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Do Individual Auditors Affect Audit Quality? Evidence from Archival Data

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ABSTRACT: We examine whether and how individual auditors affect audit outcomes using a large set of archival Chinese data. We analyze approximately 800 individual auditors and find that they exhibit significant variation in audit quality. The effects that individual auditors have on audit quality are both economically and statistically significant, and are pronounced in both large and small audit firms. We also find that the individual auditor effects on audit quality can be partially explained by auditor characteristics, such as educational background, Big N audit firm experience, rank in the audit firm, and political affiliation. Our findings highlight the importance of scrutinizing and understanding audit quality at the individual auditor level.

Keywords: *individual auditor*; *audit quality*; *auditor characteristics*; *archival research*.

Data Availability: *Data used in this study are publicly available from the sources described herein*.

I. INTRODUCTION

This study examines whether and how audit quality varies across individual auditors. Our work represents a response to the recent call from academics and policy makers for more scrutiny and understanding of audit quality at the individual auditor level. The importance

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of individual differences in the audit process has been articulated by several authors. For example, Nelson and Tan (2005, 42) note that:

> Auditors need to perform a variety of tasks to form an overall assurance or attestation opinion. To do so, various personal attributes of the auditor (e.g., skills and personality) influence the outcome.

Thus, it seems likely that individual characteristics of the auditor could affect the quality of the audit being undertaken. However, prior archival studies have largely conducted audit-quality analysis at the audit firm or city-based practice office levels (see Francis [2004] for a review). The importance of individual auditors in determining audit quality has received increasing attention in recent years. For example, former SEC Commissioner Steven Wallman (1996, 78) suggests that in assessing auditor independence, the focus should be on "the *individual*, office, and other unit of the firm making audit decisions with respect to a particular audit client" (emphasis added). In a review paper, DeFond and Francis (2005) suggest that the audit-quality analysis be pushed from the audit firm or office level down to the *individual auditor level*. Similarly, Church et al. (2008) advocate more research on whether there is a systematic relationship between *individual* characteristics and the quality of audit reporting.

Although individual auditors may influence audit outcomes with their personal characteristics, they are constrained by the quality-control mechanisms within the audit firm. In fact, audit firms try to maintain consistency in audit quality through control mechanisms, including standardization of work procedures, centralized control of risk and materiality decisions, and socialization precisely because of individual auditors' idiosyncrasies (Jeppesen 2007). Thus, it is not clear *ex ante* whether individual auditors can significantly affect audit quality and, if so, how large such effects would be.

Because data on the identity and characteristics of individual auditors are not available in the U.S. and other major markets, we analyze variation in audit quality across individual signing auditors in the Chinese market, where such auditors are required to identify themselves in the audit report. In China, an audit report is normally signed by two auditors, who can be partners or senior managers. The role of signing auditors in China is similar to that of engagement partners in other markets, in that signing auditors lead the audit team and are responsible for decision-making on significant matters in the audit process. Hence, audit reporting outcomes and clients' financial statements could be influenced significantly by signing auditors. The names of signing auditors are disclosed, and their profile data are also publicly available. These characteristics make the Chinese market a useful setting in which to investigate the effects of individual signing auditors on audit quality.

In our research design, we assign an indicator variable to each auditor who signs audit reports for multiple clients for multiple years. We then estimate an audit-quality model by including these indicators, and also control for client, audit firm, branch office, and year effects, and time-varying client characteristics that could possibly affect audit quality.[1] This research design allows us to separate the effects of individual auditors on audit quality from those of clients, audit firms, and audit offices, and to assess not only the presence, but also the magnitude and variation of the individual auditors' effects on audit quality, which we label "individual effects." We use multiple audit-quality measures, including audit reporting (AR) aggressiveness, clients' abnormal accruals and non-core earnings, and the presence of a small profit. By construction, the individual effects estimated here capture individual auditors' "fixed" effects, with larger values suggesting that the auditors are more aggressive, i.e., they tend to use higher thresholds for issuing modified audit opinions, or are more tolerant of income-increasing earnings management (Francis and Yu 2009).

[1] In this paper, we use the term "firm (firms)" exclusively to refer to an audit firm (audit firms).

We find that individual effects are significant, both statistically and economically, for all quality measures. The inclusion of individual auditor indicators in the base model increases the explanatory power by 7.02 percent to 33.82 percent, relative to the base model's adjusted R^2. The frequency of individual auditors exerting significant effects on audit quality is much greater than would be expected by chance. For example, the percentages of the individual effects for AR aggressiveness that are significant at the 0.05 and 0.10 levels are 12.7 percent and 18.2 percent, respectively. There is also considerable variation in the magnitude of individual effects. For example, abnormal accruals reported by clients for an auditor at the 75th percentile of the distribution of individual effects would be 2.6 percent higher than for an auditor at the 25th percentile. These results suggest that individual auditors differ to a notable extent in terms of audit quality.

We conduct a number of additional tests to examine the robustness of these findings. In one test, we partition audit firms into large audit firms, including Big N and the largest domestic firms, and smaller audit firms, and then estimate individual effects separately for each group. The results show that individual effects are significant in both groups. In another test, we identify a subset of signing auditors who switched audit firms during the sample period. Because these auditors work for different firms, their effects can be separated more cleanly from firm effects. The estimated fixed effects of these auditors are, again, both economically and statistically significant, providing strong evidence for the presence of individual effects.

After showing that audit aggressiveness varies across individual auditors, we next explore whether this variation could be explained by auditor demographic characteristics. Studies on auditing judgment and decision making (JDM) suggest that audit quality is affected by individual auditor JDM attributes, such as expertise, ability, risk profile, cognitive style, and independence (see Nelson and Tan [2005] and Nelson [2009] for reviews of prior studies). Based on this literature, we consider several personal characteristics, including education, gender, birth cohort, Big N experience, rank, and political affiliation, assuming that these characteristics are associated with one or more of the attributes relevant to auditor JDM. We find that partners exhibit a relatively conservative style of audit reporting, consistent with prior findings that partners take a tougher stand in requesting accounting adjustments than non-partner auditors (Trotman et al. 2009). Educational background also makes a difference, with auditors who hold graduate degrees tending to be more aggressive. Those who were exposed to Western accounting systems during their college education are more conservative. This could be due to their exposure in their early education to the notion that financial statements are designed to solve information asymmetry between insiders and outside investors. Auditors who have worked at Big N firms tend to be more conservative, consistent with the findings that Big N firms are more conservative than others (Francis 2004). The generally conservative environments in Big N firms may influence their auditors' judgments and decisions, or auditors recruited by Big N firms may be inherently more conservative. Auditors who have political affiliations, proxied by membership in the Chinese Communist Party (CCP), are associated with more aggressive audit outcomes. A possible reason for this is that CCP membership may provide individual auditors some protection from audit failure penalties, thus encouraging them to behave more aggressively.

In additional analyses, we show that individual auditor effects estimated based on the four audit-quality measures are positively correlated with the likelihood of regulatory sanctions and the frequency of accounting restatements made by clients. Taking regulatory sanctions and restatements as *ex post* measures of audit quality, this finding suggests that the documented effects of individual auditors indeed capture differences in audit quality across individual auditors.

The next section describes the characteristics of Chinese audit markets, related research, and research questions. Section III describes the research design. Section IV reports the empirical findings. Section V discusses possible directions for future research and concludes the paper.

II. INSTITUTIONAL BACKGROUND, LITERATURE REVIEW, AND RESEARCH QUESTIONS

The Development and Characteristics of China's Auditing Profession

The auditing profession in China was established in the early 1980s, and has rapidly expanded since then. Before 1998, except for international Big N's joint ventures, almost all other major audit firms were sponsored by and affiliated with governments or publicly funded universities (DeFond et al. 2000). Auditors' government affiliation enables politicians in some cases to intervene into auditors' decisions, resulting in compromised auditor independence in audits of government-controlled companies. In 1998 the government launched the disaffiliation program that required audit firms to be disaffiliated from governments or universities (Gul et al. 2009). Since China joined the World Trade Organization in 2001, both the Chinese economy and stock market have recorded unprecedented growth, further spurring the growth of audit markets. According to the Chinese Institute of Certified Public Accountants (CICPA), the total audit fee revenues earned by the largest 100 audit firms equaled about RMB 17 billion in 2009, ranking the Chinese audit market among the major audit markets in the world.

Among thousands of audit firms in China, only about 70 are eligible to provide services to public companies. To audit public companies, an audit firm must have a minimum number of CPAs and obtain a special license granted by the China Securities Regulatory Commission (CSRC). Prior studies show that audit quality varies across audit firms in China (e.g., DeFond et al. 2000; Wang et al. 2008). Specifically, the literature finds that Big N firms and the largest domestic firms provide higher quality audits than other firms because the former are more competent and/or more independent.

The Chinese audit market is also characterized by a high degree of dispersion. The ten largest audit firms audit only 20 to 30 percent of publicly listed companies in China (Wang et al. 2008). Most audit firms are relatively small and, as such, had no branch offices during our sample period. Moreover, the regulatory authority requires audit firms to centralize decision making at the firm level even if they have branch offices. In the U.S., the practice offices of the Big 4 firms have the authority to contract with clients, administer audit engagements, and issue audit reports signed on the firms' local office letterheads (Francis and Yu 2009). However, the Chinese audit firm branch offices do not have similar authority because the Chinese government discourages audit firms from adopting a decentralized structure. For example, the Ministry of Finance (MOF 2010, Article 4) requires that "accounting firms and their branch offices shall be substantively uniform in terms of personnel, finance, business, technical standards, information management, etc." According to MOF (2010) the branch offices of an accounting firm should perform audits under the name of the firm that, in turn, should bear all risks associated with those engagements administered by its branch offices (Liu 2010). Moreover, the decision to accept relatively risky clients, including public companies, must be made by the audit firm. The branch offices of an audit firm can engage in but cannot lead the audits of such clients.[2] Thus, branch offices in China are much less autonomous than and may not affect audit quality as strongly as the city-based practice offices of the Big 4 firms in the U.S.

Another important feature of Chinese audits is that China's auditing standards require engagement auditors to sign the audit reports so that the responsibility of the audits performed can

[2] For the regulatory-sanctioned cases examined later, the audit firms and signing auditors are always penalized, but no branch office is sanctioned. These cases provide evidence that audit firms, rather than the branch offices, bear the risk associated with audit failure and that the firms, not the branch offices, make key decisions in the audit process.

be clarified (MOF 1995a, 1995b). There are usually two signing auditors for each audit report, with the more senior signing auditor mainly performing the review work and the relatively junior signing auditor mainly administering the fieldwork. Signing auditors can be partners or senior managers. This unique institutional arrangement allows us to examine whether there is meaningful variation in audit quality across individual auditors who administer audit engagements and, if so, the extent to which the variation can be explained by auditors' observable demographic characteristics.

