Journal of Forensic & Investigative Accounting
Vol. 1, Issue 1

Pre and Post-SOX Association between Audit Firm Tenure and Earnings Management Risk

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Recent proposals to limit auditor tenure to enhance audit quality and current requirements for the auditor to determine the risk of material misstatement and to assess the likelihood of fraudulent financial statements motivate our research on how the association between the auditor tenure and earnings management risk has evolved prior to and after the Sarbanes-Oxley Act of 2002 (SOX). The relationship between auditor tenure and audit quality has been a controversial issue for years. As the Enron and WorldCom fiascoes illustrate, high-profile financial scandals give proposals to limit auditor tenure a lot of "curb appeal."[1] Although Congress considered requiring the mandatory rotation of audit firms in SOX, they choose to require the rotation of lead and reviewing engagement partners instead.[2] Just two years later however, a $9 billion financial statement fraud at Fannie Mae renewed concerns over auditor tenure when part of the blame fell on KPMG, Fannie Mae's auditor of 36 years (Department of Housing and Urban Development's Office of Federal Housing Enterprise Oversight (OFHEA) 2006). Subsequently, the Department of Housing and Urban Development (HUD) issued a proposal for the mandatory

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[1] This phrase is taken from a comment made by Olivia Kirtley, former chair of the AICPA Board of Directors, about mandatory audit firm rotation during a PBS NewsHour forum on Wall Street Reform in July 2002.

[2] Section 203 of the Sarbanes-Oxley Act of 2002 calls for mandatory rotation of the lead and review of audit engagement partners every five years.

rotation of audit firms (HUD 2004, 19129),[3] which it later dropped (HUD 2005, 17308-17309). The International Monetary Fund (IMF), itself no stranger to financial scandals, stood by a similar proposal and now requires the mandatory rotation of audit firms (IMF 2004).

In a Congressionally mandated study, the Government Accountability Office (GAO) concluded that the costs of mandatory rotation exceed its benefits (GAO 2003). Tempering this conclusion, however, is GAO's "wait and see" attitude. In its report, GAO recommended that "the most prudent course at this time is for the SEC and the PCAOB to monitor the effectiveness of the act's requirements to determine whether further revisions, including mandatory audit firm rotation, may be needed to enhance auditor independence and audit quality to protect the public interest (2003, 5)." A conversation with a high ranking GAO official revealed a recent up tick in the number of inquiries to GAO by the user community (e.g., investors, creditors, and rating agencies) concerning mandatory auditor rotation. While GAO currently maintains its position from the 2003 study, it has noted that a mandatory auditor rotation policy is "gaining traction" and that it may have to reconsider the matter.[4] Consequently, the threat of mandatory rotation of audit firms remains.

One of the main concerns about a mandatory rotation policy is the claim that audit failures are more likely to occur in the first few years of auditor tenure. The AICPA, for example, asserts that there is a "positive correlation between auditor tenure and auditor competence" because "over successive audits, audit firms increase institutional knowledge, including, for example, their knowledge of the client's accounting and internal control systems and greater familiarity in the industry in which the client operates (AICPA 2004)." We

[3] The Department of Housing and Urban Development's Office of Federal Housing Enterprise Oversight (OFHEO, 2005) issued a proposal to amend Section 1710.18 of its corporate governance standards that would have required mandatory audit partner rotation every 5 years and mandatory audit firm rotation every 10 years.

[4] Private conservation with Jeanette Franzel, Director of Financial Management and Assurance at the U.S. Government Accountability Office (6/21/2007).

investigate this assertion by examining the link between audit firm tenure and earnings management risk over a five year time-period (from 2000 to 2004).

In this study, our primary focus is the risk of misstatements in the financial reporting process. Underlying this issue is the regulators' expectation that SOX would act as a mitigating force to fraudulent financial reporting thereby improving the quality of financial reports. We evaluate the earnings management risk of our sample firms both before and after SOX and examine how audit firm tenure is associated with this risk over time and whether the relationship has changed in the new regulatory (post-SOX) environment. We employ Beneish's (1999) recently developed measure for the probability of earnings manipulation (which we refer to as "earnings management risk"),[5] as the dependent variable of interest in the study. Beneish's measure, commonly referred to as "M-Score," itself is gaining traction within the practitioner community (e.g., Association of Certified Fraud Examiners), in the investing community (e.g., Forbe's Investopedia.com), as a pedagogic tool (e.g., Wiedman 1999), and in research (e.g, Teoh

[5] Following an approach developed by Beneish (1999), eight financial indicators are used to construct a composite score for earnings management risk (M-SCORE) and test its empirical association with the audit firm tenure. Prior studies (e.g., Johnson et al. 2002, Myers et al. 2003) have investigated the relationship between audit firm tenure and unexpected abnormal accruals, magnitude of discretionary accrual adjustments (which captures the summarized effect of managers' accounting policy choice), signed discretionary and current accruals. We focus on a specific measure of financial reporting problem that could be used as a direct warning signal for the probability of fraudulent financial reporting.

The M-SCORE constitutes a different measure of financial reporting quality to complement ones employed in prior research (e.g., abnormal accruals) as it captures not only the financial statement consequences of manipulation, but also incentives for manipulating earnings by exploiting information about specific accruals. Moreover, the M-SCORE has gained popularity among the practice and education communities as a tool to detect earnings manipulation. According to Beneish (1999), M-SCORE is effective in identifying a manipulator company from a non-manipulator company. In education, M-SCORE is a tool taught in financial statement analysis. For example, Cornell University's Johnson Graduate School of Management professors use Beneish's model to analyze Enron Corporation's financial statements. The analysis of the year 1998 reveals that Enron had been aggressively managing earnings in the previous reporting periods (Harrington, 2005). Wiedman (1999) developed an instructional case using M-SCORE to detect earnings manipulation. Investopedia.com describes "The Beneish Model" as a method to identify if a company has manipulated its earnings. (http://www.investopedia.com/terms/b/beneishmodel.asp).

et al. 1998; Jones et al. 2006). Our multivariate regression analysis covering a five-year time period (2000 to 2004) for a sample of New York Stock Exchange (NYSE) listed firms demonstrates that the earnings management risk is significantly and negatively related to the length of audit firm tenure. The association is, however, substantially attenuated in the post-SOX period. In general, we observe that the level of earnings management risk substantially decreases in the post-SOX years compared to the pre-SOX years. In particular, earnings management risk is greater in the pre-SOX years (2000-2001) when auditor tenure is short—three years or less. After the introduction of SOX (2002-2004), the association between audit firm tenure and earnings management risk has become virtually non-existent. Moreover, we find no evidence that long auditor tenure (i.e., nine years or more) is associated with the earnings management risk in any period. Overall, the results for short-tenure in the pre-SOX years are consistent with other studies of that era (e.g., Carcello and Nagy 2004, Geiger and Raghunandan 2002, Johnson et al. 2002, Myers et al. 2003). Furthermore, the decline in earnings management risk from the pre- to post-SOX periods is consistent with two contemporaneous studies that report lower discretionary accruals (Cohen et al. 2007) and less earnings management to meet/beat analyst earnings forecasts (Bartov and Cohen 2007) in the post-SOX period. Various sensitivity analysis tests indicate that industry effects do not influence the main results, that the results are also robust to alternative specifications of earnings management risk and auditor tenure; the results are also qualitatively similar when industry, mergers, new issuance of securities and restructuring are included in the analysis. Moreover, the change of auditor from Arthur Andersen does not influence the results.

This study contributes to the existing auditor tenure literature by documenting that the problem of financial misreporting, as proxied by a comprehensive measure of earnings

management risk, is primarily associated with short auditor tenure and that this risk virtually disappears in the post-SOX years. This result is consistent with the view that, in the post-SOX period, short-tenured auditors elevate their efforts to provide a level of audit service commiserate with that of long-tenured auditors. For policy makers, our results suggest that SOX has been successful in mitigating the adverse effect of short audit firm tenure on audit and financial reporting quality. Hence, two conclusions develop from our study in regards to the enactment of SOX and the current heightened scrutiny over corporate financial reporting. First, short-tenure audit firms are now producing work of similar quality as audit firms with longer tenure. Hence, there should not be any incremental quality concern for short-tenured versus long-tenured auditors. Second, overall financial reporting quality has improved with the corresponding reduction of financial reporting biases and thus, earnings management risk.

The remainder of the paper is organized as follows. The next section provides background and hypothesis development. This is followed by discussions of research design, sample, data, and then results. The conclusions appear in the final section of the paper.

Background and Development of Hypotheses

Recent events (e.g., Enron, Waste Management, and WorldCom) have underscored the importance of auditing on the reliability of corporate annual reports. The audit's effectiveness depends partly on auditor's ability to detect material misstatements and partly on the auditor's behavior subsequent to the detection of such misstatements (DeAngelo 1981). As SAS No. 99 points out, through the manipulation of various accounting numbers and estimates, management can execute financial statement fraud. The auditor's ability to decipher those activities and report on them is a critical part of the auditor's responsibility to provide a reasonable assurance that the financial statements are free of material misstatement (SAS No. 99 and SAS No. 109). The

auditor's acquisition and development of in-depth client specific knowledge (competence) assists the auditor in meeting this responsibility. However, regulators fear that long-term auditor-client relationships might reduce the auditor's willingness to report detected material misstatements and, in the extreme, can result in the auditor collaborating in the production of distorted financial information.[6]

Since long-term auditor-client relationship helps develop an economic bond between auditor and client, the subject of audit firm tenure is increasingly being associated with the impairment of auditor objectivity, that is, a failure to detect and report financial statement fraud. For years, the perception that auditors sacrifice their independence for the sake of close and long-lasting relationships with their clients led policy makers to consider the enactment of mandatory audit firm rotation as a possible means to alleviate the problem (U.S. Senate 1977, AICPA 1978, Berton 1991, SEC 1994). In response to recent financial accounting scandals, several bills containing a proposal to limit audit firm tenure were submitted to the House and Senate in an effort to improve financial reporting and audit quality.[7]

[6] In a longer lasting auditor-client relationship, auditors become stale and tend to rely heavily on prior-year working papers as a base for planning current year audit. Such over-reliance on prior year's work may potentially undermine the audit effectiveness for the current period by acting as a counter force to auditor judgment on client's accounting discretion for the GAAP compliance. Moreover, long auditor tenure may evoke an unconscious desire of the auditor to please clients. Psychological research has long demonstrated that even when people attempt to remain objective and impartial, often they are unconsciously and unintentionally unable to remain impartial due to a self-serving bias that causes them to reach decisions that favor their own interests (Arel et al. 2005).

