

Auditor independence, corporate governance and aggressive financial reporting: an empirical analysis

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Abstract This paper seeks to provide empirical evidence on the efficacy of three important governance mechanisms (auditors, directors, and institutional shareholders) in constraining aggressive financial reporting, proxied by abnormal accruals. It also examines the effects of the Sarbanes–Oxley Act (SOX) on their efficacy. Using a sample of US firms audited by the Big 5 (4) auditors between 2000 and 2004, we document a positive relation between abnormal accruals (our proxy for financial reporting aggressiveness) and auditors' economic dependence on their clients. Furthermore, we find that this relation is driven by firms with weak non-auditor governance mechanisms before and after the enactment of SOX. The results suggest that aggressive financial reporting occurs only when multiple governance mechanisms 'fail'. More specifically, such type of reporting requires that a highly dependent auditor operates in a 'poor' governance setting. Thus, the paper underscores the importance of strong governance in constraining aggressive financial reporting. Moreover, our results suggest that governance regulation (such as SOX) is not a substitute for strong governance mechanisms and thus caution against the over reliance on SOX-type legislation in other parts of the world.

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1 Introduction

The last decade has witnessed a number of major governance failures of firms and drastic responses by regulators to prevent such failures from recurring. Perhaps the most famous example of these failures is the case of Enron where a poorly thought out business strategy together with weak monitoring mechanisms resulted in one of the biggest bankruptcies in the history of the US (see for example Coffee 2002; Healy and Palepu 2003; McLean and Elkin 2004). The Sarbanes–Oxley Act of 2002 (SOX) was passed in response to the accounting scandals at Enron, WorldCom and several other large corporations. It includes sweeping measures dealing with the oversight of the accounting profession, financial reporting, corporate governance, and other provisions affecting the business environment (Romano 2005).

An important presumption underlying SOX was that in the pre-SOX period governance failures (for example in auditing, monitoring by directors, or monitoring by institutional shareholders) were wide-spread and contributed to the failure of these corporations. However, critics of SOX argue that it is unclear whether such governance failures were widespread (see DeFond and Francis 2005). Furthermore, even if these problems were widespread, there are questions about whether new regulation could fix these problems. For example, Ribstein (2002, p. 2) predicts that “new regulation of fraud in general and Sarbanes–Oxley in particular, is unlikely to do a better job than markets”. Despite these questions about the efficacy of governance regulations, several countries have adopted SOX-type regulations and other countries are considering adoption (see Engelen 2004; Jopson 2004; Lerner 2006; Marshall 2007).

Because of this controversy over the effectiveness of governance mechanisms and regulation we provide evidence on the efficacy of auditing in constraining aggressive financial reporting before and after the passage of SOX. We also examine how the relation of auditing and aggressive financial reporting varies with the strength of other non-auditor governance mechanisms (board of directors and institutional shareholders). We focus on these governance mechanisms because they are most directly concerned with financial reporting. We proxy for aggressive financial reporting using abnormal accruals estimated from cross-sectional models. Intuitively, the more aggressive the financial reporting, the higher the abnormal accruals.

We expect that auditor effectiveness is likely to be a function of auditor’s economic dependence on the client. Holding the technical competence of an auditor constant, the more economically dependent the auditor is on a client, the less effective the auditing and therefore, the more aggressive the client’s financial reporting. We proxy for the economic dependence of the auditor using an office-level measure of relative client revenue following Reynolds and Francis (2001).

As non-auditor governance mechanisms such as the board of directors and institutional investors monitor auditor-manager interactions, we expect these other mechanisms mitigate the hypothesized positive relation between financial reporting aggressiveness and auditor dependence. We proxy for board of director monitoring using the fraction of inside directors and institutional investor monitoring using the fraction of outstanding shares held by institutional investors. We also provide evidence on how the passage of SOX impacted these relations.

Our tests are based on a sample of firms in Audit Analytics and Compustat that are audited by the Big 5 (or Big 4 after 2001) accounting firms over a pre-SOX period (2000–2001) and a post-SOX period (2002–2004). Restricting our sample to the major accounting firms ensures that auditors' technical competence is held roughly constant. We first examine the relation between abnormal accruals and auditors' economic dependence measured at the audit-office level. We also test whether this relation changed between the pre-SOX and post SOX periods. Second, we include the strength of non-auditor governance as a moderating factor and examine its effect on the above relations.

We find that (1) the relation between signed abnormal accruals and auditor dependence on the client is significantly positive in the pre-SOX period but not in the post-SOX period before considering the strength of other non-auditor governance mechanisms, (2) the positive relation between auditor dependence and abnormal accruals holds only when non-auditor governance is weak in both the pre-SOX and post-SOX periods.

Overall, our results suggest that strong non-auditor governance mitigates the effects of auditor dependence on the client. In other words, aggressive financial reporting results when *both* auditor's economic dependence on the client is high *and* other non-auditor governance mechanisms are weak. Perhaps, most importantly, our results suggest that despite its costs, SOX has not mitigated the adverse effects of weak non-auditor governance mechanisms.¹ Thus, even in the post-SOX period, aggressive financial reporting resulting from high auditor economic dependence on its client is not mitigated in the absence of strong non-auditor governance mechanisms.

Our results underscore the importance of good governance as well as raise questions about the efficacy of SOX-type regulations in addressing the potentially adverse effects of auditor dependence on the client that was presumed to be an important driver of the accounting scandals before SOX. The results are of importance to policy makers, governance professionals, and regulators. Furthermore, we believe that our study has implications not only for governance regulation in the US but also in other international settings. More specifically, our results suggest that the enactment of corporate governance legislation may not be sufficient to ensure "good" governance or to prevent aggressive financial reporting. This is consistent with the argument in Mintz (2005, p. 595) that laws are not sufficient by themselves to deter 'managerial malfeasance'. He further states that "While new regulations can impose penalties for violating governance standards, they cannot

¹ See Coates (2007) for a discussion of the costs and benefits of SOX and Ahmed et al. (2010) for evidence on the realized costs of SOX.

create an ethical culture that fosters responsible behavior.” This is also consistent with Park and Shin (2004) who argue that the effectiveness of monitoring mechanisms of Canadian companies did not change after the issuance of Toronto Stock Exchange’s Corporate Governance Guidelines of 1994. Finally, Holland (1999) cautions against the effects of a “box ticking” mentality in the Cadbury and the Greenbury governance proposals in the UK. In short, our results caution against considering governance regulation as a substitute for strong governance mechanisms.

The remainder of the paper is organized as follows: The second section presents the literature review and hypothesis development. The third section presents the research design. The fourth section presents the evidence on the effects of auditor dependence on abnormal accruals and how these effects are moderated by other governance mechanisms’ strength and the passage of SOX. The fifth section concludes the paper.

2 Literature review and hypotheses development

We study three factors that likely affect aggressive financial reporting: (1) the extent to which the auditor is economically dependent on its client, (2) the regulatory governance landscape, and (3) the strength of non-auditor governance mechanisms.²

2.1 External auditors and economic dependence on clients

Jensen and Meckling (1976) recognize the importance of external auditing as a monitoring mechanism. External auditors are hired to perform an independent examination of a firm’s financial reports and issue an opinion on their consistency with GAAP.³ Thus, external auditors are the most direct monitors of financial reporting decisions and constitute the first line of defense against potential earnings or accounting manipulation. However, monitoring by external auditors may be compromised under certain conditions and in return impair audit quality. For example, Mautz and Sharaf (1961) recognize the auditor’s financial dependence on clients as a “built-in anti-independence factor.” Similarly, DeAngelo (1981) argues that future economic interest in a client reduces the auditor’s independence vis-à-vis that client. Thus, auditor independence is likely to be compromised when the auditor’s economic dependence on the client is high.⁴

² Coffee (2002), Healy and Palepu (2003) argue that the failure of Enron was essentially driven by the failure of gatekeepers including auditors, directors, analysts, and institutional investors. In addition, governance varies across firms as the benefits and incentives of monitoring vary across operating environments (Demsetz and Lehn 1985). The primary cause of these conflicts is the separation of ownership and control of the assets of the firm (Berle and Means 1932; Jensen and Meckling 1976).

