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The effect of the Sarbanes-Oxley Act of 2002 on earnings quality

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The Effect of the Sarbanes-Oxley Act of 2002 on Earnings Quality

An Honors Program Project Presented to
the Faculty of the Undergraduate
College of Business
James Madison University

by Emily Berneen Blair

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Abstract

The purpose of this paper is to determine the impact of the Sarbanes-Oxley Act of 2002 on the earnings quality of public firms. I begin by discussing the history of the act and examining its provisions. I then explain the significance of earnings quality and how earnings quality can be measured. After gathering financial statement and earnings quality data, I used SAS to compare quality of earnings before and after 2002. From the results, I concluded that the Sarbanes-Oxley Act of 2002 did in fact significantly improve earnings quality.

Introduction

In the early 2000s, a series of financial scandals came to the attention of the public. The most notable of these were the bankruptcies of Enron and WorldCom.

Executives contributed to the collapse of their companies by falsifying information for personal gain or hiding the evidence if their company was struggling.

Accounting firms acted only in the interests of the companies they audited, profiting from this relationship at the expense of shareholders (Holt, 2008). Investors had little to no warning of these corporate bankruptcies and lost hundreds of billions of dollars because of it. The public was outraged and investors began to lose confidence in the market (Jahmani, 2008). The Sarbanes-Oxley Act of 2002, also known as SOX, was passed in order to combat this issue.

The goals of SOX included protecting and providing confidence to investors, deterring and punishing fraudulent financial reporting practices, and improving the ethical standards and internal controls of companies (Holt, 2008). SOX was also intended to make financial statements more transparent and understandable and to promote accountability by senior executives. One result of SOX, if the act was effective, would be improved earnings quality of public firms. Earnings quality is a function of both the financial performance of a company and how its accounting system measures performance. It is an important aspect to consider because it affects whether or not companies' reported earnings are informative about their financial performance (Dechow, 2010).

In order to determine the effect SOX had on earnings quality, I gathered financial statement and earnings quality data for a set of publicly traded companies. After synthesizing and analyzing this data, I was able to determine what measures of earnings quality changed significantly after SOX was passed. From the results of my research, I concluded that SOX had a positive impact on earnings quality.

Background

I. The Sarbanes-Oxley Act of 2002

Successfully monitoring internal controls and enforcing ethical accounting problems had been an issue for decades prior to SOX. The Foreign Corrupt Practices Act of 1977 (FCPA) monitored internal controls and accounting practices; this law applied to all companies filing with the SEC. Unfortunately, FCPA was not successful in curbing fraud, as evidenced by the continued financial scandals and unanticipated bankruptcies. The scandals of Enron, WorldCom, and other companies spurred the creation of SOX by showing the need for legislative reform. While FCPA addressed the bribery of foreign officials and accounting transparency, SOX targeted domestic fraud directly. SOX improved on FCPA by imposing additional disclosure requirements about a company's internal controls and financial reporting practices, as well as placing further criminal penalties on fraudulent disclosure (Ge & McVay, 2005).

SOX is widely considered to be the most significant piece of financial legislation since the 1930s regulation of securities markets (Holt, 2008). By bringing

governmental oversight into the accounting industry, the act aimed to expose corruption, reduce financial statement fraud, and restore public confidence in the market. While some companies saw compliance with the new law as costly, SOX generally required companies to do things they should have already been doing. Other companies believed that SOX compliance could actually help them, if utilized as a management tool (U.S. House, 2004).

SOX is divided into 11 chapters, each with a different focus. While I will touch on all of them, sections 4, 8, 9, and 11 are particularly significant. These chapters specifically were intended to impact companies in ways that would improve earnings quality. When examining the impact of SOX on earnings quality, it is the success of the rules set forth in these chapters that are in question.

The first chapter, denoted as Title I, established the Public Company Accounting Oversight Board (PCAOB). PCAOB became responsible for developing professional standards of auditing and ethics, overseeing the audit process of public companies, and enforcing compliance with SOX and other regulations. Title II mandates that accounting firms cannot simultaneously provide both audit and non-audit services to a company. The purpose of this is to maintain independence between auditors and the companies for which they prepare reports. Title III outlines the responsibilities of public company audit committees. It also states that chief executive officers and chief financial officers may have to forfeit certain bonuses if their company is found noncompliant with financial reporting requirements due to misconduct.

