Earnings management before and after the Sarbanes Oxley Act

An analysis of earnings management in American listed companies

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Abstract

The purpose of this thesis is to provide an answer to the research question of how the Sarbanes Oxley Act has impacted the relationship between the auditor and earnings management in the United States. Evaluating the extant literature on the SOX act and the auditor it has been established that the SOX act has changed the way the auditor relates to its clients. Using the modified Jones model the thesis provides an answer through evidence showing that earnings are managed differently in the Post-Sox period in comparison with the Pre-Sox Period. The results show that earnings management has decreased in the Post-Sox period versus the level of the earnings management in the Pre-Sox period. Furthermore, earnings management for firms audited by the Big 4 group in the Pre-Sox period is lower than for firms audited by the Non-Big4 group. Lastly, the results show that the effects of the Big 4 auditors on earnings management of their client firms become more pronounced and significantly negative in the Post-Sox period.

Introduction

The major accounting scandals of the last two decades have impacted the financial markets and damaged the credibility of financial reporting. These scandals, such as the collapse of the companies Enron, WorldCom and the accounting firm Arthur Anderson are well known to the general public.

This in turn has led to a major change in the laws and regulations regarding financial reporting in the United States, which has become known as the Sarbanes-Oxley (SOX) Act. The SOX act was passed by Congress on July 25, 2002, with the purpose of protecting investors by improving the accuracy and reliability of corporate disclosures. According to James Hall (2011) the act is the most significant securities law since the Securities and Exchange Commission (SEC) acts of 1933 and 1934. The act has been developed for treating specific problems relating to capital markets, corporate governance and the auditing profession (Hall 2011).

Apart from the regulatory institutions such as the SEC, auditors also have a crucial role in the financial system, namely as a gatekeeper of the financial system it has the responsibility to establish whether a client's financial statements are free of material misstatement, whether caused by error or fraud. In direct opposition with this a client firm has an incentive to influence earnings; this is possible, due to the inherent flexibility of contemporary accounting standards.

This phenomenon is recognized as earnings management and can be defined as: "Earning management occurs when management uses judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers" (Healy & Wahlen, 1999). An auditor is expected to be vigilant in order to ensure that the client does not excessively manage earnings which could potentially result in the financial statements not giving a true and fair view of the firm's financial position and performance. The main research question in this thesis is what has been the effect of the SOX Act on the relationship between earnings management and the auditor. This is a question for which the answer is relevant to all stakeholders of public firms, but especially for managers, auditors and investors. Investors can learn from the evidence provided by the thesis that there is less earnings management in big four audited firms. Regulators can take away that their efforts to regulate the financial market through legislation can be effective, as the evidence shows that there is a reduction in earnings management. The thesis also shows that there is a stronger negative correlation between big four auditors and earnings management. The contribution of this thesis is that it focuses on the Sarbanes Oxley Act, the auditor and earnings management; these variables are often studied by researchers in different configurations. The work of Lobo & Zhou (2006) reports on the same variables however, but with a stronger focus on earnings conservatism.

The thesis will contain a number of five chapters excluding the introduction and the conclusion. The first three chapters can be construed as the literature review segment of the thesis. First I will highlight the theoretical framework, after this has been established I will describe and discuss the SOX Act in the second chapter for the purpose of creating a framework. In the third chapter I will put the focus on the auditor and the auditing profession and how these have been affected by the change of laws and regulations that comprise the SOX Act. In the fourth chapter I will give a conceptual review of earnings management, while establishing the operational definition of earnings management as used in this thesis. Hereafter I will present the research design and the used methodology of the thesis. In the final chapter the data analysis will be performed and the resultant outcome will be discussed. The thesis will be summarized in a final conclusions segment that will give a short overview of what has been discussed in the main text and will succinctly list the findings of my research.

Chapter 1: Theoretical Accounting Framework

§1.1 Introduction

In this first chapter an overview of the extant types of accounting research will be presented and I will seek to properly place this thesis in the most appropriate category of accounting research. It is prudent to establish a clear framework of reference regarding the existing theory in order to justify the subject of my research and to be able to make a contribution to economic science.

§1.2 An overview of theories of accounting

There are various theories in accounting research, which all contribute to better scientific knowledge, however there is no consensus among academics on which theory is best or even on how theory should be developed (Deegan and Unerman 2006, 5).