[7] For example, The Integrity in Auditing Act of 2002 (which suggests that auditors should not be considered independent if they have audited a firm for more than seven consecutive years), the Comprehensive Investor Protection Act of 2002 (which suggests that non-independence is a problem when auditor has consecutively audited a firm's financial statements for more than four years), and the Truth and Accountability in Accounting Act of 2002 (which states that an auditor should not be considered independent if it has audited a firm's financial statements for more than seven consecutive years). Though none of those bills was ultimately passed by the Congress (Congress passed only a comprehensive legislation in the name of Public Company Accounting Reform and Investor Protection Act, popularly known as Sarbanes-Oxley Act), the entire legislative process underscores the tremendous regulatory concern about restoring the reliability and integrity of published financial statements issued by the publicly traded U.S. corporations.

The accounting profession argues that mandatory auditor rotation increases start up costs of audit firms and the risk of audit failure since new auditors are more likely to rely on client staff for accounting estimates and representations in the initial years of engagements (Myers et al. 2003). Moreover, research shows that possessing less client specific knowledge in the early years of auditor engagement may result in a lower likelihood of detecting material misstatements. Knapp (1981) argues that client-specific knowledge creates a significantly steep learning curve for new auditors. Auditors with long tenure have a comparative advantage in this respect since they possess client-specific knowledge and a thorough understanding of their clients' business process and risk (Beck et al. 1988). Geiger and Raghunandan (2002) suggest that auditor independence and objectivity would be more severely impaired in the early years of engagement because the threat of dismissal makes it more likely that auditor will issue an unqualified audit report instead of going-concern audit report for companies approaching bankruptcy. After investigating 406 alleged cases of audit failures between 1979 and 1991 involving the SEC clients, an AICPA's Quality Control Inquiry Committee concluded that audit failures are three times more likely in the first two years of an engagement than in subsequent years (AICPA 1992).[8] Several recent studies examine the relationship between audit firm tenure and various measures of financial reporting quality, which we discuss in the following sections.

[8] The SEC Practice Section of the AICPA (1992) has cited the following reasons while justifying that mandatory audit firm rotation is not necessary: 1) Audits are strengthened by institutional continuity. It is a significant benefit to be well acquainted with a client's business, operations and control. 2) Audit firm rotation is disruptive, time consuming and expensive. 3) Key individuals involved in the audit process all change in the normal course of events anyway. 4) Audit committees are in the best position to evaluate the desirability of changing auditors. 5) Growing public expectations, regulatory changes and recent professional initiatives have all served to improve the auditing and financial reporting process. The GAO in its November 2003 report concludes that the benefits of mandatory audit firm rotation were not certain and that more experience with the effects of the other requirements of the SOA was needed.

Audit Failures (SEC Enforcement Actions and Going Concern Opinions)

Carcello and Nagy (2004) find evidence that firms with short auditor tenure of three years or less are more likely to face SEC charges for violating Sec 10 (b)-5 of 1934 Act as identified in SEC Accounting and Auditing Enforcement Releases (AAER) dating from 1990 to 2001. Geiger and Raghunandan (2002) find that auditor tenure is associated with the likelihood of issuing a going concern opinion prior to bankruptcy in a sample of firms going bankrupt between 1996 and 1998. They find that auditors with tenure less than four years are less likely to issue going concern opinions than long-tenured auditors. In a subtle variation on auditor tenure, Carey and Simnett (2006) examine the tenure of the audit *engagement partner* on the propensity to issue a going concern opinion. For a sample of Australian firms in year 1995, they found a lower (higher) propensity to issue a going concern opinion when the engagement partner's tenure exceeds seven (less than three) years. Consequently, their evidence supports the mandatory rotation of engagement partners as is now required in Section 203 of SOX.

Investor Perceptions

Two recent studies examine how the investor community values auditor tenure. Mansi et al. (2004) examine the affect of auditor tenure on the costs of debt financing for bonds issued between 1974 and 1998. They find that auditor tenure is associated with lower interest cost and higher bond ratings. Ghosh and Moon (2005) observe a positive relationship between investor perception of earnings quality (as measured by earnings response coefficients estimated from return-earnings regressions) and audit firm tenure for a sample of firms between 1990 and 2000. Hence, extant research indicates that the investor community perceives that financial statements are more credible when there is a lengthy auditor-client relationship—albeit the wave of recent financial statement scandals probably weakened this perception.

Earnings Management (Abnormal Accruals)

Johnson et al. (2002) report that the level of unexpected accruals (a measure of earnings management) is greater in firms with short auditor tenure of three years or less compared to firms with medium auditor tenure of four to eight years in a sample of firms from 1986 to 1995. Myers et al. (2003) compare the level of abnormal accruals for "quick-turnover" firms to long-tenured firms (using five years as the cut-off between the two) for a sample taken from 1988 to 2000. They find a negative association between auditor tenure and both current accruals and discretionary accruals. Davis et al. (2005) find that firms with auditors with three or less years of tenure are more likely to use discretionary accruals to meet or beat earnings forecasts for a sample ranging from 1988 to 2001. This is consistent with Johnson et al. (2002) and Myers et al. (2003). In contrast to other studies, however, Davis et al. (2005) also report a higher discretionary accrual use when auditor tenure is long (exceeding fourteen years). Carey and Simnett (2006) find no association between lead engagement audit partner tenure and abnormal accruals.

Earnings Restatements

Three contemporaneous studies examine the association between auditor tenure and propensity for issuing earnings restatements. Myers et al. (2004) study restatements between 1997 and 2001 and find that auditor tenure is unrelated to earnings restatements. Lazer et al. (2004) analyze restatements issued between 1988 and 2002 and find a change in auditor is associated with a greater likelihood of an earnings restatement and, if issued, in greater magnitude of earnings adjustments than when there is no change in auditor. Jones et al. (2006) analyse the magnitude of earnings restatements for a sample of 43 firms that issued fraudulent

financial statements between 1991 and 2001 (i.e., pre-SOX). They find the M-Score (which they call "BPROB") is a positive and significantly associated with the magnitude of the restatement.

Earnings Management Risk and Audit Firm Tenure

Our study differs from the related studies in two important ways. First, by using a specific accrual based measure of earnings manipulation risk, our study complements prior studies that used either aggregate accruals (i.e., unexpected accruals) or *ex post* indicators of audit failure (i.e., SEC enforcement actions, failure to issue a going concern opinion, earnings restatements). Second, by using a sample covering periods both before and after SOX, our study examines the association between auditor tenure and financial reporting quality in the two different regulatory regimes.

Beneish's Earnings Manipulation Score (M-SCORE)

In his initial study, Beneish (1997) analyzed a sample of "GAAP violator" firms against a control sample of "aggressive accruers." AAER and news searches for a public admission to violating GAAP identified 64 firms that violated of GAAP in 1983-1992. In each year, firms in the top decile of positive discretionary accruals as determined by using the modified Jones model (Dechow et al. 1995) comprise the control sample. He develops a 12 factor probit model that consistently estimates a higher probability of earnings manipulation among GAAP violator firms than do aggressive accruer firms. Since extreme financial performance is characteristic of both GAAP violators and aggressive accruers, the ability of model to identify GAAP violators from other firms is notable.

Beneish (1999) refines his earlier (1997) study using a sample of earnings manipulators (n=74) and non-manipulators (n=2332) for 1987-1993. The result is a model commonly referred

to as "M-SCORE" where higher values imply a greater likelihood that the firm has manipulated its earnings. M-SCORE takes the following form:

M-SCORE = - 4.84 + 0.920*DSRI+ 0.528GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI - 0.172*SGAI + 4.679*TATA - 0.327*LEVI

DSRI = Days' sales in receivables index computed as: $[REC_t / Sales_t] / [REC_{t-1} / Sales_{t-1}]$, where REC stands for receivables.

GMI = Gross margin index computed as: $[(Sales_t - COS_t) / Sales_t] / [(Sales_{t-1} - COS_{t-1}) / Sales_{t-1}]$, where COS stands for cost of sales.

AQI = Asset quality index computed as: $[1- (CA_t + NFA_t)/TA_t] / [1- (CA_{t-1} + NFA_{t-1})/TA_{t-1}]$, where CA stands for current assets, NFA for net fixed assets and TA for total assets.

SGI = Sales growth index computed as: $Sales_t / Sales_{t-1}$.

TATA = Total accruals to total assets (TATA) computed as: [(Δ Current assets $_t$ – Δ Cash $_t$) - (Δ Current liabilities $_t$ - Δ Current maturities of long term debt $_t$ - Δ Income taxes payable $_t$) - Depreciation and amortization $_t$] / Total Assets $_t$.

