Does the Performance of Non-Audit Services by Auditors Impair Independence? Evidence from Firms Post-Service Performance

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ABSTRACT

This study examines whether the provision of non-audit services by a firm's own auditors provides value to the firm. We examine the future return on assets and sales growth as a function of the expenditures by the client firms on non-audit services, reasoning that if such payments are intended primarily to impair auditor independence, no association with future firm performance should be detected. Our findings show that, in fact, the payments to auditors for non-audit services are positively related to the one-period ahead sales growth in the post-Sarbanes-Oxley (post-SO) period but not in the pre-SO period. We interpret these findings as suggesting that firms do obtain value for their expenditures on non-audit services provided by their auditors, with the Sarbanes-Oxley Act providing the motivation to accentuate the value proposition. Thus, even if auditor independence is compromised by such hiring, the value obtained by the client firms for their non-audit services may justify their hiring.

1. Introduction

The question of whether the provision of non-audit services by auditors compromise their independence has been the subject of much debate and research. Auditor independence is an essential feature of an efficient capital market. Managers have incentives to reduce agency costs in the firms by hiring independent auditors (Jenson and Meckling 1976; Watts and Zimmeramn 1983). Auditors also have market based institutional incentives to act independently to protect their reputation capital (Benston 1975; Watts and Zimmerman 1983) and reduce litigation costs (Palmrose 1998; Shu 2000). The provision of non-audit services by auditors has the potential to make auditors financially dependent on their clients. This may make auditors less willing to stand up to client pressure for fear of losing their business (DeAngelo 1981; Simunic 1984; Beck, Frecka, and Solomon 1988). The consulting nature of many non-audit services also puts auditors in managerial roles, potentially threatening the objectivity about the transactions and account balances that they audit (DeFond et al. 2002).

In response to the concerns related to the provision of non-audit services by auditors, aprovision in the Sarbanes-Oxley Act (SOX) passed in 2002 in the U.S, prohibited auditors from providing to their clients certain types of non-audit services. Under the SOX, auditors were required to report to and are overseen by a company's audit committee which must pre-approve all services (both audit and non-audit services not specifically prohibited) provided by its auditor.[1]

The purpose of this paper is to contribute to the debate on the costs and benefits of

[1] The SOX prohibits auditors from offering certain non-audit services to audit clients. These services include: bookkeeping, information systems design and implementation, appraisals or valuation services, actuarial services, internal audits, management and human resources services, broker/dealer and investment banking services, legal or expert services unrelated to audit services and other services the board determines by rule to be impermissible. Other non-audit services not banned are allowed if pre-approved by the audit committee.

auditor-provided non-audit services by examining a fundamental question. Regardless of whether auditor independence is compromised or not, do the client firms who hire the auditors to provide these services obtain value for their expenditures? We examine this issue by evaluating the relationship between the expenditures for non-audit services and future firm performance. We reason that if the non-audit services are operationally needed (as opposed to inducements for the auditors to be lax in their audit opinions), then a relationship should exist between the relative magnitude of the payments for such services and future firm performance.

In the sections which follow, we first review the literature on auditor independence and the provision of non-audit services by auditors. We then present our hypotheses and the reasoning underlying them in Section 3, along with our methodology and proposed tests. Our empirical results and related discussion are presented in Section 4, and our conclusions in the final section.

2. Literature Review

The literature relating to the trade-offs involved in the provision of non-audit services by auditors can be divided into two categories: (1) the studies which examine the adverse impact of non-audit services by auditors to their clients in terms of the impact on auditor independence; and (2) the studies that seek to identify the economic payoffs realizable when non-audit services are provided by auditors. We review below these two sets of studies and how their findings relate to this study.

2.1 Auditor Independence & Non-Audit Fees

The studies which have examined the potential adverse impact of the provision of non-audit

services by auditors generally assess the association between non-audit fees paid by clients to their audit firms and auditor independence. One common approach is to examine the impact of non-audit fees on the common proxy for earnings management - discretionary accruals. Among studies using this approach are Frankel et al. (2002), DeFond et al. (2002), Ashbaugh et al. (2003), Chung and Kallapur (2003), and Larcker and Richardson (2004). A second common approach adopted by researchers examines the magnitude of the non-audit services (proxied by non-audit fees) and relate them to the extent of subsequent financial statement re-statements. That is, this set of studies argues that re-statements of previously audited financial statements represent a kind of audit failure, and the researchers seek to link such "audit failures" to the concurrent provision of non-audit services by the auditors. Among researchers using this approach are Raghunandan, et al. (2003), and Kinney et al. (2004). A third set of studies in this general area examined the association between the provision of non-audit services and the propensity of the affected auditors to issue going-concern opinions in situations where such opinions might be warranted. DeFond et al. (2002) is representative of this approach.

The findings across all three approaches have however been mixed. In the first approach, Frankel et al. (2002) documented that non-audit fees are positively associated with the magnitude of discretionary accruals, suggesting that high non-audit fees are likely to impair auditor independence. However, Ashbaugh et al. (2003), using a more refined measure of discretionary accruals, did not find a statistically significant association between non-audit fees and positive discretionary accruals. They concluded that there is no systematic evidence to support the findings that higher non-audit fees impair auditor independence. Chung and Kallapur (2003) used a different non-audit fee metric and reached a similar conclusion as Ashbaugh et al. (2003).

Using the second approach, Raghunandan et al. (2003) modeled expected audit and

non-audit fees among SEC filers in 2001 and examined the differences in unexpected non-audit fees between firms that restated and control firms that did not restate financial statements previously filed. They find no significant differences between the restatement and control samples for unexpected nonaudit fees, fee ratios, and total fees, suggesting that either nonaudit fees or total fees inappropriately influence the audit and lead to restatements. Using a similar approach, Kinney et al. (2004) found a positive association between some unspecified non-audit services and subsequent restatements. However, they found no association between information system design and implementation and restatements, nor did they find such a relationship between the provision of internal audit services and restatements.

Of particular interest are the findings reported by Defond et al. (2002) who used the third approach. They found that, in the context of going concern opinions, there is no significant association betweens either audit, non-audit, or total, service fees and impaired auditor independence. The findings are consistent with market-based incentives, such as loss of reputation and litigation costs, dominating the expected benefits from compromising auditor independence (DeFond et al., 2002).

2.2. Knowledge Spillover Effect

At its most fundamental level, the economic argument in favor of permitting auditors to provide non-audit services is the cost efficiencies that may be realized for such an arrangement. Simunic (1980) investigated this argument empirically and examined the effects of the joint provision of audit and other services on returns to auditors. He argued that auditor-provided management advisory services can generate economic rents due to the creation of "knowledge spillovers". Knowledge spillovers refer to efficiencies that can be partially appropriated as rents

to the auditors by reducing auditing costs but also creating a threat to auditor independence. This threat of auditor independence arises when economic rents outweigh the expected costs of sacrificing auditor independence in terms of lost reputation capital and increased litigation risk.

Simunic (1984) found higher audit fees in the presence of non-audit services. Client firms who purchased non-audit services from their auditors paid significantly higher audit fees than those who did not purchase these services. This result is interpreted as consistent with the existence of knowledge spillovers between the audit and non-audit services. Knowledge spillovers allow auditors to offer both services at a lower cost while managements of client companies decided to reply on their CPA firms as both auditors and business consultants because it was efficient (profit maximizing) to do so (Simunic 1984, p.699).[2]

DeFond et al. (2002) noted that the impact of non-audit services on auditor independence is based on this intuitive cost-benefit trade-off. They argued that it is ultimately an empirical question whether auditors compromise their independence in order to retain their non-audit service clients. Beck et al. (1988) examined if the effect of knowledge spillovers on auditor independence is conditioned on the nature of the non-audit services offered. They found that knowledge spillovers resulting from recurring non-audit services increases the threat of auditor independence, while the opposite effect is experienced with non-recurring non-audit services.