Literature Review

Audit Quality

Audit quality is determined by an auditor's ability to discover breaches of accounting standards and the auditor's incentives to report such breaches, i.e., audit quality is a product of auditor competence and independence. DeAngelo (1981) argues that large firms are associated with higher audit quality because they are more independent. For large auditors such as Big N firms, no single client is economically important relative to the cost of a detected audit failure. Furthermore, Big N firms have established brand-name reputations and thus have incentives to protect their reputations by providing high-quality audits (Simunic and Stein 1987; Francis and Wilson 1988). Motivated by these arguments, early studies use the dichotomy between Big N and non-Big N firms and show that Big N firms perform audits of higher quality and are more conservative (Becker et al. 1998; Francis and Krishnan 1999).

Big N firms consist of many semi-autonomous, city-based practice offices. DeAngelo's (1981) argument on audit quality and auditor size can be applied to the office level. In terms of economic importance, for instance, a client that is small relative to a Big N firm could be very important to one of its offices. Accordingly, recent studies have begun to analyze audit quality at the office level (Reynolds and Francis 2000; Krishnan 2005). For example, Francis and Yu (2009) show that the bigger offices of Big 4 firms are of higher quality that may be attributed to bigger offices having more in-house expertise.

A natural extension of the literature is to push the audit-quality analysis further down, from the office level to the individual auditor level, because individual auditors may differ on both determinants of audit quality, independence, and competence (DeFond and Francis 2005). Accounting scholars have recently begun investigating the roles of individual auditors in determining audit quality. For example, Chen et al. (2010) perform one of the first analyses of how economic dependence affects audit quality at the individual auditor level using Chinese data, and find that the effect of client importance on individual auditor independence is conditional on the strength of investor protection.

The Managerial Fixed Effect Literature

A recent stream of literature has demonstrated that individual executives exert significant influence over a wide range of corporate policies. Bertrand and Schoar (2003) show that a significant portion of the heterogeneity in corporate investment, financial, and organizational practices can be explained by the presence of executive fixed effects. Following a similar approach, Dyreng et al. (2010) show that top executives have incremental effects on tax avoidance in their companies, Ge et al. (2011) find that CFO-specific factors explain a significant portion of the heterogeneity in financial reporting practices, and Bamber et al. (2010) find that top executives exert economically significant effects on five aspects of management forecasts: frequency, precision, the news conveyed by the forecast, bias, and accuracy.

The literature also examines whether observable executive characteristics such as gender, education, and experience can explain managerial fixed effects. Overall, the findings suggest that, at best, these observable characteristics partially explain managerial fixed effects on corporate

decisions. However, the lack of a strong association between observable characteristics and managerial effects does not lessen the main conclusion that individual managers matter (Dyreng et al. 2010). Instead, it suggests that some unidentified factors are important in explaining these effects and thus highlights the importance of quantifying the effects of managers' characteristics.

Research Questions

Kachelmeier (2010) emphasizes that managerial effect studies show that people rather than business organizations make decisions, which suggests the potential benefit of relating the archival and behavioral research in accounting. The individual auditor may also play an important role in decision making in the audit process. Such personal attributes of individual auditors as risk preferences, experiences, and incentives may have a significant effect on audit quality (Nelson and Tan 2005). However, the importance of individual auditors in determining audit outcomes has not been widely examined in archival research, possibly due to the lack of data on individual auditors in the U.S. Hence, DeFond and Francis (2005) suggest that scholars analyze audit quality at the individual auditor level in those markets where data are available.

The requirement of disclosing signing auditors' identity in China enables us to examine the above issue. We seek to answer two related questions. First, is there a significant variation in audit quality across individual auditors? Second, if so, to what extent can observable demographic characteristics of individual auditors, such as educational background, experiences, and gender, explain this variation?

To answer the first question, we adopt the methodology developed by Bertrand and Schoar (2003). This approach allows us to determine the presence, magnitude, and variation of the individual auditor effects on audit quality, which is important for two main reasons. First, although individual auditor characteristics may affect the audit outcomes, the significance of such effects is not clear. Unlike corporate executives such as CEOs who are very powerful and may dictate corporate decisions, auditors must comply with the auditing standards promulgated by a professional body or a regulatory authority and follow standardized audit procedures to perform their work. Key decisions such as the level of acceptable risk and the materiality threshold are also controlled by the firm. Moreover, their work is subject to internal and external peer review. These quality-control mechanisms may leave little room for individual auditors to exercise discretion. Second, individual auditors differ in numerous aspects; thus, focusing solely on a limited set of observable characteristics may seriously underestimate their effects on audit quality. Indeed, the managerial fixed effect literature has shown that unidentified or unobservable factors are much more important than observable characteristics in explaining the influence of individuals on decisions. This suggests that focusing on observable characteristics only may lead to the incorrect inference that individual auditors have little or no impact on audit outcomes. Hence, to demonstrate the importance of individual auditors on audit quality, it is necessary to first estimate the overall individual auditor effects, which capture the influences of both observable and unobservable individual characteristics on audit quality.

After estimating the effects of individual auditors on audit quality, we then explore whether the variation of these effects across individual auditors can be explained by their demographic characteristics.

III. RESEARCH DESIGN

Empirical Models

We follow the methodology developed by Bertrand and Schoar (2003) to construct the individual auditor sample and estimate individual effects while controlling for other factors that could affect audit quality. For each audit-quality measure, we estimate the following ordinary least-

square model:

$$y_{it} = \beta X_{it} + \sum \alpha_t Year_t + \sum \gamma_i Client_i + \sum \kappa_j Firm_j + \sum \lambda_k Office_k + \sum \delta_l Auditor_l + \varepsilon_{it}, \quad (1)$$

where i, t, j, k, and l index clients, fiscal years, audit firms, branch offices, and individual signing auditors, respectively; y_{it} is one of the audit-quality measures, which will be defined below; X_{it} is a vector of time-varying client and auditor variables that may affect audit quality; $\sum Year_t$ is a set of year indicators; $\sum Client_i$ is a set of client indicators; $\sum Firm_j$ is a set of audit firm indicators; $\sum Office_k$ is a set of branch office indicators; $\sum Auditor_l$ is a set of individual auditor indicator variables; and ε_{it} is the regression error term.

The coefficient on the auditor indicator, δ_l, captures the fixed effect of individual auditor l on audit quality. Client, audit firm, and office fixed effects are included to mitigate the concern that the results are driven by time-invariant client, audit firm, or office characteristics. As is explained later, we define audit quality proxies so that higher values indicate more aggressive (e.g., more lax) audits. A significantly positive value of δ_l suggests that individual auditor l is relatively aggressive, i.e., she is more tolerant of clients' aggressive accounting, or maintains higher thresholds for issuing modified audit opinions.[3]

We then link the estimated individual effects to the characteristics of individual auditors by the following model:

$$\delta_l = \alpha + \theta_l Z_l + \varepsilon_l, \quad (2)$$

where δ_l is the coefficient on individual auditor indicators estimated from Model (1); Z_l is a vector of demographic characteristics; and ε_l is the regression error term. Because δ_l is estimated regression coefficients and may contain measurement errors, we use the least trimmed squares (LTS) method developed by Rousseeuw (1984) in fitting the regressions. Using an iterative resampling algorithm, this method detects and eliminates outliers to minimize the sum of squared residuals of regressions. Generally, the LTS regression has better statistical efficiency and generates more stable results in the presence of outliers (Rousseeuw and Van Driessen 2006).

The Construction of the Individual Auditor Sample

We construct our individual auditor sample in a way similar to that adopted by Bertrand and Schoar (2003). To be assigned an indicator variable, an auditor must meet two conditions: (1) she has audited a client for at least *three* years and there are at least *three* years in which she does not audit this client, and (2) she has audited at least *two* such unique clients.

An auditor must audit a client for a few years so that she has a chance to "imprint her mark" on the client's financial reporting. We thus require that an auditor has audited a client for at least three years. We impose the second criterion to separate individual effects from the client fixed effects. The importance of these criteria can be illustrated by the following extreme example. Suppose an auditor has only one client and she has been the only auditor for that client throughout the sample

[3] More precisely, a positive value of δ_l suggests that the audit outcomes of an individual auditor are relatively aggressive. The aggressive outcome could be due to the auditor being inherently less risk-averse, i.e., she uses higher thresholds for issuing modified opinions or delineating material and immaterial misstatements. It could also be due to auditor's inability to detect misstatements because she lacks knowledge, ability, and/or expertise and thus does not request accounting adjustments, or she waives accounting adjustments because she is persuaded by invalid evidence presented by clients or she compromises her independence in the face of economic incentives. Although the underlying reasons for aggressive outcomes are different, the results are the same. For convenience, we say an auditor is more aggressive than another if the former's fixed effect on audit quality (δ_l) is larger than the latter's.

period. In this case, the auditor and the client indicator variables are perfectly correlated, and it is impossible to separate her effect from the client fixed effect. We thus require that the auditor must have at least two clients and, for each of them, that there are at least three years in which she audits them and at least another three years in which she does not audit them. Under this method, we estimate the incremental effect of the auditor, l, on audit outcomes from the multiple clients she audits over time as the fixed effect coefficient, δ_l. This method also mitigates the correlated omitted variables problem. After controlling for client fixed effects and time-varying characteristics in the regressions, the unobservable and thus omitted variables do not bias the auditor fixed effect coefficients unless such variables change over time and across companies in the same pattern as audits performed by individual auditors over time and across companies.[4]

Audit Quality Measures

Audit reports and audited financial statements are two observable audit outcomes. Accordingly, prior studies measure audit quality by determining auditors' thresholds for issuing modified audit opinions (MAOs) and the quality of clients' audited earnings. The underlying assumption is that high-quality auditors maintain lower thresholds for issuing MAOs and constrain aggressive earnings management. To obtain convincing evidence of individual effects, we employ four quality proxies, as discussed below.

Audit Reporting Aggressiveness

Modified audit opinions (MAOs) in China include unqualified opinions with explanatory notes, and qualified, disclaimed, and adverse opinions. China's auditing standards (MOF 1995a) require that audit firms issue qualified (disclaimed or adverse) opinions for (1) GAAP violations, (2) scope limitation, or (3) inconsistencies in applying accounting standards, and allow audit firms to use explanatory notes to indicate significant events, such as pending lawsuits.[5] Following prior studies (e.g., Francis and Krishnan 1999; DeFond et al. 2000), we define an indicator variable, *MAO*, which equals 1 if a client receives a modified audit opinion, and 0 otherwise. We then estimate the predicted probability of issuing MAOs by running a logistic model, with *MAO* as the dependent variable and a set of client characteristics as explanatory variables. Our audit reporting aggressiveness measure (*ARAgg*) is the predicted probability minus the actual value of *MAO*. A higher *ARAgg* value means that an auditor's propensity to issue MAOs is lower than what would be predicted from the whole sample.[6] The details about how we measure *ARAgg* are described in Appendix A.