DEPI = Depreciation Index computed as: $[Depreciation_{t-1}/ (Depreciation_{t-1} + PPE_{t-1})] / [Depreciation_t /(Depreciation_t + PPE_t)]$

SGAI = Sales General and Administrative Expense Index computed as: $[SGA\ Expense_t / Sales_t] / [SGA\ Expense_{t-1} / Sales_{t-1}]$

LEVI = Leverage Index computed as: $[(LTD_t + Current\ Liabilities_t) / Total\ Assets_t] / [(LTD_{t-1} + Current\ Liabilities_{t-1}) / Total\ Assets_{t-1}]$

Beneish points out some practical uses for his research. He states that M-SCORE can assist practicing auditors to make "timely assessments of the likelihood of manipulation (1997, 299)." Moreover, he concludes that "the model can be applied by the SEC, independent auditors, and investors to screen a large number of firms and identify potential earnings manipulators for further investigation (1997, 300)."

Teoh et al. (1998) use M-SCORE as a proxy for earnings management in their study of IPO firms' post-issue earnings underperformance. They found that M-SCORE "significantly predicts post-issue earnings underperformance (1988, 193)." Similarly, Beneish and Nichols

(2007) find that M-SCORE is a significant predictor of future earnings for firms with a high likelihood of earnings manipulation. Wiedman (1999) introduces M-SCORE as tool to detect earnings management in an instructional case based on the real-life company Comptronix Corporation. McNichols comments (2000, 335) that M-SCORE has great potential over other approaches in detecting earnings management. She observes that aggregate accrual approaches (e.g., Jones (1991) model) can pick up performance characteristics unrelated to earnings management (an omitted variable problem).

We employ Beneish's measure of earnings management risk in our study and examine its association with audit firm tenure over a period surrounding the enactment of SOX. We use two versions of Beneish's measure. As previously defined, we use M-SCORE as developed in his 1999 study. In addition, we take the first principal component factor (through varimax rotation) of five ratios that Beneish reports as being statistically significant in his study (i.e., days' sales in receivables, gross margin, asset quality, sales growth, and total accruals indices). We label this as "M-FACTOR". The advantage of this second measure is that it does not rely on weights applied to each ratio derived from Beneish's sample, which may be an advantage given that our sample is different in time period, regulatory environment, and other characteristics. Since Sox has been in effect for a while, an analysis of earnings manipulation risk and audit firm tenure for both the pre-SOX and post-SOX periods has the potential to provide insight into the SOX's effectiveness in ensuring the desired level of audit and financial reporting quality.

The Effect of SOX on the Quality of Financial Information

In a recent study, Lobo and Zhou (2006) examine the potential effect of CEO/CFO certifications required by Section 302 of SOX on management's discretion over financial reporting (as measured by the level of discretionary accruals). They report more conservative

financial reporting following the implementation of the certification requirement. Several recent studies also examined the impact of SOX on financial reporting. Cohen et al. (2007) report that absolute discretionary accruals steadily increased in the pre-SOX period but this trend reverses following the passage of SOX. Heflin and Hsu (2004) document a significant decline in the use of non-GAAP earnings measures and the probability that earnings meet or exceed analysts' forecasts after the advent of SOX. Consistent with those prior studies, our paper focuses on testing the effect of SOX on the relationship between the probability of earnings manipulations and audit firm tenure. In this respect, we not only examine the SOX's effectiveness in ensuring financial reporting quality but also revisit the important issue of auditor tenure and financial reporting quality in the pre and post-SOX environment to document how this relationship has changed across the two different regulatory regimes.

Based on prior research, we develop a couple of expectations for the association between earnings management risk (i.e., the probability of earnings manipulation) and audit firm tenure. We expect that with the increase in audit firm tenure the risk of financial misreporting will diminish. Hence, a negative association between earnings management risk and audit firm tenure is expected. Furthermore, following prior research (e.g., Carcello and Nagy 2004; Myers et al. 2003; Geiger and Raghunandan 2002, Johnson et al. 2002), we expect that in the pre-SOX period, short-tenured auditors will produce lower quality audits and, consequently, the probability of earnings manipulation (i.e., earnings management risk) is higher than for firms with auditors of medium tenure.[9] Therefore, the first two hypotheses are stated in the following alternative form.

[9] In this study, we focus on the ex-ante risk in the financial reporting process, i.e., the probability of financial misreporting, in contrast to earlier studies that have dealt with ex-post situation of earnings management (i.e., discretionary accrual adjustments). The concept of ex-ante risk is more suited to the comparison between the pre and post-SOX effect on the association between audit firm tenure and the level of earnings management in the sense that

H_1: Ceteris paribus, there is a negative association between the earnings management risk and the number of consecutive years of audit firm-client relationship (audit firm tenure).

H_2: In the pre-SOX period (2000-2001), earnings management risk is greater for firms with short audit firm tenure (three years or less) compared to firms with medium audit firm tenure (four to eight years).

The basic expectation behind the enactment of SOX is that it would mitigate the risk of fraudulent financial reporting. SOX and other accompanying reforms of accounting profession were intended to improve auditor objectivity and, therefore, audit and financial reporting quality. Indeed, several recent studies (e.g., Lobo and Zhou, 2006; Cohen et al., 2007; Bartov and Cohen 2007; Heflin and Hsu, 2004) document that management's discretion over financial reporting has become more constrained since SOX. However, these studies primarily focus on corporate executive accountability. It is unclear, however, whether an auditor's years of consecutive engagement with a client has any incremental impact on the risk of material misstatements in published financial information in the post-SOX environment; whether the relationship between auditor tenure and financial misstatements attributed to the pre-SOX period persists in the post-SOX period. This is even more interesting in the backdrop of SOX Section 404 (PCAOB No. 2) which requires management's assessment of internal control over financial reporting and auditor's attestation of such controls in the audit report.[10] If SOX achieved its objective, auditors

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the key underlying objective for introducing SOX is to improve the audit and financial reporting quality by mitigating the probability of material misstatements in published financial information. Hence, the ex-ante probability of earnings management in financial reporting is an appropriate variable of interest to evaluate the effect of pre and post SOX environment on the association between auditor tenure and probability of financial misstatements.

[10] The SEC adopted the final rules for SOX Section 404, "Management Assessment of Internal Controls" on June 5, 2003. SOX Section 404, effective for publicly traded firms with fiscal year-ends subsequent to November 15, 2004, requires an annual management report on internal controls over financial reporting (ICOFR) to be filed with the SEC Form 10-K annual report. The management report must be accompanied by an auditor attestation report by the registered public accounting firm that audited the company's financial statements. The auditor attestation report includes both the auditor's opinion on management's assessment of internal controls and the auditor's opinion on the effectiveness of the company's ICOFR (SOX 2002).

should conduct quality audits regardless of the length of tenure. Conversely, if SOX is ineffective then the negative relationship between auditor tenure and earnings management risk found in the pre-SOX period may persist. Therefore, no prediction is made regarding the effect of SOX on the association between audit firm tenure and earnings manipulation risk in the post-SOX period. The third and fourth hypotheses are stated in null form as follows:

H_3: Ceteris paribus, there is no effect of post-SOX environment on the association between earnings management risk and audit firm tenure.

H_4: Ceteris paribus, there is no effect of post-SOX environment on the relative level of earnings management risk for firms with short audit firm tenure (three or less years) compared to firms with medium audit firm tenure (four to eight years).[11]

Research Design

Consistent with prior studies (Bell and Carcello 2000, Johnson et al. 2002, Myers et al. 2003, Carcello and Nagy 2004, Carey and Simnett 2006, Ghosh and Moon 2005, Mansi et al. 2004, Davis et al. 2005, Geiger and Raghunandan 2002), we develop a cross-sectional regression model to examine the association between the audit firm tenure and earnings management risk. Two models are estimated using different tenure-related variables. Model 1 uses a continuous TENURE variable. Model 2 uses dummy variables to indicate SHORT and LONG tenure periods in the relative setting. The models are as follows:

Model 1: Pooled Cross Sectional Model for 2000-2004 using a Continuous Tenure Variable

$$\text{M-SCORE or M-FACTOR} = \beta_0 + \beta_1 \text{LTA} + \beta_2 \text{LEV} + \beta_3 \text{MB} + \beta_4 \text{ROA} + \beta_5 \text{ROA\_NEG} + \beta_6 \text{ASSTGROW} + \beta_7 \text{CHANGE} + \beta_8 \text{AGE} + \beta_9 \text{CALENDARYE} + \beta_{10} \text{OCF} + \beta_{11} \text{SPECIALIST} + \beta_{12} \text{TENURE} + \beta_{13} \text{TRAN} + \beta_{14} \text{SOX} + \beta_{15} \text{TENURE*TRAN} + \beta_{16} \text{TENURE*SOX} + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where,

[11] Consistent with prior studies (e.g., Carcello and Nagy 2004; Myers et al. 2003; Johnson et al. 2002), we consider short auditor tenure as three years or less while long auditor tenure as nine years or more. So, medium auditor tenure ranges between four and eight years. In the analysis, we use the long audit firm tenure in a relative setting for the completeness of the analysis and make it comparable with prior studies. However, our main focus here is to examine the impact of short auditor tenure relative to medium tenure.

Dependent Variable:
M-SCORE = Composite score obtained using eight financial ratios multiplied by regression coefficients in Beneish (1999). This variable measures the level of earnings management risk.

M-FACTOR = The first principal component factor score (varimax rotation) using five statistically significant ratios out of eight indices that are used to develop M-SCORE (Beneish, 1999), e.g., days in sales receivables index, gross margin index, asset quality index, sales growth index and total accruals to total assets index.

