

Auditor Tenure and the Ability to Meet or Beat Earnings Forecasts

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November, 2005

* The authors acknowledge the comments of Krish Krishnan, Rick Mendenhall, G. Peter Wilson, Arnie Wright and participants of the Boston College Accounting Workshop and AAA Annual and Auditing Mid-Year Meetings. Financial support from the Wallace E. Carroll School of Management is gratefully acknowledged by the second author.

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ABSTRACT

We examine the relation between auditor tenure and a firm's ability to use discretionary accruals to meet or beat analysts' earnings forecasts. Regulators have long expressed concern over the use of earnings management to attain earnings targets. These concerns are compounded by lingering questions over whether long-term auditor-client relationships impair an auditor's ability to independently stem such practices. The profession counter-argues that mandatory auditor rotation reduces auditors' familiarity with the client and would adversely affect audit quality. We find that firms with both short (three years or less) and long (15 years or more) tenure are more likely to have smaller absolute forecast error, and more likely to use discretionary accruals to meet or beat earnings forecasts. The results suggest that both short and long tenure have detrimental effects on audit quality. While auditor independence may decrease as auditor tenure lengthens, audit quality also suffers in new engagements.

1. Introduction

This paper examines the relation between auditor tenure and a firm's ability to successfully manage earnings to meet earnings forecasts. Motivated by a perceived decline in auditor independence and the belief that mandatory rotation might strengthen independence, the Securities and Exchange Commission (SEC), investors and the US Congress have all called for the study or enactment of mandatory auditor rotation (cf. Turner [1999], Turner and Godwin [1999], Trumka [2001]). In a 2003 report, the Government Accountability Office (GAO) did not recommend mandatory rotation, but made clear that they might support it in the future if auditor independence concerns persisted. In the meantime, other bodies interested in financial reporting quality continue to advocate for the use of mandatory rotation as a means of enhancing auditor independence (NYSE [2003], Commission on Public Trust and Private Enterprise [2003]).¹ As in the past, the accounting profession strongly opposes mandatory rotation. The profession asserts that mandatory rotation would increase costs and lead to a decrease in audit quality (cf. AICPA [1978, 1992], Elliot, Eddy, Kirtley and Melancon [2000], Melancon [2002], Copeland [2002], PricewaterhouseCoopers [2002]).

The relation between auditor tenure and audit quality has been the subject of several studies. However, work investigating the relation between auditor tenure and audit failures finds mixed evidence (e.g., Raghunathan, Lewis and Evans [1994], Geiger and Raghunandan [2002], Carcello and Nagy [2004], Myers, Myers, Palmrose and Scholz [2004]). In addition, the SEC [2001, p. 16] has indicated that they are more interested in less obvious ways in which independence can be impaired. In line with this, two recent studies (Johnson, Khurana and

¹ We define financial reporting quality as the extent to which reported income is measured in accordance with Generally Accepted Accounting Principles. Financial reporting quality is a function of audit quality - the performance of an audit in conformity with Generally Accepted Auditing Standards and the rendering of an opinion based on the evidence gathered. Audit quality is, in turn, dependent on auditor independence: the extent to which the auditor renders an unbiased opinion (DeAngelo [1981]).

Reynolds [2002], Myers, Myers and Omer [2003]) investigate the relation between tenure and financial reporting quality, as measured by the level of absolute discretionary accruals, and find that absolute discretionary accruals decreases with tenure. Implicit in these studies is the assumption that higher levels of discretionary accruals equate to increased earnings management and a reduction in audit quality.

In this paper, we evaluate the relation between auditor tenure and earnings management through earnings surprises (or forecast errors, defined as the difference between analysts forecasts and reported earnings), and by directly measuring the association between auditor tenure and the use of discretionary accruals to meet or beat forecasts. We initially test for a relation between auditor tenure and earnings quality using absolute forecast errors. If increased tenure is associated with reduced independence and greater auditor tolerance for earnings management to meet forecasts, there should be a negative relation between absolute forecast errors and auditor tenure. This alleged relationship between auditor tenure and firms' increasing ability to meet earnings expectations underlies, at least in part, the recent impetus for mandatory auditor rotation (GAO [2003], Biggs [2002], Levitt [1998], Pitt [2002]). In our second analyses, we test for a relation between tenure and whether discretionary accruals are actually used to meet or beat earnings forecasts. This provides for a more direct and compelling test of regulators' concerns that tenure is associated with a greater ability on the part of firms to report the discretionary accruals needed to meet analyst earnings forecasts.

Our sample includes 27,377 I/B/E/S firm-years encompassing 1988-2001. We observe a general decrease in absolute earnings forecast error and, more importantly, an increase in the use of discretionary accruals to meet or beat earnings forecasts when auditor tenure is three years or less *and* when tenure is fifteen years or longer. Our findings contribute to the literature as

follows. We provide the first evidence of a relation between long-term tenure and deteriorating audit quality, in the form of a firm's ability to manage earnings to meet or beat forecasts.

Together with our findings on short term tenure, these two results indicate that the relation between tenure and audit quality is nonlinear and may explain the mixed findings observed in earlier studies. Secondly, our results with respect to long tenure indicate that the tenure-related deterioration in audit quality occurs at a later point in the auditor-tenure relation than what has been considered in prior research (e.g., Johnson et al. [2002] and Carcello and Nagy [2004] define long tenure as more than eight years). Finally, we provide a more direct test of the relation between tenure and earnings management. Previous studies focus on just the level of discretionary accruals and implicitly assume that increased levels of accruals associated with tenure is evidence of greater earnings management. By examining the extent to which discretionary accruals are used to meet or beat forecasts, this approach more directly measures whether tenure is associated with an increased ability for firms to manage earnings.

In the next section we provide background on mandatory auditor rotation and briefly present arguments for and against such regulation. That is followed by a review of prior research and development of our hypotheses. This is followed by a discussion of our sample selection and variable measurement. The last two sections provide our empirical models and results, and summarize the study, present conclusions, and discuss limitations.

2. Background

The efficacy of mandatory auditor rotation as a means of enhancing auditor independence has been debated off and on over the last thirty years (c.f., AICPA [1978, 1987], Turner [1999], US Congress [2002]). The current interest in mandatory auditor rotation has its roots in two

concerns expressed by the SEC beginning in the mid 1990's about a perceived decline in the quality of financial reporting (Levitt [1998]). The first concern was that firms were increasingly managing earnings to meet analyst forecasts, using income-increasing accruals in times when earnings were low and income-decreasing accruals to create 'cookie jar' reserves when earnings were high. The second concern was that auditors were failing to serve as an effective check on earnings management as a result of alleged impaired independence due to the changing nature of the public accounting profession (c.f., Turner [1999], Turner and Godwin [1999]).

Prior to the SEC taking action on mandatory auditor rotation, the financial reporting crisis of the early 2000's arose. Subsequent Congressional investigations into financial reporting resulted in the passage of the Sarbanes-Oxley Act of 2002. Mandatory auditor rotation was among the actions proposed for enhancing auditor independence and financial reporting quality, and the final act called for a GAO study of mandatory auditor rotation (US Congress [2002]).

The basic arguments for and against mandatory auditor rotation appear in numerous reports and articles.² Briefly, the arguments against mandatory rotation are that, in addition to increasing audit costs, it also reduces auditors' familiarity with the client and consequently reduces audit quality. Opponents of mandatory rotation argue that current regulations, the existing litigation climate, and auditors' economic incentives to preserve their reputations, make mandatory rotation unnecessary. The profession asserts that there is no evidence that long-term auditor tenure impairs audit quality and that the primary consequence of regulation will be increased costs to clients and investors (c.f. AICPA [1997], PricewaterhouseCoopers [2002]).

The profession further argues that there is a positive relation between tenure and auditor quality,

² For extended discussion of the arguments for and against rotation, see the Commission on Auditor Responsibilities (AICPA [1978]); the National Committee on Fraudulent Financial Reporting (AICPA [1987]), the AICPA White Paper [1992], the SEC's chief accountant's call for academic research (Turner 1999); the AFL-CIO petition to the SEC (Trumka [2001]), as well as Brody and Moscovice [1998] and Myers et al. [2003].

and that mandatory rotation will most likely impair, not enhance, audit quality (c.f. AICPA [1992], Elliot et al. [2000], AICPA [1978], Copeland [2002], PricewaterhouseCoopers [2002]).

The basic argument for mandatory rotation is that it provides a ‘fresh look’ at a client’s financial statements and changes the economic incentives of the auditor. Proponents of mandatory auditor rotation claim that it would provide a powerful peer review effect (Seidman [2001], Biggs [2002], Public Oversight Board [2002]). Further, they argue that mandatory rotation reduces the present value to the auditor of the auditor-client relationship, thus mitigating incentives to reduce objectivity (Biggs [2002]). Finally, they claim that psychological effects of long term auditor client relationships impair auditor objectivity in the client’s favor through what may generally be classified as self-serving judgment biases. By their nature, these biases occur without auditors being aware of them and consequently are more difficult to remedy by economic sanctions, professional regulations like those described above or by moral suasion (Bazerman, Morgan and Lowenstein [1997]).