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[4] We denote the design choice as $n \times t$, where n is the number of clients and t is the number of years in auditing a client. Thus, our main analyses are based on a 2×3 design. The findings reported in Section IV are not sensitive to varying the values of n and t from 2 to 5.

[5] According to these standards, financially healthy companies may still receive MAOs if they deviate from GAAP in preparing financial statements or have significant events that may materially affect their performance or financial strength. Indeed, Chen and Yuan (2004) show that about 9.5 percent of Chinese companies that apply for seasoned equity offerings during 1996–1998 and appear to be very profitable receive MAOs. In contrast, going-concern opinions are issued by auditors in the U.S. to those potentially financially distressed companies and, thus, prior research (e.g., Reynolds and Francis 2001) typically restricts the audit reporting analysis to a subsample of such companies. Because of differences in nature between MAOs in China and going-concern opinions in the U.S., we follow prior China-related research (e.g., DeFond et al. 2000; Chan and Wu 2011) using the full sample rather than a subsample of financially distressed firms to conduct the auditing reporting analysis.

[6] Using *MAO* directly as the dependent variable to estimate individual effects generates qualitatively similar results to our main findings. For example, the F-statistic for the joint significance of individual auditor indicators is 1.659 ($p < 0.001$), the inclusion of these indicators increases the model's R^2 from 49.53 percent to 54.91 percent, and 17.42 percent of these indicators are significant at the 0.1 level in the t-test.

Abnormal Accruals

We use a modified version of the Dechow and Dichev (2002) model suggested by McNichols (2002) to estimate abnormal accruals (*AbAcc*). Appendix A provides the details of the model for estimating abnormal accruals. Consistent with prior studies (Becker et al. 1998; Francis and Krishnan 1999), higher *AbAcc* indicates more aggressive earnings and thus lower quality auditing.

Below-the-Line Items

The adoption of below-the-line items or non-core earnings as another proxy for earnings quality is motivated by previous studies that find that Chinese companies tend to inflate earnings by timing the execution of transactions pertaining to below-the-line items (Chen and Yuan 2004; Haw et al. 2005; Kao et al. 2009). These transactions are often dubious related-party transactions and attract much attention from regulators and investors. Consistent with these studies, we define variable *BL* as the sum of investment net income, profits from other operations, and non-operating net income, scaled by the average of the beginning and ending total assets. *BL* thus measures the effect of these items on pre-tax ROA.

Small Profits

The presence of a small profit is interpreted as evidence of income-increasing earnings management (Burgstahler and Dichev 1997; Francis and Wang 2008; Francis and Yu 2009; Jorgensen et al. 2012). Chinese companies have particularly strong incentives to inflate earnings to report a small profit for regulatory reasons. In China, a company must be profitable for three consecutive years to qualify for issuing a seasoned equity offering. Moreover, a company that incurs losses for two consecutive years will be subject to special treatment, e.g., a daily price change limit of 5 percent, and will risk being delisted from the stock exchange if it cannot generate profit in the third year. Jiang and Wang (2008) show that this regulatory requirement induces Chinese companies to inflate earnings to report small profits. Chen et al. (2001) show that Chinese companies with small profits are more likely to receive MAOs, which suggests that small profits are likely to result from earnings management. Similar evidence is documented based on our data (untabulated). We define a company as having a small profit (*SP*) if its ROA is between 0 and 1 percent. Audit quality decreases with the likelihood of *SP* in audited financial reports.[7]

Although earnings management does not necessarily violate Generally Accepted Accounting Principles and is usually not outright fraud, aggressive earnings are often perceived to be of low quality and can mislead financial statement users. The ambiguous nature of these financial reporting practices provides auditors with considerable latitude to influence audit outcomes, and the extent to which auditors may use this latitude could be affected by their personal characteristics.

The choice of time-varying client characteristics is motivated by Dechow et al. (2010), who review the literature on the determinants of earnings quality. Dechow et al. (2010, 379) suggest that

[7] Note that *SP* is a dichotomous variable. While it is theoretically appealing to estimate a logistic model for a dichotomous dependent variable, here we still apply the OLS method. This is because the "complete or quasi-complete separation" problem in the logistic fixed effect model occurs in our data, as some auditors' clients never take a value of 1 in *SP* and therefore it is impossible to compute the maximum likelihood values of the fixed effect coefficients for such auditors. Nevertheless, for dichotomous dependent variables, OLS coefficient estimates remain unbiased, especially in large samples, and can be interpreted as usual (Wooldridge 2005, Chap. 7).

financial characteristics such as operating performance, debt, growth, and size are found to affect earnings quality. Moreover, previous studies find that in China earnings management is affected by the listing age (Chen et al. 2001) and local state ownership (Wang et al. 2008; Chan et al. 2006). We therefore include a variable to indicate that a client is ultimately controlled by a local government (*LGOV*) and control for the following time-varying client characteristics: return on assets (*ROA*), the presence of loss (*Loss*), the ratio of sales to assets (*Turnover*), the log value of total assets (*Size*), the book-to-market ratio (*B/M*), the leverage ratio (*Leverage*), and listing age (*Age*).

Dechow et al. (2010) also suggest that earnings quality is affected by time-varying auditor characteristics. Auditor size (*PSize*), tenure (*Tenure*), and the relative importance of a client (*CI*) to an auditor may affect the auditor's independence (e.g., Reynolds and Francis 2000; Myers et al. 2003; Chen et al. 2010). We measure *PSize*, *Tenure*, and *CI* at both the audit firm (denoted by subscript *AF*) and individual auditor (denoted by subscript *IA*) levels. We cannot measure these variables at the office level because the majority of clients are not audited by branch offices. While most audit firms in China are organized as limited liability companies, a small portion of them are organized as partnerships. Firth et al. (2012) find that audit firms organized as partnerships provide higher quality audit services. Thus, we include an indicator variable, *Partnership*, to control for audit firms organized as partnerships.[8]

Determinants of Individual Effects

We consider several demographic characteristics of auditors that may relate to auditor JDM attributes, including educational background, birth cohort, Big N work experience, gender, rank (partner or not), and political affiliation. Because these variables are exploratory, we do not specify directional predictions as to how they affect individual auditors' styles.

Education

An auditor's educational background may affect her knowledge, risk preference, and values. The first educational measure is whether an auditor has obtained a master's degree or above. Holders of graduate degrees command more job opportunities, higher salaries, and a greater likelihood of being promoted in China.[9] Bertrand and Schoar (2003) show that M.B.A. degree holders are relatively more aggressive than other CEOs. However, we are uncertain whether this should hold true for auditors who are master's degree holders. Western accounting systems were introduced into the college education in China in 1990. To capture exposure to the modern principles of financial reporting and concepts of corporate governance through university education, we include the variable of education cohort to indicate that an auditor began her undergraduate study in 1990 or later. The education cohort equals 1 if an auditor was born in or after 1971, and 0 otherwise because the typical age of Chinese students entering university is 19. The third educational variable indicates whether an auditor majored in accounting during her college education.

[8] Note that this partnership indicator varies over time. In 2000, about 30 percent of Chinese audit firms were organized as partnerships. However, most of these firms were subsequently converted into limited liability companies.

[9] For example, a recent survey by MyCOS Inc. (a leading education data provider in China) shows that in 2011, the starting salary for bachelor's degree holders was about RMB 2,400 per month, while that for master's degree holders was about RMB 4,000 per month. An introduction to the report is available at: http://edu.people.com.cn/GB/14057581.html (in Chinese).

Gender

Females and males are arguably different in terms of problem-solving ability, risk preference, and cognitive style (Hardies et al. 2010). For example, Gold et al. (2009) find that female auditors are, on average, more influenced by male CFOs and less influenced by female CFOs than male auditors. Furthermore, the psychology literature suggests that females are generally more risk-averse and more conservative in finance-related matters than males (Fellner and Maciejovsky 2007). More recently, Srinidhi et al. (2011) find that U.S. companies with female directors have higher earnings quality.

Big N Experience

Because an auditor's experience may affect her judgment and actions, we include a variable to indicate whether an auditor has worked in one of the Big N firms. Big N firms are more independent and provide higher quality audits. To achieve high and consistent audit quality, Big N firms tend to recruit individuals who are more sociable and adaptable to bureaucratic systems and their culture, values, and goals (Jeppeson 2007). The work experience in Big N firms is thus likely to "mold" auditors such that they are different from those in non-Big N firms. Alternatively, those recruited by Big N firms may have relatively more conservative personalities, which also leads to conservative audit outcomes.

Birth Cohort

Important events that occur during childhood or youth could have a profound impact on an individual's risk attitude, personality, values, and cognitive base (e.g., Bamber et al. 2010). Because they are likely to be affected by the same important early life events, auditors of the same birth cohort may share similarities in judgment and decision-making ability. We thus include the auditor's birth year.

Rank

Rank defines whether a signing auditor is a partner. The auditing literature shows that auditors who are partners act differently from other auditors. Because audit partners own and manage the firm, the goal congruence between the partners and the firm is greater than that between non-partner auditors and the firm. From this perspective, Miller (1992) argues that audit partners should be more conservative than non-partners. Partners also have more authority, both within the firm and as perceived by the clients, and can take a harder stand than other auditors when requesting accounting adjustments. This conjecture is borne out by Trotman et al. (2009), who provide evidence showing that partners request higher initial proposed write-downs than non-partner auditors.

Political Affiliation

We include a variable to indicate whether an auditor is a CCP member. Prior studies find that political factors may influence business decisions. For example, Yang (2012) shows that Chinese companies tend to hire audit firms with political connections. One important benefit introduced by political connections is "relaxed regulatory oversight" (Faccio 2006, 369). It is possible that CCP membership may provide some protection for auditors in case of audit failure, e.g., auditors who are CCP members may receive lighter penalties than others if both are similarly responsible for an audit failure. The "insurance" effect of CCP membership may induce auditors with CCP memberships to behave more aggressively. Hence, we include CCP membership as a proxy for an auditor's political affiliation and participation.

IV. EMPIRICAL RESULTS

Sample and Data

We obtain accounting and stock return data from the China Stock Market and Accounting Research database (CSMAR). We collect audit opinions and the identities of audit firms and signing auditors manually from annual reports. We cross-check the identities of signing auditors against the enquiry system compiled by the CICPA (available at http://cmis.cicpa.org.cn, in Chinese). Data on individual auditors' demographic information are also obtained from this source. We manually input each auditor's full name into the relevant search fields and match the search results with the audit firm and individual auditor data collected from companies' annual reports.

The original sample consists of 15,571 nonfinancial company-years for companies listed on the Shanghai and Shenzhen stock exchanges between 1998 and 2009. We start our sample period at fiscal 1998 to mitigate the possible effects of the 1998 disaffiliation program on audit firms. We drop 260 observations that lack data on total assets or sales, 235 observations with missing market value data, and 274 observations where signatory auditor identity data are missing, resulting in a total of 14,802 observations in our final sample.