Control Variables:
LTA = Natural log of total assets.
LEV = Ratio of total debt divided by total assets
MB = Market to book ratio calculated as equity market value divided by stockholders' equity.
ROA = Return on assets, computed as net income before extraordinary items divided by lagged total assets.
ROA_NEG = A dummy variable of 1 if ROA is negative, 0 otherwise.
ASSTGROW = Change in total assets from one year to the next expressed as a percentage of the beginning total assets.
CHANGE = A dummy variable of 1 for firms with auditor change in a sample year, 0 otherwise.
AGE = Number of years for which total assets are reported in Compustat Research Insight database since 1980 (e.g., Myers et al. 2003).
CALENDARYE = A dummy variable of 1 for firms with Dec 31 fiscal year end and 0 otherwise.
OCF = Operating cash flows scaled by the lagged total assets.
SPECIALIST = A dummy variable of 1 for industry-specialist auditor; 0 otherwise. [12]

Independent Variables:
TENURE = Consecutive years of audit firm and client relationship.
TRAN = A dummy variable of 1 for the transition SOX year of 2002; 0 otherwise.[13]
SOX = A dummy variable of 1 for the post-SOX years of 2003 and 2004; 0 otherwise.
TENURE*TRAN = Interaction term for audit firm tenure in the transition year; 0 otherwise.
TENURE*SOX = Interaction term for audit firm tenure in the post-SOX years; 0 otherwise.

[12] We account for industry specialization for the Big-five firms based on the report of the U.S. Government Accountability Office, formerly known as General Accounting Office (GAO-03-864 of July 2003 entitled, "Public Accounting Firms: Mandated Study on Consolidation and Competition"). The GAO utilized various databases like *Who Audits America*, *Public Accounting Report*, and SEC proxy filing and other publicly available information to develop the report on the Big-five audit firms' industry specialization based on the two-digit SIC codes to define an industry. We also use the data reported by Eisenberg and Macey (2003), Cornell Law School for the purpose of identifying industry-specialist Big-five auditors. We adopt the GAO's threshold level to define industry-specialization as auditing 25% or more of total assets in an industry (i.e., audit firms having significant presence in an industry).

[13] We use to dummy variables for the two post-SOX years because the year 2002 is a transition year (Huang et al. 2007) since more than half of this year elapsed before SOX went into effect. Hence, it is not clear whether 2002 should be included in the post-SOX years. We conjecture that the effect of SOX on financial reporting process is different between the transition and post-SOX years, and therefore, we include two dummy variables to capture such differential effect on the association between auditor tenure and earnings management risk.

Model 2: Using Indicator Variables for Short and Long Auditor Tenure

$$\text{M-SCORE or M-FACTOR} = \beta_0 + \beta_1 \text{LTA} + \beta_2 \text{LEV} + \beta_3 \text{MB} + \beta_4 \text{ROA} + \beta_5 \text{ROA\_NEG} + \beta_6 \text{ASSTGROW} + \beta_7 \text{CHANGE} + \beta_8 \text{AGE} + \beta_9 \text{CALENDARYE} + \beta_{10} \text{OCF} + \beta_{11} \text{SPECIALIST} + \beta_{12} \text{SHORT} + \beta_{13} \text{LONG} + \beta_{14} \text{TRAN} + \beta_{15}\text{SOX} + \beta_{16} \text{SHORT*TRAN} + \beta_{17} \text{LONG*TRAN} + \beta_{18} \text{SHORT*SOX} + \beta_{19} \text{LONG*SOX} + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$ [14]

Where:
SHORT = A dummy variable of 1 for firms with audit firm tenure of 3 years or less; 0 otherwise.
LONG = A dummy variable of 1 for firms with audit firm tenure of 9 years or more; 0 otherwise.

Earnings Manipulation Score

Beneish (1997 and 1999) developed M-SCORE as a means to identify possible cases of earnings manipulation. In essence, it indicates the level of earnings management risk among the sample firms. The greater the M-SCORE, the higher is the probability of distorted earnings information (which we term as earnings management risk). M-SCORE captures not only the financial statement consequences of manipulation, but also incentives for manipulating earnings (Beneish and Nichols 2007). Moreover, M-SCORE exploits information about specific accruals rather than aggregate accruals. McNichols (2000) and Wiedman (2002, 40) point out that in addition to its ability to predict the probability of earnings management (i.e., earnings management risk). M-SCORE also helps identify conditions that might indicate that a company is predisposed to engage in earnings management. McNichols contends that M-SCORE has the potential to lead to more powerful methods of detecting earnings management (2000, 335). As previously mentioned, Teoh et al. (1998) have used M-SCORE as a proxy for earnings management in a study of initial public offerings and Jones et al. (2006) provide evidence that M-SCORE can help to explain the magnitude of earnings restatements for firms that previously

[14] In both equations (1) and (2), we do not include LEV as one of the controls when M-SCORE is used as the dependent variable in the analysis since leverage index itself is a constituent of M-SCORE in the Beneish's model. But we use LEV as a control variable when M-FACTOR is used as the dependent variable since leverage index is not one of the significant five indices that are used to construct M-FACTOR for the analysis.

issued fraudulent financial statements. Hence, auditors can effectively utilize the M-SCORE of a company as an analytical procedure to identify the probable cases of earnings management.

Consistent with prior studies (Geiger and Raghunandan 2002, Ghosh and Moon 2005, Mansi et al. 2004, Myers et al. 2003), we use both continuous and discrete measures of audit firm tenure in our analysis. First, we define TENURE as the number of consecutive years that an audit firm audited a particular client company. For this, we count the number of years backward from the sample year 2000 to 2004 until the year 1988.[15] Next, we also analyze tenure using two categorical variables; one for tenure of three years or less (SHORT) and another for tenure of nine or more years (LONG), which is consistent with Carcello and Nagy (2004) and Johnson et al. (2002).

Lobo and Zhou (2006) report an increase in conservatism of financial reporting following SOX. They observe lower discretionary accruals and a tendency to report losses more quickly than gains in the post-SOX period. SOX requirements that CEO/CFO certify the accuracy and completeness of financial statements (Section 302) or else face severe penalties for knowingly certifying statements that do not meet those requirements (Section 906) are assumed to be the incentives leading to more conservative reporting. Similarly, Cohen et al. (2007) report that accrual-based earnings management was high in the pre-SOX period but declined significantly

[15] We consider 1988 the beginning year for this purpose because it is the first year for which the detailed codes for 27 audit firms are available in the Research Insight database. We assume that the 13 to 16 year period would sufficiently provide a basis for evaluating the effect of longer versus shorter auditor-client relationship on earnings management risk. Especially, this measurement of auditor tenure helps evaluate the differential effect of initial years of auditor engagement versus auditor's continuing engagement over a period of time on the cross-sectional difference in financial fraud indicators. In order to determine the continuity of an audit firm for a specific client company, we take into account the mergers among big audit firms occurred during this time-period. In 1989, there were two mergers of the big audit firms: Touch Ross merged with Deloitte Haskins and Sells to become Deloitte and Touche, and Ernst and Young was created through the merger between Arthur Young and Ernst and Whinney. In 1998, Coopers and Lybrand merged with Price Waterhouse to create PricewaterhouseCoopers. In case of such mergers, we assume that there was no switching of auditor for sample firms; the same audit firm had the continued audit engagements for the specific client companies. So, in that sense the consecutive years of audit firm-client relationship was not interrupted in such cases.

after SOX. Bartov and Cohen (2007) find a significantly lower propensity to just meet/beat analysts' earning forecasts in the post-SOX period than in the pre-SOX years.

To evaluate whether this regulatory effect substantially mitigates earnings management risk, we use an indicator variable for the transition year of SOX (Huang et al. 2007) and another indicator variable for the post-SOX years. A series of interaction terms are used to analyze whether the association between auditor tenure and earnings management risk has undergone a change after the advent of SOX.

Based on prior studies, we include several variables in the model as controls for the effects of firm specific factors on the cross sectional difference in the probability of earnings manipulation. LTA controls for firm size because size is a proxy for various economic phenomena such as risk, growth, earnings persistence, information environment, and political and regulatory costs (Carcello and Nagy 2004, Carey and Simnett 2006, Davis et al. 2005, Geiger and Raghunandan 2002, Johnson et al. 2002, Mansi et al. 2004, Myers et al. 2003). LEV, ROA, MB and ASSTGROW respectively control for the effects of a firm's leverage, profitability, growth prospects (Carcello and Nagy 2004, Teoh and Wong 1993, Collins and Kothari 1989) and its actual change in firm size (Reynolds et al., 2004). We also use a dummy variable ROA_NEG to account for the specific effect of negative ROA on financial statement fraud in addition to the general effect of profitability (ROA) on financial fraud. CALENDARYE controls firms with the December 31 fiscal year end versus firms with non-December 31 fiscal year end.

We include a separate dummy variable, CHANGE to additionally account for the differential earnings management risk for firms with auditor change in a sample year. Myers et al. (2003) suggest that accruals differ depending on the life cycle of the company. Hence, we

utilize their proxy for the age of the company based on the number of years the company reports total assets in Compustat since 1980 (AGE). OCF controls for the effect of operating cash flows, which is presumed to be an important factor in management's decision to engage in manipulation of reported financial numbers (Carey and Simnett 2006, Johnson et al. 2002, Myers et al. 2003). SPECIALIST controls for the effect of industry-specialist auditor on the cross-sectional difference in earnings management risk.

Sample and Descriptive Data

We initially select all New York Stock Exchange-listed firms from the Compustat Research Insight database (2,537 firms) with fiscal year end in 2000 through 2004.[16] We eliminate 1,476 firms for which complete set of required audit firm tenure data is not available from the Compustat. We also exclude firms operating in financial (154) and regulated industries (119). We lose another 73 firm-observations because of non-availability of complete data for regression analysis. We also eliminate 12 firms that are persistently audited by non-Big 5/4 auditors throughout the sample period in order to keep the sample firms uniform with respect to having comparable audit quality.[17] After applying these filters, we are left with 703 unregulated firms operating in the industrial and service sectors that form the final sample of the study. So, 3,515 firm-year observations are used in the analyses for the period from 2000 to 2004. The required data are collected from Compustat Research Insight database. The sample selection process is described in Panel A of Table 1.

Panel B of Table 1 exhibits the industry distribution of the sample firms based on the two-digit SIC codes. Altogether, 37 industries are represented in the final sample, out of which

[16] We conjecture that the NYSE-listed firms provide a reasonable basis for performing the analysis because several large financial statement frauds were perpetrated by the NYSE-listed firms (e.g., Enron, Fannie Mae etc).