The motivation behind Title IV is to improve the accuracy of financial disclosures. It states that all financial reports must follow generally accepted accounting principles. It also prohibits firms from maintaining or extending credit to give personal loans to any director or executive officer. Rules pertaining to codes of ethics are included in this chapter as well. Each firm is obligated to disclose whether or not it has a code of ethics for its senior financial officers and explain why if it does not. Section 404 presented a distinct challenge for firms to comply with. It requires that each annual report contain an internal control report. The report must state that management is responsible for establishing internal control structure and procedures for financial reporting; it must also assess the effectiveness of the internal control structure and procedures as of the end of the most recent fiscal year. Title V discusses the conflicts of interest that can arise when analysts are recommending equity securities. The rules in this chapter are meant to give investors more confidence in the objectivity of research reports.

The authority and resources of the Securities and Exchange Commission (SEC) are discussed in Title VI. The SEC has the authority to censure or deny any person from appearing or practicing before it, but the person must first be given notice and an opportunity for a hearing. The Commission can also prohibit any person from participating in an offering of penny stock if court proceedings determined misconduct. Any person may be barred or suspended from association with a broker or dealer or from engaging in the business of securities, insurance, or banking; this action would be taken after fraudulent, manipulative, or deceptive

conduct is found. This chapter also appropriated funds for the functions and duties of the SEC, including security enhancements, additional professional support, and information technology. Title VII discusses studies to be conducted by the Comptroller General and the related reports that should be generated. Studies mentioned include an examination of consolidations of public accounting firms and an analysis of the role of credit rating agencies in the function of securities markets.

Criminal fraud accountability is the focus of Title VIII. It first describes the criminal penalties for altering, falsifying, or destroying corporate records. The next topic covered is securities fraud. Any debts incurred in connection with violation of Federal securities laws will be nondischargeable, as will any debt incurred through common law fraud in connection with the sale or purchase of a security. The statute of limitations on securities fraud is 2 years after the discovery of the violation or 5 years after the violation itself. Title VIII also directed the United States Sentencing Commission to review and amend the sentencing guidelines for fraud and obstruction of justice. The consequences should be sufficient to deter and punish these activities. Whistleblowers are given protection under this chapter. No company can threaten, suspend, demote, or discharge an employee for assisting with an investigation or providing information about violations of SEC regulations. Any person who is discharged under these circumstances can file a complaint with the Secretary of Labor and may receive compensation for damages.

Title IX increases the penalties for white-collar crime. Conspiracy or attempt to commit any of the criminal fraud offenses mentioned is subject to the same

penalties as commission of the act itself. Offenses included are mail fraud, wire fraud, and violations of the Employee Retirement Income Security Act of 1974. It states that the Federal Sentencing Guidelines should be reviewed to more effectively deter and punish fraud. Guidelines should also account for any additional circumstances that might justify exceptions to a sentencing range. A written statement by the issuing company's chief executive officer or chief financial officer must accompany all reports containing financial statements. This statement must certify that the report accurately presents the financial condition of the company and fully complies with all requirements. This is complemented by Title X, which simply states that a company's federal income tax return should be signed by the chief executive officer of the firm.

The next and final section of SOX is Title XI, which deals with corporate fraud accountability. Anyone found obstructing or influencing an official proceeding will be subject to a fine and up to 20 years imprisonment. This includes concealing, altering, or destroying records with the purpose of impairing the document's use in an official proceeding. Title XI also asserts that the SEC can prohibit any person from serving as an officer or director for violating regulations or other conduct unfit for an officer or director. It also amended section 32 of the Securities Exchange Act of 1934, increasing the criminal penalties (H.R. 3763).

Implementing SOX was initially costly for companies; the most expensive aspect was installing and maintaining an Internal Control System. There was also a significant jump in auditing fees. There were theories that United States capital

markets would become somewhat uncompetitive after SOX. In the beginning, many foreign companies delisted from U.S. exchanges, and more U.S. corporations listed overseas to avoid compliance costs. However, soon other countries adopted their own versions of SOX, and regulations began to converge internationally.

Corporations also realized the benefits of improving internal controls. Some of these positive effects include increased operating efficiency, increased investor liquidity, decreased employee theft, and reduced likelihood of employee redundancy (Holt, 2008).

II. Quality of Earnings

Earnings quality is defined as the likelihood that a firm can sustain current earnings in the future (Beneish, 2002). Having high quality of earnings is important to reducing uncertainty in the market and improving capital market efficiency. It reveals the current financial state of firms while providing accurate inputs for predictions about the future (Ewert, 2011). Quality of earnings is complex to determine because it is not directly observable. Various models have been developed to measure earnings quality, using variables that are directly observable as a proxy. One such model is the Beneish M-Score Model, which uses financial ratios to detect earnings manipulation.

