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ABSTRACT

We offer an economic explanation for why audit firms oppose mandatory firm rotation. Using an innovative sample that overcomes sample selection biases, we find that fees for Big 4 audit firms increase noticeably over the audit firm's tenure. In contrast, fees for non-Big 4 audit firms decline as tenure lengthens. Using audit report lag as a proxy for audit cost, we find that audit cost declines over the audit firm's tenure, and this decline is even larger for Big 4 auditors. Our results indicate that Big 4 engagements become more profitable or earn quasi-rents over time, which may explain why Big 4 audit firms are so opposed to firm- but not partner-rotation. Whether non-Big 4 auditors earn any quasi rents remains doubtful. Our findings suggest a need to better monitor auditor independence and audit judgments when tenure is long, especially for Big 4 auditors, because economic bonding between the audit firm and client tends to increase over time.

Keywords: Audit tenure, audit effort, audit fees, and profitability

JEL Classification: M40, M42

I. INTRODUCTION

Because of concerns that lengthy audit firm-client relationships undermine auditor independence, skepticism and objectivity, and may erode audit quality (Doty 2012), legislators and regulators have tried to impose term limits.[1] These term limits have been the subject of active lobbying by the accounting profession, especially by Big 4 audit firms. According to www.OpenSecrets.org, Big 4 audit firms donated more than $10 million to national political campaigns and spent another $12.6 million on federal lobbying efforts opposing regulation aimed at strengthening auditor independence (Bazerman and Moore 2011).

Why are audit firms opposed to firm rotation but not to audit partner rotation?[2] The most prevalent explanation is that clients benefit from superior audit quality rendered over longer audit firm tenure regardless of partner tenure (e.g., Bell, Causholli, and Knechel 2015, Chen, Lin, and Lin 2008, Ghosh and Moon 2005, Mansi, Maxwell, and Miller 2004, Myers, Myers, and Omer 2003, Johnson, Khurana, and Reynolds 2002). In contrast to prior studies, we posit that audit firms oppose firm rotation, and not partner rotation, because they earn quasi rents from longer engagements through two distinct sources. First, holding audit effort constant, audit firms' pricing power is likely to increase with tenure as they render higher audit quality over time and

[1] In the aftermath of Penn Central, Equity Funding and other corporate scandals in 1977, the staff of the Subcommittee on Report, Accounting and Management of the Senate Committee (Metcalf Report) published a study on the accounting profession and recommended mandatory audit firm rotation. However, in a report issued by an American Institute of Certified Public Accountants' (AICPA) group the following year reached different conclusions about the need for reform. In 1978, the Cohen Commission also considered mandatory rotation but recommended against regulating audit firm tenure. In 2002, Congress again considered mandatory rotation but eventually directed the General Accounting Office (GAO) to study the effects of rotation. The GAO (2003) report concludes that 79% of the Big N audit firms were opposed to rotation. In response to a recent initiative on audit firm rotation, the Public Company Accounting Oversight Board (PCAOB 2011) received more than 670 comment letters, primarily from audit firms, almost universally opposing mandatory rotation (Doty 2012).

[2] Audit partner rotation, introduced in 1978, required the lead audit partner rotate off an engagement after seven years (AICPA 1978). Under Sarbanes-Oxley Act (SOX 2002), both the lead and concurring partners are required to rotate off an engagement after five years. Under the Securities and Exchange Commission (SEC 2003) rules, lead audit partners must sit out for another five years following rotation before returning to the same engagement (Laurion, Lawrence, and Ryans 2017).

demand a bigger return for superior service (Fortin and Pitman 2007; Willenborg 1999).[3] Audit firms might also increase fees following initial engagements to recoup any initial losses from fee discounting (DeAngelo 1981a). Controlling for the other determinants, our interest is in determining the magnitude of the tenure-related fee premium, if any. Second, profitability might also increase because of audit efficiencies (Causholli 2016). In-depth client-related information acquired over time, which remains with the audit firm even after partner rotation, allows the incumbent audit firms to make more timely judgments (Alissa, Capkun, Jeanjean, and Suca 2014). This suggests that audit firms are able to provide the desired level of assurance with less audit effort, which lowers audit costs over time.

In any economic game theoretic model, understanding the bargaining power of all players is critical to arriving at the equilibrium solution. This is why it is important to understand the bargaining power (benefits) of longer tenure to audit firms, which is missing from prior studies because prior studies emphasize the benefits of audit firm tenure to clients. A central concern with quasi rents accumulated over time is that auditor independence and audit judgments may become questionable for long engagements (Bowlin, Hobson, and Piercey 2015, Wang and Tuttle 2009, Chung and Kallapur 2003, Dye 1991).

We contribute to the prior literature as follows. First, prior studies find conflicting fee-tenure results (see Hay, Knechel, and Wong 2006).[4] We highlight a sample selection bias inherent in fee-tenure studies and implement a research design that overcomes this type of a bias.

[3]Because audit firms have limited knowledge during the early years of audit firm tenure, audit quality is likely to be lower during the initial years of an engagement. As audit firms gain more knowledge of clients' businesses, operations, systems and controls, i.e., audit firms accumulate 'client-related experience,' audit quality is expected to improve (Ghosh and Moon 2005; Myers et al. 2003; Johnson et al. 2002, Waller and Felix 1984).

[4]Among others, Felix, Gramling, and Maletta (2001), Copley, Doucet, and Gaver (1994), Ward, Elder, and Kattelus (1994), and Rubin (1988) find that the coefficient on tenure is positive and significant in a fee model, while Clatworthy, Mellett, and Peel (2002) find that the coefficient is negative and significant. In contrast, Chung and Lindsay (1988) and Simunic (1980) find that tenure is insignificant in audit fee regressions.

Thus, our study may explain the conflicting results from prior studies. Second, we model a non-linear relationship which allows us to infer whether the impact of tenure on fees is non-linear or limited to a certain range. Third, our research design extends prior studies on initial fee discounts, or lowballing, (e.g., Ghosh and Lustgarten 2006, Huang, Raghunandan, and Rama 2009, Sankaraguruswamy and Whisenant 2009, Desir, Casterella, and Kokina 2014) while allowing us to infer when audit firms start charging a fee premium following any initial fee discounting. Fourth, in contrast to prior studies, we examine how tenure affects fees and cost structure, which are likely to be the prime drivers of quasi rents (DeAngelo 1981b).

A typical econometric problem confronting prior tenure-audit fee studies is a distinctive sample selection bias which is due neither to data truncation nor data censoring (see the sample section discussion for details). Because audit firm information is available from 1974 and audit fee data are available from 2000, tenure-fee panel data include a sizeable number of companies with fee information for long tenure but not for short tenure. For example, Exxon Mobil Corp, which has not changed its audit firm since 1974, appears in the sample with tenure of 27 in 2000, but the tenure values 1 through 26 are truncated for this company.[5] Similarly, if a company switched its audit firm in 1980 (1990), the first tenure-fee value that would be available is 21 (11) years, so tenure-fee values of 1 through 20 (1 through 10) are missing from the panel dataset. If companies with truncated tenure-fee data are fundamentally different from those without data truncation, the regression results might be biased. We use a novel approach to address this type of sample selection bias. To maintain a homogenous sample, we only include a company in our sample when tenure-fee observations are available for the entire range of tenure. Because audit fee data are available from 2000 and our sample ends in 2013, the maximum value

[5]Our analyses indicate that 15% of observations have tenure and fee data for tenure values ranging between 21 and 40 years, but without fee data for the prior years. Therefore, these observations appear in the sample with high tenure values but are excluded for low tenure values because fee information is unavailable.

of tenure for our sample is limited to 14 years. To demonstrate the magnitude of the downward bias in the tenure coefficient from audit fee regressions, we compare the tenure estimates from the restricted and unrestricted samples.

After controlling for other client- and auditor-related factors that influence audit fees, our linear regression estimates indicate that, on average, a 100% increase in tenure increases audit fees by 7% for the Big 4 audit firms. In sharp contrast, for the non-Big 4 sample, audit fees decrease by about 4% for a 100% increase in tenure. Thus, quasi rents from a tenure-linked fee premium increase for the Big 4 audit firms, but not for the non-Big 4 audit firms.

One underlying assumption in our audit fee estimation is that the relation between audit firm tenure and fees is linear, i.e., the elasticity of fee/cost relative to tenure is constant. A relevant empirical question is whether fee increases are sustained over prolonged periods. Thus, we relax the linearity assumption by replacing tenure with a series of tenure indicator variables. For the Big 4 audit firm sample, and relative to the initial year, fees increase by about 13% in the second year, by about 22% between years three and four, by about 23% to 24% between years five and six, by about 17% between years seven and ten, by about 22% in year eleven, by about 28% in year twelve, and by more than 32% for years longer than twelve. The relatively large increases in audit fees over consecutive years of tenure are consistent with a potential economic bonding between audit firms and the clients when tenure is long. In contrast, for the non-Big 4 sample, the corresponding coefficients are negative and statistically significant for all the tenure years up to year ten and then insignificant for the subsequent years.

Audit firms must retain audit work papers from prior engagements. Expert knowledge gained through years of on-the-job experience increases the likelihood that audit firms will detect errors in financial statements (Ashton 1991; Libby and Frederick 1991). Therefore, prior audit

experience with the client is expected to enhance audit quality (Wright 1988), and, if so, audit firms may charge a larger tenure-related fee premium for rendering superior audit quality. When we partition the sample based on whether the audit firm was previously engaged by the client, we find that the Big 4 audit firms charge a considerably larger tenure-related fee premium when the incumbent audit firm was previously engaged by the client than when the client did not previously engage the incumbent audit firm. However, for the non-Big 4 sample, there is no such tenure-related fee premium difference between the two sub-samples.