The GAO [2003] reviewed these arguments and related empirical work. In addition, it conducted a survey of preparers, auditors and users. The survey data generally supported the assertion that mandatory rotation would result in additional costs. However, there was disagreement among the survey participants regarding potential benefits. The results of the empirical studies reviewed (see below) also failed to provide strong evidence of benefits from mandatory rotation. Based on these results, the GAO concluded that mandatory rotation was likely not a cost-efficient means of enhancing independence and instead chose to recommend that other reforms (e.g., elimination of certain consulting services) be relied on to enhance auditor independence. At the same time, the GAO made clear that mandatory rotation is an option for future implementation if enacted reforms do not prove effective.

3. Prior Research

The original line of research investigating the effects of auditor tenure focused on audit failures (AICPA [1978, 1987], Raghunathan et al. [1994], Geiger and Raghunandan [2002], Carcello and Nagy [2004]). A related work has examined the relation between tenure and earnings restatements (Myers et al. [2004]). These studies have produced equivocal evidence, with Geiger and Raghunandan [2002] and Carcello and Nagy [2004] finding that audit failures (defined as failure to issue a going-concern opinion to soon-to-be bankrupt clients and firms subject to SEC accounting and auditing enforcement actions [AAERs], respectively) are more likely in the early years of an audit engagement, and Raghunathan et al. [1994] finding that problem audits are more likely in the first-year and when auditor tenure is longer than five years.³ Dopuch, King and Schwartz [2001], in a controlled experiment, find that subjects are more likely to issue unbiased reports when mandatory rotation is imposed. Casterella, Knechel and Walker [2004] also find evidence of a positive relation between tenure and auditor reporting bias. However, Myers et al. [2004] find no relation between annual earnings restatements and auditor tenure.⁴

The use of auditor opinions, AAERs or restatements as measures of audit quality is both a strength and a limitation of the above studies. It is a strength in that they provide an unambiguous measure of quality. It is a weakness in that it may limit generalizability and work *against* finding a relation between tenure and audit quality. Failure to issue a going-concern opinion when the client subsequently goes bankrupt and the issuance of an AAER are relatively

³ Raghunathan et al. [1994] define firms appearing on the SEC Docket because of financial statement misrepresentations as problem audits.

⁴ In related work Mansi, Maxwell and Miller [2004] and Ghosh and Moon [2005] examine the relationship between tenure and capital markets' perceptions of audit quality. In general, their results are consistent with tenure having a positive effect on perceived audit quality.

infrequent and atypical events. Further, they generally result from fairly egregious lapses in audit quality. Impaired audit quality stemming from a decline in independence need not be as extreme as these metrics imply. It is likely that audit quality is gradually impaired long before it results in an outcome as dramatic as, for example, an AAER. Perhaps in recognition of these issues, the SEC has indicated that they do not find the results of audit failure studies persuasive and has explicitly stated that they are interested in more subtle ways in which auditor independence may be compromised (SEC [2001, p.16]).

Consistent with the SEC's expressed interest, two recent studies have examined the relation between auditor tenure and discretionary accruals (Johnson et al. [2002] and Myers et al. [2003]). Using the amount of discretionary accruals as a measure of earnings quality, both Johnson et al. [2002] and Myers et al. [2003] find evidence suggesting that earnings quality deteriorates with short tenure but *not* with longer tenure. While there is a substantial body of research that uses discretionary accruals to capture earnings quality (e.g., Becker, DeFond, Jambalvo and Subramanyam [1998], Francis, Maydew and Sparks [1999], Francis and Krishnan [1999]), neither study controls for potential differences among firms' incentives and abilities to manage earnings, implicitly assuming that they are pervasive and uniform across firms. In particular, they do not directly examine whether accruals are used to achieve specific earnings objectives, such as to meet or beat analyst forecasts.

4. Hypotheses

There is both empirical and anecdotal evidence that firms have incentives to meet analyst earnings forecasts by managing their reported earnings. For example, Bartov, Givoly and Hayn [2002] find that firms that meet or beat analysts' earnings forecasts consistently enjoy a

higher return than firms that fail to meet expectations. It is no surprise then that studies by Abarbanell and Lehavy [2003], DeGeorge, Patel and Zeckhauser [1999] and Kasznik [1999] provide evidence consistent with earnings management to meet earnings forecasts.

In this context, we examine whether clients' ability to meet analyst earnings forecasts is related to auditor tenure. Assuming that an audit effectively curtails the client's ability to manage earnings—either *upward* or *downward*—with respect to analysts' forecasts, there should be no systematic relation between auditor tenure and the absolute value of forecast errors. However if auditor tenure (either short or long) results in a lower quality audit, then it may be associated with an increased ability for the client to manage reported earnings to meet forecasted earnings, thus resulting in a smaller absolute value of forecast error. To investigate this issue we test the following hypothesis:

H1: There is no association between auditor tenure and the size of absolute forecast errors.

A negative relation between absolute forecast errors and tenure would be consistent with regulators' concerns that firms manage earnings to meet forecast, and that long-term auditor-client relationships impair independence and allow managers more latitude in managing earnings. A positive relation would be consistent with the audit firms' contention that audit quality improves as they become more familiar with their client, and become better able to constrain management's actions. However, an observed relation between tenure and forecast errors alone is subject to alternative interpretation and is not conclusive evidence of a relation between tenure and earnings quality. For example, prior studies have found that firms that switch auditors are more likely to be financially distressed and experience a change in management (Schwartz and Menon [1985]). These firms are likely to experience more volatile and less predictable earnings and thus have systematically greater absolute earnings surprises.

However, in this case, financial distress, rather than short auditor tenure, is more likely the primary driver behind the earnings disappointment. To further tighten the linkage between auditor tenure and firms' ability to manage earnings to meet forecasts, we integrate the use of discretionary accruals to meet or beat analysts forecasts in our analyses and make the following hypothesis:

H2: There is no association between auditor tenure and the frequency with which discretionary accruals allow firms to meet or beat earnings forecasts.

5. Sample Selection and Variable Measurement

The sample consists of firms on both Compustat and I/B/E/S for the period 1988-2001 with available accruals, auditor and forecast data as described below. We limit the sample to the period after 1987 because Hribar and Collins [2002]) show that accruals data is measured with error if not derived directly from the statement of cash flows. In addition, we exclude all firms that reported a merger or acquisition in Compustat using the same approach as Myers et al. [2003] and Hribar and Collins [2002]. We also exclude all firms with SIC codes from 6000-6999 (financial services) and 9000-9999 (non-classifiable establishments) because accrual estimation is problematic for these industry sectors.

Consistent with prior studies (Johnson et al. [2002], Myers et al. [2003]), we exclude firms in their first year with their auditor. Firms that switch auditors are often financially distressed, and studies argue that managers and auditors behave differently in the initial year of the engagement and cite the unusual level of discretionary accruals reported in the first year (Schwartz and Menon [1985], DeFond and Subramanyam [1998]). Consistent with Myers et al. [2003], we also exclude firms with auditor-client relationships that last less than five years because the abbreviated duration of the auditor-client relationship for these firms make

comparisons with longer tenure firms inappropriate. Furthermore, Myers et al. [2003] argue that the nature of the auditor-management relationship is atypical for these short tenure duration firms and find unusual levels of accruals for these firms. For additional insight, we conduct and discuss tests that include these “quick turnover” firms and first year clients and report them as additional analyses.

We measure tenure as the cumulative number of years the auditor has been employed by the firm since 1974, the first year in which Compustat identified auditors. A change in auditors due to an audit firm merger is treated as a continuation of the auditor-client relationship.

The discretionary component of total accruals (DA) was estimated from the following Jones [1991] model estimated cross-sectionally by industry (two-digit SIC code) and year:

$$TA_{it} = \beta_0 + \beta_1 PPE_{it} + \beta_2 \Delta REV_{it} + DA_{it} \quad (1)$$

where:

TA = total accruals, defined as operating income after depreciation (Compustat data item 178) minus cash flow from operations (Compustat data item 308);

PPE = net property, plant and equipment (Compustat data item 8);

ΔREV = change in annual net revenue (Compustat data item 12).

DA = discretionary accruals equal to the model residuals;

All variables are scaled by average total assets for the year.

To mitigate the effects of outliers, we delete the top and bottom 1% of total accruals and cash flow from operations per industry-year. We also exclude all industry-years that had fewer than eight observations. This resulted in a final sample of 27,377 firm-years representing 4,662 distinct firms.

5.1 Sample Characteristics

Table 1 provides some descriptive information about the number of auditors and length of auditor tenure. Panel A classifies the sample according to the number of auditors employed by each firm over the period 1988-2001 and the median number of years each client-auditor combination is represented in the sample. A large majority of the firms had the same auditor over the entire 14-year period (4,015 firms, representing 86.1% of the sample). Almost 13% of the sample had two auditors (604 firms) and the remainder had three to four auditors (less than 1%). Firms with one to two auditors had, on average, over five years of data in the sample while those with two or three auditors had an average of only three to four years.⁵ Panel B provides a distribution of the sample by length of tenure. Most of the sample is in their second to fifth and sixth to tenth years of audit (26% and 31% of the sample, respectively). Firms in their eleventh to fifteenth and sixteenth to twentieth years of tenure each represents approximately 15% of the sample, with the remaining 13% having an auditor tenure of over 20 years.