The differences of opinion regarding the role of accounting are one of the main determinants which cause academics to value one form of theory and theory development over another. One can discern between researchers that take a positive attitude towards accounting research; meaning that accounting research should be devoid of any value judgment and merely describe the accounting environment and phenomena. Others believe that accounting research should be prescriptive, for these researchers believe that scientific advice would benefit stakeholders and society at large (Deegan and Unerman 2006, 6). Personally I do not claim one form to be superior to another; I assume that all forms of accounting research add value to the scientific body of knowledge. Often research is heavily rooted in one form but also has elements that belong in another strand of accounting research.

§1.2.1 Positive Accounting Theory

In this subchapter Positive Accounting theory will be discussed, this is a theory of Watts and Zimmerman (1986) that is concerned with explaining accounting practice, it is designed to explain and predict firm's decision making regarding accounting methods without advocating a particular method.

Positive Accounting Theory borrows and supports itself on other theories; the most important ones to be highlighted are the Efficient Market Hypothesis and Agency Theory. We will discuss both of these briefly to further illustrate Positive accounting theory.

§1.2.2 Efficient Market Hypothesis

The efficient market hypothesis is developed through the efforts of various researchers, including the work of Fama. The Efficient Market Hypothesis assumes that capital markets react in an efficient and unbiased manner to publicly available information (Deegan and Unerman 2006, 210). The key element that characterizes the Efficient Market Hypothesis is that there is competition for information and that this competition leads to efficiency on the capital markets. The Efficient Market Hypothesis exists in three different forms, namely in a weak, semi-strong or strong form. The weak form assumes that existing security prices simply reflect information about past prices and trading volumes. The semi-strong form of the Efficient Market Hypothesis assumes that all publicly available information is incorporated in the prices of traded securities. In the strong form of the hypothesis it is assumed that all information known to anyone at a certain point in time is reflected in the security prices, this includes knowledge that is not publicly available (Deegan and Unerman 2006, 259). For the research purposes of this thesis the weak form of the Efficient Market Hypothesis would be too conservative of a standpoint to adopt, and the strong form would be too overbearing. So the semi-strong variation of the Efficient Market Hypothesis is adopted in order to conduct our research using market data. This is supported by Watts and Zimmerman (1986, 19) who claim that most evidence that has been gathered is consistent with the semi-strong variation of the Efficient Market Hypothesis.

§1.2.3 Agency Theory

The Agency Theory developed by Jensen and Meckling (1976) had a key role in the development of the Positive Accounting Theory by Watts and Zimmerman. It describes the relationship between owners and management as the agency relationship, which was defined by Jensen and Meckling as a contract between the principal(s) and other persons (agents) to perform some service on behalf of the principals(s) which would involve the delegation of some measure of decision-making authority to the agent. This is not always without trouble. A conflict of interest can emerge between the principal and agent, that can be caused by: (i) effort aversion by

the agent, (ii) misappropriation of firm assets for personal gain, (iii) differential time horizons, for example the agent being less concerned with the future period because of a limited tenure, and (iv) a different perception of risk between agent and principal (Deegan and Unerman 2006, 213).

This begs the question why would the principal engage in such a contract? This is because in the literature firms are often considered to be a nexus of contracts. Smith and Watts (1983) similarly also define the corporation as a set of contracts among parties who have a claim to a common output. But often there is a-goal incongruence among the involved parties, which bring about agency costs; these costs are inherent to the relation between principal and agent. This is also reflected in the assumption of Agency theory, to never assume that individuals will ever act out of other than self interest. A well-functioning organization should lower agency costs by putting in place mechanisms which ensure that actions that are beneficial to the individual, also benefit the organization (Deegan and Unerman 2006, 215).

Within positive accounting theory we can also differentiate between the efficiency perspective and the opportunistic perspective. The former is often referred to as an ex ante perspective, meaning before the fact. Using an ex ante perspective one considers what mechanisms are put in place up front, with the objective of minimizing future agency and contracting costs. Often within the efficiency perspective accounting practices adopted by firms are explained to be the methods that best reflect the underlying economic performance of the reporting entity. Differences between selected accounting methods would therefore be caused by a difference in core business activities by the reporting entities. Regulating the set of accounting options available to firms would lead to the imposition of unwarranted costs on reporting entities, or it would lead to an inaccurate reflection of the entities' underlying performance (Deegan & Unerman 2006, 221). The opportunistic perspective of Positive Accounting Theory is an ex post perspective; it considers opportunistic actions that could possibly be undertaken under certain contractual arrangements. It is assumed that managers will be biased in the selection of accounting methods because of their interest in increasing their personal wealth. In reality it is often hard to discern whether a decision taken by management about accounting policies was driven solely by efficiency or opportunistic motivations (Deegan and Unerman 2006, 223). In the

next section debt contracting will be discussed, the phenomenon will be explained and its place within positive accounting theory will be clarified.