[17] The sample firms are audited by one of the Big 5/4 auditors during the sample time-period (2000-2004).

22 industries are heavily represented by the sample firms. We test the effects of heavily represented industries (having at least 10 sample firms) on the main results to see whether the industry effect is a crucial factor. The results for this analysis are reported in a subsequent section. (See Appendix A, Table 1).

Table 2 reports the descriptive data for the variables used in the study. Some statistics are noteworthy. The sample firms, on an average (Panel A), are large with mean (median) total assets of $6,433 million ($1,660 million). An average sample firm is leveraged substantially with mean LEV of 0.572 (median: 0.576) while the average profitability is somewhat low with mean ROA of 0.035 (median: 0.047). Moreover, 594 out of 3,515 firm-years have a negative ROA (Panel B). Average growth prospect of the sample firms is positive with the mean MB of 2.107 (median: 2.023). The average firm has audit firm tenure of 10.813 years (with a median of 13 years). Auditor change occurred in 285 firm-years (8.1%). An average sample firm is matured with the mean AGE of 20.476 years (median: 22 years). The M-SCORE averages -2.671 with a median of -2.682 over the five year time-period (Panel C). (See Appendix A, Table 2).

Table 3 reports the correlation statistics for variables used in the M-SCORE analysis. Some correlations are noteworthy. M-SCORE is negative and significantly correlated with TENURE, SOX and TRAN consistent with the notion that SOX improves financial reporting environment by reducing misstatements of financial information. However, M-SCORE is not related to SIZE which suggests that firm-size does not have any effect on the cross-sectional difference of M-SCORE for sample firms. LTA, however, has a positive correlation with TENURE indicating that the larger the firm-size the greater is the continuity of auditor-client relationship. Larger firms change auditors with less frequency compared to smaller firms. Although some variables are significantly correlated with each other, multicollinearity was

deemed not to be a problem for regression analysis due to inconsequential variance inflation factors and condition indices. (See Appendix A, Table 3).

Preliminary insight into the relationship between M-SCORE and auditor tenure is revealed in two charts. Figure 1 depicts a noticeable decline in M-SCORE in the highest four deciles of auditor tenure for the 2000-2004 time period. This trend is consistent with studies that find earnings management risk is higher in early, rather than later years of auditor tenure (Carcello and Nagy 2004, Geiger and Raghunandan 2002, Johnson et al. 2002, Myers et al. 2003, Lazer et al. 2004). Figure 2 shows the relationship for the following three time periods: (1) pre-SOX (2000-2001), (2) transitional year (2002), and post-SOX years (2003-2004). The effect of regulation can be seen in the difference between the pre-SOX timeline and the two other timelines. While M-SCORE is relatively unassociated with deciles of audit tenure in the transitional and post-SOX years (i.e., the lines are more-or-less "flat"), the pre-SOX line is remarkably similar to the line in Figure 2 for the entire time period. (See Appendix B, Figures 1 and 2).

Results and Discussions

Regression results appear in Table 4 and 5. Table 4 reports the cross-sectional regression results of M-SCORE and M-FACTOR on TENURE and other control variables for the four year period (2000-2003). Of primary interest, are the results pertaining to auditor tenure. As shown in the table, the results indicate that auditor tenure (TENURE) is negatively associated with M-SCORE (coefficient: -0.088; p-value: 0.001). This is consistent with previous research observations that the longer the length of auditor tenure the lower is the risk of financial misreporting. In addition, earnings management risk is lower in the post-SOX years as demonstrated by the negative and significant coefficients for the two year dummy variables,

TRAN (coefficient: -0.076; p-value: 0.036) and SOX (coefficient: -0.068; p-value: 0.056). Furthermore, consistent with the notion that SOX acts as a mitigating force to the probability of earnings management, the overall association of TENURE with M-SCORE is substantially moderated in the post-SOX years as the interaction terms TENURE*TRAN and TENURE*SOX are positive and statistically significant (with p-values of 0.006 and 0.025 respectively). Similar but more robust results occur when M-FACTOR (i.e., the first factor score obtained from the principal component analysis) is used as the dependent variable in the analysis. TENURE is negative and highly significant (p-value: 0.000) while its interactions with TRAN and SOX are positive and significant at 1% level (p-values of 0.003 and 0.013 respectively).[18]

Furthermore, as reported in Table 4, several control variables such as ROA, the one year change in total assets (ASSTGROW) and cash flows from operating activities (OCF) are significant at different levels. The client's age (AGE) is significant in the M-FACTOR model but not in the M-SCORE model. Client size (LTA), leverage (LEV), and market-book value (MB) are all insignificant. Calendar fiscal year ends (CALENDARYE), negative ROA (ROA_NEG), and auditor change (CHANGE) are all insignificant. We also include a dummy variable to control for the effect of auditor's industry specialization (SPECIALIST) in the analysis based on the notion that industry-specific knowledge makes a difference in the slope of the learning curve in the initial years of audit engagement. The industry specialization dummy variable is insignificant in the analysis. (See Appendix A, Table 4).

Similar to prior studies, we investigate the association between the M-SCORE and auditor tenure using discrete time periods for short, medium, and long auditor tenure. While the cut-off points between those three time periods is admittedly arbitrary, the most common

[18] We also use the second factor score as M-FACTOR in a separate test (not tabulated here). TENURE is still significant at 5% level (p-value: 0.014) and its interactions with TRAN and SOX produce the similar results.

approach is to define tenure as SHORT at three years or less (Carcello and Nagy 2004, Geiger and Raghunandan 2002, Johnson et al. 2002, Davis et al. 2005) and LONG at nine or more years (Carcello and Nagy 2004, Johnson et al. 2002). Hence, medium tenure of four to eight years is imbedded in the intercept.

Table 5 presents the results of the regression models when SHORT and LONG are used to replace the continuous measure of auditor tenure (TENURE). The most noteworthy findings pertain to the results related to short auditor tenure. In both models with M-SCORE and M-FACTOR as the dependent variables, audit firm tenure of three or less years (SHORT) is associated with higher risk of earnings management (coefficient: 0.101; p-value 0.022 and coefficient: 0.099; p-value: 0.021 respectively). The association is substantially moderated after SOX, however, since the interaction term of SHORT and SOX is negative and significant for both M-SCORE and M-FACTOR (coefficient: -0.064; p-value 0.083 and coefficient: -0.063; p-value: 0.081 respectively). These results provide a statistical explanation for the trends of M-SCORE on deciles of auditor tenure depicted in Figures 1 and 2. Taken together, the results for the continuous measure of auditor tenure and discrete measures for short-tenured auditors of three or less years produce evidence consistent with prior research (Johnson et al. 2002, Myers et al. 2003, Carcello and Nagy 2004) that the earnings management risk is negatively related to the audit firm-client consecutive years of relationship. The longer the audit firm tenure, the lower is the probability that such clients will engage in fraudulent financial reporting. Therefore, it is shorter rather than longer audit firm tenure that is associated financial reporting problems in the pre-SOX period. However, the results for the transition year and the post-SOX years reveal a change. For both the time-periods, none of the tenure related variables are significantly associated with the probability of earnings management. (See Appendix A, Table 5).

Sensitivity Analyses

Extreme Observations for the M-SCORE and Composite Factor Score (M-FACTOR)

To test whether extreme observations have any confounding effect on the multivariate test results, we eliminate the top and bottom 1% of each of the eight fraud indicators and recalculate the M-SCORE. The revised M-SCORE is used as the dependent variable of interest in the regression equation (1). The results remain qualitatively similar. The coefficient of TENURE is -0.091 (p-value: 0.003). Consistent with the main results, such M-SCORE and TENURE relationship is significantly moderated in the transition and post-SOX years with the coefficient of the interaction variables, TENURE*TRAN of 0.058 (p-value: 0.084) TENURE*SOX of 0.086 (p-value: 0.028).

We also recalculate the factor score (M-FACTOR) by eliminating the top and bottom 1% of the data from the five fraud indicators and use them as the dependent variables in repeat analyses. The results are similar to those for the main tests. For the first factor score, the coefficient of TENURE is -0.178 (p-value: 0.000), and for the second factor score, the coefficient of TENURE is -0.047 (p-value: 0.084). Consistent with the main results, the factor scores and TENURE relationship is found to become moderated in the transition and post-SOX years with the interaction variables being significantly positive at various levels of significance.

Analysis by Omitting Quick Turnover Firms

Following Myers et al. (2003), we use a restricted sample of 2634 firm years after omitting quick turnover firms where the audit firm-client relationship does not last at least five years. Panel A of Table 6 presents the results for this restricted sample and the continuous auditor tenure variable (for brevity the controls variables are omitted from the table). In the M-SCORE model the coefficient of TENURE is insignificant (coefficient: -0.050; p-value: 0.143).

Likewise, the results for the transition year (YR 2002) and post-SOX years (YR 2003 and YR 2004) are insignificant as are the interaction terms for tenure and TRAN and SOX. In contrast, all of the tenure and year variables are significant in the M-FACTOR model. TENURE, TRAN, and SOX are all negative and significantly associated with M-FACTOR. The interactions of between TENURE, and TRAN and SOX are positive and significant. Consequently, the results pertaining to the continuous measure of auditor tenure and earnings management risk are mixed when the sample omits quick turnover firms. However, it is noteworthy that consistent with the main results, earnings management risk associated with TENURE virtually disappears in both the transition and post-SOX years for the quick turnover firms too when M-FACTOR is used as the dependent variable of interest.