In addition to fee-related benefits, profitability might also increase over the audit firm's tenure because costs decline as a result of audit efficiencies (DeAngelo 1981a). To capture audit cost/effort, we use the audit report lag, measured as the natural logarithm of the number of days between the fiscal year end and the audit report date. We expect audit report lag to become shorter as audit firms are able to complete audit testing more efficiently and provide the desired level of assurance with less audit effort (O'Keefe, Simunic, and Stein 1994; Bell, Landsman, and Shackelford 2001). We find that audit report lag becomes shorter with longer tenure, especially for Big 4 audit firms and the decline is large. Relative to the initial year of an engagement, audit report lag declines by about 2% when tenure is 2 years, by about 6% when tenure is 3 years, by about 9% to 10% when tenure is between 4 and 5 years, by about 14% when tenure is between 6 and 8 years, by about 16% when tenure is 9 years, by about 14% when tenure is between 10 and 11 years, and by about 12% when tenure is 12 years or longer.

Because filing date requirements depend on the designation of the filer, we also perform our audit effort-tenure test separately for large accelerated filers, accelerated filers, and non-accelerated filers. Audit effort decreases with audit firm tenure across all groups of filers. Finally, we partition the sample into the pre-financial-crisis period (2004-2007), the crisis period

(2008-2009), and the post-crisis period (2010-2013) to ensure that our results are robust to various business shocks. When we estimate audit fee and audit report lag regressions for the various sub-periods, we find consistent results.

Our results suggest that Big 4 audit firms earn quasi rents that are economically large. The magnitude of these quasi rents increases with tenure because of a sizable fee premium and lower audit costs. In contrast, non-Big 4 audit firms do not earn large quasi rents. We conclude that these results provide a compelling explanation for why the Big 4 audit firms are so fervently opposed to firm rotation but not audit partner rotation (SEC 2003, CEC 2006). This implies that investors and boards/audit committees should be mindful of longer tenure because quasi rents might pose a threat to auditor independence and audit judgments for Big 4 audit firms.[6]

The rest of the paper is organized as follows. The second section develops the hypotheses. The third and fourth sections describe the research design and data, respectively. The fifth section discusses the empirical findings. The sixth section reports the results of the additional analyses. Finally, we conclude with the seventh section.

II. HYPOTHESIS DEVELOPMENT

Tenure and Audit Pricing

Economic theory suggests that audit firm tenure is likely to influence the pricing and profitability of audit engagements. Simunic (1980) describes the audit pricing process as a function of the cost of the external audit and the audit firms' expected losses from litigation. The cost of the audit depends on the billing rate (i.e., per unit factor cost) which includes the audit firm's opportunity costs and the quantity of resources utilized by the auditor in performing the audit (i.e., audit effort). The task of auditing a client is expected to become more complex over

[6]Because the prior literature generally assumes a linear relation between audit quality and audit firm tenure, our results suggest the need to reassess this relation.

time as clients become bigger, increase their investments in other companies, acquire or merge with other companies, and expand operations both geographically and across industries. A key consequence of the growth in client size is that more audit effort is required to provide the desired level of assurance. Thus, for a given billing rate, the cost of the audit effort is expected to increase with tenure because of added effort, which in turn leads to higher audit fees.

For a given level of audit effort, audit fees might increase with tenure because audit firms increase their billable rates. To the extent the audit task is more complex over time because clients become bigger and operations become more complex, audit firms need to assign more specialized staff and allocate more manager/partner time to provide the desired level of assurance. This is expected to increase the billing rate.

Another reason for higher audit fees with longer tenure relates to audit firms' expected losses from litigation. Audit firms are exposed to litigation when management, shareholders, creditors, or other third parties attempt to recover their losses by attributing those losses to misstatements in the audited financial statements, thereby holding the audit firm responsible for such losses (Seetharaman, Gul, and Lynn 2002). If audit firms perceive larger clients as being more prone to litigation, then they are likely to charge more as tenure lengthens to compensate for their added exposure to litigation risk.

Finally, audit firms might charge a fee premium that is linked to tenure, i.e., they might earn client-specific quasi-rents, because they supply superior audit quality. Audits require substantial initial investments, also known as start-up costs that are uniquely specific to the client (DeAngelo 1981a). Arguably, the most costly and time-consuming aspect of an initial engagement is obtaining an understanding of the clients' business, which includes information about management, organization structure, operations, and internal controls over financial

reporting. In addition, auditors need to verify the beginning balances of the balance sheet accounts, which requires substantial audit investments. A lack of familiarity with the client and initial start-up costs might contribute to lower audit quality during the initial years of an audit engagement. Over time, audit quality is expected to improve because the auditors' experience increases the likelihood of detecting material misstatements (Libby and Frederick 1991).

When contracting is costly, the transaction cost of switching audit firms increases for a client because any potential successor audit firm is unlikely to match the audit quality of the incumbent audit firm.[7] Because a successor audit firm must incur start-up costs, and because client-specific experience is determined by the length of the engagement, the client must wait before a successor audit firm can render comparable audit quality. Hence, switching costs are expected to increase over time because the loss in audit quality from replacing the incumbent audit firm with a successor audit firm increases as tenure lengthens. Because the switching cost for the client increases with tenure, the incumbent audit firm has more bargaining power in the pricing of audit fees as audit engagement lengthens.

A consequence of improvements in audit services and higher switching costs as audit firm tenure lengthens is that audit fees are expected to increase over the auditor-client relationship (e.g., Kanodia and Mukherji 1994). Our hypothesis that audit firms earn client-specific quasi-rents with longer audit firm tenure is a well-established notion in the auditing literature. As DeAngelo (1981b, 188) notes,

> *the absence of perfect substitutes enables incumbent auditors to set future audit fees above the avoidable costs of producing audits, i.e., incumbent auditors earn client-specific quasi-rents….. In bilateral monopoly, both parties have*

[7]Although it is possible for a highly specialized successor audit firm to provide the same level of assurance as the incumbent audit firm with long tenure, we assert that the likelihood of the client finding such an audit firm is low. Even when the client finds such a successor audit firm, the cost of a comparable audit would be substantially higher.

incentives to continue an established relationship because of the absence of costlessly available perfect substitute auditors.

Tenure, Audit Investments, and Profitability

Audit investments are expected to be significantly greater during the initial years of the audit engagement. Auditors need to exert greater effort to gain client-specific knowledge through extensive substantive testing and client interactions (Bedard and Johnstone 2010). However, as tenure lengthens, audit investments (i.e., audit effort) are expected to decline as a consequence of client familiarity and audit efficiency from having audit work papers from prior years. Thus, audit engagements are expected to become more profitable over the audit firms' tenure as: (1) audit investments decline, and (2) audit firms charge a fee premium that increases with the length of the engagement. Stated differently, audit firms are able to set fees above periodic audit investment costs, which results in quasi rents for the audit firm.

III. RESEARCH METHODOLOGY

Tenure and Audit Pricing

Consistent with much of the prior audit fee literature,[8] we model audit fees using the following regression specification:

$$AUDIT\_FEES_{it} = \beta_0 + \beta_1 AUDIT\_TENURE_{it} + \beta_2 AUDIT\_OPINION_{it} + \beta_3 AUDIT\_SPEC_{it} + \beta_4 AUDITOR\_CHANGE_{it} + \beta_5 IC\_OPINION_{it} + \beta_6 IC\_WEAKNESS_{it} + \beta_7 BIG4_{it} + \beta_8 AT_{it} + \beta_9 LOSS_{it} + \beta_{10} M\&A_{it} + \beta_{11} DISCONTINUED_{it} + \beta_{12} BUSY\_SEASON_{it} + \beta_{13} INVENTORY_{it} + \beta_{14} ROA_{it} + \beta_{15} LEVERAGE_{it} + \beta_{16} GROWTH_{it} + \beta_{17} CA\_CL_{it} + \beta_{18} CA\_TA_{it} + \beta_{19} MTB_{it} + \beta_{20} PRCT\_FOREIGNSALE_{it} + \beta_{21} N\_BUSSEG_{it} + \beta_{22} AGE_{it} + \text{Industry\&Year fixed effects} + \varepsilon \quad (1)$$

The dependent variable is the natural logarithm of the level of audit fees (*AUDIT_FEES*) for company *i* in fiscal year *t*. Our experimental variable is *AUDIT_TENURE* which is the natural logarithm of the length of the audit firm engagement to date. As determinants of audit fee pricing, we include several variables based on audit and client characteristics that are known to

[8] See for example, Hogan and Wilkins (2008), Hoitash, Hoitash, and Bedard (2008), Ghosh and Lustgarten (2006), Whisenant, Sankaraguruswamy, and Raghunandan (2003), Seetharaman et al. (2002).

affect audit fees. For audit characteristics, we follow the prior literature (Craswell, Francis, and Taylor 1995; Hackenbrack and Hogan 2005; Hoag and Hollingsworth 2011; Raghunandan and Rama 2006; Whisenant et al. 2003) and include an indicator variable for whether the client's fiscal year end is in December and January (*BUSY_SEASON*), audit specialization (*AUDIT_SPEC*),[9] and indicator variables for whether the audit firm is a Big 4 auditor (*BIG4*), whether the firm issues an unqualified opinion (*AUDIT_OPINION*), whether the client engages a new audit firm (*AUDITOR_CHANGE*), whether the audit firm expresses any opinion on Section 404 (*IC_OPINION*), and whether the client reports a material weakness in internal controls (*IC_WEAKNESS*).