We identify a total of 3,726 unique signing auditors. Among them, 878 auditors meet the requirements specified in Section III. When two auditors work as a relatively stable team over time, their client portfolios tend to be almost the same. This leads to a high correlation between the indicator variables for these two auditors. To mitigate the resulting multicollinearity problem, we drop the auditor with the smaller client portfolio when the correlation coefficient between the two indicators for a pair of auditors is higher than 0.70. After this procedure, we have 861 individual auditors for the fixed effect estimation.

Table 1 shows the descriptive statistics of the dependent (Panel A) and independent variables (Panel B) used in Model (1). To mitigate the undue influence of outliers, we winsorize all of the continuous variables at the bottom and top 1 percentiles. For *ARAgg* and *AbAcc*, the means are close to 0 because both are essentially regression residuals. However, both variables show considerable variation in the data. The mean of *BL* is 0.014, suggesting that the use of below-the-line items increases pre-tax ROA by 1.4 percent on average. Approximately 11.6 percent of client-years report an ROA between 0 and 1 percent. Panel B reports the time-varying client and auditor characteristics. The values of these variables are reasonably distributed with some degrees of variation. The mean value of client importance measured at the audit-firm level is 0.052. The corresponding number measured at the signing auditor level is 0.273, a number very close to previous findings (Chen et al. 2010). The median audit firm tenure is four years, while the median tenure for individual auditors is two years.[10]

Table 2 presents descriptive statistics for audit firms, branch offices, and signing auditors. The number of audit firms each year is about 71 with minor variation. The median number of branch offices per audit firm is 0, suggesting that the majority of audit firms do not have branch offices.[11] The median number of unique clients for each audit firm and each branch office is 21 and 2, respectively. The descriptive statistics also show that audit firms and branch offices have multiple signing auditors, and signing auditors who are assigned an indicator variable have multiple unique

[10] The statistics are for all signing auditors. The mean client portfolio size, client importance, and tenure for those signing auditors for whom we estimate the fixed effects are 134.8, 0.234, and 2.406, respectively.

[11] As indicated in Section II, branch offices in China can engage in the audits of publicly traded companies. A branch office is considered to have engaged in the audit of a company, and thus to be likely to influence that company's audit outcome, if the office's location is indicated in the audit report. Based on this criterion, about 4.9 percent of the audit engagements involve branch offices. Individual auditors who sign the reports for such audits are considered as being affiliated with the branch offices in the years they sign such reports.

TABLE 1

Descriptive Statistics of Variables Used in Estimating Individual Auditor Fixed Effects

Panel A: Dependent Variables

Variables	Mean	Q1	Median	Q3	Std. Dev.
ARAgg	−0.001	0.005	0.022	0.058	0.232
AbAcc	0.002	−0.023	0.006	0.034	0.057
BL	0.014	0.001	0.007	0.019	0.035
SP	0.116	0.000	0.000	0.000	0.320

Panel B: Independent Variables

Variables	Mean	Q1	Median	Q3	Std. Dev.
ROA	0.029	0.010	0.036	0.066	0.082
Loss	0.129	0.000	0.000	0.000	0.335
Turnover	0.616	0.311	0.503	0.779	0.457
Size	21.142	20.445	21.031	21.733	1.039
B/M	0.399	0.203	0.336	0.545	0.301
Leverage	0.488	0.337	0.480	0.617	0.224
Age	6.774	3.436	6.422	9.660	4.094
LGOV	0.520	0.000	1.000	1.000	0.500
Partnership	0.123	0.000	0.000	0.000	0.329
$PSize_{AF}$	709.900	345.600	547.700	879.200	566.800
$PSize_{IA}$	124.900	63.542	106.100	167.500	79.726
CI_{AF}	0.052	0.025	0.039	0.061	0.050
CI_{IA}	0.273	0.126	0.198	0.331	0.230
$Tenure_{AF}$	4.953	2.000	4.000	7.000	3.338
$Tenure_{IA}$	2.168	1.000	2.000	3.000	1.112

The sample size is 14,802 client-year observations for all variables except abnormal accruals (n = 13,896).
All of the continuous variables have been winsorized at the bottom and top 1 percentiles according to the respective variables' annual distribution.

Dependent Variable Definitions:
ARAgg = difference between the predicted probability of *MAO* and the actual value of *MAO*, where the predicted probability of *MAO* is derived from annual logistic regression modeling of the probability of *MAO*, and the actual value of *MAO* equals 1 if the client receives a modified opinion, and 0 otherwise. See Appendix A for details of the logistic model;
AbAcc = regression residuals estimated by the Dechow and Dichev (2002) model. See Appendix A for details of the estimation;
BL = sum of investment net income (CSMAR data item B001302000), profits from other operations (B001304000), and non-operating net income (B001000000 minus B001300000), scaled by the average of the beginning and ending total assets; and
SP = indicator variable that equals 1 if the client has reported an *ROA* (net income divided by average total assets) of between 0 and 1 percent, and 0 otherwise.

Independent Variable Definitions:
ROA = income divided by average total assets;
Loss = 1 if the client has reported a loss, and 0 otherwise;
Turnover = total sales divided by average total assets;
Size = natural logarithm of the client's total assets, expressed as 1998 constant RMB adjusted by CPI;
B/M = book value of equity divided by market value of equity at year-end;
Leverage = liabilities divided by the total assets at year-end;
Age = number of years a company has been listed;
LGOV = indicator variable for companies that are ultimately controlled by local governments;

(continued on next page)

TABLE 1 (continued)

Partnership = indicator for audit firms that are organized as partnerships;
$PSize_{AF}$ = client portfolio size of the audit firm, measured as $\sum_{i=1}^{n} LnTAST_i$, where $LnTAST_i$ is the natural logarithm of the total assets (expressed as 1998 constant RMB) of client i, and n is the number of clients audited by the audit firm in a particular year;
$PSize_{IA}$ = client portfolio size of an individual auditor, measured as $\sum_{k=1}^{m} \sum_{i=1}^{l} LnTAST_i$, where i is the number of clients audited by auditor k in a particular year and m is the number of auditors signing the audit reports;
CI_{AF} = client importance at the audit-firm level, measured as client size ($LnTAST_i$) divided by $PSize_{AF}$, defined previously;
CI_{IA} = client importance at the individual auditor level, measured as client size ($LnTAST_i$) divided by $PSize_{IA}$, defined previously;
$Tenure_{AF}$ = number of consecutive years that the audit firm has audited the client; and
$Tenure_{IA}$ = mean of the number of consecutive years that the signing auditors have signed the client's annual audit report.

clients. These features of our data enable us to separate individual effects from the effects of clients, audit firms, and branch offices.

Individual Auditor Fixed Effects

Table 3 contains the results of the regressions for estimating Model (1), based on the four audit-quality measures presented in Columns (1) to (4). In Panel A, we report the coefficients and t-statistics of the control variables. In all regressions, we include year, client, audit firm, branch office, and individual auditor indicators. The adjusted R^2 range between 32.52 percent (*ARAgg* regression) and 65.09 percent (*AbAcc* regression).

In Panels B to E, we assess the significance of client, audit firm, branch office, and individual auditor fixed effects, respectively. In addition to the F-statistics that evaluate the joint significance of these fixed effect indicators, we also examine how these indicators improve the models' explanatory power. Following Collins et al. (1997), we calculate the incremental R^2 that can be attributed to each set of fixed effect indicators as:

TABLE 2

Descriptive Statistics for Audit Firms, Offices, and Individual Auditors

Variables	Mean	Q1	Median	Q3	Std. Dev.
1. Number of audit firms per year	71.250	65.000	71.000	74.000	11.202
2. Number of branch offices per audit firm	0.510	0.000	0.000	1.000	0.963
3. Number of clients per audit firm	29.369	9.000	21.000	41.000	27.474
4. Number of clients per branch office	3.671	1.000	2.000	5.000	3.598
5. Number of signing auditors per audit firm	35.234	9.000	28.000	50.000	32.584
6. Number of signing auditors per branch office	6.237	2.000	4.000	9.000	5.059
7. Number of unique clients per signing auditor for whom we estimate the fixed effects	7.904	4.000	6.000	10.000	5.430

The statistics are based on the 1998–2009 period.
An audit is considered to involve a branch office if the office's location is indicated in the audit report, and individual auditors who sign the reports for such audits are considered as being affiliated with the branch offices in the years they sign such reports.
The signing auditor for whom we estimate the fixed effects must meet two conditions: (1) she has audited a client for at least three years and there are at least three years in which she does not audit this client, and (2) she has audited at least two such unique clients.

TABLE 3

Estimating Individual Auditor Fixed Effects

Panel A: Regression Results

	(1) *ARAgg*		(2) *AbAcc*		(3) *BL*		(4) *SP*	
Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
ROA	−0.052	−1.231	0.448	56.423***	0.319	65.880***	−1.256	−23.077***
Loss	0.026	3.014***	−0.013	−8.143***	0.004	3.880***	−0.472	−42.418***
Turnover	0.038	4.206***	−0.022	−12.760***	−0.020	−19.207***	−0.096	−8.290***
Size	0.005	0.886	0.005	5.143***	−0.011	−17.287***	−0.049	−6.871***
B/M	−0.005	−0.385	−0.016	−7.342***	0.017	11.998***	0.255	16.660***
Leverage	0.023	1.290	−0.030	−9.166***	0.034	16.512***	0.117	5.172***
Age	0.003	0.305	−0.016	−8.680***	0.007	6.213***	0.040	3.083***
LGOV	0.009	0.939	−0.002	−0.926	0.003	2.384**	0.003	0.268
Partnership	0.002	0.171	−0.003	−1.031	0.001	0.803	0.010	0.596
$PSize_{AF}$	0.000	0.002	−0.000	−0.001	0.000	0.000	−0.000	−0.001
$PSize_{IA}$	−0.000	−0.002	0.000	0.001	0.000	0.000	−0.000	−0.001
CI_{AF}	0.215	2.298**	−0.029	−1.557	0.002	0.175	−0.056	−0.461
CI_{IA}	−0.013	−0.916	0.002	0.820	0.002	0.865	−0.027	−1.409
$Tenure_{AF}$	−0.001	−0.744	−0.000	−0.704	−0.000	−0.605	0.004	2.683***
$Tenure_{IA}$	−0.005	−2.116**	−0.001	−2.173**	−0.000	−0.385	0.007	2.487**
Year, client, audit firm, branch office, and individual auditor indicators	Included		Included		Included		Included	
Adj. R^2	32.52%		65.09%		59.18%		41.25%	
Sample size	14,802		13,896		14,802		14,802	