§1.2.4 Debt Contracting

Debt contracting is one of the focal points of positive accounting theory inquiry. Debt contracting is when a party lends funds to another organization, and where the recipient of the funds may undertake activities that reduce or even eliminate the probability that the funds will be repaid. The costs that are associated with divergent behavior of the borrower are referred to as the agency costs of debt and under Positive Accounting theory we assume that lenders anticipate this divergent behavior of the borrower (Deegan and Unerman 2006, 227).

There are a few key examples which illustrate situations where debt contracting issues may arise between lenders and borrowers or within these respective groups. One example is the case where a debtor pays out excessive dividends, leaving few assets available to service the debt. Another example is when the firm invests in high risk projects; this strategy is not beneficial to debt holders, because the added risk does not increase possible returns for debt holders. This can be countered by debt holders however by requiring a higher interest payment by the firm (Deegan and Unerman 2006, 237).

Another way of protecting the interests of debt holders is by contracting. Management may be willing to benefit from lower interest rates on loans while in turn giving up some decision making freedom regarding the use of available funds in the company. Deegan and Unerman highlight the studies of Cotter as evidence of debt contracts. Debt covenants reduce the risk of default for debt holders by limiting the amount of debt a firm can attract. Two key findings of Cotter regarding debt covenants are that, firstly, assets are often defined in a way within debt agreements that they could be revalued. The number of revaluations was however somewhat restricted by banks in order to tighten the agreement. Secondly, besides debt to assets constraints, interest coverage and current ratio clauses were frequently used in debt agreements (Deegan and Unerman 2006, 238).

Positive Accounting Theory assumes that debt contracts give management an incentive to manage earnings ex-post as the established (accounting based) constraint is about to be violated. Watts (1995) developed the leverage hypothesis which states that firms with higher leverage are

more likely to use earnings-increasing methods to avoid default. Other works, by Christie (1990) and Watts and Zimmerman (1990), Jiambalvo (1994) and Sweeny (1994) support this evidence (Deegan and Unerman 2006, 239).

Besides the use of debt covenants which may or may not be breached, another contractual mechanism which is gaining popularity is performance pricing; this is a measure which ties the interest rate charged on a bank loan as a function of the borrower's current creditworthiness. Performance pricing creates a more continuous and direct link between accounting information and interest rates, but this also has the unintended effect of giving managers added incentive to engage in income increasing accounting method changes (Deegan and Unerman 2006, 240). Research on performance pricing has been done by Beatty and Weber for example; they researched whether the existence of accounting based performance pricing would increase borrower's tendencies to adopt income increasing accounting method changes. Before their investigation they noted that debt contracts often prohibit borrowers from exercising voluntary accounting method changes to affect contract calculations. They also suggested that some borrowers might actually choose to suffer a higher interest rate in order to be allowed greater flexibility in choosing accounting methods- this would infer that managers perceive some value in having the ability to select alternative accounting measures for which they are willing to pay. Beatty and Weber (2003) found that firms in their sample with the right to exercise voluntary accounting method changes are more likely to adopt income increasing accounting methods. Furthermore they found that such firms are more likely to do so as the cost of technical violation of debt contracts increases.

Besides debt contracting there is also the possibility of protecting the debt holders' investments through monitoring by external parties, this is especially the case when the firm has borrowed funds, and accounting-based covenants are in place. In concordance with this, it could be argued that as the proportion of debt to total assets increases, there will be also an increase in the demand for auditing (Deegan and Unerman 2006, 241). The subject of the role of the auditor as a gatekeeper in the financial system will be touched upon in a later segment. Next some limitations and criticisms of Positive Accounting Theory will be covered.

