.006***	0.005***	0.007***	0.005***	0.007***	0.005***	0.011***	0.005***
	(5.12)	(4.46)	(3.87)	(4.63)	(3.68)	(4.95)	(4.27)	(5.52)
RETURN	-0.002*	-0.001	-0.001	-0.002	-0.001	-0.002*	-0.004	-0.001
	(-1.66)	(-0.87)	(-0.08)	(-1.63)	(-0.33)	(-1.72)	(-1.65)	(-1.48)
SALES	0.009***	0.010***	0.012***	0.009***	0.004	0.010***	0.007	0.009***
	(4.18)	(4.22)	(3.47)	(4.21)	(0.79)	(6.11)	(1.21)	(5.14)
CFO	-0.091***	-0.070***	-0.066**	-0.083***	-0.105***	-0.077***	-0.109***	-0.076***
	(-4.94)	(-4.08)	(-2.31)	(-6.25)	(-3.02)	(-5.92)	(-3.77)	(-5.66)
Z-SCORE	-0.005***	-0.006***	-0.008***	-0.005***	-0.004**	-0.006***	-0.004**	-0.006***
	(-6.15)	(-5.89)	(-4.74)	(-7.32)	(-2.02)	(-8.14)	(-2.20)	(-8.53)
LOSS	0.021***	0.020***	0.018***	0.021***	0.012**	0.022***	0.015**	0.021***

	(7.49)	(7.23)	(4.25)	(9.02)	(2.50)	(10.03)	(2.54)	(9.75)
SOE	-0.005**	-0.002	-0.007***	-0.003	-0.003	-0.004**	0.003	-0.005***
	(-2.46)	(-1.25)	(-2.77)	(-1.49)	(-0.67)	(-2.41)	(0.59)	(-3.16)
M&A	0.007***	0.002	0.003	0.005***	0.009***	0.004***	0.001	0.005***
	(3.50)	(1.09)	(1.27)	(3.14)	(3.07)	(2.71)	(0.30)	(3.36)
_cons	0.142***	0.131***	0.112**	0.142***	0.173***	0.122***	0.109***	0.144***
	(4.95)	(4.35)	(2.52)	(6.09)	(4.07)	(4.87)	(2.59)	(5.91)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,654	6,012	2,538	9,128	1,293	10,373	1,278	10,388
Model p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
adj. R^2	10.60%	7.61%	10.82%	8.70%	8.74%	9.00%	8.46%	9.11%