In results not reported in the tables, we find the sample to be dispersed over 53 different two-digit SIC industry codes with no single industry group constituting more than 9% of the sample. Reflecting the large firm composition of I/B/E/S, over 97% of the firm-years had a Big 5 auditor.⁶

6. Empirical Model and Results

To investigate if management's ability to meet analysts' forecasts is related to auditor tenure, we estimate the following models:

⁵ Although the sample includes only those that remained with their auditors for a minimum of five years, we used all available data on Compustat from 1974 onwards to determine the length of association. Inferences are similar when we limit our tests to auditor-client relationships that have a minimum of five years' representation in our sample.

⁶ The period examined includes years prior to the merger of the Big 5 firms. For brevity, we refer to the Big 6 and Big 5 firms uniformly as the Big 5.

$$AFE_{i,t} = \beta_0 + \beta_1 TENURE_{it} + \beta_2 \#ANLYST_{it} + \beta_3 FORSTD_{it} + \beta_4 HORIZON + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \beta_7 ROA_{it} + \sum \beta_j YEAR_{jt} + \sum \beta_k IND_{kt} + u_{it}, j = 1, \dots, 13, k = 1, \dots, 52 \quad (2)$$

$$AFE_{i,t} = a_0 + a_1 SHORT_{it} + a_2 LONG_{it} + a_3 \#ANLYST_{it} + a_4 FORSTD_{it} + a_5 HORIZON + a_6 SIZE_{it} + a_7 AGE_{it} + a_8 ROA_{it} + \sum a_j YEAR_{jt} + \sum a_k IND_{kt} + e_{it}, j = 1, \dots, 13, k = 1, \dots, 52 \quad (3)$$

where:

AFE = absolute forecast error calculated as the absolute value of (actual earnings per share - median consensus analysts' forecast)/stock price at the beginning of year t.

TENURE = auditor tenure, measured as the number of continuous years of auditor employment since 1974.

SHORT = indicator variable equal to one if auditor tenure is greater than one but less than four years; 0 otherwise.

LONG = indicator variable equal to one if auditor tenure is 15 years or greater; 0 otherwise.

#ANLYST = number of analysts making an earnings forecast.

FORSTD = forecast dispersion, calculated as the standard deviation of earnings forecasts.

HORIZON = forecast horizon, equal to the number of months between earnings announcement and the month when the earnings forecast was made.

SIZE = natural log of total assets.

AGE = age of the firm, defined as the number of years the firm has been listed on Compustat since 1972.

ROA = return on assets, equal to income before extraordinary items divided by average total assets.

YEAR_j = yearly dummies, equal to one for each of the years 1989 to 2001.

IND_k = two-digit SIC industry code dummies, equal to one if firm belongs to one of the first 52 two-digit SIC industries represented in the sample; 0 otherwise.

We use the median consensus forecast closest to the earnings announcement date and the I/B/E/S actual earnings per share from the I/B/E/S Historical Summary tape in our calculation of forecast error. To eliminate the effects of outliers, we winsorize all forecast data at the 1% and 99% levels.

We measure tenure using an ordinal tenure variable as well as separate dichotomous variables for short and long-tenure firms. Previous studies, such as Myers et al. [2003] and Ghosh and Moon [2005], measure tenure as the number of years of continuous service provided by the auditor as determined from Compustat as of a particular year. We use 1974 as the initial

year of calculating auditor tenure because Compustat did not identify auditor identity until 1974. This limits our ability to precisely measure auditor tenure for firms that have kept the same auditor since before 1974. In addition, using a continuous tenure variable assumes that the ability to manage earnings is linear over tenure. As an alternative approach, we also use separate indicator variables for short and long tenure firms in place of a single, continuous tenure variable. Using indicator variables to distinguish short from long tenure firms has the advantage of detecting non-linear relationships between tenure and forecast errors, as well as not suffering from the potential measurement error that arises from not knowing the auditor's identity prior to 1974. Consistent with earlier studies that use this approach (Johnson et al. [2002], Carcello and Nagy [2004]), we define short tenure as firms having auditor-client relationships lasting three years or less. For long tenure, we use a cut-off of fifteen years or more because it represents the maximum length by which long tenure can be measured without error.⁷ As additional analyses, we also use alternative cut-offs of four or five years for short tenure, and eight, ten, twenty and twenty-five years for long tenure.

Prior research has found that the closer the forecast is to the earnings announcement, the smaller the forecast error (Brown, Foster and Noreen [1985], O'Brien [1988]). Because the timing of the most recent forecast varies across firms, we include a control variable, HORIZON, which measures the number of months between earnings announcement and the most recent forecast available (similar results are obtained using only the earnings forecasts made at year-end). We also include the number of analysts covering a firm (#ANLYST), forecast dispersion (FORSTD) and firm size (SIZE) to control for cross-sectional differences in the information environment that may explain variation in forecast accuracy (Atiase [1985], Freeman [1987], Lys

⁷ Recall that Compustat identifies auditor identity commencing 1974. Because our sample begins in 1988 due to the availability of cash flow data, the longest tenure cut-off that can be defined with precision would be fifteen.

and Soo [1995]). Because earnings predictability may be related to the age of the firm, we also include it as a control variable. Consistent with the approach used by Myers et al. [2003], we define AGE as the number of years the firm has been listed on Compustat since 1972. The addition of age as a control variable in our models also provides some assurance that any observed results on the tenure variables are not due simply to the likely correlated effects of age.

Kothari, Leone and Wasley [2005] find that discretionary accruals are highly affected by firm performance. To control for the possibility that any observed earnings surprise behavior is caused simply by tenure-related financial condition, we include return on assets (ROA) as a control variable. Finally, to control for potential time-period or industry-specific effects, we also include yearly dummies using 1988 as the base period and industry dummies for each of the first 52 two-digit SIC industry codes represented in the sample.

6.1 Descriptive Statistics

Table 2 provides descriptive statistics for our sample. Mean (median) asset size is \$2,672 (439.2) million. As a point of reference, this is larger than the Compustat only sample used in Myers et al. [2003].⁸ Average cash flows and ROA (absolute discretionary accruals) are also greater (smaller) than their sample. Consistent with the forecast literature, there is evidence of analyst optimism in earnings forecasts, as the mean forecast error is negative (Fried and Givoly [1982], O'Brien [1988]). The mean forecast horizon is just over one month before the earnings announcement and the mean number of analysts covering each firm is approximately nine.

⁸ Myers et al. [2003] do not report descriptive statistics for their entire sample, but provide them by length of tenure. Comparisons are made based on the largest sub-group (tenure greater than four years). Inferences will be consistent with the full sample, however, as the other sub-groups are at the other end of the comparison, i.e., the other sub-groups have even less assets and cash flow and greater absolute discretionary accruals than the largest sub-group.

Table 3 provides the Pearson correlation matrix among the independent variables. Not surprisingly, correlations among the tenure variables are high, with correlation coefficients (ρ) ranging from 0.30 to 0.81. Age, size and tenure (continuous and indicator variables) are correlated with each other (ρ generally ranging from 0.14 to 0.78), and size is highly positively correlated with the number of analysts ($\rho = 0.65$). The latter result is not surprising as larger firms tend to have greater analyst following (Bhusan [1989], O'Brien and Bhusan [1990]). The rest of the variables have correlation coefficients less than 0.28. Subsequent specification tests indicate that multicollinearity does not drive our results.

6.2 Regression Results

Table 4 provides the absolute forecast error regression results using a continuous tenure variable in column one and indicator variables for short and long-tenure firms in column two. For brevity, we do not report the parameter estimates for the yearly and industry dummies although some are significant. All t-statistics are calculated based on White's [1980] heteroskedasticity-consistent covariance matrix. The continuous tenure variable is significantly negative at the 1% level, two-tailed test (t-statistic = -2.40, $P(t) = 0.008$). This indicates that the absolute forecast error declines with auditor tenure, and is consistent with the hypothesis that the longer the auditor tenure, the better able firms are to meet earnings forecasts. Using separate indicator variables for firms with tenure of less than four years (SHORT) and fifteen years or greater (LONG), however, we find significantly negative coefficients for *both* SHORT and LONG variables (5% level or better, two-tailed tests). These results indicate that absolute forecast error is likely to be smaller for firms in the early and latter years of the auditor-client

relationship, and are consistent with short and long tenure firms being better able to meet earnings forecasts than intermediate tenure firms.