§1.2.5 Criticisms of Positive Accounting Theory

There are some limitations of the theory that have been met with some criticism. The main point of critique is that Positive Accounting Theory does not provide prescription and therefore does not improve the practice of accounting. This criticism has for example originated from theorists such as Sterling (1990) and Howieson (1996). A second criticism is that is not free of value judgment as it proclaims, following from this is the fundamental assumption of Positive Accounting Theory, namely that all action is driven by a desire to maximize one's wealth. This was attacked by Gray et al. (1996), stating that Watts and Zimmerman promote "a morally bankrupt view of the world" (Deegan and Unerman 2006, 248). In defense of the *homo economicus* assumption, it is used in many theories within the discipline of economics, and from an economic Darwinism point of view one could argue that it has served its purpose well in explaining economic decision making by individuals and institutions. But this could be charged with another criticism, namely that Positive Accounting Theory has not shown great development as a theory and is still continually being tested. Besides these mostly scientific and philosophical dilemmas there is also too much focus on individual accounting choices; according to Fields et al. managers typically make multiple accounting method choices within the firm, besides this fact there may also be multiple correlated motivations behind those choices (Deegan and Unerman 2006, 249). Another criticism was that in the early research efforts employed proxies and measurement were too simplistic. Lastly critics sometimes claim that Positive Accounting Theory is scientifically flawed, Christenson (1983) argued for example that Watts and Zimmerman's acceptance of exceptions disqualified Positive Accounting Theory as a scientific law. The authors of the theory countered by stating that their theory has produced useful results and should therefore not be discarded (Deegan and Unerman 2006, 251). Despite the shortcomings of the theory it provides an adequate framework for this research. By building on Positive Accounting Theory my own research findings are grounded in extant theory and literature, therefore solidifying the theoretical basis.

Chapter 2: The Sarbanes Oxley Act

§2.1 Introduction

In this chapter the SOX act will be discussed by describing the socio-economic political situation that led to the development and enactment of the SOX legislation. Firstly, the important historical events will be put into context in order to get a grasp of the setting which led served as a catalyst for the SOX act enactment. Secondly, the costs and benefits of the SOX legislation will be discussed coupled with an explanation of how the key provisions of the Act are implemented. Thirdly, the main strands of criticism will be covered culminating in a discussion of potential long term benefits, unintended consequences of the act and potential legal challenges for the SOX act in the near future. In the third chapter a greater focus will be put on the role of the auditor with respect to the SOX legislation and implementation.

§2.2 Historical background and key events

The Sarbanes-Oxley Act also known as the 'Public Company Accounting Reform and Investor Protection Act' in the Senate and as the 'Corporate and Auditing Accountability Act' is a body of legislation that was enacted on the 30th of June 2002 by signature of former president of the United States George W. Bush (Petra & Loukatos, 2009, 1). The Act contains the standards for all U.S public company boards, firm management and public accounting firms.

The two men credited with the development of this standard and from where the act borrowed its name are: Senator Paul Sarbanes and U.S representative Michael G. Oxley. The SOX Act was developed to counter the fall out of the biggest accounting scandals of the past couple of decades. Ronen & Yaari (2008) claim that regulatory reform takes place during the aftermath of a meltdown of the capital markets and economic crises because they expose firms that have engaged in creative bookkeeping, also known as "cooking the books". The main scandals that then come to mind as an example of this are the financial restatements of WorldCom and the downfall of Enron and its auditor Arthur & Andersen.

Enron was named by Fortune magazine as America's most innovative company from 1996 to 2000; it was a front runner among companies operating in the electricity, natural gas and communications sectors. It was featured on Fortune's listing of 100 best companies to work for in America in 2000, when the company managed to declare revenues of a hundred and eleven

billion dollars ($111 billion). However these successes took a turn for the worse; Enron collapsed and filed for bankruptcy on the 20th of December 2001. According to Greer (2002) it became clear that Enron's financial position was achieved through accounting fraud. The brunt of the negative effects of Enron's downfall was felt by investors which saw the company's stock drop from 90 dollars per share to 30 cents on the dollar; suddenly all of Enron's stock held by investors was devoid of value (Petra & Loukatos, 2009, 2).