Table 6 Continued

Panel B: Dependent Variable = *STD_WCA*

	FEMALE		*MAJOR*		*EXPERIENCE*		*IND_EXPERT*	
	=0	=1	=0	=1	=Top decile	<Top decile	=Top decile	<Top decile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FAIL_0	0.004***	0.001	0.005**	0.002*	0.003	0.003***	-0.001	0.003***
	(3.18)	(1.22)	(2.49)	(1.75)	(1.08)	(3.11)	(-0.23)	(3.86)
CI_OFFICE	-0.004	0.002	-0.017	0.005	0.004	0.001	-0.013	-0.004
	(-0.36)	(0.13)	(-0.90)	(0.48)	(0.14)	(0.02)	(-0.66)	(-0.35)
SIZE_OFFICE	-0.004***	-0.003***	-0.008***	-0.000	-0.005	-0.003***	-0.006***	-0.003***
	(-3.28)	(-3.74)	(-3.86)	(-0.13)	(-1.44)	(-4.15)	(-4.15)	(-3.65)
CI_AUDITOR	-0.007	-0.010***	-0.002	-0.009**	0.005	-0.010***	-0.008	-0.007**
	(-1.52)	(-2.58)	(-0.38)	(-2.33)	(0.46)	(-2.93)	(-0.97)	(-1.97)
SIZE_AUDITOR	-0.001	-0.004***	0.001	-0.003**	0.004	-0.004***	-0.001	-0.003**
	(-0.84)	(-2.73)	(0.51)	(-2.46)	(1.22)	(-3.25)	(-0.43)	(-2.04)
LAG_ACC	-0.022***	-0.021***	-0.021	-0.022***	0.006	-0.025***	0.001	-0.023***
	(-2.62)	(-2.64)	(-1.57)	(-3.86)	(0.39)	(-4.00)	(0.04)	(-3.84)
SIZE	0.002	0.003**	0.003	0.003**	-0.003	0.003***	0.004	0.002
	(1.45)	(2.26)	(1.30)	(2.31)	(-0.88)	(3.14)	(1.48)	(1.44)
LEV	0.010***	0.005***	0.001	0.006***	0.005***	0.009***	0.010	0.006***
	(2.66)	(15.78)	(0.19)	(7.93)	(11.91)	(3.48)	(0.84)	(8.47)
SALES_GROWTH	0.005***	0.004***	0.002	0.004***	0.006***	0.004***	0.004	0.004***
	(4.40)	(3.71)	(1.46)	(4.85)	(2.96)	(4.23)	(1.54)	(4.99)
MTB	0.006***	0.005***	0.007***	0.006***	0.007***	0.005***	0.003**	0.006***
	(5.35)	(5.28)	(4.19)	(5.22)	(3.62)	(5.74)	(2.20)	(5.81)
RETURN	-0.001	-0.001	0.001	-0.002**	-0.001	-0.001**	-0.003*	-0.001
	(-0.97)	(-1.30)	(0.64)	(-2.31)	(-0.02)	(-2.00)	(-1.68)	(-0.74)
SALES	0.008***	0.010***	0.010***	0.009***	0.009***	0.009***	0.013***	0.009***
	(4.89)	(6.50)	(3.68)	(7.55)	(3.37)	(8.15)	(2.98)	(8.39)
CFO	-0.003	0.014	0.006	0.002	0.023**	0.003	0.020	0.002
	(-0.43)	(1.64)	(0.43)	(0.38)	(2.00)	(0.46)	(1.04)	(0.38)
Z-SCORE	-0.006***	-0.006***	-0.008***	-0.005***	-0.006***	-0.006***	-0.003	-0.006***
	(-6.63)	(-6.78)	(-5.60)	(-8.16)	(-3.24)	(-8.84)	(-1.56)	(-9.46)
LOSS	0.025***	0.024***	0.022***	0.024***	0.022***	0.024***	0.023***	0.024***
	(13.15)	(11.78)	(7.05)	(17.44)	(5.65)	(17.82)	(4.63)	(18.59)

SOE	-0.003*	-0.002	-0.004**	-0.003**	-0.003	-0.003***	-0.004	-0.003***
	(-1.87)	(-1.64)	(-2.33)	(-2.37)	(-1.07)	(-2.74)	(-1.30)	(-3.04)
M&A	-0.001	-0.001	0.001	-0.001	0.002	-0.001	-0.002	-0.001
	(-0.27)	(-0.56)	(0.43)	(-1.08)	(1.21)	(-0.81)	(-0.61)	(-0.36)
_cons	0.123***	0.164***	0.153***	0.064***	0.161*	0.134***	0.041	0.142***
	(5.68)	(6.05)	(3.61)	(2.82)	(1.93)	(7.83)	(0.69)	(7.02)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,174	5,512	2,321	8,365	1,202	9,484	1,136	9,550
Model p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
adj. R^2	22.05%	19.54%	25.05%	19.87%	28.22%	19.84%	11.86%	22.00%

ABS_ACC is the absolute value of performance-adjusted abnormal accruals, and *STD_WCA* is the standard deviation of abnormal working capital accruals. See the Appendix for variable definitions. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively. T-statistics (in parentheses) are calculated based on robust standard errors clustered at both the year and firm levels.

Table 7. Individual auditors' Personal Characteristics and the self-contagion Effect: the Matched Sample