³ We refer to the ‘external auditor’ as the ‘auditor’ for brevity.

⁴ Trompeter (1994) documents that audit partners whose compensation is closely tied to client retention are less likely to oppose income-increasing earnings management by requiring downward adjustments to income. Nelson et al. (2002) survey 253 auditors from a Big 5 audit firm and find that auditors are more likely to oppose earnings management attempts, via adjustments, for smaller clients than for larger clients.

Based on the above logic and evidence, if auditor independence is compromised when auditor dependence on clients is high, we expect to see more aggressive financial reporting. This prediction is consistent with Becker et al. (1998) who argue that higher quality auditors will tend to reduce the incidence of income-increasing earnings management. Next, we discuss how the relation between auditor dependence and aggressive financial reporting may be affected by both the regulatory governance landscape and other non-auditor governance mechanisms.

2.2 The regulatory governance landscape: the impact of the Sarbanes–Oxley act

It is widely recognized that the Sarbanes–Oxley Act (SOX) has radically altered the landscape of financial reporting. Barry Melancon, the president and CEO of the American Institute of CPAs (AICPA), stated in a 2002 speech that SOX “contains some of the most far-reaching changes that congress has ever introduced to the business world. Its scope is large. It contains fundamental reforms. Many of its standards are high. And its penalties are stiff.”

There are several ways that SOX can potentially affect the relation between aggressive financial reporting and auditor dependence. First, as DeFond and Francis (2005) note, SOX has transformed the auditing industry from a ‘self-regulated’ industry to an industry controlled by a quasi-government agency (the Public Company Accounting Oversight Board). This may provide management of accounting firms with incentives to exercise tighter control over individual offices. Furthermore, SOX has made important engagement-specific changes. For example, it has banned provision of non-audit services, mandated audit partner rotation, and requires a 1-year waiting period before auditor employees can accept executive positions with the client. Taken together, these changes likely increase the cost to auditors of compromising their independence even for influential clients.

Second, SOX has altered audit committee composition and responsibilities (Klein 2003; DeFond and Francis 2005). For example, it requires all members of the audit committee to be independent. It also requires the presence of a financial expert on the audit committee. Furthermore, it has given the responsibility of hiring and firing auditors to the audit committee. In theory, these changes suggest greater monitoring of auditors and managers by the audit committee.

However, whether or not SOX will have any real effects on auditors or managers’ accounting choices is not clear. Francis (2004) argues that audit failure rates were close to zero before SOX so auditing was quite effective in constraining aggressive accounting. Similarly, the evidence cited above suggests that outside directors as well as audit committees were effective in constraining aggressive accounting as well as ensuring that auditors were not fired because of unfavorable opinions. Of course, auditing before SOX was not perfect but given the prohibitive costs of ‘perfect’ auditing, it is not clear that SOX or any other regulation will completely prevent occasional accounting fraud or manipulations. Given the above arguments, whether or not SOX has affected the relation between aggressive reporting and auditor dependence is an empirical question.

2.3 Non-auditor governance mechanisms: the board of directors and institutional shareholders

The board of directors and institutional shareholders are two important governance mechanisms. Kor et al. (2008) finds the effectiveness of these mechanisms, in terms of outsider directorship and institutional ownership, is utilized more extensively in cases of demand uncertainty and competitive uncertainty faced by IPO firms. While this study focused on the antecedents of deploying strong board and institutional shareholders' monitoring other studies have examined the effects of such deployment. Specifically a number of studies show that strong boards and institutional shareholders constrain aggressive financial reporting or earnings management.

For example, Beasley (1996), Dechow et al. (1996), and Farber (2005) find that board independence is negatively related to the likelihood of financial statement fraud. Peasnell et al. (2005) find that the percentage of outsiders on the board is negatively related to income-increasing abnormal accruals for UK companies. Klein (2002b) finds similar results for US firms using absolute abnormal accruals as a proxy for earnings management. Beekes et al. (2004) and Ahmed and Duellman (2007) document that outside director percentage is positively associated with more conservative (or less aggressive) financial reporting.

A second governance mechanism that is likely to constrain earnings management is institutional shareholdings. Cornett et al. (2008, p. 359) state that "Large institutional investors have the opportunity, resources, and ability to monitor, discipline, and influence managers." Thus, institutional shareholders have both the incentive and power to constrain opportunistic behavior of managers in the form of earnings management.

Empirically, Chung et al. (2002) document a negative association between institutional ownership and income-increasing accruals for US firms. Similarly, Koh (2003) finds that institutional investors are negatively related to aggressive reporting using a sample of Australian firms. Furthermore, Barton (2005) finds that among former Andersen clients, firms with greater institutional ownership defected faster than those with lower levels of institutional ownership. Thus, the results of prior studies suggest that institutional shareholders play an important role not only in mitigating opportunistic managerial behavior but also in scrutinizing the auditor–client relationship. The level of institutional investors' activism would be a function of their financial stake in the company.

Results of empirical studies suggest that the strength of these mechanisms affects the extent to which the auditor can operate in a setting that is conducive to higher quality audits. For example, McMullen (1996) finds that the likelihood of auditor turnover following an auditor–client disagreement is negatively related to the presence of an audit committee. Similarly, Carcello and Neal (2003) find that the independence of the audit committee is negatively related to the likelihood of auditor dismissal following a going concern report suggesting that an independent audit committee may shield the auditor from potential retaliation by management, alleviating any pressure on the auditor's opinion and thus enhancing the auditor's independence. While these studies link audit committee independence to auditor

behavior, evidence in Klein (2002a) suggests a strong correspondence between audit committee independence and overall board independence.

To the extent these other governance mechanisms are effective; we expect they will mitigate the adverse effects of auditor dependence on financial reporting aggressiveness. Thus, the greater the strength of these other governance mechanisms, the weaker should be the relation between aggressive financial reporting and auditor dependence on clients.

To summarize, we test the following hypotheses about the relation between aggressive financial reporting and governance mechanisms:

H1: The greater the auditor's economic dependence on its client, the more aggressive the financial reporting by the client.

H2: The positive relation between aggressive financial reporting and auditor dependence is mitigated by SOX.

H3: The positive relation between aggressive financial reporting and auditor dependence is mitigated by the strength of monitoring by other non-auditor governance mechanisms.

3 Research design

We provide evidence on the effects of the auditor's economic dependence on the degree of financial reporting aggressiveness using a regression of abnormal accruals on our measure of auditor's economic dependence (*Aud-Dep*) and a set of control variables. We also examine the moderating effects of SOX and the strength on non-auditor governance mechanisms on this relation. This section describes our abnormal accrual measures, auditor dependence measure, construction of board and institutional shareholders strength partitions, and the rationale for the control variables used in our tests. We also perform additional robustness and sensitivity tests that are described in the evidence section of the paper.

3.1 Abnormal accrual measure

We use the following accrual model used by Larcker and Richardson (2004), estimated by 2-digit industry each year, to measure abnormal accruals:

$$\begin{aligned} Total\ Accruals_{i,t} = & \alpha + \beta_1 (\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} \\ & + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where, *Total Accruals* is the difference between operating cash flows (CFO) and income before extraordinary items reported on the statement of cash flows deflated by average total assets, *Sales* is the change in sales for the year deflated by average total assets, *ΔREC* is the change in receivables reported on the statement of cash flows deflated by average total assets, *PPE* is the gross property plant and equipment deflated by average total assets, *BTM* is the book-to-market ratio defined as the book value of common equity outstanding divided by the market

capitalization at the end of the fiscal year, and *CFO* is the cash flows from operations deflated by average total assets. The residual of this model (ε) is our measure of abnormal (or discretionary) accruals.