We also reran the model using different specifications of the SHORT and LONG variables. For SHORT tenure, we used cut-offs of four and five years and found consistent results (significant at the 1% level, two-tailed tests). For LONG tenure, we use cut-offs of 8, 10, 20 and 25 years in place of the previous fifteen years or more. LONG remains significant at specifications of 20 or 25 years or more (1% level, two-tailed test), but is not significant at a cut-off of eight or ten years. The lack of significance of long tenure defined as eight or ten years or more suggests that previous studies' inability to find a significant result for long tenure may be due to the shorter time frame in which long tenure is defined. While there is no theoretical justification for why long tenure has to be defined as greater than 14 years, it is also not evident from the existing literature at which point in time audit quality begins to suffer from an extended auditor-client relationship.⁹

The control variables are mostly significant in the expected directions. The number of analysts (#ANALYST) and firm size (SIZE) are significantly negative. Consistent with the prior literature, these results indicate that forecast accuracy is positively related to analyst coverage and firm size (Brown et al. [1985], O'Brien [1988]). Forecast dispersion (FORSTD) and forecast horizon (HORIZON) are significantly positive, indicating that the lack of consensus among analysts and the tardiness of earnings forecast are more likely to result in greater absolute forecast error (Lys and Soo [1995]). ROA is also significantly negative, consistent with the expectation that profitability is associated with a firm's ability to meet earnings forecasts. In

⁹ We provide an assessment of the relative costs of short with long tenure by comparing the magnitude of their coefficients. For all specifications of short (2, 3, 4 and 5 years) and long (8, 10, 15, 20 and 25 years) tenure, we are unable to reject the null that both coefficients are equal.

contrast, the age of the firm is highly positive and not significant in the expected direction. This result suggests that the older the firm, the larger the forecast errors.¹⁰

6.3 Association between Discretionary Accruals and Forecast Errors

We tie together the observed tenure-related reduction in forecast error with the results of previous studies that have found discretionary accruals to be also related to tenure by examining if the discretionary accruals are directly used to meet earnings forecasts. For each observation, we first calculate non-discretionary EPS (NDEPS) which we define as:

$$\begin{aligned} \text{NDEPS} &= \text{Actual EPS} - \text{Discretionary accruals per share, or equivalently} \\ &= \text{Cash flow from operations} + \text{Non-discretionary accruals per share.} \end{aligned}$$

We then compute an adjusted absolute forecast error (ADJFE) where:

$$\text{ADJFE} = |\text{NDEPS} - \text{Median consensus analysts' forecast}|.$$

Essentially, ADJFE represents the difference between analysts' estimated earnings and the earnings number that management would report if no discretionary accruals were recorded. Stated differently, it represents the deficiency (or surplus) in earnings that management would like to reduce through discretionary accruals in order to meet earnings forecasts (or capture surpluses to benefit future earnings).

To measure management's ability to use discretionary accruals to meet or beat earnings forecasts, we use two measures. First, we compare the magnitudes of the original absolute forecast error with the adjusted absolute forecast error. We deem earnings management to be

¹⁰ We calculated condition indices to check for evidence of multicollinearity and found them to be over 50 in both of the regressions with maximum variance inflation factors (VIFs) of over 12. Condition indices of 30-100 and VIFs of over 10 are generally considered evidence of moderate to strong dependencies (Belsley, Kuh and Welsch [1980], Neter, Wasserman and Kunter [1990]). Further analyses reveal however, that once the industry and yearly dummies are excluded, condition indices drop below 25 and maximum VIFs to 2.3 (with continuous tenure, long and short tenure variables remaining significant). These results suggest that multicollinearity is not driving the significance of the tenure variables.

successful if absolute forecast error is lower with reported discretionary accruals than without (we refer to this as the *absolute forecast error minimization* objective). Descriptive results (not reported in tables) show that the absolute forecast error is significantly lower when discretionary accruals are included in earnings 92% of the time (significantly different from equal probability, at less than the 1% level, using both parametric and non-parametric tests), i.e., in the remaining 8% of the cases, absolute forecast error was greater with the discretionary accruals included in earnings than without. Although this is a relatively weak measure of earnings management, given that analysts are attempting to forecast earnings (as opposed to forecasting earnings minus discretionary accruals), we use this measure as a first attempt to capture managers' use of accruals to meet earnings objectives.¹¹

A second metric is *successful earnings management*, which we define as occurring anytime management: (i) uses positive discretionary accruals to meet or beat analysts' forecasts when earnings before discretionary accruals are below forecasts (34% of the sample); or (ii) uses negative discretionary accruals to minimize earnings surprise when earnings before discretionary accruals exceed forecasts (26% of the sample). In the first scenario, 'non-discretionary' income is below forecast and management uses discretionary accruals to meet or beat forecast (*profit-increasing accruals*). In the latter case, 'non-discretionary' earnings exceed earnings forecasts and management chooses to use discretionary accruals to squirrel away reserves for the future (*profit decreasing accruals*).¹²

¹¹ Research by Burgstahler and Eames [2003] and Liu [2004] argue that analysts actively incorporate earnings management into their forecasts. It is likely that both management and analysts jointly affect the extent to which earnings meet, surprise or disappoint. We attempt to control for factors that may affect analysts' ability to systematically over- or under-estimate earnings by including such variables as forecast dispersion, age, year and industry effects.

¹² We consider all other cases to be "unsuccessful" earnings management. These include all instances when firms failed to meet or beat earnings forecasts even after discretionary accruals or where earnings exceed (or miss) forecasts by a larger margin with discretionary accruals than without.

We then examine whether the use of discretionary accruals to manage earnings was related to auditor tenure by estimating the following probit models:

$$EM(1,2)_{i,t} = \beta_0 + \beta_1 TENURE_{it} + \beta_2 AGE_{it} + \beta_3 SIZE_{it} + \beta_4 ROA_{it} + \sum \beta_j YEAR_j + \sum \beta_k INDUS_k + u_{it} \quad (4)$$

$$EM(1,2)_{i,t} = \alpha_0 + \alpha_1 SHORT_{it} + \alpha_2 LONG_{it} + \alpha_3 AGE_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \sum \alpha_j YEAR_j + \sum \alpha_k INDUS_k + e_{it} \quad (5)$$

where: EM = dichotomous measures of earnings management success:

EM1 = indicator variable equal to one if absolute forecast error is smaller with discretionary accruals than without; 0 otherwise (i.e., absolute forecast error minimization objective).

EM2 = indicator variable equal to one if any of the following conditions hold: (i) forecast error is non-negative and adjusted forecast error is less than zero; or (ii) forecast error and adjusted forecast error are both greater than zero but forecast error is less than the adjusted forecast error; 0 otherwise (i.e., successful earnings management objective).

All other variables are as defined earlier.

We include age, size of the firm and ROA, as well as yearly and industry dummies to control for other potential factors that may affect the propensity of firms to use accruals to meet earnings forecasts. Results are reported in Panel A of Table 5. The first two columns provide the results using absolute forecast error minimization as the dependent variable while the last two columns use successful earnings management. For brevity, we again do not report the parameter estimates for the yearly and industry dummies although some of them are significant. Tenure as a continuous variable is significantly positive (at the 1% level or better, two-tailed tests) when absolute forecast error minimization is the objective but not for successful earnings management. In contrast, the indicator variable for long tenure firms is significantly positive at the 5% level in both cases although short tenure is not significant in either model. Overall, the results suggest

that long-tenure firms are more likely to engage in accruals management to minimize absolute forecast error and meet earnings objectives.¹³

6.4 Sub-analyses of successful earnings management

We examine next if the observed results apply consistently to the two instances of successful earnings management by estimating the probit equations separately for the case when *profit-decreasing* accruals are expected (because forecasts have been exceeded), and the case when *profit-increasing* accruals are expected (because non-discretionary earnings are below forecasts). Results are provided in Panel B of Table 5. The first two columns report the results for firms using profit-decreasing accruals and the last two columns are based on firms using profit-increasing accruals. For brevity, we do not report the parameter results for the yearly and industry indicator variables.

We find mixed evidence that tenure is related to firms' use of profit-decreasing accruals to reduce earnings because non-discretionary earnings already exceed forecast (i.e., use of cookie jar reserves). Neither the continuous tenure variable nor the long tenure indicator variable is significant. However, the short tenure firms appear to be significantly *less* inclined to use profit-decreasing accruals even though earnings forecasts have already been met.

Results on the use of profit-increasing accruals to meet or exceed earnings forecasts are much more consistent. Although the continuous tenure variable is not significant, both short- and long-tenure indicator variables are positively related to firms' ability to increase accruals when non-discretionary earnings are below forecasts. This suggests that firms that have had

¹³ Long tenure defined as eight or ten years or more is not significant in either model but are fully consistent when set to be in excess of 20 or 25 years or more. When short tenure is set to four or five years, it remains insignificant when absolute forecast error minimization is the objective, but becomes significantly positive (at the 5% level) for the successful earnings management model.

long-standing or recently engaged auditors are more likely to successfully use discretionary accruals to meet or exceed earnings forecasts.¹⁴

In sum, the results suggest the following: auditor tenure is associated with managers' use of accruals to minimize the difference between reported and forecasted earnings. Specifically, we find evidence consistent with auditor tenure being related to firms having greater ability to use accruals to minimize absolute forecast error, and using income-increasing accruals to meet or beat earnings forecasts but not with using income-decreasing accruals to minimize earnings surprise. However, we find that the relationship is non-linear. In particular, we observe that both short (three years or less) and long (fifteen years or more) tenure firms are more likely to use discretionary accruals to meet or exceed earnings forecasts.