Discretionary Accruals as the Dependent Variable

Consistent with prior research, we use the absolute value of discretionary accrual which is estimated from cross-sectional version of the modified Jones model (Dechow et al., 1995) as the dependent variable in a separate test. As reported in Panel B of Table 6, the variables, TENURE and TRAN are not significant. SOX variable is negative and significantly associated with the magnitude of discretionary accruals-ADACC (p-value: 0.018) indicating that ADACC has significantly declined in the post-SOX years. In addition, the interaction terms between TENURE and TRAN and TENURE and SOX are positive and significant. When discrete variables for short and long auditor tenure are used to replace the continuous measure in the analysis, all of the results are insignificant. Hence, contrary to prior studies we do not observe any significant result for the association between absolute discretionary accruals and audit firm tenure for our sample firms. (See Appendix A, Table 6).

Control for Extreme Firm Performance

In order to check whether the main results of the study are confounded by extreme firm performance, we eliminate 1% of highest and lowest observations based on ROA, OCF, MB, and ASSTGROW respectively and perform the regression analysis. The results obtained are similar to the ones reported for the main analysis.

Additional Control Variables: Mergers, New Issues, Restructuring Activities

As a part of sensitivity analysis, we also use several additional control variables in the regression such as change in operating cash flows (ΔOCF), change in ROA (ΔROA), a dummy variable for merger and acquisition, a dummy variable for new issue of equity and debt, and for restructuring activities. The results remain unchanged to the inclusion of such variables.

Control for Industry Effects

The sample comprises firms from 37 industries based on the two-digit SIC codes. To examine whether industry-specific effects drives the results, we include industry dummy variables to control the effect of 22 heavily represented industries in the sample. The results remain unchanged in presence of such industry dummy variables.

Change of Audit Firm from Arthur Andersen to Others

Arthur Andersen was dissolved in 2002 which falls within the study's sample period. Cahan and Zhang (2006) find evidence that ex-Andersen clients exhibited more conservative reporting behavior in 2002 as reflected in lower levels of abnormal accruals as well as large decreases in abnormal accruals in 2002 compared to 2001. The finding is consistent with the view that successor auditors of ex-Andersen clients have induced them to engage in more conservative accounting in order to minimize ex-post litigation risk. Further, Nagy (2005) observes conservative accounting among small ex-Andersen clients as exhibited by their lower

discretionary accrual adjustments. In order to ensure that our results are not confounded by conservative accounting policy choices of ex-Andersen clients, we exclude 112 ex-Andersen client firms from our sample and rerun the analyses. The results obtained are identical to those reported for the main analyses.

Alternatively, we segregate the CHANGE variable into two separate dummy variables, one for the auditor change of Andersen clients and the other for auditor change of non-Andersen clients, and include them in the analyses as separate controls. The main results remain unchanged.

Regression Diagnostics

The adjusted R-square for all of the regression models range between 0.45 and 0.48. Various diagnostic tests indicate that the model employed in the study is not unduly influenced by extreme observations, heteroscedasticity, or collinearity among the explanatory variables. Variance inflation factors (VIF) and condition indices suggest that the influence of multicollinearity is not a concern since all VIF are below 2.0. In general, residual plots do not exhibit any systematic pattern of error distribution. When plotted against various independent variables of interest, the residuals exhibited a random distribution with no apparent pattern. Moreover, the influence statistics, Cook's D and DFFITS do not indicate the presence of influential data points that might significantly affect our empirical results.

Conclusions

The consecutive years of audit firm client relationship has been an issue of concern for regulators who regard such "cozy" relationship as having the potential to impair auditor objectivity. Our study compliments a number of recent studies on this matter (Carcello and Nagy 2004, Johnson et al. 2002, Geiger and Raghunandan 2002, Myers et al. 2003, Carey and Simnett

2006, Davis et al. 2005) by testing the association between auditor tenure and earnings management risk (Beneish 1997, 1999) and by extending the analysis into the post-SOX period. Following Beneish, we employ M-SCORE, which is based on eight separate financial indices, as a measure of the probability of earnings manipulation (which we term "earnings management risk"). Using cross-sectional multivariate regression analysis for a time-period covering both the pre-SOX and post-SOX years, we find evidence that auditor tenure is significantly and negatively associated with earnings management risk especially in the pre-SOX years. Using indicator variables to distinguish three ranges of auditor tenure (i.e., 0-3 years, 4 to 8 years, and 9 or more years) we discover that auditor tenure of three or less years is associated with a higher probability of earnings manipulation but only in the pre-SOX period. In the post-SOX period there is no significant relationship between auditor tenure and earnings manipulation risk. The results remain unchanged in several specification tests for alternative definitions of auditor tenure and earnings management risk; when control variables are added for industry, mergers and acquisitions, restructuring, and issue of new equity and debt securities; and also when we winsorize the data to remove firms with extreme financial performance.

The study's results are consistent with prior research evidence in the pre-SOX period (Carcello and Nagy 2004, Myers et al. 2003, Johnson et al. 2002) that reduced financial reporting quality is associated with short audit firm tenure rather than long tenure as posited by regulators. In this respect, our study contributes to this stream of audit literature by employing a measure of *ex ante* earnings management risk that can readily be used by accounting professionals as an analytical procedure to assess fraud risks (SAS no. 99) and the risk of material misstatements (SAS No. 109). Moreover, like other studies (e.g., Myers et al. 2003), our results suggest that the regulators' concern about financial reporting biases and audit quality as a result of long audit

firm-client relationship is somewhat misplaced. Indeed, in the post-SOX period we find no evidence that auditor tenure is related to earnings management risk. Perhaps, the mere threat of additional regulation affecting auditor tenure and the overall heightened sense of scrutiny of audit quality (e.g., PCAOB inspections) might have produced this result.

The sample firms in the study are all NYSE-listed. These firms were selected because many of the recent financial statement fraud involved the largest of the publicly traded firms (e.g., Enron, WorldCom, TYCO). Using NYSE firms also extends the application of M-Score by Teoh et al. (1998) who used it to predict post-issue earnings underperformance in a sample of IPO firms. A useful extension of the current research is to investigate the probability of financial misreporting and audit firm tenure relationship for firms listed in other stock exchanges like NASDAQ in different regulatory regimes. Compared to NYSE listed firms, NASDAQ firms are, on average, younger and more growth-oriented firms. Therefore, the earnings management risk is likely to be greater for NASDAQ firms than for larger and matured NYSE firms.

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Appendix A

Table 1: Sample Selection Process

Panel A: Sample Selection

Total NYSE listed firms as per Compustat Research Insight:	2,537
Less: Number of firms for which complete audit firm tenure data is not available from 1988 through 2003:	1,476
Number of firms which have complete audit firm tenure data from 1988 through 2003	1,061
Less: Firms operating in regulated industry (SIC 4000-4999)	(154)
Firms operating in financial industry (SIC 6000-6999)	(119)
	788
Less: Firms with incomplete time-series data set in Compustat Research Insight for regression analysis	(73)
Firms audited by the non-Big 5/4 auditors	(12)
Firms included in the final sample	**703**
Total firm year observations (2000-2004) in the final sample	**3515**

Panel B: Industry Distribution of Sample Firms based on two-Digit SIC Codes

Industry	OBS	Industry	OBS
Agricultural products	16	Household furniture	6
Poultry and dairy products	30	Leather products	4
Apparel and fabrics	10	Glass products	7
Paper and allied products	30	Wholesale -paper, grocery, chemical products	13
Printing and publishing	25	Retail products	4
Chemical and allied products	76	Variety stores, food and grocery stores	15
Oil and gas	54	Convenience stores	10
Rubber, plastics and tires	12	Auto dealers, home supply stores	3
Steel works, foundries	30	Retail-shoe, family clothing	9
Metal cans, containers, heating equipments	24	Retail-furniture stores	7
Engines and turbines	62	Eating and drinking places	15
Electronic and other electrical equipments	53	Retail-Jewelry, toy, catalog, mail orders	6
Motor vehicles aircraft, ship building	38	Conglomerates	3
Laboratory apparatus, aeronautical systems	32	Hotels and motels	6
Jewelry, precious metals, silverware	9	Services-personal	5
Services-advertising, consumer credit rating	36	Amusement and recreation services	12
miscellaneous equipment rental and leasing		Services-hospitals, med lab, health care	10
Wholesale -durable goods	20	Educational services	2
Lumber and wood products	6	Engineering services	3
			703

Table 2: Descriptive Data
N = 3515

Panel A: Descriptive Data for Continuous Variables

Variables	Mean	Median	Standard Deviation	Minimum	Maximum
TA (in million $)	6,433	1,660	16,674	226	208,537
LEV	0.572	0.576	0.464	0.042	22.788
MB	2.107	2.023	23.203	-52.311	176.405
ROA	0.035	0.047	0.529	-27.736	0.355
ASSTGROW	0.088	0.039	0.305	-0.976	3.632
OCF	0.113	0.105	0.085	-0.258	0.622
AGE (in years)	20.476	22	3.665	8	25
TENURE	10.813	14	5.189	1	17
Five Components of Factor Score (M-FACTOR)					
DSRI	1.030	0.980	0.631	0.048	27.810
GMI	1.053	0.995	3.886	-7.157	29.010
AQI	1.037	0.998	0.381	0.082	10.552
SGI	1.081	1.045	0.279	0.123	8.112
TATA	-0.072	-0.056	0.423	-22.145	0.595

Panel B: Descriptive Data for Dummy Variables

Variables	Mean	Median	No. of firm years coded as '1'	No. of firm years coded as '0'
ROA_NEG	0.169	0	594	2921
CHANGE	0.081	0	285	3230
CALENDARYE	0.724	1	2546	969
SPECIALIST	0.477	0	1677	1838
TRAN	0.200	0	703	2812
SOX	0.400	0	1406	2109

Panel C: Descriptive Data for M-Score and the Component Variables

Variables	Mean	Median	Standard Deviation	Minimum	Maximum
M-Score	-2.671	-2.682	0.906	-15.247	23.485
DSRI	1.017	0.979	0.636	0.048	27.810
GMI	1.052	0.990	3.943	-7.157	29.006
AQI	1.037	1.000	0.378	0.082	10.552
SGI	1.082	1.055	0.274	0.128	8.112
TATA	-0.072	-0.051	0.369	-22.145	0.595
DEPI	1.016	0.986	0.224	0.048	4.689
SGAI	1.019	1.003	0.318	0.243	13.697
LEVI	1.025	0.989	0.784	0.024	29.852

Variable Definitions

TA = Total assets.
LEV = Leverage ratio computed as total debts divided by total assets.
ROA = Return on assets computed as net income before extraordinary items divided by lagged total assets.
MB = Market to book ratio calculated as equity market value divided by stockholders' equity.
ASSTGROW = Change in total assets from one year to the next expressed as a percentage of the beginning total assets.
CALENDARYE = A dummy variable of 1 for firms with Dec 31 fiscal year end and 0 otherwise.
ROA_NEG = A dummy variable of 1 if ROA is negative, 0 otherwise.
CHANGE = A dummy variable of 1 for firms with auditor change in a sample year, 0 otherwise.
SPECIALIST = A dummy variable of 1 for industry-specialist auditor; 0 otherwise.
AGE = Number of years for which total assets are reported in Compustat Research Insight database since 1980.
OCF = Operating cash flows scaled by the beginning total assets.
TENURE = Consecutive years of audit firm and client relationship.