The above accrual model is an extension of the modified Jones (1991) model in Dechow et al. (1995). It is based on the assumption that accruals are a function of sales growth ($\Delta\text{Sales}-\Delta\text{REC}$) and capital intensity (PPE). Larcker and Richardson (2004) add (1) the book-to-market ratio as a proxy for expected growth, and (2) operating cash flows because evidence in Dechow et al. (1995) suggests that the modified Jones model is mis-specified for firms with extreme performance.

3.2 Auditor's economic dependence measure

Our measure of the auditor's economic dependence is defined as the log of total fees (audit plus non-audit fees) paid to the auditor obtained from Audit Analytics divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. We assign a client to the audit office (associated with the auditor) closest to the client's headquarters based on zip codes as in Chung and Kallapur (2003). We obtain audit office zip codes from the lists of audit offices reported in annual reports filed by auditors with the AICPA from 2001 to 2004.⁵ We assume that auditors' office zip codes in 2000 are the same as in 2001. Any mismatching, that occurs between audit client and audit office should bias against results, as it will essentially add noise to our office-level dependence measure. We obtain client zip codes from Audit Analytics.

In our sample, the average (median) office audits 19.1 (15) firms, with a range of 1–64 clients per office. Although our average number of audits per office is higher than that reported in Reynolds and Francis (2001), 13.5, our range is much lower (1–139).

3.3 Measure of the strength of non-auditor governance mechanisms

Given the previously discussed arguments and evidence regarding governance mechanisms and accounting choices, in addition to examining the direct relation between (*Aud-Dep*) and abnormal accruals in pre-SOX and post-SOX periods, we examine the moderating effects of non-auditor governance strength. The strength of non-auditor governance mechanisms is based on (1) the extent to which insider representation on the board is limited and (2) the fraction of institutional shareholdings. We partition firm-year observations to three groups; *Weak governance*, *Moderate governance*, and *Strong governance*.

We define the weak (strong) governance partition as the set of firms with above (below) the median fraction of insiders on their boards and below (above) the median fraction of institutional shareholdings. The remaining firms are classified as

⁵ We have a total of 303 audit offices for fiscal-year 2004 (Big 4) compared with 404 audit offices for fiscal year 2001, the dramatic decrease is due to the closure of Arthur Andersen. The number of total offices is comparable to Chung and Kallapur (2003) who find 412 audit offices for fiscal year 2000. If a firm has multiple offices in the same zip code, we treat these offices as one office.

‘moderate’ governance firms. We focus on these two governance mechanisms because they have been shown to affect accounting choices.⁶

3.4 Empirical model and control variables

The main argument underlying the empirical model is that aggressive financial reporting proxied by abnormal accruals is a function of (1) incentives of earnings management and (2) deterrents/impetuses of earnings management. For the purpose of our study we focus on the latter group while controlling for firm-specific characteristics that affect the extent of earnings management. The primary purpose of controls in our context is to mitigate measurement error in abnormal accruals due to mis-specification in the accrual model. We utilize the following empirical model to test our predictions:

$$\begin{aligned}
 AA_{i,t} = & \alpha_0 + \beta_1 Aud - Dep_{i,t} + \beta_2 Tenure_{i,t} + \beta_3 SOX_{i,t} + \beta_4 SOX_{i,t} * Aud - Dep_{i,t} \\
 & + \beta_5 SOX_{i,t} * Tenure_{i,t} + \beta_6 CFO_{i,t} + \beta_7 Size_{i,t} + \beta_8 Debt_{i,t} + \beta_9 Altman Z_{i,t} \\
 & + \beta_{10} Asset Growth_{i,t} + \beta_{11} AA_{i,t-1} + \beta_{12} First_{i,t} + \beta_{13} Last_{i,t} + \varepsilon_{i,t}
 \end{aligned}
 \tag{2}$$

where $AA_{i,t}$ is the abnormal accruals estimated in Eq. 1, $Aud-Dep_{i,t}$ is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion, $Tenure_{i,t}$ is the number of consecutive years the auditor has audited the firm since 1990, $CFO_{i,t}$ is the operating cash flows of the client divided by average total assets, $Size_{i,t}$ is the natural log of total revenues,⁷ $Debt_{i,t}$ is total liabilities divided by total assets, $Altman Z_{i,t}$ is the Altman Z score (Altman 1968) calculated as follows: $(1.2 * \text{Net Working Capital/Total Assets}) + 1.4 * (\text{Retained Earnings/Total Assets}) + 3.3 * (\text{EBIT/Total Assets}) + 0.6 * (\text{Market Value of Equity/Book Value of Liabilities}) + 1.0 * (\text{Sales/Total Assets})$,⁸ $Asset Growth_{i,t}$ is the percentage change in total assets, $AA_{i,t-1}$ is lagged abnormal accruals, $First$ is a dichotomous variable set equal to one if the current year is the auditor’s first year with the client, zero otherwise, and $Last$ is a dichotomous variable set equal to one if the current year is auditor’s final year with the client, zero otherwise.

We include *Tenure* as an explanatory variable because Myers et al. (2003) find that auditor tenure is positively related to signed accruals and negatively related to

⁶ Section 301. *Public Company Audit Committee* (SOX) states that “Each member of the audit committee of the issuer shall be a member of the board of directors of the issuer, and shall otherwise be independent” [Emphasis added]. This SOX provision would naturally reduce the variation of audit committee independence. However, SOX did not directly address the board members’ independence. Since we are examining the joint moderating effects of non-auditor governance strength and SOX on the auditor–client relation and in turn aggressive financial reporting, we believe that focusing on ‘voluntary’ board independence rather than ‘mandated’ audit committee independence is more appropriate in our setting.

⁷ Total revenues are measured in thousands of dollars to remain consistent with Reynolds and Francis (2001).

⁸ Results remain unchanged if we calculate the Altman Z score using the private firm multipliers for the Z-score determinants.

absolute abnormal accruals. If auditor tenure is correlated with *Aud-Dep*, omitting auditor tenure could bias the coefficient on *Aud-Dep*. We define *Tenure* as the number of consecutive years the client has been audited by the same audit firm.⁹ We control for operating cash flows (*CFO*) because cash flows in Eq. 1 only control for performance differences across firms within an industry whereas there could be important performance differences across firms in different industries as well as across time. We define operating cash flows as cash flows from operations divided by average total assets.¹⁰

We control for the natural log of revenues (*Size*) because size may be related to the operating characteristics of the firm. Additionally, large firms may have differential incentives to manage earnings given their larger analyst following and the increased scrutiny their financial reports receive in the business press. We include the ratio of total liabilities to total assets (*Debt*) to control for the investment opportunity set. Furthermore, debt levels affect the incentives to manage earnings as firms are more likely to manage earnings as they come closer to violating debt covenants (DeFond and Jiambalvo 1994). However, in tests of signed earnings management the negative accruals associated with debt due to interest generally lead to a negative association between debt and abnormal accruals. Consistent with Reynolds and Francis (2001) we also include the Altman Z score (*Altman Z*). We control for the probability of bankruptcy because firms that are close to bankruptcy may have greater incentives to manage earnings. We also control for *Asset Growth* because the model for expected accruals could be mis-specified for firms experiencing unusual growth or changes in assets. We include the abnormal accruals estimated for the previous year to control for the potential reversal of prior period abnormal accruals not captured in Eq. 1.¹¹ Finally, we include controls for auditor switching by including dummy variables for the first year the client is with a given auditor (*First*) and for the last year the client is with a given auditor (*Last*). We control for auditor switches as DeFond and Subramanyam (1998) find that discretionary accruals are generally income decreasing during the firm's last year with the auditor and indistinguishable from zero in the first year with the new auditor.

4 Evidence

In this section we describe the sample used in the study and related descriptive statistics. Then we provide evidence on the relation between auditor economic dependence and abnormal accruals and the moderating effect of SOX. In addition we introduce non-auditor governance strength as another moderating factor. Finally we discuss the results of several sensitivity tests.