The formerly described event of Enron's stock decline begs the question of how this all could have happened, it is therefore important to take a moment to analyze how Enron managed to fool the investing community through accounting fraud. Enron's stock had been able to grow continuously due to the fact that the company's financial statements did not include debts and losses that were incurred by special purpose entities (SPEs) that were under its control. These SPEs were created to isolate financial risk and provide organizations with less expensive financing (Petra & Loukatos, 2009, 2). SPEs do not enlist in business activities besides the ones they are initially brought into existence for. The pursued benefit of SPEs is that they give added protection to creditors, namely creditors are shielded from the risks of the borrower's operations outside of the SPE therefore reducing the borrower's cost of borrowing'. Another benefit of using a SPE is that it operates autonomously from its creator and is therefore not required to be consolidated into the creator's other operations; thus it becomes possible to remove debt of the borrower's balance sheet. According to the information presented in the Accounting Research Bulletin No 51 (1959), Consolidated Financial Statements requires the consolidation of entities through a majority voting interest. In most circumstances the creator of the SPE owns no stock or an insignificant amount of stock in the SPE and thereby avoids consolidation (Petra & Loukatos, 2009, 2).

In response to the Enron incident, the Financial Accounting Standards Board (FASB) issued Interpretation 46, Consolidation of Variable Business Entities, an Interpretation of ARB 51 in January 2003. Interpretation no. 46 was revised by the FASB in December 2003, leading to FIN 46(R). FIN 46 (R) hopes to improve financial reporting by enterprises involved with variable interest entities without restricting the use of SPEs. The FASB established a second model for consolidating financial statements; believing that the variable interest entity should be consolidated with the borrower where the borrower is the primary beneficiary in the case where

there is an absence of majority voting interest (Petra & Loukatos, 2009, 2). The objective of FIN 46 (R) is to ensure that companies such as Enron will not be able to overuse off balance sheet financing in order to obscure the true financial condition of the company. However, Enron was not the only company affected by its fraud scheme, Arthur Andersen & Company, formerly one of the largest and most respected accounting firms globally faced intense scrutiny because of its business relationship with Enron. Arthur Andersen was engaged in performing audit, tax, and consulting services for Enron. The accounting firm was indicted and found guilty of obstruction of justice when David Duncan (lead partner on the Enron account) and Nancy Temple (part of Andersen's legal team) destroyed supporting documentation of their Enron audit. This led to reputation damage so great, that Arthur Andersen & Company surrendered its licenses to practice in 2002 effectively ending its operations.

§2.3 The SOX Act and its effects

In this subchapter I will seek to define the intended purposes of the SOX Act and its effect on the accounting environment. Firstly, I will describe the creation of the Public Company Accounting Oversight Board (PCAOB) and its main functions. Secondly, I will explain how the SOX Act seeks to enhance auditor independence. Finally I will highlight the main requirements and prohibitions of the SOX act versus management and the auditor.

§2.3.1 The Public Company Accounting Oversight Board

After the accounting scandals, with the downfall of Enron as the greatest low point, the public demanded more stringent regulation and improved monitoring and control. Much of the public's criticism was directed at the accounting profession's failure to monitor and control its members and therefore the Public Company Accounting Oversight Board was created as a nonprofit corporation to administer the audit of public companies for the sake of protecting investors (Petra & Loukatos, 2009, 2). The PCAOB is tasked with and responsible for setting guidelines for the audit of companies which are publicly traded. Another task is for the PCAOB to register all public accounting firms that engage in the audit of financial statements. The Board is also burdened with the role of having to develop standards regarding auditing, quality control, ethics, independence and other standards that may be related to the auditing of financial statements (Petra & Loukatos, 2009, 2). The PCAOB also has the power to conduct inspections of public

accounting firms and organize disciplinary hearings for the purpose of promoting superior standards within public accounting firms. The board consists of five members (two of five members are allowed to be (former) CPAs) which have demonstrated to have the investor's interest at heart. All members of the board are required to be employed on a full time basis.

§2.3.2 Audit documentation, auditor independence and other requirements

As mentioned above, during the Enron case important documentation was destroyed by Arthur Anderson that was of material significance. In response to the criticism of Arthur Anderson's failing to maintain proper audit documentation the Act requires audit work papers to be detailed sufficiently to substantiate the attained conclusions and these records have to be kept for no less than seven years. Also every attained conclusion in the audit report must be supported by a second partner and be concurrently approved by a qualified person associated with the public accounting firm, other than the person charged with the leadership of the audit.