In a further refinement of this line of reasoning, Gul et al. (2007) argued that the impact of non-audit services on auditor independence should be contingent on auditor tenure. They found a positive relationship between non-audit fees and positive current discretionary accruals (their proxy for auditor independence) for firms with short auditor tenure of not more than three years. However, such a positive relationship was absent for auditors with tenure of three years or more,

[2] A later study by Palmrose (1986) found that audit fees were also higher even when clients engage consultants who are not the incumbent auditors.

suggesting that non-audit fees may impair auditor independence when auditor tenure is short but not for auditors with long tenure.

2.3 Contribution of Current Study

From the review of the literature above, it is evident that the issue of whether the benefits from the provision of non-audit services by auditors outweigh their potential costs is far from settled. Thus, although the Sarbanes-Oxley Act may have prohibited the provision of some non-audit services to audit clients, the topic itself deserves additional study.

This research is intended to contribute to this debate by exploring the post-implementation effects of the award of the non-audit consulting contracts to the incumbent auditors. Presumably, the award of such contracts may be the result of a deliberate decision by client firm management that the incumbent auditors are most likely to be cost-effective management consultants. If so, the post-implementation results should provide some confirmation of this decision. Thus, the focus of this study is on the extent to which some measurable effects can be identified from situations where incumbent auditors are awarded non-audit services contracts by their audit clients. In choosing this focus, we hope to address the question of whether such contracts have measurable payoffs.

3. Hypotheses and Methodology

3.1 Formal Hypotheses

The ranges of services that are typically included in the general rubric of "non-audit services" include the following:

(1) bookkeeping and financial statement compilation services;

(2) information systems design and implementation;
(3) appraisals or valuation services;
(4) actuarial services;
(5) internal audits;
(6) management and human resources services;
(7) broker/dealer and investment banking services;
(8) legal or expert services unrelated to audit services;
(9) tax advisory services;

Arguably, the net effect of the provision of these services is to (a) increase firm growth, as reflected in the growth of sales and/or assets, and (b) increase firm profitability in future years through the expansion of administrative and information processing capabilities. If these general objectives are achieved with the hiring of the auditors as management consultants, then firm performance in the years following the award of the services contracts should show a measurable improvement over the current or previous years. This leads to the following testable hypotheses, stated in alternative form:

H1A: There is a positive association between the one-period ahead sales growth (SG_{yt+1}) and the magnitude of fees paid to the auditor for non-audit services in any given year (NAS_{yt}).

H2A: There is a positive association between the one-period ahead return on assets (ROA_{yt+1}) and the magnitude of fees paid to the auditor for non-audit services in any given year (NAS_{yt}).

Under SOX, the first eight services are prohibited to be provided by a firm's own auditors. Since SOX is effective for fiscal years 2002 and subsequently. Thus, if using data for the years before 2002 and after 2002, we expect the results to be stronger for the post-SOX period than before. This follows from the fact that the restriction on the ability of auditors to offer such services (if there are knowledge spillover effects) are relatively more costly to their clients. Clients are motivated to engage the services of auditor where benefits, in terms of improved performance, exceed costs. However, in comparing the relative costs of auditor services in the

pre-SOX and post-SOX periods, it is likely that the post-SOX period would be characterized by higher costs given the much greater attention drawn to the issue of auditor independence. This leads to the inference that, in the post-SOX period, auditors would continue to be hired to provide NAS only if the cost-benefit ratio is more significantly weighted in favor of benefits. More specifically, we test the following hypothesis:

H3A: The positive association between $SG_{yt+1}$and ROA_{yt+1} on one hand, and NAS_{yt} on the other, is expected to be stronger (respectively) in the post-SOX period than in the pre-SOX period.

3.2. Proposed Tests

To evaluate the hypotheses presented above, we perform regression analysis in which we relate firm performance in $year_{t+1}$ as a function of non-audit services in $year_t$ (NA_{yt}), using sales growth (SG_{yt+1}) and return on assets (ROA_{yt+1}) as our proxy for firm performance. SG_{yt+1} is measured by ($Sales_{yt+1} - Sales_{yt}$) / $Sales_{yt}$ and ROA_{yt+1} is measured by $Net\ Income_{yt+1}$ divided by $Total\ Assets_{yt}$, expressed in percentages.

The regression models we propose to test the hypotheses may be presented as follows:

$$SG_{yt+1} = \alpha 1 + \lambda_{11}NAS_{yt} + \lambda_{12}GOV_{yt} + \lambda_{13}BIG4_{yt} + \lambda_{14}LEV_{yt} + \lambda_{15}SIZE_{yt} + \lambda_{16}SG_{yt} + \Sigma\beta_{1i}IND_i \quad (1)$$

$$ROA_{yt+1} = \alpha 2 + \lambda_{21}NAS_{yt} + \lambda_{22}GOV_{yt} + \lambda_{23}BIG4_{yt} + \lambda_{24}LEV_{yt} + \lambda_{25}SIZE_{yt} + \lambda_{26}ROA_{yt} + \Sigma\beta_{2i}IND_i \quad (2)$$

The control variables we introduce into the regression model are corporate governance (*GOV*), leverage (*LEV*) firm size (*SIZE*), whether the auditor involved is a Big 4 auditor or not (*BIG4*), and dummy variables for industry membership. In addition, the lagged values of the dependent variables are used as additional control variables. This is to allow for the likely degree of serial correlation of the dependent variables across time. As an alternative measure, we rerun

the regressions using the one-period change in the dependent variables (e.g., $SG_{yt+1} - SG_{yt}$; $ROA_{yt+1} - ROA_{yt}$). Results of this alternative formulation are presented in the Robustness tests section of this paper.

Bhagat and Bolton (2008) have reported findings that better governance as measured by the Gompers, Ishii, and Metrick (2003) indices is positively correlated with better contemporaneous and subsequent operating performance in terms of *ROA*.[3] Gompers et al. (2003) reported that firms with better governance in terms of stronger shareholder rights have higher firm value, higher profits, higher sales growth, lower capital expenditures, and made fewer corporate acquisitions. Further, Ashbaugh et al. (2004) examined the extent to which governance attributes that are intended to mitigate agency risk affect firms' cost of equity capital. They found that firms with better governance attributes as measured by (1) financial information quality, (2) ownership structure, (3) shareholder rights, and (4) board structure have lower cost of equity.[4] The results support the general hypothesis that firms with better governance present less agency risk to shareholders resulting in lower cost of equity capital. Given these findings, controlling for differences in corporate governance (*GOV*) is necessary in our regression models.

One of our control variables is *BIG4*, which is used to control for any systematic difference on firm performance between non-audit services provided by Big 4 and non-Big 4 auditors. In addition, we control for the effects of firm size (*SIZE*) and leverage (*LEV*) on performance. Following Francis et al. (2005), we use the Fama-French 49 industry classification (*IND*) to

[3] Bhagat and Bolton (2008) model for the endogeneity relationships among corporate governance, performance capital structure and ownership structure. They find no correlation between governance measures and future stock market performance. However, the relation between the (stock market) performance and governance relationship do depend on whether or not one takes into account the endogenous nature of the relationship between governance and (stock market) performance.

[4] Ashbaugh et al., (2005) find that collectively, the governance attributes we examine explain roughly 8% of the cross-sectional variation in firms' cost of capital and 14 % of the variation in firms' beta.

control for industry effects.[5]

In terms of the interpretation of our results, we expect the coefficient for *NAS* ($_{11}$ and $_{21}$) to be positive and significant, implying support to **H1A** and **H2A**. Relying on the findings from previous studies, we also expect the coefficient for (weaker) *GOV* to be negative and significant, *SIZE* and *BIG4* to be positive and significant while no prediction is made for the sign of *LEV*.