⁹ Auditor tenure is measured from 1975 which is the fiscal year Compustat reports the auditor. If the firm's auditor was not previously available in Compustat we set *Tenure* equal to one.

¹⁰ Results are qualitatively unchanged if we use an alternative proxy for profitability such as lagged ROA as in Chung and Kallapur (2003). Additionally, in robustness tests we utilize performance adjusted abnormal accruals and find similar results.

¹¹ We obtain similar results if we use lagged total accruals to control for the reversal of previous accruals.

4.1 Sample selection and descriptive statistics

We estimate Eq. 1 annually for each 2-digit industry (with at least eight firms in the industry) using all firms with data available in Compustat between 1999 and 2004 and average total assets exceeding two million dollars.¹² We exclude financial institutions such as banks and insurance companies (SIC codes 6000–6999) similar to prior work. The pooled sample contains 32,259 firm-years and is estimated using 366 industry-year regressions. The mean coefficient estimates of our accrual model are similar to those reported in Larcker and Richardson (2004) Table 3(A) except that we find a positive and significant coefficient on book-to-market.¹³ Additionally, in our sample the average adjusted R^2 is higher (37.9%) than the average adjusted R^2 in their study (30.1%).

To test for the effects of auditor dependence on abnormal accruals we utilize a sample of all Compustat firms audited by the Big 5 (or Big 4 after 2001) accounting firms with available data over 2000–2004 and zip codes available on Audit Analytics. This leaves us with a final sample of 10,748 firm-years. Our sample contains 3,460 firm-years in the pre-SOX era (2000–2001) and 7,288 firm-years in the post-SOX era (2002–2004). The difference in sample size is due to Audit Analytics expanding from 5,702 (8,053) firm-years with available data in 2000 (2001) to over 14,000 firm-years annually available for fiscal-years 2002–2004. The top and bottom 1% of all variables are winsorized to mitigate the potential effects of outliers.¹⁴

Table 1 presents the descriptive statistics of our full sample and Table 2 presents descriptive statistics for our sample of firms from the pre- and post-SOX era. The mean (median) abnormal accruals (AA) is 0.013 (0.018) for our sample period. Note that these magnitudes are for our sample firms (and not for all firms that are used to estimate the accrual model). These magnitudes are slightly larger than magnitudes reported in Chung and Kallupar (2003) and Larcker and Richardson (2004). The mean (median) of *Inside Director Fraction* is 0.309 (0.273). The mean (median) level of *Institutional Ownership Fraction* is 0.670 (0.689) consistent with the values reported by Ahmed and Duellman (2007), Chen et al. (2008), and Harford et al. (2008).

The mean (median) *Inside Director fraction* is 0.449 (0.429) for weak governance firms in the pre-SOX period (not tabulated) and 0.457 (0.429) in the post-SOX period (not tabulated). Thus, the structure of the board of directors did not drastically change regarding director composition for weak governance firms post-SOX. The mean (median) value of *Aud-Dep* based on office-level fees is 0.104 (0.035). With respect to other firm characteristics, the firms in our sample are slightly larger, on average, than the firms in Reynolds and Francis (2001). The mean log sales are approximately 12.722 for our sample versus 11.85 for their sample.

¹² We exclude smaller firms because they often have extreme values for accruals that may bias the results.

¹³ This result may be an anomaly or due to the different time-periods of the studies. However, our results are robust to several alternative abnormal accrual designs and the inclusion/exclusion of book-to-market in the abnormal accruals equation does not qualitatively change our findings.

¹⁴ Results remain qualitatively unchanged if we control for outliers by deleting observations with a Cook's D value greater than $4/n$.

Table 1 Descriptive statistics for the sample period 2000–2004 $N = 4\,310$

	Mean	Std. Dev.	Min	25%	Median	75%	Max
Accrual and governance measures							
AA	0.013	0.118	-0.479	-0.029	0.018	0.066	0.363
Total accruals	-0.080	0.115	-0.625	-0.111	-0.061	-0.024	0.189
Inside director fraction	0.309	0.166	0.000	0.181	0.273	0.429	0.889
Institutional ownership fraction	0.670	0.198	0.000	0.546	0.689	0.802	0.991
Auditor and firm characteristics							
Aud-Dep	0.104	0.107	0.016	0.035	0.064	0.127	0.567
Tenure	8.642	7.436	1.000	3.000	6.000	12.000	29.000
SOX	0.678	0.467	0.000	0.000	1.000	1.000	1.000
CFO	0.055	0.161	-0.686	0.019	0.079	0.137	0.373
Revenues (Billions)	2.457	0.300	0.000	0.086	0.357	1.354	36.977
Size	12.722	2.119	1.386	11.397	12.786	14.063	17.426
Debt	0.489	0.255	0.059	0.286	0.482	0.656	1.353
Altman Z	4.464	6.306	-12.088	1.662	3.147	5.510	35.625
Asset growth	0.140	0.419	-0.579	-0.037	0.075	0.213	2.412
First	0.104	0.306	0.000	0.000	0.000	0.000	1.000
Last	0.111	0.315	0.000	0.000	0.000	0.000	1.000

AA is the amount of abnormal accruals (ε) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t}$. *Total Accruals* is the difference between operating cash flows and income before extraordinary items reported on the statement of cash flows deflated by average total assets. $\Delta Sales$ is the change in sales for the year deflated by average total assets. ΔREC is the change in Receivables reported on the statement of cash flows deflated by average total assets. *PPE* is the gross property plant and equipment deflated by average total assets. *BTM* is the book-to-market ratio defined as the book value of common equity outstanding divided by the market capitalization at the end of the fiscal year. *Inside Director Fraction* is the fraction of directors who are currently employed by the firm. *Institutional Ownership Fraction* is the total fraction of shares held by institutional investors. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *Tenure* is the number of consecutive years the auditor has audited the firm since 1975. *CFO* is the operating cash flows of the client divided by average total assets. *Revenues* is the total revenue of the firm. *Size* is the natural log of total revenues. *Debt* is total liabilities divided by total assets. *Altman Z* is the Altman Z score calculated as follows: $(1.2 * Net\ Working\ Capital / Total\ Assets) + 1.4 * (Retained\ Earnings / Total\ Assets) + 3.3 * (EBIT / Total\ Assets) + 0.6 * (Market\ Value\ of\ Equity / Book\ Value\ of\ Liabilities) + 1.0 * (Sales / Total\ Assets)$. *Asset Growth* is the percentage change in total assets. *First* is a dichotomous variable set equal to one if the current year is the auditor's first year with the client, zero otherwise. *Last* is a dichotomous variable set equal to one if the current year is auditor's final year with the client, zero otherwise

The mean (median) of *CFO* is 0.055 (0.079) to 0.040 and 0.070 in Larcker and Richardson (2004).

Table 2 presents the means and medians of our sample pre- and post-SOX. Consistent with SOX increasing financial statement quality, we find the mean value of abnormal accruals reduced from 0.019 pre-SOX to 0.010 post-SOX. Surprisingly, the average fraction of directors who are members of management increased from 0.294 in the pre-SOX era to 0.315 in the post-SOX era. However, this increase may be due to the expanded sample size due to improved data availability in Audit

Table 2 Descriptive statistics of the pre- and post-sox era $N = 4,310$

	Pre-SOX 2000–2001 $N = 1,326$		Post-SOX 2002–2004 $N = 2,984$		Post-Sox – Pre-Sox	
	Mean	Median	Mean	Median	Mean	Median
Accrual and governance measures						
AA	0.019	0.025	0.010	0.015	-0.009	-0.010
Total accruals	-0.090	-0.066	-0.075	-0.059	0.015	0.007
Inside director fraction	0.294	0.250	0.315	0.286	0.021	0.036
Institutional ownership fraction	0.637	0.651	0.685	0.706	0.048	0.055
Auditor and firm characteristics						
Aud-Dep	0.135	0.089	0.089	0.055	-0.046	-0.034
Tenure	9.558	7.000	8.208	6.000	-1.35	-1.000
Sox	0.000	0.000	1.000	1.000	1.000	1.000
CFO	0.053	0.078	0.056	0.080	0.003	0.002
Revenues (Billions)	2.362	0.337	2.502	0.367	0.140	0.030
Size	12.688	12.725	12.738	12.816	0.050	0.091
Debt	0.499	0.501	0.485	0.475	-0.014	-0.026
Altman Z	4.889	3.135	4.263	3.158	-0.626	0.023
Asset growth	0.144	0.037	0.112	0.053	-0.032	0.016
First	0.059	0.000	0.125	0.000	0.066	0.000
Last	0.166	0.000	0.086	0.000	-0.080	0.000