The act also entails guidelines and practices with the purpose of guaranteeing auditor independence. One of the key legislation amendments that helped make this possible, was the amendment of Securities and Exchange act of 1934. This amendment made it unlawful for a registered public accounting firm to provide non auditing services to an audit client. These services include the following: bookkeeping services, financial information systems design, appraisal or valuation services, actuarial services, internal audit services, outsourcing services, human resource services, management services, investment banking services and legal services or expert services unrelated to the audit (Petra & Loukatos, 2009, 3). However, other non-audit services (such as tax services), are allowed to be provided to audit clients as long as the audit committee has given its approval. The political reasoning that highlighted the purpose and legitimized the enactment of the SOX Act was in the words of Sarbanes: "to get auditors to start being auditors again". The senator believed that audit firms put too much focus on generating extra revenue for the firm by trying to obtain more consulting work from their clients at the cost of their prime business activity and purpose, which is the audit of their clients' financial statements. However this criticism was not universally accepted, Petra & Loukatos for example describe that a senior manager of midsize firm disagreed with senator Sarbanes position, he stated that a credible audit firm would not risk compromising its independence for the sake of

additional consulting fees. However a partner with Big Five experience agreed with Sarbanes, believing that audit firms found ways to shorten audit procedures to concentrate on consulting work (Petra & Loukatos, 2009, 3).

With regard to the audit itself, each registered public accounting firm is obligated to report findings to the audit committee. The reports should contain: a description of the accounting policies to be used, alternative treatments of accounting principles that have already been discussed with management, the consequences of those treatments and the practices that the registered public accounting firm prefers and any other written documents between the firm and the client. Also an attempt has been made to prevent potential conflicts between registered public accounting firms and the issuers of financial statements. The SOX Act seeks to achieve this by barring clients from being audited by an accounting firm in the case that a chief executive officer (CEO), controller, chief financial officer (CFO) or anyone in a similar position was formerly employed by the audit firm within a one year period. Another measure of conflict avoidance is expressed by rotating the partner leading the audit or the partner that reviews the audit after every five years (Petra & Loukatos, 2009, 3).

The SOX Act also mandates the Comptroller General of the United States to present an analysis of the effects of requiring mandatory rotation of registered public accounting firms. This means that an audit firm can only audit a client for finite amount of periods. However, mandatory rotation of the auditor is not common; for 99 percent of the Fortune 1000 companies have no formal public accounting firm rotation policy in place. The explanation that Petra & Loukatos give is that there is only a limited number of registered public accounting firms which have the capability to perform the audit of financial statements of highly complex and large clients.

Another measure of the SOX Act that also perpetuates from the Enron scandal is the increased emphasis on corporate responsibility for the financial statements. This is because during the Enron scandal management claimed to be unaware of fraudulent accounting practices. The SOX Act prescribes that the CEO and the CFO must affirm, in a management letter, specific responsibilities over financial reporting and internal control. The officers in question must sign this letter, therefore acknowledging that they have reviewed the report that accompanies the financial statements or other quarterly reports that are filed (Petra & Loukatos, 2009, 4). They must also attest that the report does not contain any material false statements or that any material

information has been omitted. Corresponding with the signing of the report, the officers maintain that the information that they present fairly presents the financial condition and the results of operations of the company for the periods that are contained in the financial statements (Petra & Loukatos, 2009, 4).

The SOX Act also prohibits an issuer from influencing, coercing, manipulating or misleading a public accountant or auditor engaged in auditing the financial statements of the issuer. In the case that an issuer of financial statements is materially non-compliant or acting in misconduct and is in need of restating the financial statements, in that case under SOX the CEO and CFO are held personally liable to the issuer. This is a measure of deterrence since management might suffer personal financial damages which could manifest in officers being liable to paying back any bonuses, incentive based or equity-based compensation they received. The benefits from the sale of securities by the officers also need to be repaid if the officers are personally held liable (Petra & Loukatos, 2009, 4).

The Act also includes provisions that are designed to ensure the accuracy and reliability of financial statements produced by issuers. The Sox Act mandates the following:

- Any adjustments identified by registered public accounting firms should be incorporated in the financial statements.

- All financial statements should disclose any off-balance sheet transactions and obligations with any third party entities that are not consolidated in the issuer's financial statements.

- The issuer is also required to offer an explanation of its off-balance sheet transactions in a subsection of Management's Discussion and Analysis; this should include the total amount of assets and liabilities of the off-balance sheet obligations, amounts receivable, expenses or revenues from the arrangement and any other contingent guarantees that may require future obligations.