For client characteristics, we control for client size using the natural logarithm of total assets *(AT)*. As measures of business risk, we include the ratio of inventory to total assets (*INVENTORY*), current assets to total assets (*CA_TA*), current assets to current liabilities (*CA_CL)*, total debt to total assets (*LEVERAGE*), income before extraordinary items to total assets *(ROA*), and an indicator variable for negative income before extraordinary items in the current or prior year (*LOSS*). To capture audit risk, we include the market-to-book ratio (*MTB)* and sales growth *(GROWTH)*. To capture audit complexity, we include an indicator variable for merger and acquisition activities (*M&A*), sales from foreign operations to total sales (*PRCT_FOREIGNSALE*), the number of business segments (*N_BUSSEG*), and an indicator variable for whether the client reports extraordinary items and/or discontinued operations (*DISCONTINUED*), and the number of years to date the client is listed in *Compustat* (*AGE*).

We include year fixed effects because audit costs have increased, particularly for Big 4 audit firms, due to added testing and documentation needed to satisfy PCAOB requirements.

[9] *AUDIT_SPEC* is the audit firm's national market share in a given year and industry, measured as the audit fees collected from all clients in the same industry as the client expressed as a percentage of total audit fees for all audit firms in the same industry for any given year where industry is defined using a two-digit SIC code.

Additionally, we include industry fixed effects to control for variation in audit fees across industries. Our interest is on the coefficient on *AUDIT_TENURE*. If audit firms charge a premium as the auditor-client relationship lengthens, the coefficient on *AUDIT_TENURE* (β_1) will be positive.

Tenure and Audit Effort

Drawing on prior studies (Bamber, Bamber, and Schoderbek 1993; Munsif, Raghunandan, Rama, and Singhvi 2011; Ghosh and Tang 2015), we model audit effort as follows.

$$AUDIT\_REPORT\_LAG_{it} = \beta_0 + \beta_1 AUDIT\_TENURE_{it} + \beta_2 BIG4_{it} + \beta_3 AUDIT\_SPEC_{it} + \beta_4 GOING\_CONCERN_{it} + \beta_5 AT_{it} + \beta_6 ROA_{it} + \beta_7 LOSS_{it} + \beta_8 LEVERAGE_{it} + \beta_9 INVENTORY_{it} + \beta_{10} DISCONTINUED_{it} + \beta_{11} M\&A_{it} + \beta_{12} DEC_{it} + \beta_{13} PRCT\_FOREIGNSALE_{it} + \beta_{14} N\_BUSSEG_{it} + \beta_{15} AGE_{it} + \text{Industry\&Year fixed effects} + \varepsilon \quad (2)$$

Prior studies find that greater audit effort leads to delayed audit reports (Ashton, Willingham, and Elliot 1987; Ashton, Graul, and Newton 1989). Therefore, we use audit report lag (*AUDIT_REPORT_LAG*) to proxy for audit effort. *AUDIT_REPORT_LAG* is defined as the natural logarithm of the number of days between the client's fiscal year end and the audit report date.

To capture outsiders' demand for public information, we include the natural log of total assets (*AT*). To capture risk, we include return on assets (*ROA*), an indicator variable for negative income (*LOSS*), leverage (*LEVERAGE)*, inventory (*INVENTORY*), an indicator variable for the issuance of a going concern opinion (*GOING_CONCERN*), and an indicator variable for whether the client's fiscal year end is December (*DEC*). We measure audit complexity using indicator variables for discontinued operations and/or extraordinary items (*DISCONTINUED*), mergers or acquisitions (*M&A*), and the use of a Big 4 audit firm (*BIG4*), audit specialization (*AUDIT_SPEC,* as defined previously), sales from foreign operations to total sales

(*PRCT_FOREIGNSALE*), the number of business segments (*N_BUSSEG*), and the number of years to date the client is listed in *Compustat* (*AGE*). As in the audit fee regression, we include industry and year fixed effects.

Our interest is on the coefficient on *AUDIT_TENURE*. If audit investments decline over the audit firm's tenure, the coefficient on *AUDIT_TENURE* (β_1) will be negative.

IV. DATA AND SAMPLE SELECTION

Sample Selection

We construct our sample from the list of publicly traded companies with information on audit firm tenure available from the *Compustat* annual files. Because *Compustat* files report the identity of the audit firm from 1974, audit firm tenure is set to 1 in 1974 by construction. However, analyzing this fee-tenure relation introduces a potential sample selection bias because fees are available from 2000 while tenure is available from 1974. Thus, for a sizeable number of companies with long tenure that enter the sample in 2000, fees for the early years of tenure are not available. In contrast, for companies switching audit firms following 2000, all fee-tenure values to date are available.

This type of a data limitation is distinct from the traditional censoring or truncation of data.[10] In the fee-tenure case, the dependent variable audit fees is missing for all tenure values that correspond to the years before 2000. However, the cutoff point for which fees are missing depends on the length of the engagement in 2000, i.e., it depends on whether there was any prior audit firm turnover between 1974 and 2000, which is why audit fee is not censored. In addition,

[10]In a bivariate regression of Y on X, the dependent variable Y is considered censored when the values of Y are observable only above, or below, a certain threshold point of Y. Even though Y is censored, all values of X are still observable. Data is considered truncated when observations for both X and Y are missing when Y is above (or below) a certain threshold point. Our data is not censored because the range of values of tenure is not conditional on a threshold value (either tenure or audit fees). Rather, the observed values of tenure available for the post 2000 years are endogenous to the timing of any prior audit firm turnover.

because we have all values of tenure from 1974 regardless of whether audit fee values are available, the fee-tenure data are not truncated.

Including all companies with available data in the sample is likely to bias the estimated coefficient on tenure if clients with long tenure are fundamentally different from those with short tenure. Because audit firms are more likely to increase fees in the early years of tenure as they recover any fee discount offered to clients on initial engagements and as they render higher audit quality, a lack of fee data for some companies for the early years of tenure underestimates the true increase in fees if the years excluded are associated with larger fee increases. Furthermore, the distribution of missing observations is not random because it depends on audit firm turnover prior to 2000.

To avoid this type of a sample selection bias, we only include a company in our sample following an audit firm change during our sample period (2004 through 2013). This allows us to retain all complete pairs of fee-tenure observations up to the end of our sample period, thereby avoiding the potential selection bias. Because changes introduced under SOX had large effects on the audit environment, we confine our analyses to the post-SOX period (i.e., 2004 onwards). However, although our sample period is confined from 2004 through 2013, we measure tenure from 2000, when fees and tenure are both available. Therefore, the maximum value of tenure in our sample is 14. Although we are unable to comment on the relationship between tenure and fees for tenure values greater than 14, we can calculate the economic magnitude of the effect of tenure on fees for tenure values less than 15, and we can determine whether there is any estimation bias from using the entire (unrestricted) sample.

We obtain audit fee and reporting lag information from *Audit Analytics*. We also obtain filing status and internal control effectiveness from *Audit Analytics*. We obtain data on

accounting earnings and other company characteristics from the *Compustat* annual files. This sample selection procedure results in 21,855 company-year observations over fiscal years 2004 through 2013.

Descriptive Statistics

Table 1, Panel A provides the descriptive statistics for audit fees, audit firm tenure, and other audit firm and client-related variables used in the Equation (1). The mean (median) client pays $1.40 ($0.41) million in annual audit fees. The mean (median) audit firm tenure is about 4 (4) years. The median company in the sample receives an unqualified opinion from the audit firm (*AUDIT_OPINION*). The average audit firm has 12% market share (*AUDIT_SPEC*). Approximately, 16% of the sample is associated with auditor turnover (*AUDITOR_CHANGE*). The median company in the sample must file a report on its effectiveness of internal control over financial reporting (*IC_OPINION*) and 4% of the sample has weaknesses in their internal control over financial reporting (*IC_WEAKNESS*). The median company in our sample is audited by a Big 4 audit firm.

We also analyze several client characteristics. The mean (median) company has $2.87 ($0.14) billion is total assets. 46% of the sample reports losses (*LOSS*) and 15% are involved in mergers and acquisitions (*M&A*). 17% of the sample reports discontinued operations (*DISCONTINUED*) and 71% has fiscal ending in a busy season (*BUSY_SEASON*). The mean (median) *INVENTORY* is 0.10 (0.04). The median *ROA* is 1% with *LEVERAGE* 15%. The median growth in sales is 6% (*GROWTH*). The median liquidity as measured by current assets to current liabilities (*CA_CL*) and by current assets to total assets (*CA_TA*) is 1.84 and 0.52, respectively. The median market-to-book ratio (*MTB*) is 1.54. Finally, the mean company in the sample makes 27% of its sales revenue in foreign jurisdictions (*PRCT_FOREIGNSALE*), has

more than one operating segment (*N_BUSSEG*), and has been listed in *Compustat* for 16 years (*AGE*).

Because we use a smaller dataset than used in prior research, we do not truncate observations. However, our inferences remain unchanged when we delete the top and bottom 1% of observations or when we winsorize these observations.