Panel B: Testing the Significance of Client Fixed Effects

	(1) *ARAgg*	(2) *AbAcc*	(3) *BL*	(4) *SP*
F-statistics	1.855	2.157	2.994	1.875
(p-value)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
ΔR^2_{CF}	18.37%	11.90%	17.94%	16.17%
[Vuong χ^2 statistics]	[3564.78***]	[4076.12***]	[5393.32***]	[3599.10***]
$\%\Delta R^2_{CF}$	129.89%	22.38%	43.51%	64.47%

Panel C: Testing the Significance of Audit Firm Fixed Effects

	(1) *ARAgg*	(2) *AbAcc*	(3) *BL*	(4) *SP*
F-statistics	2.070	1.260	1.514	1.030
(p-value)	(< 0.001)	(0.018)	(< 0.001)	(0.384)
ΔR^2_{AF}	1.73%	0.59%	0.76%	0.75%
[Vuong χ^2 statistics]	[373.94***]	[231.92***]	[274.38***]	[187.30**]
$\%\Delta R^2_{AF}$	5.61%	0.91%	1.31%	1.85%

(continued on next page)

TABLE 3 (continued)

Panel D: Testing the Significance of Branch Office Fixed Effects

	(1) *ARAgg*	(2) *AbAcc*	(3) *BL*	(4) *SP*
F-statistics	1.774	1.133	1.457	1.823
(p-value)	(0.004)	(0.275)	(0.044)	(0.002)
ΔR^2_{AO}	0.33%	0.12%	0.16%	0.30%
[Vuong χ^2 statistics]	[72.17***]	[46.81*]	[59.32***]	[74.17***]
$\%\Delta R^2_{AO}$	1.02%	0.18%	0.28%	0.72%

Panel E: Testing the Significance of Individual Auditor Fixed Effects

	(1) *ARAgg*	(2) *AbAcc*	(3) *BL*	(4) *SP*
F-statistics	1.694	1.573	1.551	1.570
(p-value)	(< 0.001)	(< 0.001)	(< 0.001)	(< 0.001)
ΔR^2_{IA}	8.22%	4.27%	4.55%	6.63%
[Vuong χ^2 statistics]	[1701.27***]	[1603.35***]	[1565.1***]	[1583.30***]
$\%\Delta R^2_{IA}$	33.82%	7.02%	8.33%	19.16%

*, **, *** Denote significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed for all t-statistics).
See Table 1 for definitions of dependent and independent variables. The adjusted R^2 is based on SAS's GLM procedure that absorbs time-invariant client characteristics by demeaning each variable for each client. The F-statistics are from the F-tests that examine the joint significance of fixed effect coefficients. The Vuong χ^2 statistics are from Vuong's (1989) likelihood ratio tests of whether changes in model R^2 after the inclusion of fixed effects are statistically significant. In Panels B to E, ΔR^2 and $\%\Delta R^2$ statistics are computed as:
$\Delta R^2_{CF} = R^2_{Full} - R^2_{w/o\ CF}$,
$\Delta R^2_{AF} = R^2_{Full} - R^2_{w/o\ AF}$,
$\Delta R^2_{AO} = R^2_{Full} - R^2_{w/o\ AO}$,
$\Delta R^2_{IA} = R^2_{Full} - R^2_{w/o\ IA}$,
$\%\Delta R^2_{CF} = (R^2_{Full} - R^2_{w/o\ CF})/R^2_{w/o\ CF}$,
$\%\Delta R^2_{AF} = (R^2_{Full} - R^2_{w/o\ AF})/R^2_{w/o\ AF}$,
$\%\Delta R^2_{AO} = (R^2_{Full} - R^2_{w/o\ AO})/R^2_{w/o\ AO}$,
$\%\Delta R^2_{IA} = (R^2_{Full} - R^2_{w/o\ IA})/R^2_{w/o\ IA}$,
where R^2_{Full} is the adjusted R^2 of the full model including all fixed effects, and $R^2_{w/o\ CF}$, $R^2_{w/o\ AF}$, $R^2_{w/o\ AO}$, and $R^2_{w/o\ IA}$ are the adjusted R^2 of the model without client firm, audit firm, branch office, and individual auditor fixed effects, respectively.

$$\Delta R^2_{CF} = R^2_{Full} - R^2_{w/o\ CF}, \tag{3a}$$

$$\Delta R^2_{AF} = R^2_{Full} - R^2_{w/o\ AF}, \tag{3b}$$

$$\Delta R^2_{AO} = R^2_{Full} - R^2_{w/o\ AO}, \tag{3c}$$

$$\Delta R^2_{IA} = R^2_{Full} - R^2_{w/o\ IA}, \tag{3d}$$

where R^2_{Full} is the adjusted R^2 of the full model including all fixed effects, and $R^2_{w/o\ CF}$ is the adjusted R^2 of the model that excludes client fixed effects. Similarly, $R^2_{w/o\ AF}$, $R^2_{w/o\ AO}$, and $R^2_{w/o\ IA}$ are the adjusted R^2s of the model without audit firm, branch office, and individual auditor fixed effects, respectively. ΔR^2_{CF}, ΔR^2_{AF}, ΔR^2_{AO}, and ΔR^2_{IA} represent the incremental explanatory power

contributed by client, audit firm, branch office, and individual auditor fixed effects, respectively. We perform Vuong's (1989) likelihood ratio test to assess whether the incremental R^2 is significant. We also scale each ΔR^2 statistic by the adjusted R^2 of the base model to determine the relative percentage increase in R^2:

$$\%\Delta R^2_{CF} = (R^2_{Full} - R^2_{w/o\ CF})/R^2_{w/o\ CF}, \tag{4a}$$

$$\%\Delta R^2_{AF} = (R^2_{Full} - R^2_{w/o\ AF})/R^2_{w/o\ AF}, \tag{4b}$$

$$\%\Delta R^2_{AO} = (R^2_{Full} - R^2_{w/o\ AO})/R^2_{w/o\ AO}, \tag{4c}$$

$$\%\Delta R^2_{IA} = (R^2_{Full} - R^2_{w/o\ IA})/R^2_{w/o\ IA}, \tag{4d}$$

The F-statistics over the panels suggest that all four sets of fixed effect indicators are highly significant for most regressions across the columns, except the audit firm indicators in the small profit regression (Column (4) of Panel C) and the branch office indicators in the abnormal accrual regression (Column (2) of Panel D). As for explanatory power, changes in adjusted R^2 are statistically significant in the Vuong (1989) likelihood ratio tests for all four sets of fixed effect coefficients across the four regressions. Client fixed effects provide the largest increase in the models' R^2. ΔR^2_{CF} ranges from 11.90 percent in the *AbAcc* regression to 18.37 percent in the *ARAgg* regression, which can be translated into $\%\Delta R^2_{CF}$ from 22.38 percent to 129.89 percent. This suggests that audit reporting decisions or earnings quality measures as proxies for audit quality vary considerably across clients. It is therefore important to control for client fixed effects on these measures.

In Panel C, we observe that inclusion of audit firm indicators only modestly improves the explanatory power of the audit-quality models. ΔR^2_{AF} ranges from 0.59 percent to 1.73 percent, and $\%\Delta R^2_{AF}$ is between 0.91 percent and 5.61 percent.[12] Panel D shows that the ΔR^2_{AO} statistics range from 0.12 percent to 0.33 percent, suggesting that branch offices also have some effects on audit quality.

As shown in Panel E, adding individual effects significantly improves the explanatory power of the model: ΔR^2_{IA} ranges from 4.27 percent to 8.22 percent, translating to $\%\Delta R^2_{IA}$ values of 7.02 percent to 33.82 percent. Taken together, the results suggest that the client, audit firm, branch office, and individual auditor fixed effects on audit outcomes co-exist. We next examine individual effects, the crux of our analysis, in more detail.

While the F-statistics suggest that individual effects are jointly significant, it is possible that the results are driven by a small number of significant coefficients. We therefore examine the frequency of significant individual effects. The results are reported in Panel A of Table 4. Under the null hypothesis that individual auditors have no effects incremental to the other variables considered in the regressions, one would expect about 1 percent (5 percent, 10 percent) of auditors to have coefficients significant at the 1 percent (5 percent, 10 percent) level. The results reveal that the actual percentages of auditors with significant coefficients are much greater than expected. For example, in the case of *ARAgg*, the percentage of individual effects that are significant at the 1

[12] We caution readers that ΔR^2_{AF} may not be interpreted as the total effect of audit firms on audit quality. Audit firms could have differing clienteles with differing earnings quality. For example, Big N firms have relatively large and low-risk clients, compared with non-Big N firms. As such, a substantial portion of the audit firm effects on audit quality could be absorbed by clients' time-varying characteristics and fixed effects. Similarly, individual auditor-client matching is not likely to be random and, therefore, inclusion of client characteristics may bias against finding significant individual effects. Indeed, untabulated results show that both firm and individual effects are much greater in models when client fixed effects are omitted.

TABLE 4

Testing the Significance of Individual Auditor Fixed Effects

Panel A: The Percentages of Significant Estimated Individual Auditor Fixed Effects

	(1) *ARAgg*	(2) *AbAcc*	(3) *BL*	(4) *SP*
% significant at the 1% level	4.30%	4.65%	3.83%	4.65%
% significant at the 5% level	12.66%	10.34%	10.92%	11.50%
% significant at the 10% level	18.24%	17.65%	17.07%	17.42%

Panel B: Distribution of Estimated Individual Auditor Fixed Effects

	(1) *ARAgg*	(2) *AbAcc*	(3) *BL*	(4) *SP*
Mean value	0.008	−0.002	−0.001	−0.001
Inter-quartile range	0.122	0.026	0.016	0.191
Standard deviation	0.132	0.025	0.015	0.158

Statistics are based on the properties of 861 estimated individual auditor fixed effect coefficients.
The percentages of fixed effects that are significant at the specified levels are based on the t-statistics on the fixed effect coefficients.

percent, 5 percent, and 10 percent levels are 4.30 percent, 12.66 percent, and 18.24 percent, respectively.[13]

We next examine the economic significance of individual effects by analyzing the distribution of the coefficients on individual auditor indicators in Table 4, Panel B. The mean values of these effects are close to 0 for all four audit-quality measures, suggesting that the auditors for whom we estimate the fixed effects, as a group, are not different from others in terms of auditing aggressiveness. However, the inter-quartile range and standard-deviation statistics reveal that there are considerable variations in audit quality across these auditors. For example, the inter-quartile range of the individual effects on *AbAcc* is 0.026. This suggests that the level of abnormal accruals reported by clients of an auditor at the 75th percentile of this variable's distribution would be 2.6 percent higher than that reported by clients of the auditor at the 25th percentile. The variation is economically significant if compared with the mean *ROA* for the sample (2.9 percent, see Panel B of Table 1). The variation in the individual effects on *SP* is also prominent. The inter-quartile range is 0.191, suggesting that the chance of reporting small profits for clients of an auditor at the 75th percentile of this variable's distribution would be 19.1 percent higher than that for clients of an

[13] Dyreng et al. (2010) report that approximately 12 percent (17 percent) of top-executive fixed effects are significant at the 5 percent (10 percent) level in explaining tax avoidance. Ge et al. (2011) find that the actual percentages of CFO fixed effects that are significant at the 5 percent level range between 5.0 and 14.8 percent across the five financial reporting practice variables. Bamber et al. (2010) show that the percentages of top manager effects significant at the 10 percent level are between 38 and 51 percent for five voluntary disclosure measures.

auditor at the 25th percentile. Variations in other measures are also economically significant when compared with the mean values of the corresponding variables in Table 1.[14]

Taken together, the results in Tables 3 and 4 suggest that individual auditors do affect audit reporting and audited financial statements in a significant manner, and they differ systematically in terms of audit quality or audit aggressiveness.