Bold Italics indicates the difference between the Pre- and Post-Sox era is significant at the 1% level. AA is the amount of abnormal accruals (ϵ) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \epsilon_{i,t}$. *Total Accruals* is the difference between operating cash flows and income before extraordinary items reported on the statement of cash flows deflated by average total assets. $\Delta Sales$ is the change in sales for the year deflated by average total assets. ΔREC is the change in Receivables reported on the statement of cash flows deflated by average total assets. *PPE* is the gross property plant and equipment deflated by average total assets. *BTM* is the book-to-market ratio defined as the book value of common equity outstanding divided by the market capitalization at the end of the fiscal year. *Inside Director Fraction* is the fraction of directors who are currently employed by the firm. *Institutional Ownership Fraction* is the total fraction of shares held by institutional investors. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *Tenure* is the number of consecutive years the auditor has audited the firm since 1975. *CFO* is the operating cash flows of the client divided by average total assets. *Revenues* is the total revenue of the firm. *Size* is the natural log of total revenues. *Debt* is total liabilities divided by total assets. *Altman Z* is the Altman Z score calculated as follows: $(1.2 * Net\ Working\ Capital / Total\ Assets) + 1.4 * (Retained\ Earnings / Total\ Assets) + 3.3 * (EBIT / Total\ Assets) + 0.6 * (Market\ Value\ of\ Equity / Book\ Value\ of\ Liabilities) + 1.0 * (Sales / Total\ Assets)$. *Asset Growth* is the percentage change in total assets. *First* is a dichotomous variable set equal to one if the current year is the auditor's first year with the client, zero otherwise. *Last* is a dichotomous variable set equal to one if the current year is auditor's final year with the client, zero otherwise

Analytics in the post-SOX period. We also find an increase in the average fraction of institutional ownership in the post-SOX era from 0.637 to 0.685. The mean value of *Aud-Dep* based on office-level fees decreases from 0.135 in the pre-SOX era to 0.089 in the post-SOX era. The decline in these ratios is consistent with a reduction

in non-audit work after SOX as well as an increase in the number of clients per office due to Andersen ceasing their auditing operations in 2002.¹⁵

In Table 3, we present the descriptive statistics for each non-auditor governance partition. The mean value of *Inside Director Fraction* decreases from 0.455 in the weak governance partition to 0.179 in the strong governance partition. While *Institutional Ownership Fraction* increases from 0.503 in the weak governance partition to 0.816 in the strong governance partition. However, firms appear to be of similar size and obtain similar audit quality across our governance partitions as we find no difference in *Aud-Dep* and *Revenues* between the weak and strong governance partitions. Conversely, strong governance firms appear to have stronger cash flows and lower likelihood of bankruptcy.

Table 4 presents the Pearson and Spearman correlations between our dependent and independent variables. The Pearson and Spearman correlation between *AA* and *Aud-Dep* is insignificant at the 1% level of significance. Additionally, we do not find a significant correlation between either *Inside Director Fraction* and *AA*. Although the univariate correlations are inconsistent with the predicted relation, they do not control for firm characteristics that may be correlated omitted variables.

4.2 Abnormal accruals, auditor dependence, and SOX

In Table 5 we present our regression of abnormal accruals on auditor dependence prior to controlling for other governance mechanisms. In this specification, the coefficient on *Aud-Dep* is 0.047 and significant at the 1% level suggesting that auditors allow their more important clients to report higher (relatively income increasing) abnormal accruals than their less important clients supporting H1 in the pre-SOX period. If SOX enhanced the governance environment given the heightened attention of regulators to accounting and auditing such as the formation of the PCAOB (DeFond and Francis 2005) we would expect the effect of *Aud-Dep* on abnormal accruals to weaken in the post-SOX. Consistent with H2, the coefficient on *SOX * Aud-Dep* is -0.053 while the joint coefficient of $\beta_1 + \beta_4$ is -0.006 . Thus, in the post-SOX period there is no relation between auditor dependence and abnormal accruals across all firms. The coefficient on *Tenure* is also positive and significant, consistent with the abnormal accrual tests in Myers et al. (2003). Overall, the results are consistent with the notion that clients on which an auditor is more economically dependent tend to use more aggressive accounting that boosts income compared other clients in the pre-SOX period, while there is no relation in the post-SOX period.

Surprisingly, we find a positive and significant coefficient (at the 10% level) on *SOX*. This result is inconsistent with the findings of Cohen et al. (2008) who document a negative relation between *SOX* and earnings management. However, in tests using signed accruals Cohen et al. (2008) document that firms with negative accruals have more income increasing accruals post-SOX.¹⁶ The coefficient on *CFO*

¹⁵ SOX: Title II—Auditor Independence (Sec. 201. *Services outside the Scope of Practice of Auditors*) prohibited the contemporaneous provision of audit and non-audit services to the same client.

¹⁶ If we remove fiscal year 2002 the coefficient on *SOX* becomes insignificant at conventional levels. Table 5 ignores the role of other non-auditor governance mechanisms in moderating the relation between

Table 3 Descriptive statistics of the weak, moderate, and strong governance partitions $N = 4,310$

	Weak governance $N = 1,150$		Moderate governance $N = 1,980$		Strong governance $N = 1,180$		Strong-weak governance	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Accrual and governance measures								
AA	0.007	0.012	0.009	0.013	0.020	0.020	0.013	0.008
Total accruals	-0.073	-0.060	-0.069	-0.056	-0.060	-0.055	0.013	0.005
Inside director fraction	0.455	0.428	0.301	0.273	0.179	0.181	-0.276	-0.247
Institutional ownership fraction	0.503	0.533	0.679	0.689	0.816	0.800	0.313	0.267
Auditor and firm characteristics								
Aud-Dep	0.118	0.070	0.117	0.073	0.113	0.074	-0.005	0.004
Tenure	11.051	9.000	10.951	9.000	11.632	9.000	0.581	0.000
Sox	0.692	1.000	0.694	1.000	0.690	1.000	-0.002	0.000
CFO	0.095	0.094	0.102	0.098	0.107	0.103	0.012	0.009
Revenues (Billions)	4.579	1.605	5.728	1.521	4.618	1.637	0.039	0.032
Size	13.923	13.879	14.324	14.235	14.362	14.308	0.439	0.429
Debt	0.477	0.475	0.542	0.558	0.551	0.556	0.074	0.081
Altman Z	5.226	3.645	4.324	3.107	4.423	3.336	-0.803	-0.309
Asset growth	0.082	0.062	0.105	0.075	0.104	0.069	0.022	0.007
First	0.074	0.000	0.081	0.000	0.080	0.000	0.006	0.000
Last	0.062	0.000	0.057	0.000	0.052	0.000	-0.010	0.000