Because we emphasize differences between Big 4 and non-Big 4 audit firms, we provide descriptive details by year based on audit firm size and by audit firm switches in Panels B and C, respectively. In Panel B, we find that the percentage of Big 4 audit firms decreases from 58% in 2004 to 49% by 2006, consistent with an audit market realignment in which many smaller clients started engaging non-Big 4 audit firms.[11]

Panel C reports the frequency of audit firm switches including lateral switches (i.e., Big 4 to Big 4 or non-Big 4 to non-Big 4), upward switches (i.e., non-Big 4 to Big 4), and downward switches (i.e., Big 4 to non-Big 4) for the pooled sample and by year. In the early years, most of the switches are from Big 4 to non-Big 4 auditors, which is again consistent with the audit market realignment following SOX. In the later years, most of the switches are from non-Big 4 to non-Big 4 auditors. The changes to Big 4 auditors (either from another Big 4 or from a non-Big 4) represent a small percentage of the audit firm changes.

V. EMPIRICAL RESULTS

Tenure and Audit Fees

Panel A of Table 2 provides preliminary insights into the relation between audit firm tenure and audit fees by sorting observations into quintiles based on tenure. Quintile 1 consists of observations with the lowest tenure (the mean is 1 year), while Quintile 5 includes observations

[11] For the last year of our sample period, we do not have complete data, which could be why the percentage of Big 4 and non-Big 4 audit firms does not follow the prior trend.

with the highest tenure (the mean is 9 years). The relation between fees and tenure is monotonic (see Figure 1). Mean (median) audit fees monotonically increase from $1.09 ($0.31) million in Quintile 1 to $1.98 ($0.75) million in Quintile 5.[12]

To estimate the incremental effect of tenure on audit fees, in Panel B, we regress the natural logarithm of audit fees (*AUDITFEES*) on the natural logarithm of audit firm tenure (*AUDIT_TENURE*) after controlling for other client- and auditor-related attributes that also impact audit fees. The coefficient on *AUDIT_TENURE* is positive and statistically significant at the 1% level (0.036, t-stat=4.91) which suggests that, on average, a 100% increase in tenure increases audit fees by 4%. Our results suggest that audit firms charge a fee premium that is directly attributable to tenure.[13] Because large audit firms with deeper pockets and more resources provide superior audit quality, the fee premium linked to tenure is likely to be more pronounced for the Big 4 audit firms than for the non-Big 4 audit firms. Therefore, we separately report the results for the Big 4 and non-Big 4 samples. For the Big 4 sample, the *AUDIT_TENURE* coefficient is positive and highly significant (0.072, t-stat=6.75) and double the magnitude of the corresponding coefficient from the full sample.[14] In sharp contrast, for the

[12]The mean/median differences in fees between the successive tenure quintiles are statistically and economically significant. Mean (median) audit fees increase by 1.1% (-3.6%) between Quintiles 2 and 1, by 19% (36%) between Quintiles 3 and 2, by 16% (24%) between Quintiles 4 and 3, and by 29% (51%) between Quintiles 5 and 4. The largest increase in fees occurs in the highest tenure quintile.

[13]The results for the control variables included in the model are generally consistent with prior studies. The coefficients on *AUDIT_SPEC*, *IC_OPINION*, *IC_WEAKNESS*, *AT*, *LOSS*, *M&A*, *DISCONTINUED*, *LEVERAGE, CA_TA*, *PRCT_FOREIGNSALE*, *N_BUSSEG*, and *AGE* are all positive and significant. The results suggest that clients pay more when the audit firms are specialists or subject to SOX 404, when clients have internal control weaknesses, are larger, have losses, acquire other companies, have discontinued operations, are more levered, have more operating segments, have more foreign operations, or when they are older. The coefficients on *AUDIT_OPINION* and *ROA* are negative and significant which suggests that clients pay less when they receive a clean opinion or when they are more profitable.

[14]If some of the audit costs are correlated with industry characteristics and we fail to incorporate these factors into our fee analyses, the coefficient on *AUDIT_TENURE* may be biased upwards. Therefore, we replicate our analyses from Table 2 using industry-adjusted audit fees as the dependent variable and find consistent inferences.

non-Big 4 sample, the coefficient on *AUDIT_TENURE* is negative and significant (-0.036, t-stat=-3.78). Our results suggest that quasi rents increase for the Big 4 audit firms because of a tenure-linked fee premium, but quasi rents do not increase for non-Big 4 audit firms possibly because they tend to pass on cost savings to their clients through lower fees.

The underlying assumption in Table 2 is that the relation between audit firm tenure and profitability is linear, but this may be unrealistic. Prior studies document that audit quality is expected to improve over the initial years of tenure as audit firms gain more client-specific knowledge. Therefore, it might be easier for audit firms to justify why they increase fees over the initial/medium tenure years as they render higher audit quality. To gain additional insights into temporal fee increases, we estimate Equation (1) by replacing *AUDIT_TENURE* with a series of *TENURE* indicator variables representing years 2 (*TENURE2*) through 12 (*TENURE12*). Because tenure years 13 and 14 have limited observations, we combined these two years into one indicator variable (*TENURE12+*). The coefficient on *TENUREk,* where k is 2 through 12+, represents incremental fees charged by the audit firm for the k^{th} year relative to the initial year of the engagement (*TENURE1*).

In Table 3, for the Big 4 sample, the tenure indicator variables are all positive and significant at the 1% level. Relative to year 1, fees increase by approximately 13% in year 2, 22% between years 3 and 4, 23 to 24% between years 5 and 6, 17% between years 7 and 10, 22% in year 11, 28% in year 12, and more than 32% for years longer than 12.[15] The large jump in fees especially for the longer tenure years raises concerns about an economic bonding between audit firms and their clients. In stark contrast, for the non-Big 4 sample, the corresponding

[15]For example, when *TENURE2* changes from 0 to 1, the effect on audit fees is exp (0.122) □ 1 = 0.1298, which is roughly 13%.

coefficients are negative and statistically significant for all tenure years up to year ten and then insignificant for subsequent years.

The Effect of a Prior Audit Firm-Client Relationship

For a given audit technology, expert knowledge gained through on-the-job experience increases the likelihood that audit firms will detect errors in financial statements (Ashton 1991; Libby and Frederick 1991). Because audit firms retain audit work papers from prior engagements, and they have more information about the client if they were retained by the client previously, any prior audit experience with the client is expected to enhance current and subsequent audits (Wright 1988). We expect audit firms to charge a larger tenure-related fee premium for delivering superior audit quality.

In Table 4, we investigate whether the tenure-fee premium is contingent on the incumbent audit firm being retained by the client previously. We partition the sample into two groups: (1) the incumbent audit firm was previously retained by the client in any year between 1974 and 2000; and (2) the incumbent audit firm was not retained by the client. We then estimate the audit fee regressions for the two sub-samples for the Big 4 and non-Big 4 audit firms separately. For the Big 4 sample, consistent with our expectations, the coefficient on *AUDIT_TENURE* is much larger when the incumbent audit firm was engaged by the client on a prior occasion than when the client had not engaged the incumbent audit firm previously (0.104 versus 0.049). The difference between the two coefficients is statistically significant (0.055, t-stat=2.35). For the non-Big 4 sample, there is no difference between the two sub-groups, so audit fee changes over the length of the audit engagement do not depend on whether the audit firm was previously retained by the client (0.012, t-stat=1.95).

Tenure and Audit Effort

A fundamental problem in auditing research is that researchers generally do not have access to the number of hours worked by audit firms because this information is not publicly disclosed. Therefore, we use audit report lag to proxy for audit effort. Audit report lag is measured as the natural logarithm of the number of days between the fiscal year-end and the audit report date.

Table 5 reports the relation between audit report lag and audit firm tenure. Panel A reports the mean and median audit report lag by tenure quintiles. Our results indicate a decline in audit report lag across increasing levels of audit firm tenure (see Figure 2). The mean (median) audit report lag is 92 (79) days, 85 (75) days, 80 (74) days, 78 (73) days, and 70 (66) days for tenure quintiles 1 through 5, respectively.[16]

Panel B provides the audit report lag regression results for the Big 4 and non-Big 4 audit firms separately. In Columns (1) and (3), we regress the logarithm of audit report lag on the logarithm of audit firm tenure, controlling for the other factors that affect audit report lag. In Columns (2) and (4), we replace *AUDIT_TENURE* with our series of tenure indicator variables. In Column (1), the coefficient on *AUDIT_TENURE* is negative and highly significant (-0.078; *t*-stat=-15.71) for the Big 4 sample. Thus, a negative relation is consistent with audit firms requiring less time to provide the desired level of assurance over longer tenure. In Column (2), we find that the coefficients on all the tenure indicator variables, other than *TENURE2*, are negative and significant at the 1% level. Relative to the initial year of engagement, audit report lag declines by approximately 2% when tenure is 2 years, 6% when tenure is 3 years, 9% to 10% when tenure is between 4 and 5 years, 14% when tenure is between 6 and 8 years, 16% when

[16] The mean and median differences between the extreme quintiles (Quintile 1 and Quintile 5) are statistically significant at the 1% level. The mean decline between Quintiles 2 and 1 is 7.2%, between Quintiles 3 and 2 is 5.8%, between Quintiles 4 and 3 is 2.4%, and between Quintiles 5 and 4 is 10.2%.

tenure is 9 years, 14% when tenure is between 10 and 11 years, and 12% when tenure is 12 years or longer.

Similar to the Big 4 sample, the coefficient on *AUDIT_TENURE* is negative and highly significant (-0.037, t-stat=-7.69) in Column (3) for the non-Big 4 sample, but the coefficient is half of the corresponding estimate from the Big 4 sample. Also, similar to the Big 4 results, the tenure indicator variables are all negative and significant at the 1% level for tenure years 2 through 10 for the non-Big 4 sample. In general, the decline is similar in pattern to the Big 4 sample but the *TENURE* coefficients for the non-Big 4 sample are half the corresponding estimates from the Big 4 sample.