6.5 Additional Analyses

6.5.1 Life-cycle Controls

Prior studies have argued that a firm's earnings and cash flows (and hence their accruals) are a function of where the firm is in its growth cycle. In particular, firms in the early stage of its growth cycle are more likely to report large positive accruals as their rapid expansion generates increases in working capital and income that exceed its operating cash flow. In contrast, firms in the declining stages of its life cycle are more likely to incur negative accruals as write-offs and write-downs produce income levels below their operating cash flow (Dechow and Ge [2005], Stickney, Brown and Wahlen [2004], Wild, Subramanyam and Halsey [2004]). Because auditor

¹⁴ In untabulated results, we also calculated the frequency of firms engaging in successful profit-increasing and profit-decreasing earnings management by length of tenure. We find that 36.5% (23.9%) and 36.4% (25.6%) of firms with tenure of three years or less and fifteen years or more, respectively, engaged in successful profit-increasing (decreasing) earnings management. In contrast, 32.6% (27.4%) of firms with auditor tenure of 6-14 years engaged in similar actions. We easily reject the null that there is no association between tenure and the frequency with which successful profit-increasing or decreasing actions are taken (Chi-square statistics of 43.8 and 18.2, respectively, which are significant at less than the 1% level).

tenure may be correlated with the life-cycle stage of the firm, we reestimate the models by including proxy measures for the firm's stage in its life-cycle to control for the potential association between accruals and life-cycle stage.

We use the same approach as Anthony and Ramesh [1992] in identifying a firm's life cycle. Firms are classified in one of three life-cycle stages (Growth, Mature and Decline) based on dividend yield (DP) and sales growth (SG), defined as follows:¹⁵

DP = dividend yield, equal to $([\text{common stock dividends}/\text{income before extraordinary items}] * 100)$.

SG = sales growth, equal to $([\Delta \text{sales}_t / \text{sales}_{t-1}] * 100)$.

For each firm-year, we calculate the median value of the variables based on the current and the previous four years (requiring a total of five years' data). We then rank all our observations by dividend yield and sales growth. Firms belonging to the bottom (top) third of dividend yield and top (bottom) third of sales growth were deemed to be high (low) growth stage life-cycle firms. Similar to Anthony and Ramesh [1992], we used a joint measure of both dividend yield and sales growth by simply adding the rank of both measures and classifying the top and bottom thirds of the combined ranking as GROWTH or DECLINE stage firms (we reversed the ranking of dividend yield to be consistent with that of sales growth in terms of identifying early growth or declining stage firms).

The characteristics of the sub-samples classified by life cycle stages are consistent with expectations and support the appropriateness of our classification scheme. Firms in the growth stage have the highest sales growth and discretionary accruals, and the least amount of profits, total assets, dividend yield and age. Firms in the declining stage have the lowest sales growth and discretionary accruals, but the greatest amount of profits, total assets, dividend yield and age.

¹⁵ Anthony and Ramesh [1992] use two other variables to identify the firm's lifecycle stage: age of the firm, which we already use in our model, and the relative amount of capital expenditures, which they subsequently dropped from their analyses as they found it not to have significant explanatory power.

We lose 18 observations due to the additional data requirements in calculating the life cycle proxies. In all variations of the life cycle proxies (individual or combined measures), the significance of the tenure variables remain unaffected. We report only the results using the combined ranks of the dividend yield and sales growth variables in Table 6. Panel A provides the results from using absolute forecast error as the dependent variable. Consistent with the original model, continuous tenure and both short and long tenure variables are significantly negative. In addition, we observe that both GROWTH and DECLINE are significantly negative, suggesting that firms in the early and declining stages of their life cycle are also more likely to meet earnings forecasts than firms in the mature stage.

Panel B provides the results of the probit models. Consistent with the previous results, we find that long tenure firms are more likely to use discretionary accruals to minimize forecast error, and that both short and long tenure firms are more likely to use profit increasing accruals to meet or exceed analysts' forecasts. Interestingly, we also find that firms in the growth stage of their life cycle are also more likely to use discretionary accruals to minimize forecast error as well as meet or beat earnings forecasts. We find no such association for firms in the declining stage, and in fact, observe that these firms are *less* likely to use profit increasing accruals. We also find no significant association between either of the life cycle stage proxies with the use of profit decreasing accruals to minimize earnings surprise. These results are also generally consistent with the expectation that firms in the growth (decline) stage of their life-cycle report greater (less) amounts of accruals. In sum, while we observe that firms in the growth stage of their life cycle appear engaged in the use of discretionary accruals to minimize forecast error and meet or beat forecasts, the addition of life-cycle proxies does not alter the significance of the tenure variables.

6.5.2 Controls for period-specific effects

To evaluate if the results are period-specific, we divide the sample into two periods: 1988-1994 and 1995-2001, and re-estimate the absolute forecast error and earnings management models under each sub-period. Results (not tabulated) for both time periods are generally consistent with those using the entire period. LONG and continuous tenure remained significantly negatively related to absolute forecast error in both periods. However, SHORT was significantly negative in only the first sub-period. As for the earnings management probit results, both LONG and continuous tenure remained significantly positively related to the use of accruals to minimize absolute forecast error. In terms of using profit-increasing accruals to meet or beat earnings forecasts, SHORT remained significantly positive in both periods while LONG was significantly positive only in the 1995-2001 period. Overall, the results do not indicate that the observed relation between tenure and firms' use of accruals to meet or beat earnings forecasts is period-specific.

6.5.3 Separate Analysis for Quick Turnover and First-year Engagement Firms

We also conduct separate tests that include the quick turnover and first-year engagement firms. In particular, we re-estimated all of the models but include a separate indicator variable for the quick turnover and first-year engagement firms. In untabulated results, we find these firms to behave in almost the opposite fashion as that of the short and long-tenure firms. In particular, we find both quick turnover and first-year engagement firms to have *greater* absolute forecast errors relative to intermediate tenure firms. Quick turnover firms are also significantly *less likely* to use discretionary accruals to minimize absolute forecast error and use profit-

increasing accruals when earnings are below forecasts. Short and Long tenure firms remain significantly related to minimizing absolute forecasts errors and the use of profit-increasing accruals even with these firms included in the tests.

Previous studies have found that firms that switch auditors are more likely to be financially distressed (Schwartz and Menon [1985], DeFond and Subramanyam [1998]). Consistent with Myers et al. [2003], we also find our quick turnover and first-year engagement firms to have significantly lower ROA, discretionary accruals and operating cash flow than our sample. These results are consistent with quick turnover and first-year engagement firms being in worse financial condition and having less financial flexibility to minimize their earnings shortfall.

6.5.4 Discretionary accruals tests

Prior studies have found tenure to be inversely related to the availability of discretionary accruals but we find that long tenure firms are more likely to use discretionary accruals to engage in successful earnings management to meet or beat forecasts and minimize forecast error. This raises the question as to whether our findings are due to differences in sample composition (Compustat versus I/B/E/S) or systematic differences in accrual needs of varying tenure firms to meet earnings objectives, e.g., if long-tenure firms are more likely to be profitable, they may require less discretionary accruals to meet earnings forecasts. To differentiate between these two potential explanations, we replicate the accruals models used by Myers et al. [2003] on our I/B/E/S sample. Using the same discretionary accruals measures and control variables used by Myers et al. [2003] but allowing for separate short and long tenure, we estimate the following model:

$$\text{ACCRUALS} = a_0 + a_1 \text{TENURE}_{it} + a_2 \text{AGE}_{it} + a_3 \text{SIZE}_{it} + a_4 \text{INDSAL}_{it} + a_5 \text{CFLOW}_{it} + a_6 \text{BIGN}_{it} + \sum \alpha_j \text{YEAR}_j + \sum \alpha_k \text{INDUS}_k + e_{it} \quad (6)$$

where:

ACCRUALS = accruals measure, defined as absolute discretionary accruals, negative discretionary accruals or positive discretionary accruals, scaled by average total assets.

TENURE = auditor tenure in years, also estimated using separate SHORT (two or three years) and LONG (15 years or greater) indicator variables.

INDSAL = industry sales growth, calculated as the ratio of industry sales (per two-digit SIC code) in year t over year t-1.

CFLOW = cash flow from operations, scaled by average total assets.

BIGN = indicator variable equal to one if firm is audited by a Big 6/5 auditor; 0 otherwise.

YEAR = indicator variables for each of the years 1989-2001.

INDUS = indicator variables for all but one of the 53 two-digit SIC industry groups represented in the sample.

AGE and SIZE are calculated as previously defined.

Results are reported in Table 7. For comparability, we report only the results that exclude the quick turnover firms and first-year engagements. Each of the three sets of two columns provides the results using absolute, negative and positive discretionary accruals as the dependent variable, respectively. Results show that tenure is positively related to absolute discretionary accruals, as are the individual SHORT and LONG indicator variables. We also find tenure and LONG to be negatively related to negative discretionary accruals and both SHORT and LONG (but not continuous tenure) to be positively related to positive discretionary accruals. Together with the forecast error and earnings management test results above, these results suggest that long tenure firms have greater amounts of discretionary accruals available, and are better able to utilize these accruals to minimize forecast error, and in particular, to meet or beat earnings forecasts. Short tenure firms, on the other hand, appear to have greater amounts of positive discretionary accruals but lesser amounts of negative discretionary accruals. The former is consistent with our earlier findings that short tenure firms are also better able to use

profit increasing accruals to meet or beat earnings; the latter is consistent with our finding that they are generally less likely to use profit-decreasing accruals.