Robustness Tests

Bootstrap Analysis and Robust Standard Errors

We first examine whether the statistics reported in the prior section are well specified. Following Dyreng et al. (2010), we bootstrap the data by randomizing the auditor-client pairings so that each auditor is assigned to a client company that she does not audit. We then estimate Model (1) using the randomized data. This procedure is repeated 1,000 times. As the randomly matched auditor-client data are not expected to generate significant results, the empirical distribution of the relevant statistics generated from the randomized data can be used to compare with our actual results and to evaluate whether the test statistics are well specified. Untabulated results from the bootstrapped tests show that the percentages of individual effects that are significant at the 1 percent (5 percent, 10 percent) level is only slightly different from 1 percent (5 percent, 10 percent), indicating that the value is as expected under the null hypothesis of no relationship. This suggests that the t-statistics on the fixed effect coefficients are well specified.

When comparing the percentages of significant individual effects, the F-statistics for the joint significance of individual effects, and $\%\Delta R^2_{IA}$ from actual data with corresponding statistics from the bootstrapped data, we find that, for all four measures, the former are larger than the latter in *all* of the 1,000 iterations of the randomized data (untabulated). This suggests that these statistics are significant with a p-value of 0.001 in the bootstrap analysis.[15] We also contrast the inter-quartile range and standard deviation of individual effects obtained from the bootstrapped data with the numbers from the actual data. Untabulated results reveal that, for all four measures, the inter-quartile range (standard deviation) from the actual data is larger than that from the bootstrapped data, and the difference is significant at the 0.1 percent level in the Kolmogorov-Smirnov (K-S) test (F-test). Together, these results confirm that the individual effects obtained from the actual data are highly significant.

We next consider alternative standard error estimators. Financial reporting choices are likely to be correlated over time for a company or across companies in a period. We therefore calculate t-statistics based on standard errors clustered for each client or within each year. Untabulated results suggest that when standard errors are clustered by clients, the proportions of individual effects significant at the 1 percent, 5 percent, and 10 percent levels are uniformly *higher* than the corresponding numbers reported in Table 4, while clustering standard errors by time periods yields results that are comparable to those in Table 4. Finally, to mitigate the concern that the fixed effect indicators have both heteroscedasticity and autocorrelation in the pooled data, we compute the Newey and West (1987; hereafter Newey-West) standard errors using a one-period lag. Again, we find that results based on the Newey-West estimator are stronger than those reported in Table 4. We thus conclude that individual effects are robust to these alternative estimators.

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[14] We also determine abnormal accruals based on the Jones (1991) model and obtain qualitatively similar results. For example, the percentages of individual effects significant at the 1 percent, 5 percent, and 10 percent levels are 3.72 percent, 10.22 percent, and 15.56 percent, respectively, and the inter-quartile range of fixed effect coefficients is 0.022.

[15] Denote the statistic from the actual data as ω and the vector of statistics from the bootstrapped data as ω^*. H_0 can be rejected at level of α if $\omega < \omega^*_{[\alpha/2]}$ or $\omega > \omega^*_{[1-\alpha/2]}$, where $\omega^*_{[q]}$ denotes the qth quantile of ω^*. See, e.g., Cameron and Trivedi (2005, Chap. 11) for bootstrap statistical inferences.

The Individual Effects of Auditors from Large and Small Audit Firms

We next investigate whether individual effects are significant for auditors from both big and small firms. We partition audit firms into two groups. The large audit firm subsample includes Big N firms and the top ten domestic firms, ranked by their total client assets in 2004, which is the midpoint of our sample period. All other relatively small firms are grouped into the small audit firm subsample.[16] Model (1) is run separately for client-years audited by the two subsamples. The results on individual effects are reported in Panels A and B of Table 5. For both subsamples, individual effects are statistically and economically significant throughout four audit-quality measures. In Panel C, we run the χ^2 test and K-S test to examine the differences in the proportions of significant individual effects and the distributions of these effects, respectively, between two subsamples and find no significant difference. The only exception is that the proportion of individual effects that are significant at the 5 percent level in the *ARAgg* measure for big audit firms is marginally significantly lower than that for small audit firms (p-value = 0.098).

The above findings help mitigate the concern that the individual effects documented in our main analysis could be caused by inadequate control for office effects. It is possible that some audits are mainly performed by branch offices but the locations of these offices do not appear in the audit report, although this kind of practice is not allowed by the prevailing regulations in China. Based on our approach to identify branch offices, as described in footnote 11, the office effects for these audits are omitted from our main analyses, which may create a bias toward finding significant individual effects.[17] Because small firms do not usually have branch offices, the above findings based on small firms are robust evidence on the presence of individual auditor effects.[18]

The above findings also shed some light on the issue of whether the individual auditor effects on audit quality are mitigated in large audit firms. Individual effects could be smaller in large firms because they presumably have more rigorous and effective quality-control mechanisms that limit the room for individual auditors to "imprint" their personal characteristics on the audit outcomes. However, it could be more costly for firms to monitor their engagement auditors when the firms become larger and more complicated, giving engagement auditors more discretion in making key decisions (Miller 1992). Thus, it is not clear *ex ante* how the individual effects in big firms would be different from those in their smaller counterparts. Our results suggest that individual auditors in large firms similarly exhibit significant variation in audit quality.

The Individual Effects of Auditors Who Switch Audit Firms

Next, we examine the effects of signing auditors who switch audit firms (hereafter, job-hoppers). The effects of these auditors can be separated more cleanly from firm and office effects

[16] We do not examine individual effects solely for signing auditors from Big N firms because in China the market share, based on the client number obtained by Big N firms, is quite low and the number of signing auditors meeting our data requirement is small.

[17] We thank a reviewer for pointing out this issue.

[18] The analyses based on individual auditors who switch audit firms, discussed in the next subsection, are also relatively free from the omitted-office-effect problem. These auditors have worked in different audit firms and thus branch offices. The individual effects of such auditors could be inflated only if the effect of the first office they are affiliated with is positively correlated with that of the second one and both effects are omitted from the model. However, the effects of branch offices, if any, could be idiosyncratic or even negatively correlated with each other as individual auditors are likely to switch to a new firm/office with a different style when pursuing career success. We also perform an additional test based on a sample of audits conducted by headquarter offices. Specifically, we identify 2,228 observations in which clients and audit firms are *both* headquartered in Beijing or Shanghai, the top two city audit markets in China. As the clients and audit firms are located in the same city, the audits should be administered by the headquarter offices and the model does not suffer from the possible omitted-office-effect problem. In this subsample, we continue to find significant individual auditor effects (untabulated).

TABLE 5

Analysis of Individual Auditor Fixed Effects between Large and Small Audit Firms

Panel A: Large Audit Firm Subsample (n = 272 Individual Auditors)

Measures	F-statistics (p-value)	$\%\Delta R^2_{IA}$ [Vuong χ^2 Stat.]	% Significant at the 1% Level	% Significant at the 5% Level	% Significant at the 10% Level	Inter-Quartile Range
ARAgg	1.400 (< 0.001)	17.24% [476.67***]	3.68%	7.72%	12.87%	0.106
AbAcc	1.390 (< 0.001)	4.47% [479.45***]	2.94%	7.72%	13.97%	0.022
BL	1.515 (< 0.001)	5.70% [514.19***]	5.15%	10.29%	15.44%	0.015
SP	1.612 (< 0.001)	13.28% [545.54***]	4.04%	10.29%	16.91%	0.163

Panel B: Small Audit Firm Subsample (n = 496 Individual Auditors)

Measures	F-statistics (p-value)	$\%\Delta R^2_{IA}$ [Vuong χ^2 Stat.]	% Significant at the 1% Level	% Significant at the 5% Level	% Significant at the 10% Level	Inter-Quartile Range
ARAgg	1.641 (< 0.001)	24.51% [979.04***]	5.24%	11.49%	15.52%	0.119
AbAcc	1.413 (< 0.001)	5.91% [861.66***]	3.63%	10.28%	16.73%	0.027
BL	1.477 (< 0.001)	7.09% [885.90***]	3.23%	9.07%	13.91%	0.014
SP	1.402 (< 0.001)	15.13% [842.93***]	4.03%	8.87%	14.52%	0.181

Panel C: Difference between the Large and Small Audit Firm Subsamples

Measures	χ^2 Test for the Difference in the Frequency of Significant Coefficients			K-S D Statistics for the Difference in Inter-Quartile Range
	At the 1% Level	At the 5% Level	At the 10% Level	
ARAgg	0.964 (p = 0.326)	2.738 (p = 0.098)	0.995 (p = 0.319)	0.069 (p = 0.373)
AbAcc	0.254 (p = 0.614)	1.356 (p = 0.244)	1.011 (p = 0.315)	0.081 (p = 0.205)
BL	1.727 (p = 0.189)	0.305 (p = 0.581)	0.333 (p = 0.564)	0.066 (p = 0.439)
SP	0.000 (p = 0.994)	0.419 (p = 0.518)	0.775 (p = 0.379)	0.057 (p = 0.614)

*** Denotes significance at the 0.01 level.

The large audit firm subsample includes Big N firms and the top 10 domestic audit firms, ranked by their total client assets (sum of the log of total assets of listed clientele) in 2004. All other relatively small firms are grouped into the small audit firm subsample. Model (1) is run separately for client-years audited by two subsamples. See Table 1 for variable definitions. The F-statistics are from the F-tests that examine the joint significance of fixed effect coefficients. The Vuong χ^2 statistics are from Vuong's (1989) likelihood ratio tests of whether changes in model R^2 after the inclusion of fixed effects are statistically significant. $\%\Delta R^2_{IA}$ is defined as $(R^2_{Full} - R^2_{w/o\ IA})/R^2_{w/o\ IA}$, where R^2_{Full} is the adjusted R^2 of the full model including all fixed effects and $R^2_{w/o\ IA}$ is the adjusted R^2 of the model without individual auditor fixed effects.

since they move between firms. There are a total of 85 job-hoppers in our sample. For a company that has been audited by a job-hopper, we include both its annual audits performed by the job-hopper and those performed by other auditors. The sample size is 2,494, including 1,093 observations audited by job-hoppers and 1,401 observations audited by others. Untabulated results show that the individual effects of job-hoppers are both statistically and economically significant. For example, the portion of individual effects significant at the 5 percent and 10 percent levels is around 15 percent and 20 percent, respectively, for three out of four audit-quality metrics.