Analysis

I. Data

In order to determine whether or not SOX improved earnings quality, I analyzed two sets of data. From the Compustat database, I used Fundamentals

Annual data from 1995 to 2004. This contained balance sheet, income statement, and cash flow statement data from all of the companies in the Compustat database. I also used earnings quality data on publicly traded companies from 1981 to 2014. This contained 63 variables, including Beneish Model variables: Days' Sales in Receivables (DSRI), Gross Margin Index (GMI), Asset Quality Index (AQI), Sales Growth Index (SGI), Depreciation Index (DEPI), Sales, General, and Administrative Expenses Index (SGAI), Leverage Index (LVGI), Total Accruals to Total Assets Index (TATA), Beneish Model Quality Score (M-Score). These variables were used to determine the quality of earnings. The definition and significance of each of these variables can be found in Table 1.

II. Methodology

Using SAS, I combined the Compustat Fundamentals Annual data and earnings quality data. I then created a dummy variable in the combined data set to differentiate between company data from before SOX was passed, and data from after SOX. This dummy variable took on the value of zero if the observation occurred before 2002 and a value of one if the observation occurred after 2002. Data from 2002 itself was not included to control for activity occurring directly before and after the act was passed that may not be representative of overall trends. After performing a t-test on the nine Beneish Model variables, I was able to determine if earnings quality significantly changed after SOX was implemented.

Each of the variables found to be significant were then tested further in SAS with regression analysis. In this model, I included 4 new variables to control for

firm-level differences: firm size, market-to-book, earnings yield, and leverage. The definition and significance of each of these variables can be found in Table 2. From these results, I was able to conclude specifically in what ways SOX affected earnings quality, as well as infer why these changes may have occurred. For variables with a negative relationship to earnings quality, a significant decrease after 2002 supports the hypothesis that earnings quality improved after SOX. For variables with a positive relationship, a significant increase after 2002 supports the hypothesis that earnings quality improved after SOX.

Results

The t-test compared the average of each variable before 2002 with the respective average after 2002. The t value was created by subtracting the post-SOX value from the pre-SOX value then dividing by the standard error. A positive t value indicates a decrease in the variable after SOX, while a negative t value indicates an increase in the variable after SOX. The t value was used to determine if a change was statistically significant. The following data was collected:

	DSRI	GMI	AQI	SGI	DEPI	SGAI	LVGI	TATA	M-Score
Mean Before SOX	1.5221	5.7985	-1.7669	4.0055	1.1442	1.3167	2.3249	-0.4749	-0.8715
Mean After SOX	1.4312	2.3642	-1.2779	2.0882	1.0960	1.1779	1.2379	0.0075	-0.6024
t Value	0.85	0.99	-0.62	4.35	2.32	2.43	1.82	-2.50	-0.14

There was not a significant difference in Days' Sales in Receivables Index (DSRI) after SOX.

There was not a significant difference in Gross Margin Index (GMI) after SOX.

There was not a significant difference in Asset Quality Index (AQI) after SOX.

There was a significant difference in Sales Growth Index (SGI) after SOX.

There was a significant difference in Depreciation Index (DEPI) after SOX.

There was a significant difference in Sales, General, and Administrative Expenses Index (SGAI) after SOX.

There was not a significant difference in Leverage Index (LVGI) after SOX.

There was a significant difference in Total Accruals to Total Assets Index (TATA) after SOX.
 There was not a significant difference in Beneish Model Quality Score (M-Score) after SOX.

I then used SAS to regress SGI, DEPI, SGAI, and TATA on the dummy

variable and the control variables. The outcome was as follows:

	SGI	DEPI	SGAI	TATA
t Value	-2.37	-1.11	-1.65	1.43

There was a significant difference in Sales Growth Index (SGI) after SOX.

There was a not significant difference in Depreciation Index (DEPI) after SOX.

There was a significant difference in Sales, General, and Administrative Expenses Index (SGAI) after SOX.

There was a not significant difference in Total Accruals to Total Assets Index (TATA) after SOX.

Discussion and Inferences

DEPI decreased after SOX was passed, but this difference was only significant under the t-test. DEPI compares a firm's depreciation expense and property, plant, and equipment to those of the previous year. This represents the rate at which assets are being depreciated. A higher DEPI indicates that a firm may be overstating the useful lives of its property, plant, and equipment. This would in turn cause income to be overstated. The decrease observed in DEPI is a positive signal. It means that property, plant, and equipment is being depreciated at a more accurate rate thus income is more accurately reported. It is likely that the internal control provisions in SOX contributed to this decrease despite the fact that the change was not statistically significant under regression.