However, these accruals results are inconsistent with Myers et al. [2003]. One potential explanation is that the I/B/E/S sample in our tests is systematically different from that of the Compustat sample used in Myers et al. [2003]. To determine if this might be the case, we re-estimated the same accruals models using the full Compustat sample (53,968 observations over 1988-2000). In tests not reported in the tables, we find results that are generally consistent with those of Myers et al. [2003] when we use the Compustat sample: tenure is negatively related to absolute and positive discretionary accruals, and positively related to negative discretionary accruals. When we substitute separate short and long tenure variables in place of continuous tenure, we find both short and long tenure variables to be significantly negatively (positively) related to absolute (negative) discretionary accruals. While continuous tenure is significantly negatively related to positive discretionary accruals, the individual short and long tenure variables are not significant.

These results indicate that systematic differences in accrual reporting behavior exist between the Compustat and I/B/E/S samples. Prior studies have found that bargaining power is increasing in client size. In particular, McKeown, Mutchler and Hopwood [1991] find that auditors are less likely to issue going-concern opinions for large firms (even after controlling for size effects on the likelihood of bankruptcy) while Nelson, Elliott and Tarpley [2002] find that audit adjustments are more likely to be waived by auditors for larger clients. The observed earnings management pattern for long tenure firms in the I/B/E/S, but not the Compustat, sample is consistent with larger, longer-tenure firms having greater leverage over their auditors in using accruals to meet or beat earnings forecasts. Consistent with this, we find the I/B/E/S sample to

be significantly larger (mean asset size of \$2,672 million versus \$1,753 million), more profitable (ROA of 0.03 versus -0.08) with greater operating cash flow (0.057 versus -0.000) and discretionary accruals (0.004 versus -0.002) than the Compustat sample.

6.5.5 Other Specification Tests

We conducted additional specification tests that include various other variables that may be associated with a firm's ability to meet earnings forecasts and/or use discretionary accruals to meet earnings objectives, with no significant change in our results. In particular, we reran our analysis using Myers et al. [2003] control variables but substituting our tenure variables (SHORT and LONG) for their continuous tenure measure and using our measures of earnings management (EM1 and EM2). We also estimated a model that included the control variables used by Myers et al. [2003] that were not included in our models (industry sales growth, cash flow from operations and an indicator variable for Big 5 auditors). Results on the tenure variables remain unaffected by the addition of any of these variables to the models. Industry sales growth and the Big 5 indicator variable were not significant in any of the models. Operating cash flow was significantly positively (negatively) related to absolute forecast error and the use of profit-decreasing (increasing) accruals to minimize (meet or exceed) earnings surprise. These results are consistent with prior studies who find that operating cash flow is negatively correlated with discretionary accruals (e.g., Dechow [1994] and Myers et al. [2003]).

Dechow, Sloan and Sweeney [1995] and Kasznik [1999] find that firms with extreme earnings exhibit significantly large or negative discretionary accruals. We control for this by re-estimating all models excluding firms in the top and bottom 1% and 5% of ROA, with no effect on the significance of our tenure variables. We also attempt to control for possible non-

linearities in the impact of age on the incentive to meet or beat analysts' forecasts. In particular, we use two separate indicator variables to represent the top and bottom decile of our sample in terms of age (young firms defined as age less than five and mature firms defined as age greater than 23). Results are similar with the exception of short tenure, which ceased to be significantly related to absolute forecast error but remained significantly positively associated with the use of profit-increasing accruals to meet or beat earnings forecasts.

7. Summary, Conclusion and Limitations

Mandatory auditor rotation has generated much debate over the last thirty years. Proponents point toward enhanced audit quality stemming from auditor rotation, arguing that it will eliminate the loss of objectivity and independence that is alleged to occur as auditor tenure increases. Opponents, including most of the accounting profession, argue that mandatory rotation will result in reduced familiarity with clients, which in turn, will lead to lower audit quality in general. The recent GAO study [2003] predicted that audit firm rotation would increase costs, but evidence of improved audit quality was equivocal and the GAO did not recommend enactment of mandatory rotation. However, the GAO indicated that their decision was not necessarily final and advocates of mandatory rotation continue to argue for its implementation.

We extend prior research addressing the relation between auditor tenure and earnings management by testing for a relation between tenure and forecast errors, and between tenure and the use of accruals to meet or beat earnings forecasts. The first set of tests are important as they establish whether or not firms are better able to minimize forecast errors as tenure increases – the first link in the relation identified as problematic by the SEC. The second set of tests more directly examine the relation between tenure and successful earnings management – the second

half of the relation identified as problematic by the SEC—and provide more persuasive evidence of a relation between tenure and audit quality (Levitt [1998], Turner [1999], Turner and Godwin [1999]).

Our findings indicate a reduction in absolute forecast error and more importantly, an increase in the *use* of discretionary accruals to meet or beat earnings forecasts in both the early and later years of the auditor-client relationship. These results are important for the following reasons.

First, they provide evidence consistent with the arguments put forth by *both proponents and opponents* of mandatory auditor rotation. Unlike prior research, we find evidence of increased earnings management in the later years of the relationship. Consistent with some of the past studies, we also find evidence of increased earnings management in the earlier years of the auditor client relationship. This non-linear relation between tenure and earnings quality may explain the mixed evidence observed in prior research. Second, we find that the negative impact of long-term tenure on audit quality becomes apparent only after the auditor-client relation extends beyond fourteen years. Prior research has generally tested for the effects of long-term tenure at an earlier point in the auditor-client relationship. Lastly, we provide a more powerful test of the association between tenure and earnings quality by directly linking tenure to firms' use of discretionary accruals to meet earnings forecasts.

The reported findings are consistent with the following characterization of the auditor-client relationship: During the early years of the relationship, the auditor lacks client-specific knowledge; as a result, audit quality suffers. As time goes on, the auditor's familiarity with the client increases and so does audit quality. However, as the relationship extends into the long

term, the auditor begins to lose independence. As a result of this loss of objectivity, audit quality deteriorates.

The implications of this characterization for regulators considering mandatory rotation focus primarily on the trade-offs between the costs of inefficiency and the loss of independence. Enactment of mandatory rotation will reduce the likelihood of impaired objectivity. However, the consequent increase in auditor turnover will result in efficiency costs as auditors must more frequently acquire client-specific knowledge for new engagements that they will now be able to use only for the shorter term. If mandatory rotation is not implemented, the impairment of audit quality associated with long-term auditor client relationships persists indefinitely. However, audit efficiency may be greater as auditors will less frequently be required to obtain client-specific knowledge for new engagements and, at least potentially, will be able to use that knowledge for the long run. The challenge to regulators will be to determine the right balance when contemplating new regulations.

An alternative interpretation of our results is that rather than auditor judgments exhibiting a liberal bias with respect to accruals in the early and later years of the auditor-client relationship, auditors are instead exhibiting a conservative bias in the middle years. However, the audit failure research discussed previously generally indicates that there is a reduction in audit quality in the early years, and sometimes in the later years, of the relationship. Past research also indicates that if auditors exhibit a conservative reporting bias then firms will switch auditors (Krishnan [1994]). Yet over 86% of our sample firms had only one auditor over the entire sample period, and firms in the middle tenure group in our sample are also much less likely to switch auditors than firms in the early years (3.1% versus 5.5%). These results are

inconsistent with auditors exhibiting an overly conservative bias during the middle years of the auditor-client relationship.

Finally, while our results provide evidence consistent with the assertions that both short-term and long-term auditor client relations may result in impaired audit and financial reporting quality, we do not directly measure independence-in-fact. Future research might investigate the extent to which auditor decision processes are affected by auditor tenure. Future research might also attempt to develop other measures of the costs associated with adopting and not adopting mandatory rotation.

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Table 1
Distribution by Auditors and Tenure¹

Panel A: Number of auditors and average length of representation per firm

<u>No. of auditors</u>	<u>No. of firms</u>	<u>% of firms</u>	<u>Mean no. of years in sample</u>
One	4,015	86.1%	5.3
Two	604	13.0	5.4
Three	41	0.9	4.5
Four	<u>2</u>	<u>0.0</u>	3.3
	<u>4,662</u>	<u>100%</u>	

Panel B: Distribution by length of tenure

2-5 years	7,057	25.8
6-10	8,475	31.0
11-15	4,148	15.1
16-20	4,095	15.0
Over 20	<u>3,602</u>	<u>13.2</u>
	<u>27,377</u>	<u>100%</u>

¹ Sample consists of 27,377 firm-year observations representing 4,662 distinct firms that had accruals, auditor and forecast data over the period 1988-2001. Firms in their first year with their auditor or that had the same auditor for less than five years (using data from as early as 1974 to determine length of auditor-client relationship) are excluded from the sample.