Bold Italics indicates the difference between the Strong Governance and Weak Governance is significant at the 1% level. *AA* is the amount of abnormal accruals (ε) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t}$. *Total Accruals* is the difference between operating cash flows and income before extraordinary items reported on the statement of cash flows deflated by average total assets. *ASales* is the change in sales for the year deflated by average total assets. *AREC* is the change in Receivables reported on the statement of cash flows deflated by average total assets. *PPE* is the gross property plant and equipment deflated by average total assets. *BTM* is the book-to-market ratio defined as the book value of common equity outstanding divided by the market capitalization at the end of the fiscal year. *Inside Director Fraction* is the fraction of directors who are currently employed by the firm. *Institutional Ownership Fraction* is the total fraction of shares held by institutional investors. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *Tenure* is the number of consecutive years the auditor has audited the firm since 1975. *CFO* is the operating cash flows of the client divided by average total assets. *Revenues* is the total revenue of the firm. *Size* is the natural log of total revenues. *Debt* is total liabilities divided by total assets. *Altman Z* is the Altman Z score calculated as follows: $(1.2 * Net\ Working\ Capital/Total\ Assets) + 1.4 * (Retained\ Earnings/Total\ Assets) + 3.3 * (EBIT/Total\ Assets) + 0.6 * (Market\ Value\ of\ Equity/Book\ Value\ of\ Liabilities) + 1.0 * (Sales/Total\ Assets)$. *Asset Growth* is the percentage change in total assets. *First* is a dichotomous variable set equal to one if the current year is the auditor's first year with the client, zero otherwise. *Last* is a dichotomous variable set equal to one if the current year is auditor's final year with the client, zero otherwise

Footnote 16 continued

auditor dependence on its client and abnormal accruals. After controlling for non-auditor governance strength we find a negative and significant relation between SOX and abnormal accruals in Table 6.

Table 4 Correlation table 2000–2004 Pearson (Spearman) correlations above (below) the diagonal $N = 4,310$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 AA	1	0.799	-0.030	0.039	0.001	0.032	-0.033	-0.271	-0.002	-0.054	-0.081	0.077	0.008	-0.012	0.011
2 Total accruals	0.671	1	-0.028	0.064	0.037	0.099	0.061	-0.025	0.039	0.123	-0.078	0.195	0.064	-0.045	-0.015
3 Inside director fraction	-0.029	-0.032	1	-0.116	-0.059	-0.117	0.059	0.008	-0.111	-0.238	-0.251	0.147	0.023	-0.018	0.003
4 Institutional ownership fraction	0.028	0.025	-0.096	1	-0.091	-0.029	0.112	0.126	-0.095	-0.002	-0.059	0.074	0.088	-0.012	0.003
5 Aud-Dep	-0.023	0.040	-0.096	-0.116	1	0.096	-0.200	0.088	0.045	0.150	0.126	-0.042	-0.016	-0.055	-0.018
6 Tenure	0.018	0.082	-0.090	-0.031	0.111	1	-0.085	0.105	0.163	0.273	0.084	-0.010	-0.065	-0.349	0.006
7 Sox	-0.058	0.040	0.064	0.124	-0.222	-0.102	1	0.007	0.007	0.011	-0.026	-0.046	-0.036	0.101	-0.119
8 CFO	-0.360	-0.275	0.017	0.108	0.103	0.068	0.006	1	0.089	0.490	0.026	0.198	-0.045	0.015	0.002
9 Revenues (Billions)	-0.088	0.075	-0.258	-0.029	0.202	0.219	0.012	0.348	1	0.416	0.141	-0.030	-0.001	-0.022	-0.030
10 Size	-0.088	0.075	-0.259	-0.029	0.202	0.219	0.012	0.348	1.000	1	0.388	-0.095	-0.052	-0.036	-0.067
11 Debt	-0.076	-0.028	-0.289	-0.074	0.181	0.054	-0.030	-0.020	0.448	0.448	1	-0.534	-0.070	0.039	0.012
12 Altman Z	0.042	0.160	0.176	0.133	-0.040	0.060	-0.011	0.378	-0.015	-0.015	-0.629	1	0.138	-0.043	-0.020
13 Asset growth	-0.006	0.161	0.064	0.143	0.003	-0.024	0.012	0.135	0.029	0.029	-0.086	0.203	1	-0.030	-0.010
14 First	-0.011	-0.055	-0.012	-0.003	-0.062	-0.527	0.101	0.018	-0.043	-0.043	0.037	-0.058	-0.060	1	-0.025
15 Last	0.008	-0.020	0.007	0.014	-0.003	0.011	-0.119	0.000	-0.074	-0.074	0.011	-0.030	-0.020	-0.025	1

Correlations not utilizing *Inside Director Fraction* and *Institutional Ownership Fraction* are calculated using the full sample of 10,748 firm-years; while correlations using the governance variables are based on 4,310 firm years. *Bold Italics* indicates the correlation is significant at the 1% level. AA is the amount of abnormal accruals (ϵ) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REFC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \epsilon_{i,t}$. *Total Accruals* is the difference between operating cash flows and income before extraordinary items reported on the statement of cash flows deflated by average total assets. $\Delta Sales$ is the change in sales for the year deflated by average total assets. ΔREC is the change in Receivables reported on the statement of cash flows deflated by average total assets. *PPE* is the gross property plant and equipment deflated by average total assets. *BTM* is the book-to-market ratio defined as the book value of common equity outstanding divided by the market capitalization at the end of the fiscal year. *Inside Director Fraction* is the fraction of directors who are currently employed by the firm. *Institutional Ownership Fraction* is the total fraction of shares held by institutional investors. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *Tenure* is the number of consecutive years the auditor has audited the firm since 1975. *CFO* is the operating cash flows of the client divided by average total assets. *Revenues* is the total revenue of the firm. *Size* is the natural log of total revenues. *Debt* is total liabilities divided by total assets. *Altman Z* is the Altman Z score calculated as follows: $(1.2 * Net\ Working\ Capital/Total\ Assets) + 1.4 * (Retained\ Earnings/Total\ Assets) + 3.3 * (EBIT/Total\ Assets) + 0.6 * (Market\ Value\ of\ Equity/Book\ Value\ of\ Liabilities) + 1.0 * (Sales/Total\ Assets)$. *Asset Growth* is the percentage change in total assets. *First* is a dichotomous variable set equal to one if the current year is the auditor's first year with the client, zero otherwise. *Last* is a dichotomous variable set equal to one if the current year is auditor's final year with the client, zero otherwise

Table 5 Regression of abnormal accruals on auditor dependence, tenure, and controls sample period: 2000–2004

Dependent variable	AA	
β_0 Intercept	-0.095	(-11.61)***
β_1 Aud-Dep	0.047	(3.20)***
β_2 Tenure	0.001	(4.03)***
β_3 SOX	0.008	(1.78)*
β_4 SOX \times Aud-Dep	-0.053	(-2.61)***
β_5 SOX \times tenure	-0.001	(-2.47)**
β_6 CFO	-0.273	(-34.19)***
β_7 Size	0.009	(13.42)***
β_8 Debt	-0.029	(-5.44)***
β_9 Altman Z	0.002	(11.59)***
β_{10} asset growth	0.019	(4.14)***
β_{11} AA _{t-1}	0.119	(8.65)***
β_{12} First	0.006	(1.62)
β_{13} Last	0.009	(1.68)*
Sample period	2000–2004	
N	10,748	
Adjusted R-square	0.1328	
Joint test: post-SOX $\beta_1 + \beta_4 = 0$	-0.006	
P-value of chi-square	(0.681)	
Joint test: post-SOX $\beta_2 + \beta_5 = 0$	0.000	
P-value of chi-square	(0.141)	