TATA increased after SOX was passed, and this change was also only significant under the t-test. TATA represents a ratio of a firm's total accruals to total assets. This ratio should be fairly consistent unless there are major changes occurring within the firm. Accruals are conventionally a commonly altered figure in fraudulent disclosures. Therefore, there is a correlation between high accruals and

financial statement manipulation. A high TATA could indicate that a firm is overstating profit by relying on uncollected revenue. The fact that TATA increased after 2002 shows that SOX was not effective in improving this aspect of earnings quality. This may be due to the fact that it is more difficult to detect fraud perpetrated in this manner, and there is no provision in SOX specifically addressing the appropriate use of accruals.

From the results of the regression, I concluded that the passage of SOX contributed to a statistically significant decrease in both SGI and SGAI. SGI represents the growth rate of sales as compared to the previous year. Growing firms are more likely to commit fraud because of the pressure to sustain the appearance of high growth even if growth has slowed. However, it is important to note that the presence of high growth rates does not itself indicate fraudulent activity. The decrease in SGI shows that after 2002, there were lower growth rates reported. While this could mean that there was less growth in sales after 2002, it more likely means that there were less falsely inflated growth figures published due to the passage of SOX. The increased criminal penalties for committing fraud suppressed firms' desires to keep up with shareholder expectations even if this meant sacrificing the accuracy of financial disclosures. The decrease in SGI shows that SOX was effective in decreasing fraudulent reporting, thus improving earnings quality.

SGAI measures how the ratio of a firm's sales, general, and administrative expenses to sales compares to this ratio in the previous year. Increases in sales are

generally proportionate to increases in expenses. If sales are increasing faster than expenses, this could indicate that revenues are overstated. This would be conveyed by a high SGAI. The decrease in SGAI after 2002 means that sales became more proportionate to sales, general, and administrative expenses. Revenues became less overstated or more correctly stated due to the provisions in SOX concerning internal controls. This shows that SOX was effective in increasing the accuracy of financial statements, thus improving earnings quality.

Conclusion

After the series of financial scandals exposed in the 1990s and early 2000s, the public could no longer rely on a firm's financial statements to capture its true economic condition. The passage of SOX in 2002 brought hope for a future with less fraudulent activity and restored investor confidence. SOX was not the first law in the United States to monitor internal controls and accounting practices, but it brought momentous change to public companies. Its impact extended even further when some non-public firms voluntarily adopted provisions of SOX, and other countries around the world were inspired to create their own version of the act.

One main objective of SOX was to improve the accuracy of financial disclosures, improving earnings quality. The ability of a firm to have high quality of earnings is arguably more important than the creation of high earnings itself. Without an accounting system that accurately measures performance, earnings are neither controllable nor sustainable. The intentions of SOX were promising, but enacting new regulations would have been pointless if the law was not effective.

After identifying variables that reflect earnings quality, I was able to examine those variables pre- and post-SOX in order to determine the act's effectiveness. From nine measures of earnings quality, a t-test found a significant change in four of the variables after SOX was passed: SGI, DEPI, SGAI, and TATA. Regression analysis controlling for firm differences determined a significance in only two variables: SGI and SGAI. The decreases in SGI and SGAI that occurred after SOX support the hypothesis that the act was effective at improving the quality of earnings in public companies. Based on the meaning of these variables, the provisions of SOX that improved the accuracy of financial disclosures were likely the increased criminal penalties for falsifying corporate records and the push for effective internal controls.

Analyzing public companies a few years after SOX was enacted would not have provided an accurate look at the law's effectiveness. This is especially true since it took some companies a few years to comply. Now over a decade has passed, and the provisions of SOX are well assimilated into the practices of public companies. Understanding how and why SOX was effective, and in what aspects it was ineffective, has lasting implications. This exposes parts of SOX that could be strengthened and new issues that should be covered in future regulatory laws. This knowledge will help lawmakers to maintain the progress that SOX has already made in improving earnings quality and bring further improvement in years to come.