Our initial tests used the standard OLS regression model. However, it is evident that as we test one-period ahead future performance, serial correlation among the performance measures will make the prior period values of these variables jointly-determined. Specifically, future *ROA is* likely to be jointly dependent on contemporaneous sales growth, and vice versa. The potential for such endogeneity leads to the need to explore the equations as a system of simultaneous equations.

The need to control for possible endogeneity leads to the issue of possible instruments for the two endogenous variables. For SG_{yt+1}, we consider duality of chairmanship and CEO (*DUAL*) and the square-root value of the CEO tenure (*TURE*) to be good instruments. Entrenched CEOs who also hold the chairmanship posts or have long tenures are more likely to be concerned with firm size, and hence sales growth. Thus, SG_{yt+1} is likely to be positively related to *DUAL* and *TURE*. At the same time, to the extent that *DUAL* and *TURE* reflect the top management control of the firm, we expect these two variables to be relatively uncorrelated with ROA_{yt+1}, the jointly endogenous variable.

The choice of a proper instrument for *ROA* is a more difficult task. Cash flow from operations deflated by the market value of the company (CFO_{yt}) was chosen as the proper

[5] Note that Francis et al. (2005) use the Fama-French 48 industry classification. The composition of the industries is described in detail on Ken French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. More recently the number of industries has been expanded to 49.

instrument for two reasons. First, to the extent that investors regard cash flows are relatively free of accounting manipulation, this variable can be regarded as a proxy measure of profitability that is relatively clean. As a measure of profitability, it should be highly correlated with ROA_{yt+1}. At the same time, this deflated measure should be relatively independent of the other endogenous variable $SG_{yt+1.}$ Even if the level of cash flows from operations could be a good predictor of future sales growth, its deflation by market value of the firm means that investors should have already impounded that information in stock prices. So the deflated variable, although theorized to be highly related to future *ROA*, should be relatively uncorrelated with future sales growth.

We present below the system of two equations that we estimated.

$$SG\,y_{t+1} = \alpha 1 + \lambda_{11}NAS_{yt} + \lambda_{12}GOV_{yt} + \lambda_{13}BIG4_{yt} + \lambda_{14}LEV_{yt} + \lambda_{15}SIZE_{yt} + \lambda_{16}SG_{yt} + \lambda_{17}DUAL_{yt} + \lambda_{18}TURE_{yt} + \Sigma\beta_{1i}IND_i \quad (3)$$

$$ROA\,y_{t+1} = \alpha 2 + \lambda_{21}NAS_{yt} + \lambda_{22}GOV_{yt} + \lambda_{23}BIG4_{yt} + \lambda_{24}LEV_{yt} + \lambda_{25}SIZE_{yt} + \lambda_{26}ROA_{yt} + \lambda_{27}CFO_{yt} + \Sigma\beta_{2i}IND_i \quad (4)$$

As indicated, the lagged endogenous regressors, i.e., SG_{yt} and ROA_{yt} are used as additional instrument variables in estimating SG_{yt+1} and $ROA\,y_{t+1}$. The implicit assumption here is that both SG_{yt} and ROA_{yt} consist of persistent and transient components. Thus, using their lagged values allows the extent of their serial dependence to be captured in the estimation model. Because the two equations are over-identified, we conducted the usual tests of the suitability of the instruments, the test of over-identifying restrictions, and the Hausman specification tests (Larcker and Rusticus, 2008).

Finally, to evaluate **H3A**, we divided the sample into the pre-SOX period and the post-SOX period. *NAS* was then multiplied by the PRE-SOX dummy variable and the POST-SOX dummy variable to create two variables: *PRE_NAS* and *POST_NAS*. Equations (3) to (4) were then estimated with these two variables replacing *NAS*. A test of the significance of the difference in

the coefficients was performed using the standard F-test. **H3A** is supported if *POST_NAS* is positive and higher than *PRE_NAS* with a statistically significant F-test. Since **H3A** is specified as applicable to both dependent variables, the tests are performed for each equation separately, and the results are tabulated and presented in a separate table for ease of discussion.

3.2 Data Collection

We obtained the 2000 to 2006 GOV Data from the online RiskMetrics (formerly IRRC) datasets using the Wharton Research data Services. There were 7,659 firm year observations obtained. These observations were then merged with the required financial data obtained from the Computstat North America Dataset and the audit and no-audit fees (including tax fees) data obtained online, using company search for audit fees, restated where available, from the Audit Analytics Database. Finally, they are merged with the CEO data available on the Corporate Library Database.

After deleting non-available data for financial, fee, and CEO information, there were 5,799 firm-year observations for 2000 to 2004 avaliable for use in our analyses.[6] Financial data used in the regressions are winsorized, by year, at one percent and 99 percent levels to control for the effects of extreme values. We have also deleted firm-year observation where there was a change of auditor in the year or where there were multiple auditor and/or audit fee observations in a year.

*** INSERT TABLE 1 HERE ***

We present year-by-year descriptive statistics in Table 1. As shown, means of ROA_{yt+1} and

[6] We require financial data up to 2006 for non-audit services purchased in 2004.

SG_{yt+1} vary widely across the four year sample period. For example, ROA_{yt+1} averaged 2.8% in 2001 (Panel A), dropped to 2.6% in 2002 (Panel B), then increased to 4.6% and 4.9% for 2003 and 2004 respectively (Panels C and D). Similarly, SG_{yt+1} was negative at -0.2% in 2001 (Panel A) and increases from 8.7% in 2002 (Panel B) to over 14% in both 2003 and 2004 (Panels C and D). *Dual* and *TURE* were relatively stable over the years, so was *CFO*, except for a drop in 2002. The *NAS* values dropped from 0.463 to 0.113 across the four years, while *GOV, BIG4, LEV* and *SIZE* remained fairly consistent across the four years.

Because of the wide variation of the *ROA's*, the sample was divided into positive and negative *ROA's* and the analysis done separately for each subsample in the Robustness section.

4. Results

Table 2 reports the Spearman correlations among regression variables. As shown, the performance variables, *ROA* in *year t* to *t+1* and *SG* in *year t* to *t+1* are all significantly and positively correlated, affirming the need to adopt a system of equation approach to our analyses. The instrument variables for SG_{yt+1}, *DUAL* and *TURE*, are significantly and positively correlated with both SG_{yt+1} and ROA_{yt+1} although the coefficient of correlation is less for ROA_{yt+1} than for $SG_{yt+1.}$ *CFO* is significantly and positively correlated with $ROA_{yt+1,}$ but significantly and negatively correlated with $SG_{yt+1..}$ The performance variables, SG_{yt+1} and ROA_{yt+1} are significantly and negatively correlated with *NAS* in *year t*, providing initial support for our hypothesis.

*** INSERT TABLE 2 HERE ***

The governance index in *year t*, *GOV*, is positively correlated with *ROA* in *year t* while negatively correlated with *SG* in *year t* and *t+1*, significant at the conventional levels. These results suggest that firms with stronger governance are associated with better sales growth both in current and subsequent years, while those with weaker governance are associated with lower returns on assets in the current year.

Interestingly, *NAS* is significantly and positively associated with *GOV*, suggesting that firms with weaker governance purchased more *NAS* from their auditors. *BIG4* is not significantly correlated with firm performance while positively correlated with *NAS* and *GOV*, suggesting that it is more likely that for *BIG4* to provide *NAS* than non-*BIG4* while more firms with weaker governance are engaging *BIG4* as auditors. *SIZE* is significantly and negatively correlated with *ROA*'s. It is significantly and positively correlated with SG_{yt+1}, *GOV* and *BIG4*.