M-Score: - 4.84 + 0.920*DSRI+ 0.528GMI + 0.404*AQI + 0.892*SGI + 0.115DEPI - 0.172*SGAI + 4.679*TATA - 0.327*LEVI

M-SCORE Components

DSRI = Days' sales in receivables index computed as: $[REC_t / Sales_t] / [REC_{t-1} / Sales_{t-1}]$, where REC stands for receivables.
GMI = Gross margin index computed as: $[(Sales_t - COS_t) / Sales_t] / [(Sales_{t-1} - COS_{t-1}) / Sales_{t-1}]$, where COS stands for cost of sales.
AQI = Asset quality index computed as: $[1- (CA_t + NFA_t)/TA_t] / [1- (CA_{t-1} + NFA_{t-1})/TA_{t-1}]$, where CA stands for current assets, NFA for net fixed assets and TA for total assets.
SGI = Sales growth index computed as: $Sales_t /Sales_{t-1}$.
TATA = Total accruals to total assets (TATA) computed as:
$[(\Delta \text{ Current assets}_t - \Delta \text{ Cash}_t) - (\Delta \text{ Current liabilities}_t - \Delta \text{ Current maturities of long term debt}_t - \Delta \text{ Income taxes payable}_t) - \text{Depreciation and amortization}_t] / \text{Total Assets}_t$.
DEPI = Depreciation Index computed as:
$[Depreciation_{t-1}/ (Depreciation_{t-1} + PPE_{t-1})] / [Depreciation_t /(Depreciation_t + PPE_t)]$
SGAI = Sales General and Administrative Expense Index computed as:
$[SGA\ Expense_t /Sales_t] / [SGA\ Expense_{t-1} /Sales_{t-1}]$
LEVI = Leverage Index computed as:
$[(LTD_t + Current\ Liabilities_t) / Total\ Assets_t] / [(LTD_{t-1} + Current\ Liabilities_{t-1}) / Total\ Assets_{t-1}]$

Table 3: Correlation Statistics for the Variables used in the Analysis with M-SCORE

N = 3515

Variables	M_SCORE	TENURE	YR2003	YR2002	Specialist	CHANGE	AGE	MB
M_SCORE	1.000							
TENURE	-0.080**	1.000						
YR2003	-0.095**	0.001	1.000					
YR2002	-0.042*	-0.039	-0.332***	1.000				
Specialist	0.001	0.005	-0.398***	0.133***	1.000			
CHANGE	0.012	-0.291***	0.421***	0.007	-0.232***	1.000		
AGE	0.003	0.017	0.233***	0.078***	-0.059***	0.133***	1.000	
MB	-0.011	-0.012	0.009	-0.013	0.007	0.032*	0.027	1.000
ASSTGROW	0.037*	-0.021	0.029*	-0.021	-0.041*	-0.027	0.003	0.033
ROA	0.662***	0.028*	0.009	0.005	-0.031*	0.004	0.003	0.002
NEG_ROA	-0.077**	-0.007	-0.011	0.021	0.016	0.013	0.014	-0.007
LTA	0.010	0.117***	0.040*	0.004	0.051**	0.013	0.056***	0.029
CALENDARYE	-0.009	-0.040*	0.001	-0.002	0.032	-0.005	-0.019	-0.006
OCF	-0.059**	-0.018	-0.011	0.031*	-0.074**	-0.022	-0.030	0.067**

Variables	ASSTGROW	ROA	NEG_ROA	LTA	CALENDARYE	OCF
M_SCORE						
TENURE						
SOX						
TRAN						
Specialist						
CHANGE						
AGE						
MB						
ASSTGROW	1.000					
ROA	-0.009	1.000				
NEG_ROA	-0.183***	-0.134***	1.000			
SIZE	0.096**	0.025	-0.047*	1.000		
CALENDARYE	0.020	-0.006	-0.019	0.025	1.000	
OCF	0.242***	0.081**	-0.337***	-0.006	-0.020	1.000

Note: *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level. All variables are defined in the previous section.

Table 4: Cross-sectional Regression of M-SCORE and M-FACTOR on Continuous Variable TENURE in presence of Other Control Variables (years 2000-2004)

Model: M-SCORE or M-FACTOR = $\beta_0 + \beta_1$ LTA + β_2 LEV + β_3 MB + β_4 ROA + β_5 ROA_NEG + β_6 ASSTGROW + β_7 CHANGE + β_8 AGE + β_9 CALENDARYE + β_{10} OCF + β_{11} SPECIALIST + β_{12} TENURE + β_{13} TRAN + β_{14} SOX + β_{15} TENURE*TRAN + β_{16} TENURE*SOX + ε

N = 3515

Variables	Dependent variable **M-SCORE**		Dependent variable **M-FACTOR**	
	Coefficient	p-value	Coefficient	p-value
Intercept	-0.587	0.001	0.325	0.001
LTA	-0.013	0.359	-0.011	0.472
LEV			0.042	0.245
MB	-0.006	0.668	0.004	0.767
ROA	0.674	0.000	-0.612	0.000
ROA_NEG	-0.020	0.182	-0.014	0.344
ASSTGROW	0.074	0.000	0.182	0.000
CHANGE	-0.007	0.700	0.008	0.639
AGE	-0.006	0.941	-0.033	0.023
CALENDARYE	-0.009	0.534	-0.001	0.935
OCF	-0.136	0.000	0.111	0.000
SPECIALIST	0.022	0.154	-0.010	0.509
TENURE	-0.088	0.001***	-0.099	0.000***
TRAN	-0.076	0.036**	-0.173	0.000***
SOX	-0.068	0.056*	-0.128	0.000***
TENURE*TRAN	0.106	0.006***	0.108	0.003***
TENURE*SOX	0.084	0.025**	0.093	0.013**
Adjusted R^2	0.457		0.482	

Note: ***, ** and * respectively indicate statistical significance at the 1%, 5% and 10% levels. The reported p-values are all based on two-tailed tests.

M-FACTOR is the first factor score of five ratios using the principal component factoring (varimax rotation). Two factors are extracted on the basis of eigen value greater than 1. The eigen value of factor 1 is 1.215 and the eigen value of factor 2 is 1.059.

Loading of the five ratios is as follows for M-FACTOR (Factor 1):

DSRI	GMI	AQI	SGI	TATA
0.059	-0.089	0.800	0.556	-0.506

As a robustness check, we also use the second factor as the M-FACTOR in the analysis. The results remain identical.

Table 5: Cross-sectional Regression of M-SCORE and M-FACTOR on Dummy Variables SHORT and LONG in presence of Other Control Variables (years 2000-2004)

Model: M-SCORE or M-FACTOR = $\beta_0 + \beta_1$ LTA + β_2 LEV + β_3 MB + β_4 ROA + β_5 ROA_NEG + β_6 ASSTGROW + β_7 CHANGE + β_8 AGE + β_9 CALENDARYE + β_{10} OCF + β_{11} SPECIALIST + β_{12} SHORT + β_{13} LONG + β_{14} TRAN + β_{15}SOX + β_{16} SHORT*TRAN + β_{17} LONG*TRAN + β_{18} SHORT*SOX + β_{19} LONG*SOX + ε

N = 3515

Variables	Dependent variable **M-SCORE**		Dependent variable **M-FACTOR**	
	Coefficient	p-value	Coefficient	p-value
Intercept	-0.529	0.126	0.154	0.312
LTA	-0.015	0.306	-0.016	0.302
LEV			0.040	0.265
MB	-0.007	0.640	0.004	0.789
ROA	0.675	0.000	0.614	0.000
ROA_NEG	-0.021	0.184	-0.014	0.353
ASSTGROW	0.075	0.002	0.184	0.000
CHANGE	-0.009	0.617	0.001	0.958
AGE	-0.003	0.857	-0.040	0.006
CALENDARYE	-0.009	0.542	-0.002	0.901
OCF	-0.135	0.000	-0.112	0.000
SPECIALIST	0.023	0.144	-0.007	0.635
SHORT	0.101	0.022**	0.099	0.021**
LONG	0.011	0.790	0.067	0.113
TRAN	0.023	0.702	-0.012	0.845
SOX	0.047	0.419	0.030	0.599
SHORT*TRAN	-0.057	0.149	-0.065	0.080
LONG*TRAN	-0.011	0.838	-0.052	0.330
SHORT*SOX	-0.064	0.083*	-0.063	0.081*
LONG*SOX	-0.005	0.916	-0.070	0.157
Adjusted R^2	0.459		0.479	

Note: ***, ** and * respectively indicate statistical significance at the 1%, 5% and 10% levels. The reported p-values are all based on two-tailed tests. M-FACTOR is the first factor score of five ratios using the principal component factoring (varimax rotation).