Panel A: Dependent Variable = *ABS_ACC*

	FEMALE		*MAJOR*		*EXPERIENCE*		*IND_EXPERT*	
	=0	=1	=0	=1	=Top decile	<Top decile	=Top decile	<Top decile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FAIL_0	0.007***	-0.002	0.013**	0.001	-0.001	0.004**	-0.002	0.005**
	(2.58)	(-0.60)	(2.34)	(0.20)	(-0.18)	(2.11)	(-0.22)	(2.33)
CI_OFFICE	0.052	-0.076*	-0.012	-0.012	0.140	0.006	-0.064	0.022
	(0.98)	(-1.73)	(-0.18)	(-0.28)	(1.38)	(0.17)	(-0.51)	(0.57)
SIZE_OFFICE	0.002	-0.009***	-0.005	-0.002	0.001	-0.002	-0.007	-0.001
	(1.00)	(-2.83)	(-1.10)	(-0.70)	(0.16)	(-1.05)	(-0.84)	(-0.47)
CI_AUDITOR	-0.023**	-0.010	0.003	-0.021**	-0.017	-0.013	-0.021	-0.012
	(-2.00)	(-0.91)	(0.13)	(-2.42)	(-0.68)	(-1.36)	(-0.81)	(-1.56)
SIZE_AUDITOR	-0.005	-0.005	0.001	-0.006*	-0.011	-0.003	-0.002	-0.004
	(-1.36)	(-1.37)	(0.19)	(-1.95)	(-1.11)	(-0.76)	(-0.27)	(-1.47)
LAG_ACC	0.009	0.013	-0.008	0.011	0.012	0.011	-0.052	0.015
	(0.47)	(0.60)	(-0.32)	(0.66)	(0.26)	(0.69)	(-1.21)	(1.01)
SIZE	0.001	0.007*	-0.002	0.004	-0.003	0.002	0.001	0.002
	(0.29)	(1.73)	(-0.31)	(1.60)	(-0.28)	(0.59)	(0.05)	(0.70)
LEV	0.007	0.020	-0.014	0.016**	0.029***	0.005	0.038	0.011
	(0.84)	(1.58)	(-0.99)	(2.16)	(4.67)	(0.58)	(0.86)	(1.44)
SALES_GROWTH	0.003	-0.001	0.006**	0.004*	0.006*	0.002	-0.001	0.003**
	(1.45)	(-0.19)	(2.29)	(1.88)	(1.75)	(1.21)	(-0.00)	(2.06)
MTB	0.011***	0.006**	0.013***	0.007***	0.005	0.009***	0.024**	0.008***
	(3.75)	(2.18)	(3.45)	(2.90)	(1.48)	(3.69)	(2.27)	(4.20)
RETURN	0.001	-0.004	0.005	-0.003	0.001	-0.003	-0.010	-0.002
	(0.17)	(-0.83)	(0.82)	(-1.64)	(0.13)	(-1.38)	(-1.35)	(-0.91)
SALES	0.018***	0.017***	0.012*	0.015***	0.005	0.016***	0.009	0.014***
	(3.41)	(4.35)	(1.78)	(4.81)	(0.71)	(5.52)	(0.81)	(4.95)
CFO	-0.071**	-0.037	-0.072	-0.052	-0.031	-0.075**	-0.045	-0.075**
	(-2.04)	(-0.91)	(-1.61)	(-1.54)	(-0.37)	(-2.43)	(-0.81)	(-2.38)
Z-SCORE	-0.007***	-0.007***	-0.010***	-0.006***	0.001	-0.009***	-0.019**	-0.007***
	(-4.29)	(-3.29)	(-4.03)	(-4.06)	(0.33)	(-6.23)	(-2.00)	(-5.53)
LOSS	0.023***	0.025***	0.014*	0.026***	0.006	0.024***	0.001	0.025***
	(5.17)	(6.07)	(1.89)	(6.94)	(0.55)	(6.77)	(0.08)	(7.04)

SOE	-0.005	-0.002	-0.008	-0.003	-0.002	-0.004	-0.009	-0.004
	(-1.25)	(-0.59)	(-1.34)	(-1.15)	(-0.16)	(-1.29)	(-1.22)	(-1.59)
M&A	0.004	-0.001	0.002	0.002	0.006	0.002	-0.004	0.003
	(1.33)	(-0.34)	(0.36)	(0.66)	(0.76)	(0.88)	(-0.47)	(1.02)
_cons	0.071	0.240**	0.178	0.207***	0.284	0.143**	0.268	0.137***
	(1.15)	(2.46)	(1.34)	(3.46)	(1.24)	(2.46)	(1.06)	(2.76)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,691	2,552	1,139	4,104	635	4,608	526	4,717
Model p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
adj. R^2	16.47%	14.62%	17.09%	14.79%	11.34%	13.46%	13.37%	12.39%