The first of aforementioned elements of the SOX Act improve the financial reporting of the issuer in terms of accuracy and reliability. The second and third points highlight how the Sox Act seeks to provide protection for the investor and the public (Petra & Loukatos, 2009, 4).

§2.3.3 Internal Control and Section 404

One major change that was exacerbated by the SOX Act was its demand for management to hold itself responsible for the accuracy and integrity of the financial statements. But before public accounting firms can sign off on financial statements they are required to test internal controls. This is not a new development; companies were required to have adequate internal controls since the enactment of the Foreign Corrupt Practices Act (1977). The Committee of Sponsoring Organizations of the Treadway Commission (COSO) developed common criteria to evaluate and develop internal control. It defines internal controls as ''a process, effected by the entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories: reliability of financial reporting, effectiveness and efficiency of operations, and compliance with applicable laws and regulations'' (Elder et al, 2009).

The SOX Act requires both management and the registered public accounting firms to report on the issuers internal control structure. This is mandated through the Act's Section 404, wherein is stated that an issuer of financial statements is required to provide an internal control report along with the filing with the SEC. In this internal control report the requirements that management is subjected to are stated:

1. Management acknowledges the responsibility for establishing and monitoring an adequate internal control structure.

2. Assess the effectiveness of the internal control structure and procedures as of the end of the most recent fiscal year.

The registered public accounting firm is required by the SOX Act to report on and attest to the assessments made by management. As mentioned above they cannot sign off on the financial statements without testing the internal controls. Section 404 requires that the auditor and management attest that the controls are effective against allowing any material misstatements in the financial statements. Management needs to actively test the internal controls in order to establish whether they are in place and sufficient. The testing of the internal controls by management can lead to three deficiencies (Petra & Loukatos, 2009, 5):

- A control deficiency; occurs when the design of a specific control does not allow management or employees to detect misstatements.

- A significant control deficiency exists when a company cannot report financial information in accordance with US GAAP.

- A material weakness meaning that there is more than a remote possibility those material misstatements cannot be prevented or detected.

In the case that a deficiency has been found, it must be communicated to the audit committee by management, which will relay the information to the registered public accounting firm. It is in the best interest of the company to report any deficiencies before they get become part of the financial statements and become a matter of public record. However in the case that the internal controls are implemented correctly and effective, a letter is issued stating that the issuer maintained effective internal control over financial reporting.

Section 404 of the SOX Act is not limited to the requirement of the registered public accounting to audit the financial statements of the issuer. The registered public accounting firm is also required to attest management's assertion of internal controls. The focus of this audit will be to test whether the controls are in place at a certain amount in time. The first stage of the process is a planning of the audit, similar to the audit of financial statements. In the second stage the internal controls are tested and other traditional audit procedures are used over a period short of one year. Next the registered public accounting firm evaluates management's evaluation process. It is important for the auditor to determine whether management was thorough and tested controls over all significant accounts and disclosures, after which the documentation of internal control will be checked to see if it supports management's assertions. Hereafter the auditor will need to make an effort in trying to understand the client's internal controls. This is often done by doing a walkthrough, which means tracing a transaction through the financial information system to the point it is registered in the financial statements. After this has been completed, the auditor will study the design and the operating effectiveness of the internal controls. Finally, the auditor will form an opinion on the effectiveness of those controls. In the best case scenario where no material weaknesses have been detected, an unqualified opinion will be issued on the internal control structure (Petra & Loukatos, 2009, 6).

§2.4 The costs and benefits of the SOX Act

In this subchapter the costs and benefits of the SOX Act will be discussed. In the business community there is a lack of consensus on whether the benefits of the SOX Act are worth the costs of implementation. Ronen & Yaari (2008) state that the most costly provisions of the SOX Act are §302 and §404, section 404 requires public firms to strengthen their internal control systems and to report material weaknesses, and §302 requires management to certify the reports. The costs associated with these sections comprise direct costs of investments in internal control systems and an increase in the auditor fees which must evaluate these control systems. However, compliance also entails indirect costs such as a diversion of management's effort from investment or production decisions to monitoring of internal controls. This has been corroborated by research performed by Block (2003) where he states that in his sample, time consuming internal control systems were a reason for firms to go from being public to being private. Traditionally a firm would not go public to avoid the burden of having to meet with security analysts and other interested parties. Rather, post-SOX the firms had to invest time overseeing auditors and attending committee meetings of the board to insure SEC compliance. The cost that going public brings with it is as a result the main driver behind decision-making with regards to going public to over 60% of firms (Block, 2003, 2). The firms which carry the greatest burden of the SOX Act are the smaller firms since they face higher costs in proportion to their size compared to large firms (Hsu, 2004, 36). These costs are detailed in the literature as having been caused by a lack of will of smaller firms to adopt the SOX provisions willingly before 2003, that they also spend less resources on internal control systems which increase the costs of auditing and that they are challenged when it comes to recruiting talent to the organization and gaining the interest of large auditors because of their higher risk (Ronen & Yaari, 2008, 49).