Loading of the five ratios is as follows for M-FACTOR (Factor 1):

DSRI	GMI	AQI	SGI	TATA
0.059	-0.089	0.800	0.556	-0.506

We also use the second factor score as M-FACTOR in a separate test. Both the variables SHORT and LONG appear to be insignificant in this case.

Table 6
Panel A: Sensitivity Analysis for the Restricted Sample where the audit firm-client's relationship lasts for at least 5 years (control variables omitted from table presentation for sake of brevity).

N = 2634

Variables	Dependent variable **M-SCORE**		Dependent variable **M-FACTOR**	
	Coefficient	p-value	Coefficient	p-value
TENURE	-0.050	0.143	-0.149	0.000***
TRAN	-0.055	0.652	-0.438	0.002***
SOX	-0.039	0.712	-0.308	0.008***
TENURE*TRAN	0.100	0.424	0.392	0.009***
TENURE*SOX	0.122	0.273	0.335	0.007***

Note: The reported p-values are all based on two-tailed tests. M-FACTOR is the first factor score of five ratios using the principal component factoring (varimax rotation). We do not find any result when the second factor score as M-FACTOR is used as dependent variable in the analysis.

Panel B: Sensitivity Analysis with Absolute Discretionary Accruals-ADACC (Estimated from Cross-sectional Modified Jones Model) as dependent variable of interest (control variables omitted from table presentation).

N = 3515

Variables	Dependent variable **ADACC**		Dependent variable **ADACC**	
	Coefficient	p-value	Coefficient	p-value
TENURE	-0.018	0.184		
TRAN	-0.024	0.203		
SOX	-0.049	0.018**		
TENURE*TRAN	0.033	0.090*		
TENURE*SOX	0.040	0.044**		
SHORT			0.086	0.105
LONG			-0.014	0.815
TRAN			-0.018	0.826
SOX			0.011	0.890
SHORT*TRAN			-0.050	0.344
LONG*TRAN			0.010	0.896
SHORT*SOX			-0.058	0.237
LONG*SOX			0.016	0.813

***, ** and * respectively indicate statistical significance at the 1%, 5% and 10% levels.

Appendix B

Figure 1

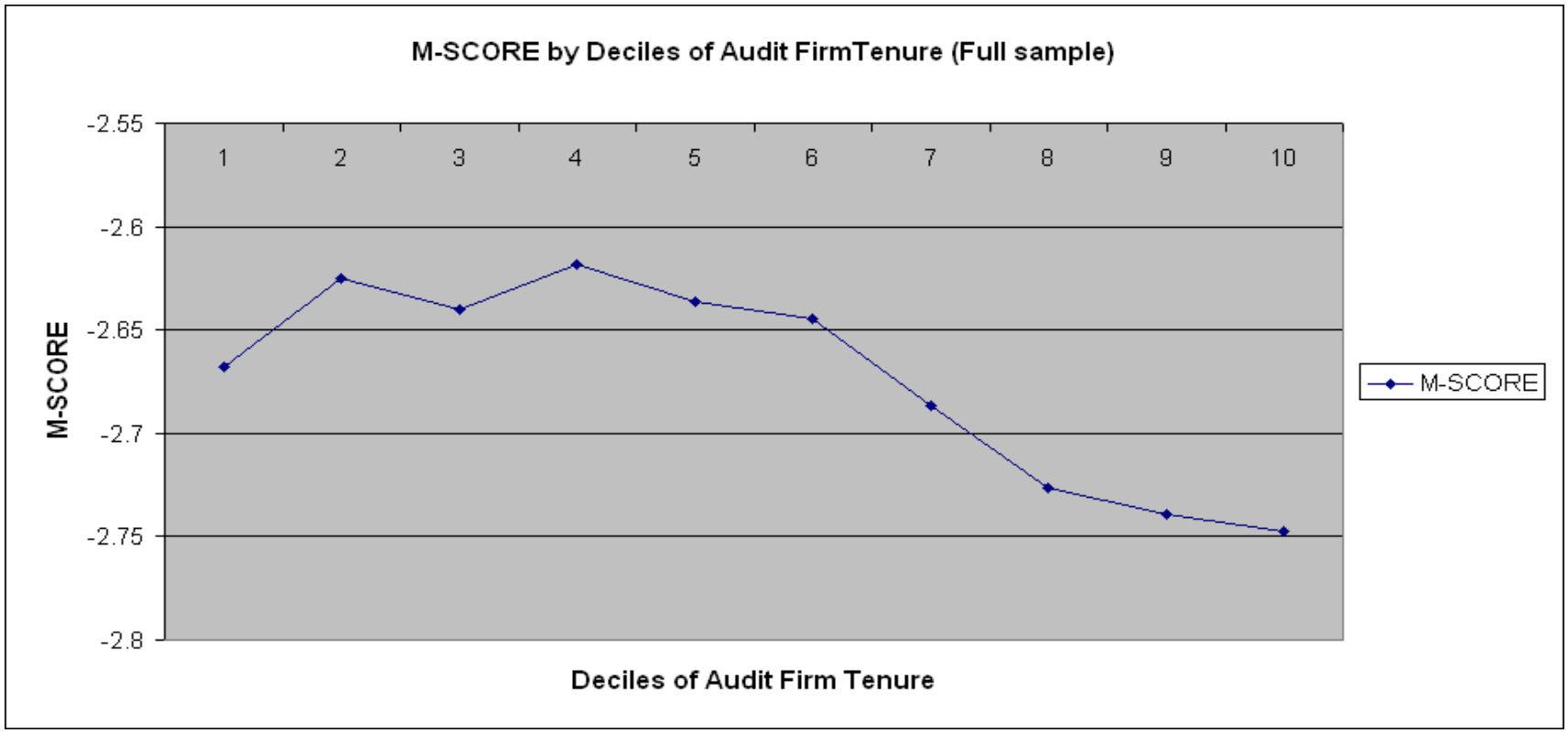
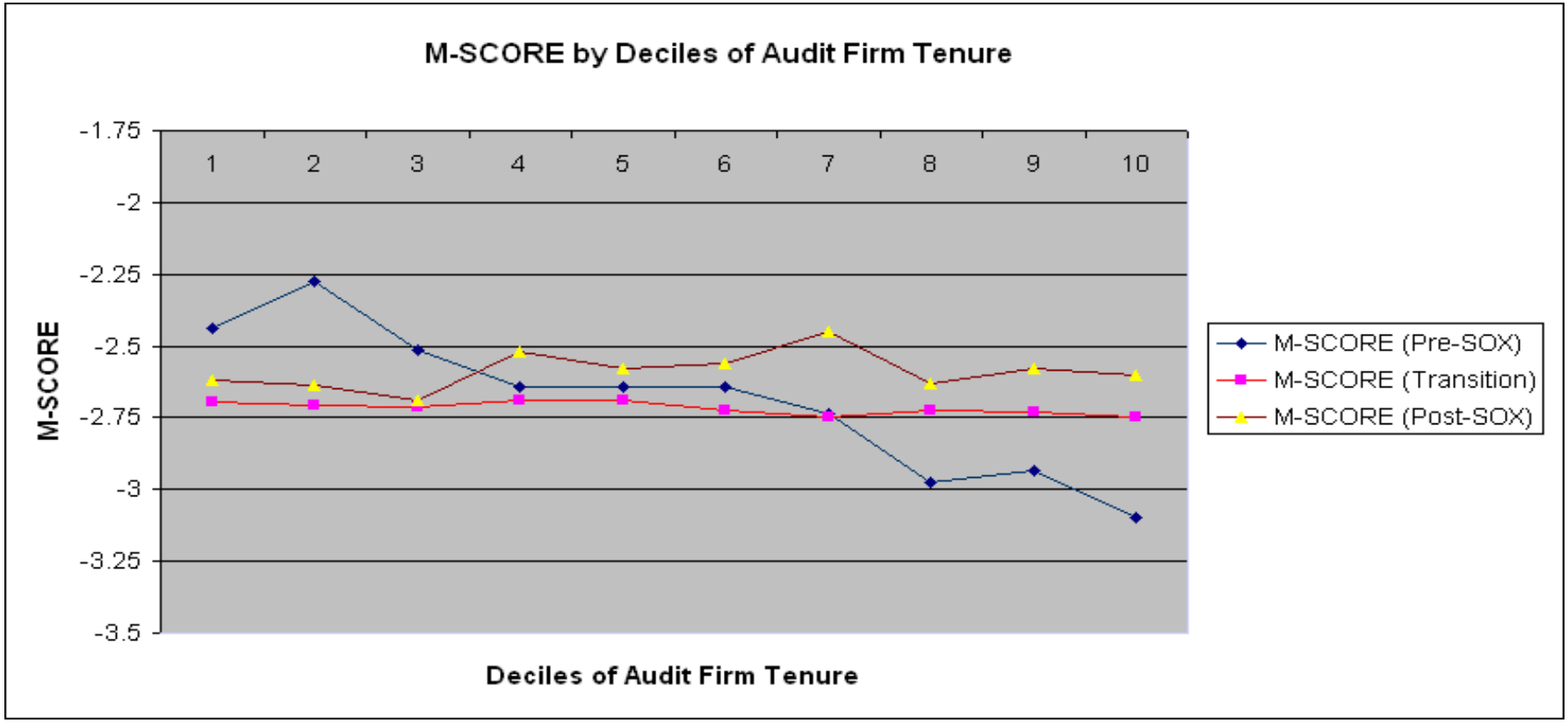


Figure 2



The opinions of the authors are not necessarily those of Louisiana State University, the E.J. Ourso College of business, the LSU Accounting Department, or the Editor-In-Chief.