4.1 Regression Results

Sales Growth in year $_{t+1}$

Panel A in Table 3 reports results for Equation (3) where SG_{yt+1} is estimated using both OLS and 2SLS regressions. The OLS results, on the left, show that the association between *NAS* and SG_{yt+1} is significantly positive with a coefficient of 0.026, supporting **H1A**. The coefficient estimates for ROA_{t+1} and SG_{yt} are also positive and significant. *GOV* and *SIZE* are significantly negative, suggesting firms with stronger governance have stronger one period ahead sales growth. $DUAL_{yt}$ is positive but not significant and $TURE_{yt}$ is positive and significant. No result is obtained for *BIG4* while *LEV* is significantly positive and *SIZE* is significantly negative, suggesting more leveraged or smaller firms having larger one period ahead sales growth.

Adjusted R^2 for model estimation using OLS regression is 0.175.

*** INSERT TABLE 3 HERE ***

The first-stage regression results (in which ROA_{yt+1} is regressed on all the exogenous variables, including the instrumental variables) are provided in the middle columns. As shown, ROA_{yt} is significant and positive while CFO_{yt} is significant and negative. *LEV* is significant and negative in predicting ROA_{yt+1}. What is more, the coefficients for $DUAL_{yt}$ and $TURE_{yt}$ are not statistically significant, consistent with the earlier argument that they are unlikely to be associated with firm profitability. The adjusted R^2 for the first-stage regression is 0.485, while the partial R-square attributable to the instruments (CFO_{yt} and ROA_{yt}) is 0.336. Thus, the instruments are quite powerful. The formal test for over-identifying restrictions does not reject the null hypothesis of the exogeneity of the instruments ($\chi 2 = 0.001$ $p = 0.99$), while the Hausman test (F-value = 76.34) rejects the null ($p < 0.001$). Together with the partial statistics obtained for the instrument variables, these results suggest that the 2SLS estimates are preferable to the OLS estimates (Larcker and Rusticus, 2008).

The right hand columns in Panel A report the second-stage 2SLS regression results in estimating $SG_{yt+1.}$ As shown, the coefficient estimate for *NAS* is positive but not statistically significant. Note that the coefficient for *NAS* (0.023) is not that different in the OLS results (0.026) although the OLS result was statistically significant at a probability of 0.10. Interestingly, ROA_{yt+1} is also positive and barely significant at the one-tailed probability level of 0.10. **H1A** would appear to be supported by these results.

ROA in year $_{t+1}$

Panel B in Table 3 reports regression results for Equation (4) where ROA_{yt+1} is estimated. The OLS regression results indicate that *NAS* is significantly and negatively associated with one period ahead ROA. This result contradicts **H2A** and suggests that firms purchasing *NAS* from its auditor reports lower one period ahead ROA. As expected, $SG_{yt+1,}$ ROA_{yt} and *SIZE* are significantly and positively associated with ROA_{yt+1}. No result is found for *GOV*. Adjusted R^2 for OLS model estimation is 0.507.

The first-stage regression results in predicting the endogenous variable SG_{yt+1} are provided in the middle columns. As shown, the instrument variable SG_{yt} is significantly and positively associated with SG_{yt+1} while no results are found for *LEV* and *MTB*. At the same time, $DUAL_{yt}$ and $TURE_{yt}$ are both significant, lending support to the argument that firmly entrenched top management may be more concerned about sales growth (and potential market share) than immediate profitability. Furthermore, CFO_{yt} is not statistically significant, thus lending further support to the appropriateness of CFO_{yt} as an instrumental variable for *ROA* relative to *SG*. The partial F-value for the instrumental variables is 8.85 and significant at $p < 0.001$ levels. The partial R^2 is 0.077. These results also indicate that strong instruments were used in predicting SG_{yt+1}**.** The formal test for over-identification restrictions, however, fails to reject the null hypothesis of the exogeneity of the instruments ($\chi^2 = 1.50$ $p < 0.47$) while the statistics for the Hausman test (F-value = 1.740) is insignificant, suggesting that the OLS results may be more reliable in this case (Larcker and Rusticus, 2008).

The right hand columns in Panel B report the second-stage 2SLS regression results in estimating $ROA_{yt+1.}$ As shown, the coefficient estimate for *NAS* is similarly significant and negative, with a coefficient of -0.015 that is not dissimilar to the OLS result of -0.011. Both

results thus fail to provide support for H2. The control variables ROA_{yt} and *SIZE* are significantly associated with ROA_{yt+1} in the predicted direction, No results are found for *GOV* and *BIG4*.

4.2 Pre- and Post-SOX period analysis

To explore further the inconsistent results we obtained for Equations (2) and (3), we examine if the effects of *NAS* in the post-SOX period would be different from the pre-SOX period. To do so, we divided the sample into the pre- and post-periods. *NAS* was then multiplied by the *PRE-SOX* dummy variable and the *POST_SOX* dummy variable to create two variables: *PRE_NAS* and *POST_NAS*. Equations (3) to (4) were then estimated with the two variables replacing *NAS*. A test of the significance of the difference in the coefficients was performed using the standard F-test. **H3A** is supported if *PRE_NAS* is positive and higher than *POST_NAS* with a statistically significant F-test. Since **H3A** is specified as applicable to all three dependent variables, the tests are performed for each equation separately, and the results are tabulated and presented in a separate table for ease of discussion.

*** INSERT TABLE 4 HERE ***

Table 4, Panel A reports OLS regression results for Equation (3) with SG_{yt+1} as the dependent variable, and *NAS* is replaced by *PRE_NAS* and *POST_NAS*. As shown, the coefficient for *PRE_NAS* is not significant while *POST_NAS* is positive and significant. Looking over to the 2SLS results, the same results are observed, with the coefficient for *POST_NAS* changing slightly from 0.086 in the OLS estimate to 0.090 in the 2SLS results. Both sets of results support the hypothesis **H3A** that *NAS* purchased after SOX was enacted was more productive. Prior to

the passage of SOX, firms acquiring *NAS* from their auditors did not experience any systematic increase in one period ahead sales growth. In contrast, firms who purchased *NAS* from their auditors under the SOX regime may have been more highly motivated or more discriminatory in their decision to enter into *NAS* contracts with their auditors. The rest of the results obtained for Equation (3) are qualitatively similar to that obtained where *NAS* was not partitioned into *PRE_NAS* and *POST_NAS* and described above.

Panel B in Table 4 similarly reports results for Equation (4). As reported, the negative and significant association between *NAS* and ROA_{yt+1} that contradicted **H2A** is only found for *PRE_NAS* but not for *POST_NAS*. *POST_NAS* is negative but not significant. Thus, although **H2A** was not supported, what can be said is that in the post-SOX period, *NAS* acquired was primarily associated with future sales increases. In contrast, in the pre-SOX period, the payments were associated with reduced future profits and negligible future sales growth. That combination seems to suggest that one positive impact of SOX was to force firms to be more demanding of the value of *NAS* services provided by their auditors. A more cynical conclusion might be that firms may have been trying to pay off their auditors in their award of *NAS* in the pre-SOX period, but this practice ceased after the passage of SOX when firms began to derive real economic value from *NAS*.

4.3 Robust Test

As mentioned above, due to variations in sample means of SG_{yt+1} and ROA_{yt+1} over the sample period, we conducted the following robustness tests. First, we repeated OLS and 2SLS regression analysis for Equations (3) and (4) with the *PRE_NAS* and *POST_NAS* variables on a year-by-year basis. The results are reported in Table 5 below.