A concern with the audit effort results from Table 5 is that the filing requirements depend on the designation of the filer, which might affect our results. For example, U.S. companies designated as large accelerated filers, non-large accelerated filers, and non-accelerated filers must file their annual reports within 60, 75, and 90 days, respectively. Therefore, in Table 6, we report the results separately for the three groups. The coefficients on *TENURE* are all negative and mostly significant for all the three sub-samples.

Investigating the Bias from Using an Unrestricted Sample

To demonstrate the magnitude of any downward bias arising from using unrestricted samples where all pairs of tenure-fee data are not available for a given company, we compare the standardized regression coefficients from our restricted sample and an unrestricted sample.[17] The results, using the Big 4 sample, are reported in Table 7. We focus on this sample because the results from the prior tables suggest that only the Big 4 earn quasi rents.

[17]Standardized coefficients are regression estimates that have been standardized so that the variances of the dependent and independent variables are equal to one. We thank an anonymous referee for this suggestion.

Panel A reports the results from estimating the audit fee model. We report the results for the restricted sample in Columns (1) and (2), and the results for the unrestricted sample in Columns (3) and (4). The standardized coefficient for the unrestricted sample is 0.017 (Column 4) and for the restricted sample is 0.041 (Column 2). Consistent with the bias hypothesis, the estimated *AUDIT_TENURE* coefficient from the unrestricted sample is approximately 41% of that from the restricted sample (0.017/0.041). Stated alternatively, the restricted sample yields a coefficient estimate that is more than twice the magnitude of the coefficient estimate from the unrestricted sample.

Panel B reports the audit report lag results. The standardized coefficients for the restricted and unrestricted samples are -0.150 (Column 2) and -0.094 (Column 4), so the magnitude of the estimate from the unrestricted sample is approximately 63% of that from the restricted sample (0.094/0.150).

VI. ADDITIONAL ANALYSES

Sub-Period Analysis

One concern with our study is that the analyses are performed over a very volatile period, with the Big 4 audit firms potentially shedding riskier clients. The sample also includes the financial crisis period. In the main tests, we try to address these concerns by incorporating year fixed effects. Nevertheless, to ensure that the results are not confined to certain time periods, we perform the main analyses separately for the following three sub-periods: (1) the pre-crisis period (2004-2007), (2) the crisis period (2008-2009), and (3) the post-crisis period (2010-2013). The results are reported in Table 8. Panel A reports the results of the audit fee regression. The positive relation between audit fees and tenure is consistent across all three sub-periods. The

coefficients on *AUDIT_TENURE* range from 0.056 for the crisis years to 0.076 for the post-crisis years. All tenure coefficients are statistically significant at the 1% level.

Panel B reports the results of the audit report lag regression. The coefficients on *AUDIT_TENURE* are all negative and statistically significant at the 1% level across the three sub-periods. The magnitude of the coefficients declines after the crisis years (-0.090 in the crisis years to -0.064 in the post-crisis years).

Alternative Proxy for Audit Specialization

In our prior analyses, audit specialization (*AUDIT_SPEC*) is the audit firm's national market share in a given year and industry. As a robustness test, we also use a measure of audit specialization based on the audit firm's local market share or city-specific market share. Following Francis, Reichelt, and Wang (2005), we define cities using the U.S. Census Bureau definition of the metropolitan statistical areas (MSAs) to identify metropolitan areas based on state and county codes.[18] *LOCAL_AUDIT_SPEC* is the audit firm's market share within each MSA in a given year and a two-digit SIC industry. All of our inferences hold when we repeat our analyses using *LOCAL_AUDIT_SPEC*.

VII. CONCLUSIONS

Most of the prior studies on the audit firm-client relationship examine the benefits and costs to client companies while ignoring how tenure affects the economics of audit firms. We isolate the benefits to audit firms from longer audit firm-client relationships. Specifically, we investigate whether: (1) audit firms charge a fee premium that is directly linked to tenure, (2) audit costs vary with tenure, and (3) the fee-tenure relation depends on the incumbent audit firm being engaged previously by the client.

[18]We assume that the engagement office of the audit firm administering the audit is located in the same city as the client's headquarters.

Our key findings are as follows: (1) audit fees increase over the duration of audit firm tenure because clients grow, on average, over time and because of a fee premium that is directly linked to tenure, (2) audit report lag declines monotonically over longer tenure, which suggests that audit engagements become more profitable over time, (3) the fee-tenure relation depends on the incumbent audit firm being engaged previously by the client, and (4) the benefits of longer audit firm-client relationships are mostly limited to the Big 4 audit firms with relatively fewer benefits to non-Big 4 audit firms.

Our results provide compelling evidence that Big 4 audit firms earn quasi rents. The magnitude of the quasi rents increases with tenure because Big 4 audit firms charge a sizable tenure-linked fee premium, which is non-linear in tenure, and because less audit effort is needed to provide the desired level of assurance as tenure lengthens and the decay in audit effort over longer tenure is also non-linear. Whether non-Big 4 audit firms earn quasi rents, if any, remains uncertain. Although audit costs decline with longer tenure for non-Big 4 audit firms, they tend to offer a tenure-linked fee discount which offsets some of the benefits of lower audit costs thereby eroding any quasi rents. Ultimately, the benefits of longer tenure, if any, are relatively small for non-Big audit firms.

This study provides new insights into the recent debate surrounding audit firm rotation by analyzing audit firm tenure and audit firms' economic welfare. The results from our study suggest a need to better monitor auditor independence and audit judgments when tenure is long because of an economic bonding between Big 4 audit firms and clients that tends to magnify over the length of the auditor-client relationship. Given our research design and sample selection criteria, one limitation of our study is that we can only comment on how tenure affects fees and profitability of audit firms for tenure values of less than 15 years.

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Figure 1
Audit fees and audit firm tenure

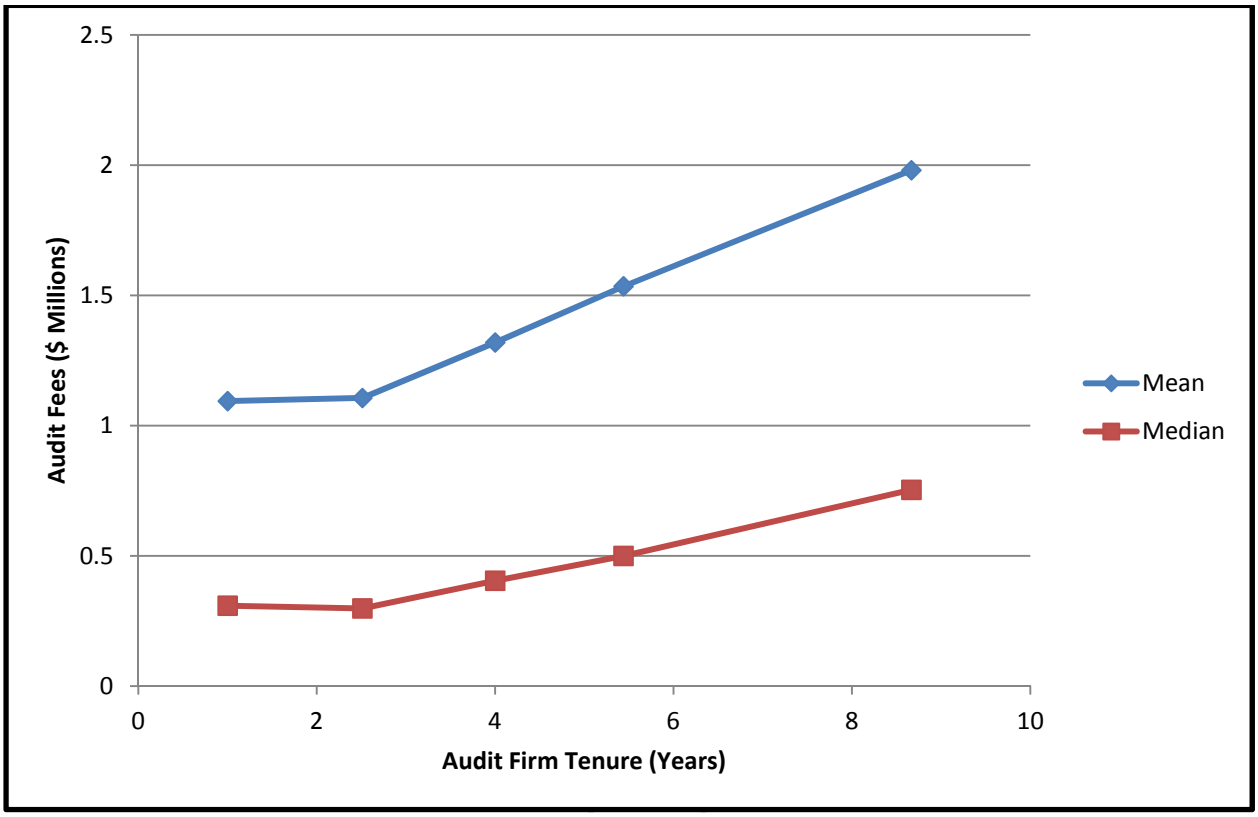

Figure 1 presents the mean and median of audit fees for each quintile of audit firm tenure. The graph is based on a sample with 21,855 observations from 2004 through 2013.