Table 2
Sample Descriptive Statistics

	<u>Mean</u>	<u>Median</u>	<u>Std Deviation</u>
Total assets (in millions)	2,672	439.2	8,596
Net income/Average total assets (ROA)	0.030	0.049	0.136
Cash flow from operations/Average total assets	0.081	0.092	0.120
Discretionary accruals/Average total assets	0.008	0.007	0.072
Absolute discretionary accruals/Average total assets	0.053	0.038	0.049
Tenure	11.17	9.0	6.9
Return on assets (Income before extraordinary items/Average total assets)	0.030	0.049	0.136
Age	12.68	12.0	7.4
Signed forecast error/Stock price	-0.003	0.000	0.021
Absolute forecast error/Stock price	0.009	0.002	0.019
Forecast horizon	1.004	1.0	0.146
Number of analyst forecasts	8.87	6.0	7.49
Forecast dispersion	0.078	0.030	0.149

Notes:

(1) Descriptive statistics are calculated based on 27,377 firm-years over the period 1988-2001, excluding first-year engagements and quick turnover firms.

(2) Discretionary accruals are estimated from the following model:

$$TA = \beta_0 + \beta_1 PPE + \beta_2 \Delta REV + DA$$

where:

TA = total accruals, defined as operating income after depreciation minus cash flow from operations.

PPE = net property, plant and equipment.

ΔREV = change in annual net revenue.

DA = discretionary accruals equal to the model residuals.

Forecast error is calculated as the difference between actual earnings per share and median forecasted earnings per share, divided by the stock price as of the beginning of the fiscal year. Forecast horizon is equal to the number of months between fiscal year-end and the month when the most recent median earnings forecast was made. Forecast dispersion is equal to the standard deviation of earnings forecasts per firm.

Table 3
Pearson Correlation Matrix

	LONG	TENURE	AGE	#ANALYST	FORSTD	HORIZN	SIZE	ROA
SHORT	-0.311	-0.360	-0.232	-0.094	0.004	0.006	-0.137	0.000
LONG	1.000	0.808	0.654	0.240	-0.015	-0.009	0.341	0.118
TENURE		1.000	0.781	0.262	-0.023	-0.008	0.415	0.118
AGE			1.000	0.265	-0.024	-0.008	0.477	0.137
#ANALYST				1.000	-0.029	-0.020	0.648	0.154
FORSTD					1.000	0.006	0.087	-0.271
HORIZN						1.000	-0.014	-0.015
SIZE							1.000	0.165
ROA								1.000

Notes:

(1) Correlations are based on 27,377 firm-year observations over the period 1988-2001 excluding first-year engagements and quick turnover firms.

(2) Variable definitions:

SHORT = 1 if auditor tenure is 3 years or less; 0 otherwise.

LONG = 1 if auditor tenure is 15 years or more; 0 otherwise.

TENURE = auditor tenure, measured as the number of continuous years of auditor employment since 1974.

AGE = discrete number of years firm has been listed on Compustat since 1972.

#ANALYST = number of analysts making an earning forecasts for the firm.

FORSTD = standard deviation of earnings forecasts made for firm.

HORIZON = forecast horizon, equal to the number of months between earnings announcement and the month when earnings forecast was made.

SIZE = natural log of total assets.

ROA = income before extraordinary items divided by average total assets.

Table 4
Absolute Forecast Error Regression Results
Coefficients and (T-statistics)

<u>Variables</u>	<u>Predicted</u> <u>Signs</u>	<u>(1)</u>	<u>(2)</u>
INTERCEPT		-0.000 (-0.16)	-0.001 (-0.53)
TENURE	(±)	-0.000** (-2.40)	-
SHORT	(±)	-	-0.001** (-2.51)
LONG	(±)	-	-0.002*** (-5.23)
#ANALYST	(-)	-0.000*** (-18.16)	-0.000*** (-18.416)
FORSTD	(+)	0.039*** (22.76)	0.039*** (22.79)
HORIZON	(+)	0.006*** (4.39)	0.006*** (4.34)
SIZE	(-)	-0.000** (-2.26)	-0.000** (-2.12)
AGE	(-)	0.000 (2.40)	0.000 (3.46)
ROA	(-)	-0.029*** (-17.27)	-0.029*** (-17.26)
Adj. R ²		0.225	0.226

Notes:

1) Models estimated for columns (1) and (2) based on 27,377 firm-years are, respectively:

$$(1) AFE_{it} = \beta_0 + \beta_1 TENURE_{it} + \beta_2 \#ANALYSTS_{it} + \beta_3 FORSTD_{it} + \beta_4 HORIZON_{it} + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \beta_7 ROA_{it} + \sum \beta_j YEAR_{jt} + \sum \beta_k INDJ_{kt} + e_{it}$$

$$(2) AFE_{it} = a_0 + a_1 SHORT_{it} + a_2 LONG_{it} + a_3 \#ANALYST_{it} + a_4 FORSTD_{it} + a_5 HORIZON_{it} + a_6 SIZE_{it} + a_7 AGE_{it} + a_8 ROA_{it} + \sum \alpha_j YEAR_{jt} + \sum \alpha_k INDJ_{kt} + v_{it}$$

Parameter estimates and statistics for the yearly and industry dummies are not reported although some of them are significant. All t-statistics are adjusted using White's [1980] correction for heteroskedasticity.

2) Variable definitions:

AFE = absolute forecast error equal to the absolute value of (actual earnings per share less median consensus analysts' forecast)/stock price at the beginning of the year.

YEAR = yearly dummies for each of the years 1989-2001.

IND = industry dummies for each of the first 52 two-digit SIC industry codes represented in the sample.

All other variables are defined in Table 3.

*** significant at the 1% level; ** significant at the 5% level, all using two-tailed test.

Table 5
Earnings Management Probit Results
Coefficients and Z-scores

PANEL A

<u>Variables</u>	Absolute Forecast Error Minimization		Successful Earnings Management	
TENURE (±)	0.010 ^{***} (3.61)	-	0.002 (1.02)	-
SHORT (±)	-	-0.0232 (-0.51)	-	0.039 (1.30)
LONG (±)	-	0.083 ^{**} (2.29)	-	0.051 ^{**} (2.12)
SIZE (+)	0.063 ^{***} (6.83)	0.064 ^{***} (6.93)	0.023 ^{***} (3.91)	0.022 ^{***} (3.84)
AGE (+)	-0.007 (-2.48)	-0.003 (-1.37)	-0.004 (-2.41)	-0.005 (-3.04)
ROA (+)	1.240 ^{***} (14.14)	1.243 ^{***} (14.15)	1.748 ^{***} (18.79)	1.747 ^{***} (18.77)
Model Fit (χ^2)	614.70 ^{***}	606.45 ^{***}	1127.99 ^{***}	1132.15 ^{***}
Pseudo R ²	0.047	0.047	0.042	0.042

PANEL B

<u>Variables</u>	Profit Decreasing Accruals		Profit Increasing Accruals	
TENURE (±)	0.000 (0.07)	-	0.001 (0.64)	-
SHORT (±)	-	-0.083*** (-2.58)	-	0.118*** (3.78)
LONG (±)	-	-0.040 (-1.57)	-	0.084*** (3.43)
SIZE (+)	0.019*** (3.18)	0.019*** (3.29)	0.016*** (2.79)	0.015*** (2.62)
AGE (+)	-0.003 (-1.46)	-0.002 (-1.01)	-0.0012 (-0.81)	-0.003 (-1.97)
ROA (+)	-0.708*** (-11.02)	-0.706*** (-10.98)	3.802*** (22.83)	3.797*** (22.85)
Model Fit (χ^2)	369.69***	378.35***	969.01***	998.81***
Pseudo R ²	0.012	0.013	0.074	0.075

Notes:

1) Sample includes 27,377 firm-year observations that exclude all quick turnover and first-year engagement firms.

2) Models estimated using probit, respectively, are:

Panel A: EARN MGT (1,2) = $\beta_0 + \beta_1 \text{TENURE}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{AGE}_{it} + \beta_4 \text{ROA}_{it} + \sum \beta_j \text{YEAR}_{jt} + \sum \beta_k \text{IND}_{kt} + e_{it}$

Panel B: EARN MGT (3,4) = $a_0 + a_1 \text{SHORT}_{it} + a_2 \text{LONG}_{it} + a_3 \text{SIZE}_{it} + a_4 \text{AGE}_{it} + a_5 \text{ROA}_{it} + \sum \alpha_j \text{YEAR}_{jt} + \sum \alpha_k \text{IND}_{kt} + v_{it}$

Parameter estimates and statistics for the yearly and industry dummies are not reported although some of them are significant. All t-statistics are calculated using robust standard errors.

3) Variable definitions:

Panel A: EARN MGT = indicator variable equal to one if (1) inclusion of discretionary accruals in earnings resulted in lower absolute forecast error (absolute forecast error minimization model); 0 otherwise; (2) inclusion of discretionary accruals in earnings resulted in [i] smaller forecast errors when both earnings and non-discretionary earnings exceed forecasts or [ii] earnings meeting or beating forecasts when it otherwise would not have; 0 otherwise

Panel B: EARN MGT = indicator variable equal to one if (3) inclusion of discretionary accruals in earnings resulted in a smaller forecast error when both earnings and non-discretionary earnings exceed earnings forecasts (profit-decreasing accruals), 0 otherwise; and (4) inclusion of discretionary accruals in earnings resulted in meeting or beating earnings forecasts when it otherwise would not have (profit-increasing accruals); 0 otherwise.