Tables and Figures

Table 1: Beneish Model Variables

Variable	Definition	Significance
DSRI	$\frac{\frac{Accounts\ Receivable_t}{Sales_t}}{\frac{Accounts\ Receivable_{t-1}}{Sales_{t-1}}}$	Disproportionate increases in this ratio suggests that earnings are overstated
GMI	$\frac{Gross\ Margin_{t-1}}{Gross\ Margin_t}$	Firms with falling gross margins have poor prospects and thus are more likely to manipulate earnings
AQI	$\frac{\frac{Long-Term\ Assets_t - PPE_t}{Total\ Assets_t}}{\frac{Long-Term\ Assets_{t-1} - PPE_{t-1}}{Total\ Assets_{t-1}}}$	If greater than 1, indicates potential increase in cost deferral
SGI	$\frac{Sales_t}{Sales_{t-1}}$	Growth firms have greater incentives to manipulate earnings
DEPI	$\frac{\frac{Depreciation_{t-1}}{Depreciation_{t-1} + PPE_{t-1}}}{\frac{Depreciation_t}{Depreciation_t + PPE_t}}$	If greater than 1, indicates possibility of upward revision of assets useful lives to increase reported earnings
SGAI	$\frac{\frac{Sales, General, and Administrative\ Expenses_t}{Sales_t}}{\frac{Selling, General, and Administrative\ Expenses_{t-1}}{Sales_{t-1}}}$	Disproportionate increase in sales is negative signal about future, thus firm more likely to manipulate earnings
LVGI	$\frac{\frac{Total\ Debt_t}{Total\ Assets_t}}{\frac{Total\ Debt_{t-1}}{Total\ Assets_{t-1}}}$	Debt covenants are an incentive to manipulate earnings

TATA	$\frac{(Working\ Capital_t - Cash_t) - (Working\ Capital_{t-1} - Cash_{t-1}) - Depreciation_t}{Total\ Assets_t}$	Accruals measures the extent to which managers make discretionary accounting choices to alter earnings
M-Score	$-4.84 + (0.92*DSRI) + (0.528*GMI) + (0.404*AQI) + (0.892*SGI) + (0.115*DEPI) - (0.172*SGAI) + (4.679*TATA) - (0.327*LVGI)$	An M-Score greater than -2.22 is an indication of financial statement manipulation

Note: All variables are indicators of earnings manipulation. Any change in the above variables signaling an increase in earnings manipulation was interpreted as also indicating a decrease in earnings quality.

Table 2: Control Variables

Variable	Definition	Significance
Firm Size	<i>Natural log of Total Assets</i>	Negative relationship between size and earnings quality
Market-to-Book Ratio	$\frac{Common\ Shares\ Outstanding * Closing\ Price}{(Total\ Assets - Total\ Liabilities - Preferred\ Stock + Deferred\ Taxes + Investment\ Tax\ Credit + Convertible\ Debt)}$	Firms with high market-to-book ratios tend to earn subsequently lower returns
Earnings Yield	<i>Earnings per Share ÷ Closing Price</i>	Firms with low P/E ratios tend to outperform firms with high P/E ratios
Leverage	$\frac{Long-Term\ Debt + Debt\ in\ Current\ Liabilities}{Total\ Assets}$	Controls for differences in financial risk

Figure 1: SAS Model

```
libname x 'H:\';
ods html close;
ods html;

data x1;
set x.qualout;
proc contents;
run;
proc sort; by gvkey;
run;

data x2;
set x.compustat_data;
proc contents;
run;

proc sort; by gvkey;
run;
proc sql;
create table combined_data
as select
a.*,b.eq,b.DSRI,b.GMI,b.AQI,b.SGI,b.DEPI,b.SGAI,b.LVGI,b.TATA,b.mscore
from x2 as a, x1 as b
where a.gvkey=b.gvkey and a.datadate = b.datadate;
proc sort; by datadate;
run;

data SOX_dummy;
set combined_data;
year = year(datadate);
if year < 2002 then dum = 0;
if year > 2002 then dum = 1;
run;

proc ttest data=SOX_dummy;
var DSRI GMI AQI SGI DEPI SGAI LVGI TATA mscore;
class dum;

run;
quit;

data SOX_controls;
set SOX_dummy;
firm_size = log(at);
market_value_equity = cshpri*prcc_f;
book_value_equity = at-lt-pstk+txditc+dcvt;
market_to_book = market_value_equity/book_value_equity;
earnings_yield = epspx/prcc_f;
leverage = (dltt+dlc)/at;

proc reg data=SOX_controls;
model SGI = dum firm_size market_to_book earnings_yield leverage;
run;

proc reg data=SOX_controls;
model SGAI = dum firm_size market_to_book earnings_yield leverage;
run;

proc reg data=SOX_controls;
model DEPI = dum firm_size market_to_book earnings_yield leverage;
run;

proc reg data=SOX_controls;
model TATA = dum firm_size market_to_book earnings_yield leverage;
run;

quit;
```

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