It is also worthwhile to examine whether a job-hopper's style at the first audit firm persists into the second firm. To this end, we obtain the residuals from the regression models without individual effects and calculate the mean residuals of observations audited by the job-hopper separately at her first and second firms. The job-hopper's mean residual in the second firm is then regressed on the mean residual in the first firm. The power of the test can be weak because the sample size is relatively small ($n = 85$) and the average residuals are noisy. We find that despite the low testing power, the coefficients (untabulated) are positive for all audit-quality measures and significant for all, except for *AbAcc*. These findings suggest that individual auditors indeed have some persistent effects on audit outcomes.

When Will Individual Effects be Absent?

In the foregoing analysis, we use abnormal accruals and small profits as audit-quality measures because clients have incentives to inflate earnings to affect capital market or contracting outcomes. When observing clients' reporting choices, auditors will exercise their judgment and decide whether to tolerate their earnings management or to make audit adjustments. Therefore, we may find individual auditor effects in these measures. It is worthwhile to examine the "mirrors" of these measures: normal accruals (*NorAcc*) and small loss (*SL*). *NorAcc* is the fitted value from the accrual expectation model (see Appendix A for details of the estimation). As *NorAcc* represents the portion of accruals driven by economic factors, we do not expect that auditors exert their influence over it. *SL* is an indicator variable for companies that report an ROA of between −1 percent and 0. Arguably, auditors are less likely to make audit adjustments when their clients report small losses that clearly indicate an absence of earnings management. We thus expect to observe insignificant individual effects in these two measures.

Untabulated results show that the F-statistics for the joint significance of individual effects are insignificant for either measure ($p = 0.932$ and 0.397, respectively). Moreover, the percentages of individual effects significant at the 1 percent (5 percent and 10 percent) level are 0.81 percent (4.88 percent and 9.41 percent) and 0.35 percent (6.27 percent and 8.94 percent) for *NorAcc* and *SL*, respectively. These percentages are not much different from what should be expected by chance. We also observe insignificant firm/office fixed effects in either measure. Together, these results suggest that individual auditor and firm/office effects do not exist when there is little room for auditors to exercise their judgment. They also indicate that our findings, based on the four audit-quality measures, in which we expect auditors to play an active role, are not likely to be spurious.

Individual Characteristics and Auditor Effects

After showing that the effects of individual auditors on audit quality are significant and that individual auditors differ systematically in terms of audit aggressiveness, we next explore whether auditors' individual effects can be explained by their demographic characteristics. Sixty-four of the auditors with estimated fixed effects do not have demographic information in the CICPA database and are thus dropped, leaving a sample of 797 individual auditors.

Untabulated results show that about 52 percent of auditors majored in accounting during their college education, and 13.6 percent hold a master's degree or above. About 27.5 percent were born in 1971 or later and thus may have been exposed to Western accounting practices during their college education. The average birth year is 1966. Around one-third of auditors are female. Only 7.7 percent have worked in a Big N firm. In addition, 39 percent of individual auditors are partners. Finally, about one-quarter are CCP members. We also examine the correlations between these demographic variables and find that, except for the relatively high correlation between education cohort and birth cohort (0.597), all other correlation coefficients are below 0.30.

Given that an auditor could substitute one dimension of audit quality for another to achieve her own optimal level of audit risk, we create an aggregate score (*Score*), which is the mean value of the four audit-quality measures (*ARAgg*, *AbAcc*, *BL*, and *SP*). Intuitively, the variable measures the overall aggressiveness associated with an auditor. As the four audit-quality measures have different scales of measurement, we standardize the fixed effects to have 0 mean values and unit variances to obtain an aggregate score.

The multivariate regression results reported in Table 6 show that the explanatory power of these models is modest (the adjusted R^2 are below 4 percent). This suggests that observable auditor characteristics can only explain a small portion of the individual effects on audit outcomes and, thus, it is important to first quantify such effects.

Despite the modest explanatory power, these results reveal some notable insights. Table 6 shows that auditors who hold graduate degrees tend to be more aggressive than others. The coefficients on this variable are positive in all specifications and significant in three. Another notable finding is that auditors presumably exposed to Western accounting during their university educations appear to be more conservative. Auditors who have work experience in Big N firms also tend to be more conservative. This variable has negative coefficients across the columns and is significant at the 5 percent and 1 percent levels for *SP* and *Score*, respectively. Table 6 also shows that auditors who are also partners are generally less aggressive in audit reporting than others.[19] Finally, auditors who are CCP members are associated with lower quality audits in *ARAgg*, *AbAcc*, and the aggregate score.

It is possible that fixed effect coefficients that are not statistically significant are less precise in measuring the fixed effects of auditors. While *a priori*, we do not expect such measurement errors to be systematically correlated with the demographic variables and bias the results, we replace the fixed effect coefficients with their t-values and re-estimate the regressions. The rationale is that standard errors of the fixed effect estimates represent the precision with which the fixed effects are measured and hence the extent of measurement error (Bertrand and Schoar 2003). Using t-values of the fixed effect coefficients thus considers both the magnitude of the fixed effects and their measurement errors. Untabulated results obtained under this approach are similar to those reported in Table 6.[20]

Individual Auditor Effects and *Ex Post* Audit Quality

We next examine the associations between the above-documented individual effects and *ex post* audit-quality measures such as the likelihood of receiving regulatory sanctions and the frequency of accounting restatements made by clients. Regulatory sanctions are imposed on

[19] Untabulated descriptive statistics suggest that both partners and non-partners who sign the audit reports exhibit significant individual effects on audit quality.

[20] More specifically, most findings are retained except the following: Master's degree or above and Education cohort in the *AbAcc* and *BL* regression, respectively, become insignificant; Education cohort and Birth year become significantly negative and positive, respectively, at the 10 percent level in the *SP* regression; for the *Score* regression, Partner is significantly negative ($p = 0.05$).

TABLE 6

The Association between Individual Auditor Fixed Effects and Demographic Characteristics

	(1) *ARAgg*		(2) *AbAcc*		(3) *BL*		(4) *SP*		(5) *Score*	
Independent Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
Intercept	−8.629	−0.892	−2.818	−0.281	−10.502	−1.031	−17.639	−1.601	−13.606	−1.358
Master's degree or above	0.146	1.691*	0.155	1.777*	0.059	0.659	0.155	1.614	0.235	2.670***
Education cohort	−0.057	−0.706	0.075	0.893	−0.160	−1.883*	−0.122	−1.326	−0.170	−2.029**
Accountancy major	0.036	0.628	0.058	0.975	0.074	1.222	−0.048	−0.724	0.024	0.403
Female	−0.004	−0.061	0.007	0.114	0.029	0.437	−0.005	−0.067	0.022	0.348
Big N experience	−0.126	−1.135	−0.069	−0.597	−0.120	−1.020	−0.299	−2.375**	−0.369	−3.209***
Birth year	0.004	0.895	0.001	0.274	0.005	1.029	0.009	1.604	0.007	1.358
Partner	−0.124	−2.035**	−0.080	−1.268	−0.006	−0.093	0.013	0.193	−0.073	−1.153
CCP membership	0.135	1.992**	0.146	2.073**	0.059	0.814	−0.063	−0.816	0.126	1.788*
LTS R^2	2.70%		2.48%		1.83%		3.22%		2.85%	

*, **, *** Denote two-tailed significance at the 0.10, 0.05, and 0.01 levels, respectively.
The sample consists of 797 individual auditor observations. The dependent variables are the estimated individual auditor fixed effect coefficients. All the dependent variables are standardized to have zero mean values and unit variances. The variable *Score* is the mean value of the four standardized measures.
The regressions are estimated by the least trimmed squares (LTS) method (Rousseeuw 1984) to generate more stable results in the presence of outliers.

Variable Definitions:
Master's degree or above = 1 if the auditor has obtained a master's degree or above, and 0 otherwise;
Education cohort = 1 if the auditor was born in or after 1971, and 0 otherwise;
Accountancy major = 1 if the auditor majored in accountancy during their college education, and 0 otherwise;
Female = indicator variable for female auditors;
Big N experience = the auditor has work experience in an international Big N audit firm;
Birth year = the year in which the auditor was born;
Partner = 1 if the auditor is a partner, and 0 otherwise; and
CCP membership = 1 if the auditor is a member of the Chinese Communist Party, and 0 otherwise.

auditors when outright audit failures occur, while accounting restatements are made when material misrepresentation in financial statements is discovered. These *ex post* audit-quality measures can help assess the validity of the individual auditor effects estimated based on the four *ex ante* audit-quality measures.

From announcements made by the CSRC or relevant news reports about sanctions imposed by the MOF, we identify a total of 82 auditors sanctioned by regulators for problematic audits during our sample period. After merging these observations with our auditor data, 76 sanctioned individual auditors remain in the sample, which means that 8.83 percent (= 76/861) of the auditors with estimated fixed effects received regulatory sanctions. We use an indicator variable, *Sanctioned*, to indicate these auditors. We estimate a logistic regression to determine whether individual auditors with large fixed effects are more likely to be subject to regulatory sanctions.

We hand-collect restatement data from the "Material Accounting Errors" section of financial statement footnotes. We exclude restatements due to changes in accounting standards or government tax rules, mergers and acquisitions, or reasons other than accounting irregularities. During our sample period, about 11.6 percent of company-years have subsequently restated their financials. About 16.3 percent of these restatements are upward restatements. These statistics are broadly consistent with those reported by Wang and Wu (2012). Because a low-quality audit is generally associated with overstated earnings or equity and our individual effect estimates are directional, we exclude the upward restatements.[21] The variable *Restatement* is defined as the number of times financial statements audited by an individual auditor are subsequently restated. For our individual auditor sample, the mean value of *Restatement* is 2.40 and the inter-quartile range is 3.00. Because *Restatement* is a count variable, we use Poisson regression when analyzing restatements.

We regress *Sanctioned* or *Restatement* on the individual effects estimated based on four audit-quality measures. Consistent with Bertrand and Schoar (2003), in fitting the regressions, we apply the feasible generalized least squares (FGLS) method by weighting observations by the inverse of the standard error on the independent variables to mitigate the downward bias in the regression coefficients when measurement errors exist.[22] Table 7 presents the results.