Figure 2
Audit effort and audit firm tenure

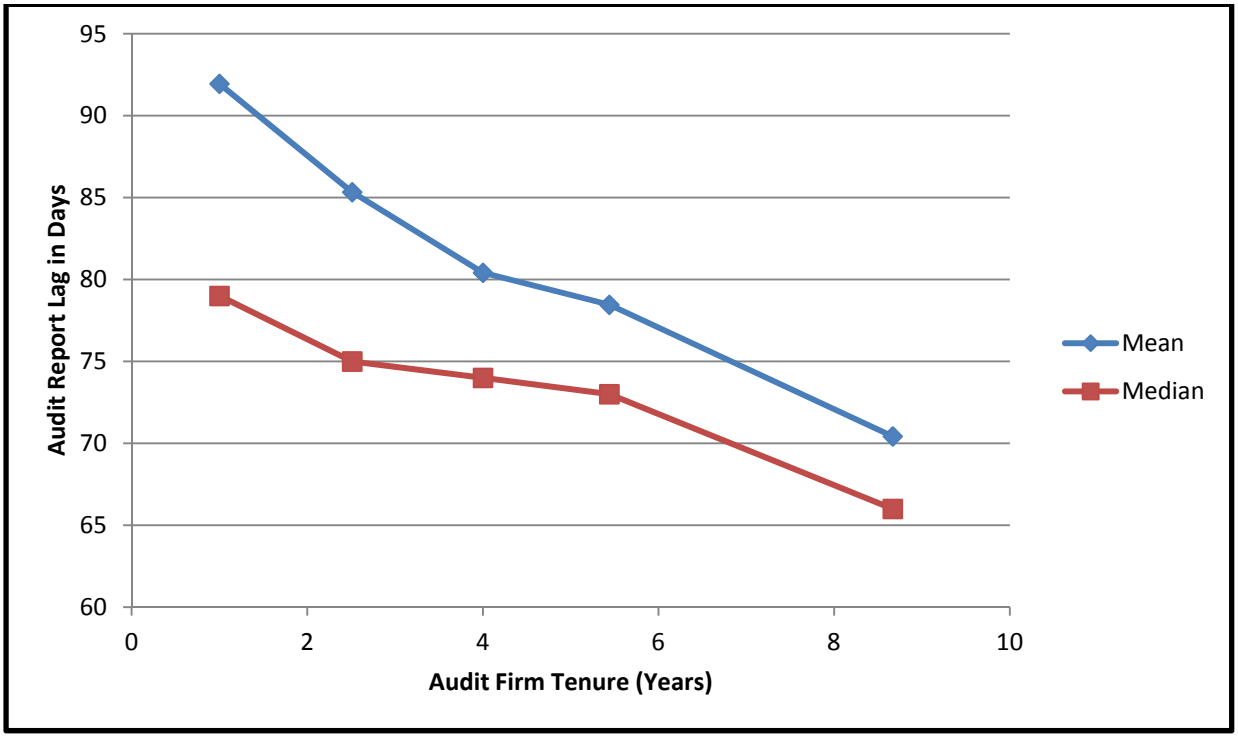

Figure 2 presents the mean and median of audit effort (audit report lag) for each quintile of audit firm tenure. The graph is based on a sample with 21,712 observations from 2004 through 2013.

Table 1

Panel A: Descriptive statistics

Variable	N	Mean	Q1	Median	Q3	Std
AUDIT_FEES ($ million)	21,855	1.40	0.15	0.41	1.22	3.69
AUDIT_TENURE (years)	21,855	4.36	2.00	4.00	6.00	2.77
AUDIT_OPINION	21,855	0.60	0.00	1.00	1.00	0.49
AUDIT_SPEC	21,855	0.12	0.00	0.18	0.23	0.12
AUDITOR_CHANGE	21,855	0.16	0.00	0.00	0.00	0.36
IC_OPINION	21,855	0.56	0.00	1.00	1.00	0.50
IC_WEAKNESS	21,855	0.04	0.00	0.00	0.00	0.20
BIG4	21,855	0.51	0.00	1.00	1.00	0.50
AT ($ billions)	21,855	2.87	0.02	0.14	0.81	13.58
LOSS	21,855	0.46	0.00	0.00	1.00	0.50
M&A	21,855	0.15	0.00	0.00	0.00	0.36
DISCONTINUED	21,855	0.17	0.00	0.00	0.00	0.38
BUSY_SEASON	21,855	0.71	0.00	1.00	1.00	0.45
INVENTORY	21,855	0.10	0.00	0.04	0.16	0.14
ROA	21,855	-2.37	-0.19	0.01	0.06	50.78
LEVERAGE	21,855	1.27	0.00	0.15	0.36	27.39
GROWTH	21,855	1.37	-0.04	0.06	0.22	82.64
CA_CL	21,855	5.37	1.10	1.84	3.22	169.29
CA_TA	21,855	0.52	0.29	0.52	0.75	0.27
MTB	21,855	47.37	1.10	1.54	2.68	1,557.09
PRCT_FOREIGNSALE	21,855	0.27	0.00	0.00	0.53	0.38
N_BUSSEG	21,855	1.81	1.00	1.00	3.00	1.54
AGE	21,855	16.40	8.00	14.00	23.00	10.32

Panel B: Big 4 versus Non-Big frequency

Year	N	Big 4	Non-Big 4
2004	2,121	58%	42%
2005	2,275	52%	48%
2006	2,402	49%	51%
2007	2,427	49%	51%
2008	2,405	49%	51%
2009	2,404	49%	51%
2010	2,419	50%	50%
2011	2,390	50%	50%
2012	2,427	49%	51%
2013	585	54%	46%
Total	21,855	51%	50%

Panel C: Audit firm change by audit firm size

	Lateral switches		Upward/Downward switches		
Year	Big 4 to Big 4	Non-Big 4 to Non-Big 4	Big 4 to Non-Big 4	Non-Big 4 to Big 4	Total
2004	89	135	214	23	461
2005	91	123	220	19	453
2006	90	130	121	31	372
2007	55	150	83	35	323
2008	67	196	52	27	342
2009	69	209	39	32	349
2010	44	311	30	27	412
2011	38	173	23	24	258
2012	54	256	30	21	361
2013	10	56	6	3	75
Total	607	1,739	818	242	3,406

AUDIT_FEES are annual audit fees. *AUDIT_TENURE* is the audit firm tenure in years. *AUDIT_OPINION* equals one if the audit firm issues an unqualified opinion, and zero otherwise. *AUDIT_SPEC* is the audit firm's national market share measured as audit fees collected from all clients in the same industry as the client expressed as a percentage of total audit fees for all audit firms in the same industry, for any given year, where industry is defined using a two-digit SIC code. *AUDITOR_CHANGE* equals one if a client engages a new audit firm, and zero otherwise. *IC_OPINION* equals one if the audit firm expresses an opinion on Section 404 of SOX, and zero otherwise. *IC_WEAKNESS* equals one if a client has material weaknesses in internal controls, and zero otherwise. *BIG4* equals one for a Big 4 audit firm, and zero otherwise. *AT* is total assets in billion dollars. *LOSS* equals one if a client reports negative net income, and zero otherwise. *M&A* equals one for merger and acquisition activities, and zero otherwise.

DISCONTINUED equals one for discontinued operations or extraordinary items, and zero otherwise. *BUSY_SEASON* equals one if a client's fiscal year end is December or January, and zero otherwise. *INVENTORY* is the ratio of inventory to total assets. *ROA* is the ratio of income before extraordinary items to total assets. *LEVERAGE* is the ratio of the sum of long and short-term debt to total assets. *GROWTH* is the growth in revenues between the current and prior year. *CA_CL* is the ratio of current assets to current liabilities. *CA_TA* is the ratio of current assets to total assets. *MTB* is the ratio of the sum of the market value of common equity, the book value of preferred stock and the book value of total debt to the book value of total assets. *PRCT_FOREIGNSALE* is the ratio of sales from foreign operations to total sales. *N_BUSSEG* is the number of business segments. *AGE* is the number of years a client is listed in *Compustat*. The sample includes 21,855 observations from 2004 to 2013.

Table 2
Audit fees and audit firm tenure

Panel A: Distribution of audit fees

		Audit fees ($ Millions)		% Increase in	% Increase in
Tenure Quintiles	Mean Tenure	Mean	Median	mean audit fees	median audit fees
Quintile 1 (Low)	1.00	1.09	0.31		
Quintile 2	2.51	1.11	0.30	1.1%	-3.6%
Quintile 3	4.00	1.32	0.41	19.3%	35.9%
Quintile 4	5.44	1.54	0.50	16.4%	23.5%
Quintile 5 (High)	8.67	1.98	0.75	29.1%	50.8%