All other variables are defined in Tables 3 or 4.

*** significant at the 1% level; ** significant at the 5% level, all two-tailed tests.

Table 6
Earnings Management Probit Results with Life Cycle Proxies
Coefficients and T-statistics (Z-scores)

PANEL A

<u>Variables</u>	<u>Absolute Forecast Errors</u>	
TENURE (±)	-0.000* (-1.92)	-
SHORT (±)	-	-0.001*** (-2.66)
LONG (±)	-	-0.001*** (-4.52)
#ANLYST (-)	-0.000*** (-17.84)	-0.000*** (-17.80)
FORSTD (+)	0.039*** (22.67)	0.039*** (22.69)
HORIZON (+)	0.006*** (4.33)	0.006*** (4.28)
SIZE (+)	-0.000 (-1.04)	-0.000 (-0.99)
AGE (-)	0.000 (2.76)	0.000 (3.83)
ROA (+)	-0.028*** (-17.12)	-0.028*** (-17.11)
GROWTH	-0.002*** (-5.88)	-0.002*** (-6.07)
DECLINE	-0.003*** (-10.59)	-0.003*** (-10.30)
Model Fit (F-stat)	33.87***	33.46***
Adjusted R ²	0.229	0.229

PANEL B

<u>Variables</u>	<u>Absolute Forecast Error Minimization</u>		<u>Profit Decreasing Accruals</u>		<u>Profit Increasing Accruals</u>	
TENURE (±)	0.011*** (3.77)	-	0.000 (0.01)	-	0.002 (1.06)	-
SHORT (±)	-	-0.019 (-0.44)	-	-0.082*** (-2.55)	-	0.122*** (3.90)
LONG (±)	-	0.091** (2.49)	-	-0.042 (-1.64)	-	0.098*** (3.95)
SIZE (+)	0.066*** (7.05)	0.067*** (7.15)	0.018*** (2.93)	0.018*** (2.99)	0.021*** (3.56)	0.021*** (3.47)
AGE (+)	-0.006 (-2.08)	-0.002 (-0.91)	-0.003 (-1.44)	-0.002 (-1.04)	0.000 (0.01)	-0.001 (-0.86)
ROA (+)	1.240*** (14.17)	1.243*** (14.17)	-0.714*** (-11.05)	-0.711*** (-11.01)	3.798*** (22.73)	3.793*** (22.76)
GROWTH	0.068** (2.20)	0.067** (2.17)	0.024 (1.09)	0.021 (0.96)	0.090*** (4.11)	0.094*** (4.32)
DECLINE	-0.025 (-0.78)	-0.024 (-0.75)	0.025 (1.10)	-0.028 (1.25)	-0.043** (-1.99)	-0.049** (-2.26)
Model Fit (χ^2)	622.54***	614.21***	370.16***	378.93***	1002.61***	1036.15***
Pseudo R ²	0.048	0.047	0.012	0.013	0.075	0.075

Notes:

1) Sample includes 27,359 firm-year observations that exclude all quick turnover and first-year engagement firms.

2) Models estimated for columns (1) and (2) of Panel A are, respectively:

$$(1) AFE_{it} = \beta_0 + \beta_1 TENURE_{it} + \beta_2 \#ANALYSTS_{it} + \beta_3 FORSTD_{it} + \beta_4 HORIZON_{it} + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + \beta_7 ROA_{it} + \beta_8 GROWTH_{it} + \beta_9 DECLINE_{it} + \sum \beta_j YEAR_{jt} + \sum \beta_k INDJ_{kt} + e_{it}$$

$$(2) AFE_{it} = a_0 + a_1 SHORT_{it} + a_2 LONG_{it} + a_3 \#ANALYST_{it} + a_4 FORSTD_{it} + a_5 HORIZON_{it} + a_6 SIZE_{it} + a_7 AGE_{it} + a_8 ROA_{it} + a_9 GROWTH_{it} + a_{10} DECLINE_{it} + \sum \alpha_j YEAR_{jt} + \sum \alpha_k INDJ_{kt} + v_{it}$$

Models estimated for Panel B using probit, respectively, are:

$$EARN\ MGT\ (1,2) = \beta_0 + \beta_1 TENURE_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 ROA_{it} + \beta_5 GROWTH_{it} + \beta_6 DECLINE_{it} + \sum \beta_j YEAR_{jt} + \sum \beta_k IND_{kt} + e_{it}$$

$$EARN\ MGT\ (3,4) = a_0 + a_1 SHORT_{it} + a_2 LONG_{it} + a_3 SIZE_{it} + a_4 AGE_{it} + a_5 ROA_{it} + a_6 GROWTH_{it} + a_7 DECLINE_{it} + \sum \alpha_j YEAR_{jt} + \sum \alpha_k IND_{kt} + v_{it}$$

where GROWTH = indicator variable equal to one for firms classified as belonging to Growth stage of life cycle based on high sales growth and low dividend yield.

DECLINE = indicator variable for firms classified as belonging to declining stage of life cycle based on low sales growth and high dividend yield.

Parameter estimates and statistics for the yearly and industry dummies are not reported although some of them are significant. All t-statistics are calculated using robust standard errors. All other variables are defined in Tables 3 or 4.

*** significant at the 1% level; ** significant at the 5% level, all two-tailed tests.

Table 7
Discretionary Accruals Regression Results

	<u>Absolute Discretionary</u>		<u>Negative Discretionary</u>		<u>Positive Discretionary</u>	
	<u>Accruals</u>		<u>Accruals</u>		<u>Accruals</u>	
SHORT	-	0.002* (1.92)	-	0.003** (2.05)	-	0.006*** (3.55)
LONG		0.002** (2.22)	-	-0.002** (-2.07)	-	0.002** (2.04)
TENURE	0.000* (1.89)	-	-0.000*** (-2.75)	-	0.000 (1.18)	-
AGE	-0.001*** (-10.30)	-0.001*** (-10.90)	0.001*** (8.40)	0.001*** (8.44)	-0.001*** (-7.06)	-0.001*** (-7.48)
SIZE	-0.005*** (-25.28)	-0.005*** (-25.25)	0.006*** (21.12)	0.006*** (21.09)	-0.004*** (-16.29)	-0.004*** (-16.20)
INDSAL	0.000 (0.29)	0.000 (0.27)	0.000 (0.62)	0.000 (0.63)	0.000 (1.14)	0.000 (1.13)
CFLOW	-0.040*** (-11.90)	-0.040*** (-11.86)	-0.012** (-2.47)	-0.012** (-2.51)	-0.099*** (-17.87)	-0.099*** (-17.87)
BIGN	-0.002 (-0.83)	-0.001 (-0.78)	-0.004 (-1.38)	-0.004 (-1.38)	-0.005* (-1.90)	-0.005* (-1.87)
Adj R-square	0.154	0.154	0.157	0.157	0.193	0.194

Notes:

(1) All t-statistics are calculated based on the White [1980] correction for heteroskedasticity. Models estimated are:

$$ACC_{it} = a_0 + a_1 TENURE_{it} + a_2 AGE_{it} + a_3 SIZE_{it} + a_4 INDSAL_{it} + a_5 CFLOW_{it} + a_6 BIGN_{it} + \sum a_j YEAR_{jt} + \sum_k a_k INDUS_{kt} + e_{it}$$

$$ACC_{it} = \beta_0 + \beta_1 SHORT_{it} + \beta_2 LONG_{it} + \beta_3 AGE_{it} + \beta_4 SIZE_{it} + \beta_5 INDSAL_{it} + \beta_6 CFLOW_{it} + \beta_7 BIGN_{it} + \sum \beta_j YEAR_{jt} + \sum \beta_k INDUS_{kt} + e_{it}$$

where ACC = accruals measure, defined as (1) absolute discretionary accruals, (2) negative discretionary accruals or (3) positive discretionary accruals

INDSAL = industry sales growth, calculated as the ratio of industry sales (per two-digit SIC code) per year t divided by the prior year sales.

CFLOW = cash flow from operations divided by average total assets.

BIGN = indicator variable equal to one if firm is audited by a Big 6/5 auditor; 0 otherwise.

All other variables are defined in table 3.

We suppress reporting the results of the intercept and yearly and industry dummy variables. Model is estimated using the 27,377 firm-year observations that exclude all quick turnover and first-year engagement firms.

(2) Discretionary accruals are estimated from the following model:

$$TA = \beta_0 + \beta_1 PPE + \beta_2 \Delta REV + DA$$

where:

TA = total accruals, defined as operating income after depreciation minus cash flow from operations.

PPE = net property, plant and equipment.

ΔREV = change in annual net revenue.

DA = discretionary accruals equal to the model residuals.

* significant at the 10% level, two-tailed test; ** significant at the 5% level, two-tailed test; *** significant at the 1% level, two-tailed test.