Panel A of Table 7 shows that the individual effects based on each quality measure are all significantly positively correlated with the probability of being sanctioned by the CSRC or the frequency of accounting restatements. In Panel B, we replace individual audit-quality measures with the aggregate score (*Score*), which is the mean value of the four fixed effect coefficients. The results indicate that individual auditors with higher values of *Score* are significantly more likely to be sanctioned by regulators in our sample period and that their clients restate their financial statements more often. The associations between individual effects and *Sanctioned* or *Restatement* are also economically significant (untabulated). For example, the marginal effects in the *Sanctioned* (*Restatement*) regression suggest that the likelihood of being sanctioned (the frequency of restatements made by client companies) for a signing auditor whose fixed effect is one standard deviation more than the mean is 83.8 percent (39.1 percent) higher than that of another auditor whose fixed effect equals the mean. These results confirm that the above-estimated individual effects capture audit quality, i.e., larger values of individual effects imply more aggressive or lower quality audits.

[21] Nevertheless, the inferences remain the same if we retain these upward restatements.

[22] The detailed procedure is as follows. We use the mean values of the inverse of the standard errors of the four independent variables in applying FGLS. As these variables are based on different scales, we re-estimate individual effects after standardizing these variables to have 0 mean values and unit variances. The re-estimated individual effects and their standard errors are based on the same scale and are used to calculate the mean of the inverse of the standard errors and fit the FGLS model.

TABLE 7

Individual Auditor Effects on Audit Quality and the Likelihood of Regulatory Sanctions and Restatements of Financial Statements

Panel A: Individual Measures

	(1) Logistic Regression Analysis of Regulatory Sanction		(2) Poisson Regression Analysis of Financial Statement Restatements	
Variables	**Coeff.**	**Asy. t-statistics**	**Coeff.**	**Asy. t-statistics**
Intercept	−2.279	−81.114***	1.051	218.896***
ARAgg	0.216	3.993***	0.043	4.674***
AbAcc	0.139	1.993**	0.024	2.017**
BL	0.302	4.067***	0.274	21.551***
SP	0.115	1.917*	0.063	6.155***
Likelihood ratio χ^2	39.821 ($p < 0.001$)		537.646 ($p < 0.001$)	

Panel B: Aggregate Score

	(1) Logistic Regression Analysis of Regulatory Sanction		(2) Poisson Regression Analysis of Financial Statement Restatements	
Variables	**Coeff.**	**Asy. t-statistics**	**Coeff.**	**Asy. t-statistics**
Intercept	−2.278	−81.638***	1.049	218.625***
Score	0.759	5.965***	0.359	16.388***
Likelihood ratio χ^2	35.435 ($p < 0.001$)		267.157 ($p < 0.001$)	

*, **, *** Denote two-tailed significance at the 0.10, 0.05, and 0.01 levels, respectively.
The sample consists of 861 individual auditor observations.
In Column (1), the dependent variable is *Sanctioned*, which indicates whether individual auditors have been sanctioned by regulators. In Column (2), the dependent variable is the frequency of restatements for financial statement audited by the individual auditors. In Panel A, the independent variables are fixed effect coefficients estimated on the four audit-quality measures (*ARAgg*, *AbAcc*, *BL*, and *SP*). In Panel B, the independent variable is *Score*, which is the mean value of the four fixed effect coefficients.
In estimating the regressions, observations are weighted by the inverse of the mean of the standard errors on the four independent variables. To ensure that individual effects and their standard errors are based on the same scale and mean standard errors can be calculated meaningfully, we re-estimate individual effects after standardizing these variables to have zero mean values and unit variances.

V. CONCLUSIONS

This study examines the importance of individual auditors in determining audit quality in a unique setting, in which we are able to obtain the identity and demographic data of the individual auditors assigned to administer specific audit engagements. We document significant variation in audit quality across individual auditors. The effects of individual auditors on the quality of audit reporting and clients' earnings quality are both statistically and economically significant and are pronounced in both large and small audit firms. We also explore the extent to which individual auditor effects can be explained by their demographic characteristics. We find that signing auditors who are also partners or who were exposed to Western accounting systems during their university

education or who have worked in an international Big N audit firm are more conservative, while auditors who have obtained a master's degree or above or have a political affiliation are more aggressive. These results suggest that auditors' individual characteristics can affect their judgments and decisions, ultimately translating into variation in audit quality across individual auditors. Finally, we show that auditor aggressiveness, as captured by fixed effect estimates, is reliably associated with the likelihood of regulatory sanctions against problematic audits and the frequency of subsequent corrections of overstated earnings or equity.

Although we show that some observable demographic characteristics explain differences in audit quality across individual auditors to some extent, much of this variation remains unexplained. The auditor characteristics that we examine constitute only a small subset of the numerous individual characteristics that may be relevant to auditor judgment and decision-making. Future studies should investigate whether other characteristics, such as career tracks, social ties, and family background, contribute to the variation in audit quality across auditors. Another important unanswered question is whether audit firms strategically match auditors with different styles to minimize the deviation between the quality of individual audit engagements and the desired audit quality set by the audit firms. The requirement that two auditors co-administer an engagement and sign an audit report in China will enable researchers to explore this issue in the future.

An important caveat related to our study is that our findings may not be readily generalized to the U.S. or other Western markets for two major reasons. First, some of our analyses, particularly the analyses of the associations between individual effects and auditor demographic characteristics, are exploratory in nature. As such, the findings from these analyses could be sample- or time-specific, or caused by omitted correlated variables. Second, and more importantly, the Chinese and Western audit markets are different in that Big N firms only audit a small share of the former but have a dominant status in the latter. Although we show that individual auditors from the largest firms in China are also significantly different in terms of audit aggressiveness, we do not separately analyze Big N firms. Moreover, the strength of other auditing institutions, such as the regulatory oversight of the auditing profession, also differs between China and Western countries, which may further limit the generalizability of our findings.

Unlike in China, audit reports in many countries have not indicated the names of engagement partners until recently. However, important regulatory changes have been proposed or implemented. In 2006, the European Union (EU) issued the Eighth Company Law Directive, which requires EU member states to adopt a requirement that the audit report be signed by the engagement partner. In 2011, the Public Company Accounting Oversight Board (PCAOB), under the SEC in the U.S., proposed to amend its auditing standards to require audit firms to disclose the names of engagement partners in their audit reports. The regulatory reform in the EU, and the proposed change in the U.S., if implemented, will provide future opportunities for accounting scholars to analyze audit quality at the individual auditor level in Western countries. Such evidence will not only address the external validity concerns of the current study, but also shed light on how auditing institutions affect the extent to which individual auditors can "imprint" their characteristics on audit outcomes.

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APPENDIX A
Estimating Audit Reporting Aggressive and Abnormal Accruals

Audit Reporting Aggressiveness

To measure auditors' propensity to issue modified audit opinions (MAOs) to clients, we first estimate a logistic model to predict MAOs. The dependent variable in the model is *MAO*, which equals 1 if a client receives a modified opinion, and 0 otherwise. Following DeFond et al. (2000), we include the following variables that may affect the probability of receiving an MAO: *Quick* (sum of cash, short-term investments, notes receivables, and accounts receivables divided by current liabilities), *Accounts Receivables* and *Inventory* (ending balances of the respective accounts divided by total assets), *ROA* (earnings divided by total assets), *Loss* (indicator for companies that report losses), *Leverage* (liabilities divided by total assets), *Size* (the natural logarithm of the ending total assets), and *Age* (the number of years a company has been listed). In addition, we include *Other Receivables* (other receivables divided by total assets). Jiang et al. (2010) find that Chinese auditors are quite sensitive to inter-corporate loans, which are booked as other receivables under Chinese GAAP, between listed companies and their parent companies. The prediction model also includes a set of indicator variables for industry membership (two digits for the manufacturing sector and one digit for other sectors), following the CSRC industry classification scheme.

We estimate the logistic model by year. The mean pseudo R^2 is 23.59 percent. Based on the distribution of the 12 annual regression coefficients (Fama and MacBeth 1973), coefficients on *Other Receivables*, *Loss*, *Leverage*, and *Age* are significantly positive at the 1 percent level, while *Inventory*, *ROA*, and *Size* are loaded with negative coefficients that are significant at the 5 percent or better levels. Coefficients on *Quick* and *Accounts Receivables* are not statistically different from 0. Overall, the results are consistent with prior Chinese auditing studies.[23] We use the predicted probability of *MAO* from the logistic regressions to define audit reporting aggressiveness (*ARAgg*) as follows:

[23] Although the negative relation between *Inventory* and *MAO* is unexpected, this result is similar to that documented by Wang et al. (2008).

$$ARAgg = \text{Predicted opinion} - \text{Actual opinion}, \quad (A1)$$

where Actual opinion equals 1 if the client receives a modified opinion, and 0 otherwise, and Predicted opinion is the probability of *MAO* derived from the above annual logistic regressions. A higher *ARAgg* value suggests that auditors are likely to issue a clean report, although an MAO could be warranted according to the predicted probability. This variable thus represents aggressiveness in audit reporting.

Abnormal Accruals

We use a modified version of the Dechow and Dichev (2002) model suggested by McNichols (2002) to estimate abnormal accruals. The model expresses working capital accruals as a function of lagged, current, and future operating cash flows, as well as sales growth and the level of fixed assets, as follows:

$$\Delta WC_t = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t-1} + \beta_4 \Delta Sales_t + \beta_5 PPE_t + \varepsilon, \quad (A2)$$

where ΔWC_t is working capital accruals in year t, computed as operating net income plus depreciation, amortization, and financial expenses, minus operating cash flows. CFO_{t-1}, CFO_t, and CFO_{t+1} are operating cash flows in years $t-1$, t, and $t+1$, respectively. $\Delta Sales_t$ is sales growth from $t-1$ to t and PPE_t is the gross value of fixed assets. All of these variables are scaled by the average of the beginning and ending total assets in year t to reduce heteroscedasticity.

The model is estimated cross-sectionally in each industry-year. We use the two-digit code for the manufacturing sector and one-digit code for other sectors, following the CSRC industry classification scheme, and require that there should be at least ten observations in an industry-year combination to estimate the regression. In total, there are 211 industry-year combinations. The mean adjusted R^2 for these industry-year regressions is 0.466, suggesting that the Chinese data fit the model well. Based on the t-statistics computed by the distribution of the regression coefficients, the mean of the coefficients on CFO_{t+1} is significantly negative ($p < 0.001$), and the means of coefficients on other variables are significantly positive ($p < 0.01$). These results are mostly consistent with McNichols (2002), except for the positive mean coefficient on PPE_t.[24]

Our abnormal accruals measure is defined as the regression residuals. Because lagged cash flows are used as independent variables and a few industry-years have less than ten observations, the number of observations with estimated abnormal accruals is 13,896, which is smaller than the sample size for the other audit-quality measures.

[24] In the original Jones (1991) model, the coefficients on *PPE* should be negative primarily because of depreciation expenses. However, in the current model, the dependent variable, working capital accruals, does not include depreciation expenses and the effect of *PPE* is not clear.