*** INSERT TABLE 5 HERE ***

The results in Panel A of Table 5 shows that, for SGy_{t+1}, *NAS* is insignificant in 2001 and 2002, but positive and significant in the post-SOX periods of 2003 and 2004. In Panel B of Table 5 where ROA_{yt+1} is the dependent variable, *NAS* is negative and statistically significant in 2001 but not 2002. In contrast, it is insignificant in both 2003 and 2004, the post-SOX years. These results provide some evidence of the robustness of our earlier findings, at least for the four-year test period.

As a second sensitivity test, we repeated regressions analysis using the *PRE_NAS* and *POST_NAS* variables on subsamples partitioned by profit (PROFIT) and loss-making (LOSS) firms to investigate if there are any systematic effects that may arise from differential behavior between profitable and unprofitable firms during the sample periods. The firms wer e labeled PROFIT or LOSS firms based on their operating performance in the year that the NAS contract was awarded. The respective sample sizes were 4,723for PROFIT firms, and 1,253 for LOSS firms.

*** INSERT TABLE 6 HERE ***

The results for the LOSS and PROFIT firms estimated using Equations (3) and (4) are reported in Table 6. These results show that *POST_NAS* is positively associated with SG_{yt+1} for both profit and loss making firms.[7] It is significant at $p < 0.01$ levels for profit making firm while not significant for loss making firms. Consistent with results obtained for full sample regressions, *PRE_NAS* is negatively associated with ROA_{yt+1}, significant at $p < 0.10$ level for

[7] We report only OLS regression results as the OLS and 2SLS regressions results are very similar to each other.

profit making firms and insignificant for loss making firms. These results suggest that our earlier results for the full sample are driven by the PROFIT firms. For the PROFIT subsample analysis with SG_{yt+1} as the dependent variable, the shift of the NAS coefficient from insignificant in the PRE period to positive and significant in the POST period indicates that NAS was being used effectively. At the same time, with ROA_{t+1} as the dependent variable, the shift from significantly negative to negative but insignificant suggests that the previous tendency hire auditors for NAS with negative future implications had given way to at least a requirement of neutrality of results.

In contrast, the consistently insignificant coefficients for PRE-NAS and POST_NAS in the LOSS subsample for both dependent variables suggest that NAS has no systematic effect on the performance of these firms.

To provide for other endogenous problems not modeled for in our system of equation analysis, we re-run the regressions by replacing the endogenous variables, SG_{yt+1} and ROA_{yt+1}, as well as the dependent variables, SG_{yt} and ROA_{yt}, by one period change in the variable (i.e., $SG_{yt+1} - SG_{yt}$; $ROA_{yt+1} - ROA$ and $SG_{yt} - SG_{yt-1}$; $ROA_{yt} - ROA_{yt-1}$). Qualitatively similar results for Equations (3) to (4), using *PRE_NAS* and *POST_NAS* and full sample observations, not tabulated, were obtained, indicating our results are robust on changes in firm performance.

V. Conclusions

In this study, we have examined the argument that auditor-independence is compromised when auditors offer non-audit services to their audit clients. By empirically examining the ex post results of non-audit services provided by auditors to their clients, we provide evidence that, in fact, such services offer value to the clients. Specifically, our results indicate positive sales growth following such non-audit services. These results did not hold for one-year ahead

profitability, however. In further tests, we found some evidence that these are due principally to an apparent change in firm behavior in the periods after the adoption of the Sarbanes-Oxley Act of 2002.

Our results offer some insight into the continuing debate over the proper way to incentivize auditors. The evidence that the offering of non-audit services provide value to audit clients suggests that an outright prohibition against such provision of services may lead to a loss of economic efficiency in the general economy. Thus, such outright prohibitions should be carefully considered before they are imposed.

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TABLE 1
Descriptive Statistics
Panel A – Full sample (2001 to 2004)

	n	Mean	Minimum	Median	Maximum
ROA_{yt+1}	5,977	0.038	-0.458	0.040	0.308
ROA_{yt}	5,977	0.030	-0.598	0.035	0.340
SG_{yt+1}	5,977	0.097	-0.728	0.078	1.205
SG_{yt}	5,977	0.076	-0.722	0.060	1.324
DUAL	5,013	0.596	0	1	1
TURE	5,013	2.418	0	2.236	7.348
CFO	5,976	0.054	-2.420	0.073	1.075
NAS	5,977	0.245	0	0.173	0.966
GOV	5,977	9.097	1	9	19
BIG4	5,977	0.980	0	1	1
LEV	5,977	0.277	0	0.235	66.648
SIZE	5,977	21.490	16.274	21.304	28.026

Panel B – Year 2001

	n	Mean	Minimum	Median	Maximum
ROA_{yt+1}	1,318	0.028	-0.458	0.033	0.253
ROA_{yt}	1,318	0.025	-0.509	0.029	0.274
SG_{yt+1}	1,318	-0.002	-0.728	0.005	0.718
SG_{yt}	1,318	0.047	-0.617	0.020	1.324
DUAL	1,058	0.286	0	0	1
TURE	1,058	2.387	0	2.236	7.211
CFO	1,318	0.075	-1.702	0.082	0.901
NAS	1,318	0.463	0	0.478	0.960
GOV	1,318	9.043	2	9	19
BIG4	1,318	0.980	0	1	1
LEV	1,318	0.289	0	0.263	2.914
SIZE	1,318	21.568	16.678	21.352	27.681

TABLE 1 (CONT'D)
Descriptive Statistics
Panel C – Year 2002

	n	Mean	Minimum	Median	Maximum
ROA_{yt+1}	1,583	0.026	-0.382	0.034	0.288
ROA_{yt}	1,583	0.010	-0.598	0.028	0.340
SG_{yt+1}	1,583	0.087	-0.539	0.070	0.974
SG_{yt}	1,583	0.007	-0.722	0.006	0.909
DUAL	1,214	0.691	0	1	1
TURE	1,214	2.456	0	2.236	7.211
CFO	1,583	0.022	-2.420	0.086	1.075
NAS	1,583	0.254	0	0.204	0.960
GOV	1,583	9.084	1	9	18
BIG4	1,583	0.979	0	1	1
LEV	1,583	0.305	0	0.234	66.648
SIZE	1,583	21.316	16.274	21.133	27.724

Panel D – Year 2003

	n	Mean	Minimum	Median	Maximum
ROA_{yt+1}	1,512	0.046	-0.334	0.045	0.298
ROA_{yt}	1,512	0.034	-0.341	0.037	0.288
SG_{yt+1}	1,512	0.147	-0.334	0.113	1.205
SG_{yt}	1,512	0.096	-0.450	0.073	1.021
DUAL	1,309	0.687	0	1	1
TURE	1,309	2.405	0	2.236	7.280
CFO	1,511	0.066	-0.578	0.067	0.721
NAS	1,512	0.184	0	0.143	0.966
GOV	1,512	9.130	1	9	18
BIG4	1,512	0.982	0	1	1
LEV	1,512	0.253	0	0.233	2.023
SIZE	1,512	21.496	17.090	21.300	27.865

TABLE 1 (CONT'D)
Descriptive Statistics
Panel E – Year 2004

	n	Mean	Minimum	Median	Maximum
ROA_{yt+1}	1,564	0.049	-0.363	0.048	0.308
ROA_{yt}	1,564	0.048	-0.334	0.044	0.290
SG_{yt+1}	1,564	0.141	-0.398	0.108	1.114
SG_{yt}	1,564	0.152	-0.368	0.115	1.195
DUAL	1,432	0.663	0	1	1
TURE	1,432	2.422	0	2.236	7.348
CFO	1,564	0.057	-0.714	0.063	0.493
NAS	1,564	0.113	0	0.078	0.713
GOV	1,564	9.124	2	9	18
BIG4	1,564	0.977	0	1	1
LEV	1,564	0.260	0	0.219	2.657
SIZE	1,564	21.593	17.284	21.443	28.026