AA is the amount of abnormal accruals (ε) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t}$. *Total Accruals* is the difference between operating cash flows and income before extraordinary items reported on the statement of cash flows deflated by average total assets. $\Delta Sales$ is the change in sales for the year deflated by average total assets. ΔREC is the change in Receivables reported on the statement of cash flows deflated by average total assets. *PPE* is the gross property plant and equipment deflated by average total assets. *BTM* is the book-to-market ratio defined as the book value of common equity outstanding divided by the market capitalization at the end of the fiscal year. *Inside Director Fraction* is the fraction of directors who are currently employed by the firm. *Institutional Ownership Fraction* is the total fraction of shares held by institutional investors. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *Tenure* is the number of consecutive years the auditor has audited the firm since 1975. *CFO* is the operating cash flows of the client divided by average total assets. *Revenues* is the total revenue of the firm. *Size* is the natural log of total revenues. *Debt* is total liabilities divided by total assets. *Altman Z* is the Altman Z score calculated as follows: $(1.2 * Net\ Working\ Capital / Total\ Assets) + 1.4 * (Retained\ Earnings / Total\ Assets) + 3.3 * (EBIT / Total\ Assets) + 0.6 * (Market\ Value\ of\ Equity / Book\ Value\ of\ Liabilities) + 1.0 * (Sales / Total\ Assets)$. *Asset Growth* is the percentage change in total assets. *First* is a dichotomous variable set equal to one if the current year is the auditor's first year with the client, zero otherwise. *Last* is a dichotomous variable set equal to one if the current year is auditor's final year with the client, zero otherwise. All *t* statistics, between parentheses, are Newey-West corrected. *, **, *** indicates the value is statistically significant at the 10%, 5%, and 1% level, respectively

is negative and significant consistent with the well-documented negative correlation between accruals and cash flows. *Size* is also positively related to abnormal accruals. *Debt* is negatively related to abnormal accruals. Furthermore, a low probability of bankruptcy (high *Altman Z*) is associated with higher abnormal accruals. The coefficient on *Asset Growth* is positive and significant. The coefficient on lagged abnormal accruals (AA_{t-1}) is positive and significant. Additionally, we find no evidence of increased abnormal accruals for clients that are in the first year with a new auditor. All *t* statistics are based on the Newey and West (1987) standard errors corrected for serial correlation and heteroskedasticity.

Overall these results indicate that prior to controlling for non-auditor governance strength *prima facie* SOX was effective in mitigating the adverse association between the auditor's economic dependence and financial reporting aggressiveness.

4.3 The role of non-auditor governance mechanisms

Table 6 presents the results of the abnormal accrual regression controlling for non-auditor governance strength proxied by the strength of board and institutional shareholder monitoring as defined in the research design section. We expect that firms with weak non-auditor governance are more likely to exert pressure on their economically dependent auditor as there are fewer restraints to prevent them from doing so. However, requiring data on outside directors and institutional shareholders results in the loss of a total of 6,438 observations (2,134 observations pre-SOX and 4,304 observations for the post-SOX) resulting in a reduced sample size of 4,310 observations.

Table 6 presents the results for the non-auditor governance mechanisms strength partitions across the sample of firms with available data. The joint coefficient tests indicate that the coefficients of *Aud-Dep* for weak governance firms in both the pre-SOX period (0.056) and the post-SOX period (0.076) are significant at the 5% and 1% levels, respectively.¹⁷ Furthermore, we do not find the coefficient on *Aud-Dep* to be different from zero for both moderate and strong governance firms in either periods. In additional untabulated tests, we find that the joint coefficient on *Aud-Dep* for weak governance firms is not equal to the joint coefficient on *Aud-Dep* for both strong and moderate governance firms at the 5% level of significance.¹⁸

Overall, our results are consistent with auditors allowing their important clients to engage in aggressive accounting relative to other clients especially for firms with weak non-auditor governance mechanisms based on board of directors and institutional shareholders. Furthermore, firms with strong or moderate non-auditor

¹⁷ Coefficient estimates, used in the joint tests, were obtained by adding the coefficient of *Aud-Dep* and the coefficient estimate for the interaction term Weak Governance * *Aud-Dep* ($-0.021 + 0.077 = 0.056$) and by adding the latter number to the coefficients of the interaction terms SOX**Aud-Dep* and SOX**Aud-Dep**Weak Governance ($0.056 + 0.038 - 0.018 = 0.076$).

¹⁸ The negative coefficients of weak and moderate governance main effects may be attributed to two factors. First, 'deficient' non-auditor governance is not a sufficient condition for more aggressive reporting. It only creates a setting that is conducive for a 'complacent' auditor succumbing to the pressure of its influential client to allow more abnormal accruals. Second, the standalone negative coefficient of 'deficient' non-auditor governance might suggest higher risk for the auditor thus lower abnormal accruals are allowed, before considering the economic dependence of the auditor on its client.

Table 6 Regression of abnormal accruals on auditor dependence controlling for the strength of non-auditor corporate governance sample period: 2000–2004

Dependent variable	AA	
β_0 intercept	-0.016	(-1.19)
β_1 Aud-Dep	-0.021	(-0.69)
β_2 moderate governance	-0.008	(-1.09)
β_3 moderate governance \times Aud-Dep	0.006	(0.15)
β_4 weak governance	-0.022	(-2.55)**
β_5 weak governance \times Aud-Dep	0.077	(2.42)**
β_6 SOX	-0.018	(-2.48)**
β_7 SOX \times weak governance	-0.001	(-0.16)
β_8 SOX \times moderate governance	-0.004	(-0.38)
β_9 SOX \times Aud-Dep	0.038	(1.06)
β_{10} SOX \times Aud-Dep \times moderate governance	-0.012	(-0.23)
β_{11} SOX \times Aud-Dep \times weak governance	-0.018	(-0.31)
Controls included	YES	
<i>N</i>	4,310	
Adjusted <i>R</i> -square	0.1616	
	Coefficient	<i>P</i> -Value of chi-square
Strong governance pre-SOX ($\beta_1 = 0$)	-0.021	(0.491)
Strong governance post-SOX ($\beta_1 + \beta_9 = 0$)	0.017	(0.787)
Moderate governance pre-SOX ($\beta_1 + \beta_3 = 0$)	-0.015	(0.517)
Moderate governance post-SOX ($\beta_1 + \beta_3 + \beta_9 + \beta_{10} = 0$)	0.011	(0.929)
Weak governance pre-SOX ($\beta_1 + \beta_5 = 0$)	0.056	(0.037)
Weak governance post-SOX ($\beta_1 + \beta_5 + \beta_9 + \beta_{11} = 0$)	0.076	(0.008)

AA is the amount of abnormal accruals (ε) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t}$. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *SOX* is a dichotomous variable equal to one if the observation is from the post-SOX period (after 2001). Firm-years are classified as strong governance (*Strong governance*) if they have both a higher fraction of outside directors than the median firm and a higher fraction of institutional ownership than the median firm. Firm-years are classified as moderate governance (*Moderate governance*) if they have either a higher fraction of outside directors than the median firm or a higher fraction of institutional ownership than the median firm but not both. Firm-years are classified as weak governance (*Weak governance*) if they have both a lower fraction of outside directors than the median firm and a lower fraction of institutional ownership than the median. The controls included in the regression are *Tenure*, *CFO*, *Size*, *Debt*, *Altman Z*, *Asset Change*, AA_{t-1} , *First*, and *Last*. All *t* statistics, between parentheses, are Newey-West corrected. *, **, *** indicates the value is statistically significant at the 10%, 5%, and 1% level, respectively

governance mechanisms seem to prevent audit clients from exerting their economic pressure. This pattern continues in the post-SOX period suggesting that effectiveness of SOX in constraining aggressive accounting choices by economically-influential clients (Table 5) dissipates when the strength of other non-auditor governance mechanisms is considered. In summary, the effectiveness of SOX

vis-à-vis the auditor's economic dependence would be exaggerated if the strength of other monitoring mechanisms is overlooked.¹⁹

4.4 Additional testing and sensitivity analysis

In this section we perform several additional to assess the robustness our main results. These tests include using a constant sample of clients, a constant auditor sample, alternative abnormal accruals measures and eliminating 'extremely' large audit clients.

4.4.1 Constant client sample

We utilize a balanced design to control for the inclusion of additional firms in our post-SOX sample biasing the results. In our sample we have 523 S&P 1,500 firms with available data for each fiscal year from 2000 to 2004. We present the results of our constant sample in Table 7. Overall, the results are consistent with a relation between abnormal accruals and auditor dependence for firms with weak corporate governance. Overall, our results using a consistent sample of firms are qualitatively similar to those presented in Table 6. Thus, our findings are not likely due to the inclusion of additional firms from the expansion of Audit Analytics and The Corporate Library in the post-SOX era.