Panel B: Regression analysis

	Full Sample	Big 4	Non-Big4
	(1)	(2)	(3)
INTERCEPT	-3.829***	-4.321***	-3.732***
	(-75.73)	(-41.74)	(-62.04)
AUDIT_TENURE	0.036***	0.072***	-0.036***
	(4.91)	(6.75)	(-3.78)
AUDIT_OPINION	-0.214***	-0.101***	-0.166***
	(-22.68)	(-7.54)	(-12.60)
AUDIT_SPEC	1.374***	0.834***	32.215***
	(7.67)	(4.75)	(28.86)
AUDITOR_CHANGE	0.019	0.073***	0.001
	(1.42)	(2.91)	(0.06)
IC_OPINION	0.300***	0.206***	0.329***
	(25.94)	(12.16)	(21.47)
IC_WEAKNESS	0.372***	0.499***	0.289***
	(16.97)	(18.53)	(8.65)
BIG4	0.013		
	(0.30)		
AT	0.423***	0.520***	0.327***
	(150.32)	(122.79)	(85.40)
LOSS	0.177***	0.165***	0.180***
	(17.50)	(11.55)	(13.41)
M&A	0.106***	0.087***	0.117***
	(8.60)	(5.70)	(6.26)
DISCONTINUED	0.242***	0.222***	0.214***
	(20.80)	(14.94)	(12.71)
BUSY_SEASON	0.023**	-0.028**	0.084***
	(2.29)	(-1.90)	(6.69)
INVENTORY	0.138***	0.214***	0.179***
	(3.27)	(2.98)	(3.63)
ROA	-0.001***	-0.087***	-0.001***
	(-13.44)	(-8.03)	(-9.91)
LEVERAGE	0.001***	0.102***	0.001***
	(9.09)	(7.90)	(5.78)
GROWTH	0.000	0.001	0.000
	(1.02)	(0.58)	(1.25)
CA_CL	0.000***	-0.002***	0.000***
	(-4.61)	(-6.70)	(-3.84)
CA_TA	0.241***	0.468***	0.187***
	(11.33)	(13.05)	(7.46)
MTB	0.000***	-0.009***	0.000***
	(5.96)	(-5.21)	(3.03)
PRCT_FOREIGNSALE	0.113***	0.007	0.204***
	(9.03)	(0.40)	(11.55)

N_BUSSEG	0.033***	0.028***	0.027***
	(10.83)	(7.99)	(5.36)
AGE	0.007***	0.004***	0.006***
	(14.02)	(5.67)	(9.17)
Adjusted R2	83.28%	77.47%	73.76%
Observations	21,855	11,037	10,818
Industry & year fixed effects	Yes	Yes	Yes

Panel A reports the distribution of audit fees across audit firm tenure quintiles. Panel B presents the regression coefficients and the t-statistics in parenthesis for the full sample and separately for the Big 4 and Non-Big 4 samples. The dependent variable *AUDIT_FEES* is the natural logarithm of annual audit fees. *AUDIT_TENURE* is the natural logarithm of audit firm tenure. *AUDIT_OPINION* equals one if the audit firm issues an unqualified opinion, and zero otherwise. *AUDIT_SPEC* is the audit firm's national market share measured as audit fees collected from all clients in the same industry as the client expressed as a percentage of total audit fees for all audit firms in the same industry, for any given year, where industry is defined using a two-digit SIC code. *AUDITOR_CHANGE* equals one if a client engages a new audit firm, and zero otherwise. *IC_OPINION* equals one if the audit firm expresses an opinion on Section 404 of SOX, and zero otherwise. *IC_WEAKNESS* equals one if a client has material weaknesses in internal controls, and zero otherwise. *BIG4* equals one for a Big 4 audit firm, and zero otherwise. *AT* is the natural logarithm of total assets. *LOSS* equals one if a client reports negative net income, and zero otherwise. *M&A* equals one if a client engages in merger and acquisition activities, and zero otherwise. *DISCONTINUED* equals one if a client reports discontinued operations or extraordinary items, and zero otherwise. *BUSY_SEASON* equals one if a client's fiscal year end is December or January, and zero otherwise. *INVENTORY* is the ratio of inventory to total assets. *ROA* is the ratio of income before extraordinary items to total assets. *LEVERAGE* is the ratio of the sum of long and short-term debt to total assets. *GROWTH* is the growth in revenues between the current and prior year. *CA_CL* is the ratio of current assets to current liabilities. *CA_TA* is the ratio of current assets to total assets. *MTB* is the ratio of the sum of the market value of common equity, the book value of preferred stock and the book value of total debt to the book value of total assets. *PRCT_FOREIGNSALE* is the ratio of sales from foreign operations to the firm's total sales. *N_BUSSEG* is the number of the firm's business segments. *AGE* is the number of years a client is listed in *Compustat*.

*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Table 3
Audit fees and audit firm tenure: Big 4 versus non-Big 4

	Big 4	Non-Big 4
	Coefficient (t-stat)	Coefficient (t-stat)
INTERCEPT	-4.379***	-3.693***
	(-41.68)	(-59.95)
TENURE2	0.122***	-0.080***
	(4.65)	(-4.00)
TENURE3	0.195***	-0.092***
	(7.50)	(-4.38)
TENURE4	0.196***	-0.077***
	(7.28)	(-3.45)
TENURE5	0.216***	-0.108***
	(7.71)	(-4.51)
TENURE6	0.209***	-0.067**
	(7.04)	(-2.57)
TENURE7	0.166***	-0.056*
	(5.31)	(-1.91)
TENURE8	0.164***	-0.073**
	(4.95)	(-2.16)
TENURE9	0.165***	-0.113***
	(4.64)	(-2.88)
TENURE10	0.167***	-0.153***
	(4.35)	(-3.00)
TENURE11	0.197***	-0.107*
	(4.82)	(-1.65)
TENURE12	0.248***	-0.079
	(4.49)	(-0.80)
TENURE12+	0.282***	-0.054
	(2.86)	(-0.31)
Adjusted R2	77.56%	73.80%
Observations	11,037	10,818
Control variables	Yes	Yes
Industry & year fixed effects	Yes	Yes

The table presents the audit fee regression coefficients and the corresponding t-statistics for the Big 4 and Non-Big 4 audit firms, respectively. The dependent variable *AUDIT_FEES* is the natural logarithm of annual audit fees. *TENUREk* equals one if the engagement is in its k^{th} year, and zero otherwise where k varies from 2 to 12. *TENURE12+* equals one if the engagement is in its thirteenth or fourteenth year, and zero otherwise. All the control variables from Table 2 have been included but the coefficient estimates are not reported for brevity.
*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Table 4
Audit fees and audit firm tenure: Prior audit firm-client relationship

	Big 4		Non-Big4	
	With Prior Relationship	Without Prior Relationship	With Prior Relationship	Without Prior Relationship
INTERCEPT	-4.423***	-4.302***	-3.040***	-3.830***
	(-12.84)	(-39.61)	(-17.61)	(-58.63)
AUDIT_TENURE	0.104***	0.049***	-0.027	-0.039***
	(3.76)	(4.22)	(-1.06)	(-3.71)
Control variables	Yes	Yes	Yes	Yes
Industry & year fixed effects	Yes	Yes	Yes	Yes
Adjusted R2	82.90%	77.54%	70.09%	74.72%
Observations	1,187	9,850	1,462	9,356
Tests of statistical difference:				
AUDIT_TENURE		0.055 (2.35)**		0.012 (1.95)*

The table presents the audit fee regression coefficients, and the corresponding t-statistics, separately for the Big 4 and Non-Big 4 samples. Columns (1) and (3) present the regression analyses for a sub-group of clients when the incumbent audit firm was retained by the client previously (Prior relationship), while Columns (2) and (4) present the regression analyses for a sub-group of clients when the incumbent audit firm was not retained by the client previously (Without prior relationship). The dependent variable *AUDITFEES* is the natural logarithm of annual audit fees. *AUDIT_TENURE* is the natural logarithm of audit firm tenure. All the control variables from Table 2 have been included but the coefficient estimates are not reported for brevity.
*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Table 5
Audit report lag and audit firm tenure

Panel A: Distribution of audit report lag

Tenure Quintiles	Mean Tenure	Audit Report Lag (Days) Mean	Median	% Decrease in Mean Audit Report Lag	% Decrease in Median Audit Report Lag
Quintile 1 (Low)	1.00	91.95	79.00		
Quintile 2	2.51	85.33	75.00	7.2%	5.1%
Quintile 3	4.00	80.42	74.00	5.8%	1.3%
Quintile 4	5.44	78.46	73.00	2.4%	1.4%
Quintile 5 (High)	8.67	70.43	66.00	10.2%	9.6%

Panel B: Regression analysis

	Big 4		Non-Big 4	
	(1) Coefficient (t-stat)	(2) Coefficient (t-stat)	(3) Coefficient (t-stat)	(4) Coefficient (t-stat)
INTERCEPT	4.295***	4.260***	4.354***	4.375***
	(81.80)	(79.91)	(139.88)	(138.03)
AUDIT_TENURE	-0.078***		-0.037***	
	(-15.71)		(-7.69)	
TENURE2		-0.019		-0.060***
		(-1.49)		(-5.87)
TENURE3		-0.062***		-0.057***
		(-5.14)		(-5.39)
TENURE4		-0.097***		-0.073***
		(-7.72)		(-6.50)
TENURE5		-0.111***		-0.062***
		(-8.38)		(-5.10)
TENURE6		-0.150***		-0.081***
		(-10.52)		(-6.00)
TENURE7		-0.155***		-0.085***
		(-10.15)		(-5.59)
TENURE8		-0.160***		-0.087***
		(-9.80)		(-4.91)
TENURE9		-0.175***		-0.074***
		(-9.80)		(-3.55)
TENURE10		-0.155***		-0.080***
		(-7.95)		(-2.95)
TENURE11		-0.158***		-0.087**
		(-7.49)		(-2.53)
TENURE12		-0.130***		-0.117**
		(-4.45)		(-2.16)
TENURE12+		-0.128**		-0.170*
		(-2.38)		(-1.83)
AUDIT_SPEC	0.160*	0.156	-4.015***	-4.022***
	(1.67)	(1.62)	(-6.85)	(-6.86)
GOING_CONCERN	0.148***	0.146***	0.124***	0.124***
	(8.82)	(8.71)	(13.45)	(13.42)
AT	-0.036***	-0.036***	-0.021***	-0.021***
	(-17.64)	(-17.60)	(-10.74)	(-10.75)
ROA	0.003	0.003	0.000	0.000
	(0.95)	(0.96)	(0.20)	(0.19)
LOSS	0.068***	0.068***	0.050***	0.049***
	(8.82)	(8.86)	(6.88)	(6.77)
LEVERAGE	0.010	0.010	0.000	0.000
	(1.45)	(1.47)	(1.22)	(1.20)