ROA = return on opening assets, measured by net income in the year divided by opening total assets for year $_{t+2}$, $_{t+1}$ and $_{t}$;
SG = sales growth, measured by increase in sales in the year divided by previous year sales for year $_{t+1}$ and $_{t}$;
DUAL = duality of chairmanship and CEO, available from the Corporate Library Database;
TURE = square root of CEO tenure (years), available from the Corporate Library Database;
CFO = cash flow from operation deflected by market value of the company where cash flow from operation is calculated as net income before extraordinary items less total accruals, measured by Δ(current assets – cash) – Δ(current liabilities – current portion of long-term debts) – depreciation;
NAS = non-audit fees/(audit fees + non-audit fees) where non-audit fees = total non-audit fees – tax services fees);
GOV = Governance Index (Gompers, Ishii, and Metrick 2003) for the firm, where the higher the index, the weaker is shareholder protection.
BIG4 = indicator variable where 1 denote a Big 4 auditor and 0 otherwise;
LEV = leverage, calculated as total (short- plus long-term) debts divided by opening total assets, and
SIZE = natural logarithm of firm total assets;

TABLE 2
Spearman Correlation of Regression Variables

	ROA_{yt}	SG_{yt+1}	SG_{yt}	*DUAL*	*TURE*	*CFO*	*NAS*	*GOV*	*BIG4*	*LEV3*	*SIZE*
ROA_{yt+1}	0.761***	0.350***	0.325***	0.038**	0.060***	0.092***	-0.053***	0.017	-0.010	-0.179 ***	-0.073 ***
ROA_{yt}		0.203***	0.389***	0.038**	0.082***	0.207***	-0.032*	0.029*	-0.016	-0.138 ***	-0.031 *
SG_{yt+1}			0.338***	0.111***	0.083***	-0.119***	-0.133***	-0.034**	0.012	0.002	-0.018
SG_{yt}				0.035*	0.113***	-0.053***	-0.101***	-0.036**	0.020	0.054 ***	0.047 ***
DUAL					0.280***	0.022	-0.142***	0.097***	0.004	0.043 **	0.125 ***
TURE						-0.017	-0.053***	-0.112***	-0.072 ***	-0.047 **	-0.076 ***
CFO							0.070***	0.128***	-0.023 #	0.121 ***	0.174 ***
NAS								0.035**	0.027 *	0.103 ***	0.159 ***
GOV									0.038 **	0.111 ***	0.182 ***
BIG4										0.084 ***	0.092 ***
LEV											0.324 ***

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; # $p < 0.1$ t-tests (2-tailed).

ROA = return on opening assets, measured by net income in the year divided by opening total assets for year $_{t+2}$, $_{t+1}$ and $_{t}$;
SG = sales growth, measured by increase in sales in the year divided by previous year sales for year $_{t+1}$ and $_{t}$;
DUAL = duality of chairmanship and CEO, available from the Corporate Library Database;
TURE = square root of CEO tenure (years), available from the Corporate Library Database;
CFO = cash flow from operation deflected by market value of the company where cash flow from operation is calculated as net income before extraordinary items less total accruals, measured by Δ(current assets – cash) – Δ(current liabilities – current portion of long-term debts) – depreciation;
NAS = non-audit fees/(audit fees + non-audit fees) where non-audit fees = total non-audit fees – tax services fees);
GOV = Governance Index (Gompers, Ishii, and Metrick 2003) for the firm, where the higher the index, the weaker is shareholder protection.

BIG4 = indicator variable where 1 denote a Big 4 auditor and 0 otherwise;
LEV = leverage, calculated as total (short- plus long-term) debts divided by opening total assets, and
SIZE = natural logarithm of firm total assets;

TABLE 3
The Association of SG_{yt+1} and ROA_{yt+1} using *NAS* as independent variable
Panel A – Estimating SG_{yt+1}

		OLS		2SLS			
				First-Stage		*Second-Stage*	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	0.377	5.68 ***	-0.024	-1.04	0.345	5.11 ***
NAS	+	0.026	1.71 #	-0.013	-2.41 *	0.023	1.49
ROA_{yt+1}	+	0.425	13.19 ***			0.081	1.57
Instrument(s)							
ROA_{yt}	+			0.635	56.19 ***		
CFO	-			-0.048	-11.26 ***		
Control variables							
SG_{yt}	+	0.097	7.40 ***	0.017	3.65 ***	0.126	9.17 ***
DUAL	+	0.010	1.63	0.002	0.85	0.011	1.73 #
TURE	+	0.004	1.74 #	0.000	-0.50	0.004	2.01 *
GOV	-	-0.003	-2.89 **	0.000	-0.06	-0.003	-2.65 **
BIG4	+	0.029	1.46	-0.002	-0.29	0.024	1.18
LEV	?	0.127	9.44 ***	-0.025	-5.42 ***	0.103	7.37 ***
SIZE	+	-0.010	-5.09 ***	0.001	1.70 #	-0.009	-4.34 ***
YEAR & IND			-	***Included***		-	
Adjusted R^2			0.175		0.485		0.147
F-values			18.73 ***		74.25 ***		15.34 ***

Partial F-statistic	1637.2 ***
R^2 IVS FSG	0.492
R^2 IVS reduced	0.156
Partial R^2	0.336
Over-identifying Restriction Test	
χ^2 d.f. = 1	.001 p=.99
Hausman test	
F-ratio	76.34 ***

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; # $p < 0.1$ t-tests (2-tailed).

The first-stage regression is the regression of ROA_{yt+1} on all exogenous variables, including the instruments, but excluding the jointly endogenous variable, SG_{yt+1}.

TABLE 3 (CONT'D)
The Association of SG_{yt+1} and ROA_{yt+1} using *NAS* as independent variable
Panel B – Estimating ROA_{yt+1}

		OLS		2SLS			
				First-Stage		*Second-Stage*	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	-0.063	-2.93 **	0.343	5.08 ***	-0.069	-2.70 **
NAS	+	-0.011	-2.27 *	0.022	1.42	-0.015	-2.82 **
SG_{yt+1}		0.071	16.83 ***			0.117	3.52 ***
Instrument(s)							
SG_{yt}	+			0.127	9.44 ***		
DUAL	+			0.011	1.76 #		
TURE	+			0.004	2.00 *		
Control variables							
ROA_{yt}	+	0.629	64.38 ***	0.052	1.56	0.629	53.00 ***
CFO	-	-0.036	-10.26 ***	-0.005	-0.43	-0.048	-11.10 ***
GOV	-	0.000	0.49	-0.003	-2.65 **	0.000	0.93
BIG4	+	-0.005	-0.77	0.024	1.18	-0.004	-0.60
LEV	?	0.002	2.44 *	0.101	7.37 ***	-0.036	-5.92 ***
SIZE	+	0.001	2.31 *	-0.009	-4.29 ***	0.002	3.09 **
Year & Industry			-	***Included***		-	
Adjusted R^2			0.516	0.146			0.486
F-values			108.9 ***	15.09 ***			81.17 ***
Partial F-statistic				34.02 ***			
R^2 IVS FSG				0.157			
R^2 IVS reduced				0.060			
Partial R^2				0.097			
Over-identifying Restriction Test							
χ^2 d.f. = 2				1.50 p=0.47			
Hausman test							
F-ratio				1.740 p=0.19			

*** p < 0.001; ** p < 0.01; * p < 0.05; # p < 0.1 t-tests (2-tailed).
The first-stage regression is the regression of SG_{yt+1} on all exogenous variables, including the instruments, but excluding the jointly endogenous variable, ROA_{yt+1}.