4.4.2 Constant auditor sample

Auditors may only be susceptible to strong client pressure during their early years with the client. Thus, we repeat our tests for a subset of firms who have been with the same auditor for 5 years or longer. Despite the smaller sample size, results (not tabulated) remain qualitatively unchanged. However, *Tenure* loses significance in some specifications.

4.4.3 Alternative measures of aggressive financial reporting

We use abnormal accruals based on the Larcker and Richardson (2004) model for expected accruals. As an alternative measure of abnormal accruals we use the performance-matched abnormal accrual measure suggested by Kothari et al. (2005). To obtain performance matched abnormal accruals we match each firm-year with a firm-year from the same two-digit SIC code with the closest ROA at time $t-1$.²⁰ The performance-matched abnormal accrual for a firm is the error term from Eq. 1 less the error term from Eq. 1 of the matched firm. Kothari et al. (2005) suggest that

¹⁹ Our results are not sensitive to the removal of fiscal year 2002. We continue to use 2002 in our sample as DeFond and Francis (2005) document that companies actively were confirming with SOX prior to its implementation.

²⁰ We define ROA $t-1$ as income before extraordinary items divided at time $t-1$ divided by total assets at the end of year $t-1$. We do not deflate by average total assets, as deflating by average total assets would cause us to lose observations. However, when deflating by average total assets at time $t-1$ results remain qualitatively unchanged.

Table 7 Regression of abnormal accruals on auditor dependence controlling for the strength of non-auditor corporate governance utilizing a constant sample of 523 firms sample period: 2000–2004

Dependent variable	AA	
β_0 intercept	0.000	(0.03)
β_1 Aud-Dep	-0.007	(-0.21)
β_2 moderate governance	-0.002	(-0.30)
β_3 moderate governance \times Aud-Dep	0.012	(0.31)
β_4 weak governance	-0.011	(-1.19)
β_5 weak governance \times Aud-Dep	0.079	(2.18)**
β_6 SOX	-0.012	(-1.43)
β_7 SOX \times weak governance	-0.008	(0.65)
β_8 SOX \times moderate governance	-0.001	(-0.12)
β_9 SOX \times Aud-Dep	0.017	(0.35)
β_{10} SOX \times Aud-Dep \times moderate governance	-0.009	(-0.17)
β_{11} SOX \times Aud-Dep \times weak governance	0.000	(0.01)
Controls included	YES	
N	2,615	
Adjusted R-square	0.1785	
	Coefficient	P-Value of chi-square
Strong governance pre-SOX ($\beta_1 = 0$)	-0.007	(0.837)
Strong governance post-SOX ($\beta_1 + \beta_9 = 0$)	0.010	(0.775)
Moderate governance pre-SOX ($\beta_1 + \beta_3 = 0$)	0.005	(0.885)
Moderate governance post-SOX ($\beta_1 + \beta_3 + \beta_9 + \beta_{10} = 0$)	0.013	(0.642)
Weak governance pre-SOX ($\beta_1 + \beta_5 = 0$)	0.072	(0.048)
Weak governance post-SOX ($\beta_1 + \beta_5 + \beta_9 + \beta_{11} = 0$)	0.089	(0.023)

AA is the amount of abnormal accruals (ε) estimated from the following two-digit SIC-year regression: $Total\ Accruals_{i,t} = \alpha + \beta_1(\Delta Sales_{i,t} - \Delta REC_{i,t}) + \beta_2 PPE_{i,t} + \beta_3 BTM_{i,t} + \beta_4 CFO_{i,t} + \varepsilon_{i,t}$. *Aud-Dep* is the log of total fees paid to the auditor (Audit Analytics) divided by the summation of the log of total fees paid to the auditor of all public clients listed on Compustat of the office issuing the opinion. *SOX* is a dichotomous variable equal to one if the observation is from the post-SOX period (after 2001). Firm-years are classified as strong governance (*Strong governance*) if they have both a higher fraction of outside directors than the median firm and a higher fraction of institutional ownership than the median firm. Firm-years are classified as moderate governance (*Moderate governance*) if they have either a higher fraction of outside directors than the median firm or a higher fraction of institutional ownership than the median firm but not both. Firm-years are classified as weak governance (*Weak governance*) if they have both a lower fraction of outside directors than the median firm and a lower fraction of institutional ownership than the median. The controls included in the regression are *Tenure*, *CFO*, *Size*, *Debt*, *Altman Z*, *Asset Change*, AA_{t-1} , *First*, and *Last*. All t statistics, between parentheses, are Newey-West corrected. *, **, *** indicates the value is statistically significant at the 10%, 5%, and 1% level, respectively

when the hypothesis being tested does not imply that earnings management varies with performance, using performance-matched abnormal accruals enhances the reliability of the inferences. Furthermore, we also obtain similar results when we estimate abnormal accruals using a modified-Jones model. Finally, we also use total accruals deflated by average total assets as the dependent variable, using this

specification the results remain qualitatively unchanged. Overall, our results are robust to differing measures of abnormal accruals.

4.4.4 Large firms and small audit offices

Extremely large clients may bias our results because the audit office to firm headquarter matching may not reflect the true nature of the audit process, since large firms may be audited by teams from multiple offices. Thus, we eliminate the largest 10% of firms in each year from our main tests. Despite the removal of these large firms we find qualitatively similar results. Due to sample limitations (we do not have governance information for the smaller firms in our sample), we cannot repeat these tests for the governance partitions. We also test whether our results are due to the audits provided by extremely small audit offices. Small audit offices may be driving the result because they may only have one or two public clients. To control for this possibility we eliminate observations that are audited by an office with three or fewer public clients. After the elimination of small audit office clients, results (not tabulated) remain qualitatively unchanged.

5 Conclusion

Recent governance failures and accounting scandals led to the increased scrutiny of the effectiveness of governance mechanisms. In addition, new governance regulations such as the Sarbanes–Oxley Act of 2002 (SOX) were passed as a response to the deterioration of confidence of the investing public in corporate ‘gatekeepers.’ Given the controversies over the effectiveness of governance mechanisms in general and governance regulation in particular we examine the efficacy of the auditor, the primary governance mechanism, in constraining aggressive financial reporting in both the pre-SOX and post SOX periods. We also examine whether other non-auditor governance mechanisms (board of directors and institutional shareholders) affect the auditor’s effectiveness.

We proxy for aggressive financial reporting using abnormal accruals estimated from cross-sectional models to explain accruals. Auditor’s effectiveness is proxied by its economic dependence on a certain client measured by an office-level measure of relative client revenue. Finally, non-auditor governance strength is based on the extent to which insider representation on the board is limited and the fraction of outstanding shares held by institutional investors.

Based on a sample of firms over the period (2000–2004) we find that the relation between abnormal accruals and auditor dependence on the client is significantly positive in the pre-SOX (2000–2001) period but not in the post SOX (2002–2004) period before considering the strength of other non-auditor governance mechanisms. This result is consistent with client retention incentives dominating reputation protection incentives. Second, the positive relation between auditor dependence and abnormal accruals holds only when other non-auditor governance is weak in both the pre-SOX and post-SOX periods.

Overall, our results suggest that aggressive financial reporting occurs only when multiple governance mechanisms ‘fail’. More specifically, such type of reporting requires that a highly dependent auditor operates in a ‘poor’ governance setting (i.e. weak other non-auditor governance mechanisms). The results also indicate that the enactment of SOX per se did not compensate for the weakness of non-auditor governance mechanisms in mitigating the adverse effects of auditor’s dependence on financial reporting quality. These results are of importance to policy makers, governance professionals, and regulators since it raises questions regarding the true efficacy of governance regulations such as SOX. A limitation of our study is that our sample selection requires data on audit fees, financial items, as well as governance measures. Thus, our results may not be generalizable to broader, less restrictive samples.

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