INVENTORY	0.062	0.063*	0.035	0.036
	(1.61)	(1.66)	(1.36)	(1.37)
DISCONTINUED	0.002	0.002	0.060***	0.060***
	(0.22)	(0.26)	(6.60)	(6.64)
M&A	-0.017**	-0.016*	0.034***	0.034***
	(-2.01)	(-1.93)	(3.37)	(3.42)
DEC	0.038***	0.038***	0.004	0.003
	(4.81)	(4.78)	(0.58)	(0.52)
PRCT_FOREIGNSALE	0.231***	0.231***	0.069***	0.069***
	(25.66)	(25.61)	(7.23)	(7.26)
N_BUSSEG	0.012***	0.012***	0.012***	0.012***
	(6.23)	(6.18)	(4.53)	(4.51)
AGE	-0.004***	-0.004***	-0.001***	-0.001***
	(-11.18)	(-10.90)	(-3.20)	(-3.71)
Adjusted R2	23.97%	24.13%	16.09%	16.22%
Observations	11,006	11,006	10,732	10,732
Industry & year fixed effects	Yes	Yes	Yes	Yes

Panel A reports the distribution of audit report lag across audit firm tenure quintiles. Panel B presents the regression coefficients, and the corresponding t-statistics, separately for the Big 4 and Non-Big 4 samples. The dependent variable *AUDIT_REPORT_LAG* is the natural logarithm of the number of days between the client's fiscal year-end and the audit report date. The independent variables are as follows. *AUDIT_TENURE* is the natural logarithm of audit firm tenure. *TENUREk* equals one if the engagement is in its k^{th} year, and zero otherwise where k varies from 2 to 12. *TENURE12+* equals one if the engagement is in its thirteenth or fourteenth year, and zero otherwise. *AUDIT_SPEC* is the audit firm's national market share measured as audit fees collected from all clients in the same industry as the client expressed as a percentage of total audit fees for all audit firms in the same industry, for any given year, where industry is defined using a two-digit SIC code. *GOING-_CONCERN* equals to one if the audit firm issues a going-concern modified report, and zero otherwise. *AT* is the natural logarithm of total assets. *ROA* is the ratio of income before extraordinary items to total assets. *LOSS* equals to one if the client reports negative net income, and zero otherwise. *LEVERAGE* is the ratio of the sum of long and short-term debt to total assets. *INVENTORY* is the ratio of inventory to total assets. *DISCONTINUED* equals one if a client reports discontinued operations or extraordinary items, and zero otherwise. *M&A* equals one if a client engages in merger and acquisition activities, and zero otherwise. *DEC* equals one if the client's fiscal year end is December, and zero otherwise. *PRCT_FOREIGNSALE* is the ratio of sales from foreign operations to total sales. *N_BUSSEG* is the number of the business segments. *AGE* is the number of years a client is listed in *Compustat*.

*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Table 6
Audit effort and audit firm tenure: By filer type

	Accelerated Filer		Non-Accelerated Filer
	Large Accelerated Filer Coefficient (t-stat)	Non-Large Accelerated Filer Coefficient (t-stat)	Coefficient (t-stat)
INTERCEPT	3.903***	4.154***	4.424***
	(54.51)	(62.77)	(115.44)
TENURE2	-0.039**	-0.035**	-0.047***
	(-2.20)	(-2.43)	(-3.58)
TENURE3	-0.088***	-0.030**	-0.044***
	(-5.21)	(-2.15)	(-3.31)
TENURE4	-0.125***	-0.053***	-0.062***
	(-7.26)	(-3.61)	(-4.34)
TENURE5	-0.123***	-0.070***	-0.046***
	(-6.92)	(-4.46)	(-2.92)
TENURE6	-0.158***	-0.092***	-0.081***
	(-8.48)	(-5.42)	(-4.62)
TENURE7	-0.155***	-0.096***	-0.100***
	(-7.87)	(-5.11)	(-5.05)
TENURE8	-0.162***	-0.115***	-0.098***
	(-7.79)	(-5.58)	(-4.25)
TENURE9	-0.172***	-0.109***	-0.09***
	(-7.66)	(-4.62)	(-3.38)
TENURE10	-0.156***	-0.118***	-0.095***
	(-6.36)	(-4.31)	(-2.93)
TENURE11	-0.169***	-0.129***	-0.093**
	(-6.53)	(-4.09)	(-2.40)
TENURE12	-0.130***	-0.127**	-0.136**
	(-3.82)	(-2.46)	(-2.31)
TENURE12+	-0.110*	-0.262***	-0.124
	(-1.82)	(-3.05)	(-1.13)
Adjusted R2	23.15%	11.87%	13.83%
Observations	5,679	6,044	7,864
Control variables	Yes	Yes	Yes
Industry & year fixed effects	Yes	Yes	Yes

The table presents the regression coefficients, and the corresponding t-statistics for the sub-group of the large accelerated filers, non-large accelerated filers, and non-accelerated filers, respectively. The dependent variable *AUDIT_REPORT_LAG* is the natural logarithm of the number of days between the client's fiscal year-end and the audit report date. The independent variables are as follows. *AUDIT_TENURE* is the natural logarithm of audit firm tenure. *TENUREk* equals one if the engagement is in its k^{th} year, and zero otherwise where k varies from 2 to 12. *TENURE12+* equals one if the engagement is in its thirteenth or fourteenth year, and zero otherwise. All the other control variables from Table 5 have been included but the coefficient estimates are not reported for brevity.

*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Table 7
Estimates from the restricted and unrestricted samples with Big 4 audit firms

Panel A: Audit fee regression				
	Restricted sample (Big 4)		Unrestricted sample (Big 4)	
	(1) coef. (t-stat)	(2) standardized coef. (t-stat)	(3) coef. (t-stat)	(4) standardized coef. (t-stat)
INTERCEPT	-4.321***	0.000***	-3.906***	0.000***
	(-41.74)	(-41.74)	(-68.73)	(-68.73)
AUDIT_TENURE	**0.072*** **	**0.041*** **	**0.025*** **	**0.017*** **
	(6.75)	**(6.75)**	**(-5.70)**	**(-5.70)**
Controls	Yes	Yes	Yes	Yes
Adj R2	77.47%	77.47%	80.92%	80.92%
N	11,037	11,037	37,175	37,175
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Panel B: Audit report lag regression				
	Restricted sample (Big 4)		Unrestricted sample (Big 4)	
	(1) coef. (t-stat)	(2) standardized coef. (t-stat)	(3) coef. (t-stat)	(4) standardized coef. (t-stat)
INTERCEPT	4.295***	0.000***	4.397***	0.000***
	(81.80)	(81.80)	(126.56)	(126.56)
AUDIT_TENURE	**-0.078*** **	**-0.150*** **	**-0.045*** **	**-0.094*** **
	(-15.71)	**(-15.71)**	**(-18.32)**	**(-18.32)**
Controls	Yes	Yes	Yes	Yes
Adj R2	23.97%	23.97%	25.39%	25.39%
Observations	11,006	11,006	37,027	37,027
Industry & year fixed effects	Yes	Yes	Yes	Yes

This table presents the raw and standardized regression coefficients and the t-statistics. The dependent variable in Panel A, *AUDIT_FEES,* is the natural logarithm of annual audit fees, while the dependent variable in Panel B, *AUDIT_REPORT_LAG,* is the natural logarithm of the number of days between the client's fiscal year-end and the audit report date. *AUDIT_TENURE* is the natural logarithm of audit firm tenure. All the other control variables from Table 2 and Table 5 have been included but the coefficient estimates are not reported for brevity.
*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Table 8
Audit firm tenure: Sub-period analysis for clients with Big 4 audit firms

Panel A: Audit fee regression

	Pre-crisis 2004-2007	Crisis 2008-2009	Post-crisis 2010-2013
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
INTERCEPT	-4.631***	-4.351***	-3.719***
	(-29.59)	(-22.16)	(-23.21)
AUDIT_TENURE	**0.074*** **	**0.056*** **	**0.076*** **
	(3.56)	**(2.61)**	**(5.35)**
Controls	Yes	Yes	Yes
Adj R2	75.56%	79.39%	81.26%
N	4,775	2,361	3,901
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

Panel B: Audit report lag regression

	2004-2007	2008-2009	2010-2013
	Coefficient (t-stat)	Coefficient (t-stat)	Coefficient (t-stat)
INTERCEPT	4.424***	4.470***	4.244***
	(51.74)	(45.50)	(58.96)
AUDIT_TENURE	**-0.089*** **	**-0.090*** **	**-0.064*** **
	(-8.83)	**(-9.09)**	**(-10.37)**
Controls	Yes	Yes	Yes
Adj R2	16.73%	29.73%	35.49%
N	4,759	2,357	3,890
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes

This table presents the regression coefficients and the t-statistics in parenthesis. The dependent variable in Panel A, *AUDIT_FEES,* is the natural logarithm of annual audit fees, while the dependent variable in Panel B, *AUDIT_REPORT_LAG,* is the natural logarithm of the number of days between the client's fiscal year-end and the audit report date. *AUDIT_TENURE* is the natural logarithm of audit firm tenure. All the other control variables from Table 2 and Table 5 have been included but the coefficient estimates are not reported for brevity.
*, **, *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.