ROA = return on opening assets, measured by net income in the year divided by opening total assets for year $_{t+2}$, $_{t+1}$ and $_{t}$;
SG = sales growth, measured by increase in sales in the year divided by previous year sales for year $_{t+1}$ and $_{t}$;
DUAL = duality of chairmanship and CEO, available from the Corporate Library Database;
TURE = square root of CEO tenure (years), available from the Corporate Library Database;
CFO = cash flow from operation deflected by market value of the company where cash flow from operation is calculated as net income before extraordinary items less total accruals, measured by Δ(current assets – cash) – Δ(current liabilities – current portion of long-term debts) – depreciation;
NAS = non-audit fees/(audit fees + non-audit fees) where non-audit fees = total

non-audit fees – tax services fees);

GOV	=	Governance Index (Gompers, Ishii, and Metrick 2003) for the firm, where the higher the index, the weaker is shareholder protection.
BIG4	=	indicator variable where 1 denote a Big 4 auditor and 0 otherwise;
LEV	=	leverage, calculated as total (short- plus long-term) debts divided by opening total assets, and
SIZE	=	natural logarithm of firm total assets, and,
Year & Industry	=	indicator variables (Y2001 - Y2003; I1 - I48) used to control for year (2001 to 2004) and industry (Fama-French 49 industry portfolio classification) effects.

Year & Industry	=	indicator variables (Y2001 - Y2003; I1 - I48) used to control for year (2001 to 2004) and industry (Fama-French 49 industry portfolio classification) effects.

TABLE 4
The Association of SG_{yt+1} and ROA_{yt+1} using *PRE_NAS* and *POST_NAS* as independent variables
Panel A – Estimating SG_{yt+1}

		OLS		2SLS			
				First-Stage		*Second-Stage*	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	0.372	5.60 ***	-0.025	-1.11	0.340	5.03 ***
PRE_NAS	?	0.001	0.06	-0.020	-3.34 ***	-0.005	-0.26
POST_NAS	+	0.086	3.13 **	0.007	0.71	0.090	3.21 **
ROA_{yt+1}	+	0.422	13.12 ***			0.081	1.56
Instrument(s)							
ROA_{yt}	+			0.635	56.22 ***		
CFO	-			-0.048	-11.29 ***		
Control variables							
SG_{yt}	+	0.098	7.52 ***	0.017	3.76 ***	0.127	9.28 ***
DUAL	+	0.010	1.67 #	0.002	0.88	0.011	1.77 #
TURE	+	0.004	1.71 #	0.000	-0.54	0.004	1.98 *
GOV	-	-0.003	-2.89 **	0.000	-0.07	-0.003	-2.66 **
BIG4	+	0.029	1.49	-0.002	-0.27	0.024	1.21
LEV	?	0.125	9.28 ***	-0.026	-5.55 ***	0.101	7.22 ***
SIZE	+	-0.010	-5.11 ***	0.001	1.69 #	-0.009	-4.36 ***
YEAR & IND			-		Included	-	
Adjusted R^2			0.176		0.486		0.148
F-values			18.56 ***		77.43 ***		15.25 ***
Partial F-statistic					1638.6 ***		
R^2 IVS FSG					0.492		
R^2 IVS reduced					0.156		
Partial R^2					0.336		
Over-identifying Restriction Test							
χ^2 d.f. = 1					0.01 p=.99		
Hausman test							
F-ratio					75.49 ***		

*** p < 0.001; ** p < 0.01; * p < 0.05; # p < 0.1 t-tests (2-tailed).

The first-stage regression is the regression of ROA_{yt+1} on all exogenous variables, including the instruments, but excluding the jointly endogenous variable, SG_{yt+1}.

TABLE 4 (CONT'D)
The Association of SG_{yt+1} and ROA_{yt+1} using *PRE_NAS* and *POST_NAS* as independent variables
Panel B – Estimating ROA_{yt+1}

		OLS		2SLS			
				First-Stage		*Second-Stage*	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	-0.063	-2.95 **	0.337	5.00 ***	-0.071	-2.78 **
PRE_NAS	?	-0.014	-2.43 *	-0.006	-0.35	-0.019	-3.16 **
POST_NAS	+	-0.004	-0.42	0.090	3.23 **	-0.004	-0.41
SG_{yt+1}		0.071	16.77 ***			0.119	3.61 ***
Instrument(s)							
SG_{yt}	+			0.129	9.56 ***		
DUAL	+			0.011	1.79 #		
TURE	+			0.004	1.96 *		
Control variables							
ROA_{yt}	+	0.629	64.39 ***	0.052	1.56	0.629	53.05 ***
CFO	-	-0.036	-10.26 ***	-0.006	-0.46	-0.048	-11.11 ***
GOV	-	0.000	0.49	-0.003	-2.65 **	0.000	0.95
BIG4	+	-0.005	-0.75	0.024	1.21	-0.004	-0.59
LEV	?	0.002	2.42 *	0.099	7.21 ***	-0.037	-6.07 ***
SIZE	+	0.001	2.29 *	-0.009	-4.31 ***	0.002	3.11 **
YEAR & IND			-	Included		-	
Adjusted R^2			0.516		0.148		0.486
F-values			107.09 ***		15.01 ***		79.99 ***
Partial F-statistic					43.10 ***		
R^2 IVS FSG					0.158		
R^2 IVS reduced					0.093		
Partial R^2					0.065		
Over-identifying Restriction Test							
χ^2 d.f. = 2					1.5 p=0.47		
Hausman test							
F-ratio					1.970 p=0.16		

*** p < 0.001; ** p < 0.01; * p < 0.05; # p < 0.1 t-tests (2-tailed).

The first-stage regression is the regression of SG_{yt+1} on all exogenous variables, including the instruments, but excluding the jointly endogenous variable, ROA_{yt+1}.

ROA = return on opening assets, measured by net income in the year divided by opening total assets for year $_{t+2}$, $_{t+1}$ and $_{t}$;
SG = sales growth, measured by increase in sales in the year divided by previous year sales for year $_{t+1}$ and $_{t}$;
DUAL = duality of chairmanship and CEO, available from the Corporate Library Database;
TURE = square root of CEO tenure (years), available from the Corporate Library Database;
CFO = cash flow from operation deflected by market value of the company where

		cash flow from operation is calculated as net income before extraordinary items less total accruals, measured by Δ(current assets – cash) – Δ(current liabilities – current portion of long-term debts) – depreciation;
NAS	=	non-audit fees/(audit fees + non-audit fees) where non-audit fees = total non-audit fees – tax services fees);
GOV	=	Governance Index (Gompers, Ishii, and Metrick 2003) for the firm, where the higher the index, the weaker is shareholder protection.
BIG4	=	indicator variable where 1 denote a Big 4 auditor and 0 otherwise;
LEV	=	leverage, calculated as total (short- plus long-term) debts divided by opening total assets, and
SIZE	=	natural logarithm of firm total assets, and,
Year & Industry	=	indicator variables (Y2001 - Y2003; I1 - I48) used to control for year (2001 to 2004) and industry (Fama-French 49 industry portfolio classification) effects.