Table 7 Continued

Panel B: Dependent Variable = *STD_WCA*

	FEMALE		MAJOR		EXPERIENCE		IND_EXPERT	
	=0	=1	=0	=1	=Top decile	<Top decile	=Top decile	<Top decile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FAIL_0	0.006***	0.002	0.004***	-0.002	0.006	0.004**	0.009	0.005***
	(3.21)	(0.97)	(2.86)	(-0.66)	(1.64)	(2.53)	(1.62)	(3.60)
CI_OFFICE	0.009	0.035	-0.047	0.023	0.027	0.019	-0.020	0.019
	(0.25)	(0.83)	(-0.95)	(0.80)	(0.31)	(0.70)	(-0.31)	(0.65)
SIZE_OFFICE	0.003	-0.002	-0.009*	0.002	0.001	-0.001	-0.006	-0.002
	(1.18)	(-0.97)	(-1.77)	(0.98)	(0.13)	(-0.11)	(-0.72)	(-0.95)
CI_AUDITOR	-0.009	-0.012	0.001	-0.013*	-0.006	-0.011	-0.020	-0.009
	(-1.06)	(-1.24)	(0.02)	(-1.86)	(-0.40)	(-1.47)	(-1.04)	(-1.22)
SIZE_AUDITOR	-0.003	-0.004	0.001	-0.004**	-0.004	-0.003*	-0.006	-0.003
	(-1.41)	(-1.39)	(0.05)	(-2.00)	(-0.65)	(-1.65)	(-1.00)	(-1.47)
LAG_ACC	-0.016	-0.031*	-0.009	-0.023**	-0.030	-0.020*	0.028	-0.024**
	(-1.12)	(-1.88)	(-0.54)	(-2.03)	(-0.92)	(-1.88)	(0.97)	(-2.32)
SIZE	0.002	0.002	0.005	0.002	0.003	0.003	0.007	0.001
	(0.77)	(1.08)	(1.58)	(1.29)	(0.79)	(1.36)	(1.62)	(0.71)
LEV	0.009	0.010	-0.020	0.010	0.029***	-0.004	0.001	0.008
	(0.79)	(1.34)	(-1.18)	(1.15)	(6.22)	(-0.79)	(0.02)	(0.88)
SALES_GROWTH	0.006***	0.003	-0.001	0.006***	0.003	0.005**	0.005	0.005**
	(2.79)	(1.44)	(-0.60)	(2.98)	(1.23)	(2.15)	(1.15)	(2.45)
MTB	0.008***	0.010***	0.008***	0.010***	0.011***	0.009***	0.009	0.008***
	(4.36)	(4.72)	(3.42)	(5.05)	(2.88)	(6.04)	(1.37)	(5.58)
RETURN	-0.001	-0.004*	0.003	-0.003*	-0.005	-0.001	-0.009	-0.001
	(-0.36)	(-1.81)	(1.06)	(-1.70)	(-1.27)	(-0.80)	(-1.35)	(-1.56)
SALES	0.009***	0.016***	0.009**	0.014***	0.014***	0.013***	0.015*	0.012***
	(3.56)	(6.60)	(2.35)	(6.61)	(2.72)	(7.12)	(1.72)	(7.31)
CFO	0.014	0.011	0.021	0.009	0.018	0.011	0.027	0.008
	(1.05)	(0.67)	(0.97)	(0.70)	(0.55)	(0.94)	(0.69)	(0.69)
Z-SCORE	-0.008***	-0.007***	-0.010***	-0.007***	-0.009**	-0.009***	-0.008	-0.008***
	(-6.70)	(-4.98)	(-4.49)	(-7.31)	(-2.48)	(-9.11)	(-1.53)	(-7.30)
LOSS	0.026***	0.025***	0.021***	0.025***	0.013**	0.025***	0.015	0.026***
	(6.26)	(5.96)	(3.36)	(9.55)	(2.09)	(8.61)	(1.55)	(10.40)

SOE	0.001	-0.004	-0.001	-0.002	-0.009**	-0.002	0.008	-0.003
	(0.07)	(-1.44)	(-0.32)	(-0.76)	(-1.98)	(-0.95)	(1.52)	(-1.52)
M&A	0.001	-0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.14)	(-0.56)	(0.27)	(-0.24)	(-0.20)	(-0.10)	(-0.07)	(-0.38)
_cons	-0.006	0.089	0.212**	0.032	0.183*	0.105**	-0.088	0.099**
	(-0.09)	(1.30)	(2.09)	(0.79)	(1.96)	(2.14)	(-0.47)	(2.33)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Audit firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,481	2,365	1,065	3,781	589	4,257	489	4,357
Model p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
adj. R^2	0.30	0.25	0.28	0.28	0.40	0.25	0.33	0.27

ABS_ACC is the absolute value of performance-adjusted abnormal accruals, and *STD_WCA* is the standard deviation of abnormal working capital accruals. See the Appendix for variable definitions. *, ** and *** indicate significance at the 0.10, 0.05 and 0.01 levels, respectively. T-statistics (in parentheses) are calculated based on robust standard errors clustered at both the year and firm levels.