TABLE 5
Panel A – Second-stage 2SLS Estimation of the SG_{yt+1} Equation - year by year

		2001		2002		2003		2004	
		n=1,058		*n=1,214*		*n=1,309*		*n=1,432*	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	0.095	0.62	0.399	3.53 ***	0.267	2.17 *	0.248	1.81 #
NAS	+	0.003	0.13	0.015	0.58	0.105	3.04 **	0.137	3.05 **
Predicted ROA_{yt+1}	+	0.594	5.77 ***	0.069	0.68	-0.292	-0.79	0.033	0.38
Control variables									
SG_{yt}	+	0.004	0.14	0.187	6.74 ***	0.267	9.06 ***	0.179	7.00 ***
DUAL	+	0.014	1.12	0.002	0.16	0.008	0.63	0.022	1.89 #
TURE	+	0.007	1.79 #	0.005	1.29	0.007	1.70 #	-0.001	-0.24
GOV	-	-0.002	-1.11	-0.004	-1.90 #	-0.004	-1.82 #	-0.001	-0.31
BIG4	+	-0.036	-0.85	0.035	0.95	0.065	1.70 #	0.026	0.72
LEV	?	0.202	7.31 ***	0.088	2.86 **	0.036	1.35	0.076	3.15 **
SIZE	+	-0.014	-3.32 ***	-0.002	-0.58	-0.009	-2.33 *	-0.010	-2.63 **
Industry				-	*Included*		-		
Adjusted R^2			0.229		0.126		0.178		0.122
F-values			6.81 ***		4.18 ***		6.07 ***		4.48 ***
Partial F-statistic			341.1 ***		337.6 ***		425.6 ***		656.9 ***
R^2 IVS FSG			0.546		0.480		0.500		0.559
R^2 IVS reduced			0.236		0.177		0.159		0.136
Partial R^2			0.309		0.304		0.340		0.422
Over-identifying Restriction Test									
χ^2 d.f. = 1			.001		0.45		2.22		0.00
(p-value)			0.99		0.50		0.14		0.99
Hausman test									
F-ratio			0.10		8.21		56.8		20.07
(p-value)			0.75		0.00		0.00		0.00

*** p < 0.001; ** p < 0.01; * p < 0.05; # p < 0.1 t-tests (2-tailed).

TABLE 5 (CONT'D)
Panel B – OLS Estimation of the ROA_{yt+1} Equation - year by year

		2001		2002		2003		2004	
		n=1,318		*n=1,583*		*n=1,511*		*n=1,564*	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	0.002	0.05	-0.070	-1.79 #	-0.103	-2.56 *	-0.084	-1.91 #
NAS	+	-0.014	-1.75 #	-0.009	-1.01	-0.004	-0.34	0.013	0.89
SG_{yt+1}	+	0.066	6.61 ***	0.074	8.18 ***	0.068	8.35 ***	0.063	7.82 ***
Control variables									
ROA_{yt}	+	0.634	29.00 ***	0.520	29.27 ***	0.685	34.34 ***	0.741	36.29 ***
CFO	-	-0.025	-3.51 ***	-0.026	-5.01 ***	-0.038	-3.25 **	-0.021	-1.67 #
GOV	-	0.000	0.70	0.001	0.94	-0.001	-0.90	0.000	0.17
BIG4	-	-0.025	-1.81 #	-0.014	-1.06	0.009	0.74	0.013	1.18
LEV	+	-0.008	-0.91	0.003	1.73 #	-0.027	-3.32 ***	-0.036	-4.98 ***
SIZE	+	0.000	-0.09	0.002	1.19	0.003	2.32 *	0.004	3.09 **
Industry				-	*Included*	-			
Adjusted R^2		0.538		0.488		0.516		0.566	
F-values		28.40 ***		27.93 ***		29.76 ***		37.34 ***	

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; # $p < 0.1$ t-tests (2-tailed).

ROA = return on opening assets, measured by net income in the year divided by opening total assets for year $_{t+2}$, $_{t+1}$ and $_{t}$;
SG = sales growth, measured by increase in sales in the year divided by previous year sales for year $_{t+1}$ and $_{t}$;
DUAL = duality of chairmanship and CEO, available from the Corporate Library Database;
TURE = square root of CEO tenure (years), available from the Corporate Library Database;
NAS = non-audit fees/(audit fees + non-audit fees) where non-audit fees = total non-audit fees – tax services fees);
GOV = Governance Index (Gompers, Ishii, and Metrick 2003) for the firm, where the higher the index, the weaker is shareholder protection.
BIG4 = indicator variable where 1 denote a Big 4 auditor and 0 otherwise;
LEV = leverage, calculated as total (short- plus long-term) debts divided by opening total assets, and
SIZE = natural logarithm of firm total assets;
Industry = indicator variables (I1 - I48) used to control for industry (Fama-French 49 industry portfolio classification) effects.

TABLE 6
Panel B – OLS Estimation of both Equations partition by profit-and loss making firms

		Profit making firms				***Loss making firms***			
		Dep. variable is SG_{yt+1} (n=4,120)		Dep. variable is ROA_{yt+1} n=(4,723)		Dep. variable is SG_{yt+1} (n=893)		Dep. variable is ROA_{yt+1} (n=1,253)	
	Sign	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*	*Coef*	*t-value*
INTERCEPT	?	0.188	2.73 **	-0.062	-3.15 **	0.762	4.04 ***	-0.227	-3.43 ***
PRE_NAS	?	-0.010	-0.55	-0.009	-1.90 #	0.038	0.74	-0.028	-1.52
POST_NAS	+	0.082	3.11 **	-0.008	-1.01	0.045	0.45	0.025	0.68
ROA_{yt+1}	+	0.006	15.38 ***			0.003	4.32 ***		
SG_{yt+1}	+			0.072	17.54 ***			0.075	6.81 ***
ROA_{yt}	+			0.007	51.78 ***			0.004	13.13 ***
CFO	-			-0.022	-4.61 ***			-0.018	-2.24 *
SG_{yt}	+	0.067	4.71 ***			0.163	4.92 ***		
DUAL	+	0.005	0.88			0.027	1.41		
TURE	+	0.006	2.68 **			-0.008	-1.12		
GOV	-	-0.002	-1.85 #	0.001	0.64	-0.007	-1.96 #	0.001	0.001
BIG4	+	0.003	0.13	0.001	0.01	0.124	1.85 #	-0.012	-0.57
LEV	?	0.128	9.27 ***	-0.033	-11.91 ***	0.091	2.29 *	0.004	1.58
SIZE	+	-0.004	-2.12 *	0.002	4.4 ***	-0.023	-3.4 ***	0.006	2.53 *
Year & Industry				-		***Included***		-	
Adjusted R^2		0.184		0.481		0.230		0.277	
F-values		16.20 ***		73.95 ***		5.68 ***		9.14 ***	
Sample size									

*** p < 0.001; ** p < 0.01; * p < 0.05; # p < 0.1 t-tests (2-tailed).

ROA = return on opening assets, measured by net income in the year divided by opening total assets for year $_{t+2}$, $_{t+1}$ and $_{t}$;

SG = sales growth, measured by increase in sales in the year divided by previous year sales for year $_{t+1}$ and $_{t}$;

DUAL = duality of chairmanship and CEO, available from the Corporate Library Database;

TURE = square root of CEO tenure (years), available from the Corporate Library Database;

NAS = non-audit fees/(audit fees + non-audit fees) where non-audit fees = total non-audit fees – tax services fees);

GOV = Governance Index (Gompers, Ishii, and Metrick 2003) for the firm, where the higher the index, the weaker is shareholder protection.

BIG4 = indicator variable where 1 denote a Big 4 auditor and 0 otherwise;

LEV = leverage, calculated as total (short- plus long-term) debts divided by opening total assets, and

SIZE = natural logarithm of firm total assets;

Year & Industry = indicator variables (Y2001 - Y2003; I1 - I48) used to control for year (2001 to 2004) and industry (Fama-French 49 industry portfolio classification) effects.