But has the SOX Act benefitted the financial markets of the United States? If the responses have been favorable, then SOX has accomplished its stated mission of restoring investors' confidence in the integrity of the capital markets. It can be posited that the overall goal has been achieved because of the positive reaction that has been demonstrated by the market. This has been corroborated by evidence supplied by Cohen et.al. (2005a), having studied 5,538 firms in the 1987–2003 period, they observe that earnings management increased steadily before SOX and declined thereafter. Similarly, Lobo & Zhou (2006) detect a decrease in earnings management coupled with an increase in conservatism in the Post-SOX period.

Chapter 3: The role of the auditor and the SOX Act

§3.1 Introduction

In this section the role of the auditor will be discussed as a gatekeeper of the financial system with an emphasis on the situation before and after enactment of the SOX Act. This thesis puts the focus on American listed companies so that means that the respective auditors will belong to the Big Five/Big Four auditing firms and the so called Second tier auditing firms which will be briefly discussed.

§3.2 Auditor as a Gatekeeper

There exists an asymmetry in the financial markets between firms and investors under the semi-strong assumptions of efficient capital markets. As discussed above share prices would reflect all the public information, yet investors would not be privy to private information held by firm management. Information asymmetry might provide the better- informed parties (firms) the opportunity to take advantage of those less well informed (potential investors), because of this asymmetry of information there is a need for intermediation. Gatekeepers are the independent professionals who are interposed between investors and managers who provide verification services to investors (Ronen & Yaari, 2008, 187). In the absence of such gatekeepers financial markets could potentially break down which is called market failure. In this situation firms will fail to raise much needed capital from willing investors, who will forego the investment opportunity since the potential investor will not trust that firms will not try and sell their securities at inflated prices. This is known as the lemons problem (Palepu et.al, 2010, 15).

The auditor's role in the financial system is to attest to the financial reports of their clients. Because of this they can be considered the most important gatekeeper for blocking pernicious earnings management. In the next section the institutional setting in the Pre-SOX period will be contrasted by the Post-SOX period.

§3.2.1 The institutional setting in the Pre-SOX period

In the Pre-SOX period the auditor was formally appointed by the shareholders in the annual meeting. Yet they were not paid by the shareholders, but by the companies they audit. In the old

situation auditing firms depended on CEOs and CFOs for their commissioning and economic compensation (Ronen & Yaari, 2008, 264).

The auditor is charged with the task of validating the data using Generally Accepted Auditing Standards (GAAS) and measures of financial statement items using Generally Accepted Accounting Policies (GAAP). Data validation seeks to verify the appropriateness, completeness, accuracy, and timelines of the accounting data. Validation of financial statement items involves judgment of the reasonableness of the values presented in the financial statements, for example, the quantification of inventory at cost or market, whichever is lower, or the impairment of goodwill (Ronen & Yaari, 2008, 265). Audit failure occurs when the audit does not discover improprieties in data or in presentation in the financial reports. Audit failures might be attributed to various factors, such as weak internal controls in the client firm, since the audit relies on inputs of the firm, or the complexity of business contracts and transactions. Besides client complexity it is also argued that the switch from an industrial economy to an information economy has severely impacted the auditing process, since it has brought about a major change in the nature of assets and liabilities. There is a greater volume of intangible assets and liabilities have become more complex due to their value depending on unrealized conditions, such as derivatives.

The Pre-SOX period's accounting landscape is much different from the current situation. The safeguards that are in place now were absent which created the backdrop for the accounting scandals such as Enron and WorldCom. Changes in the second half of the twentieth century that affected the situation negatively were: First, increased competition which led to auditors offering discounts to their clients at the beginning of the engagement. Second, there was a decrease in the auditor's legal liability which led to lower conservatism among auditors. Third, an increased focus on consulting led the auditor to become more loyal towards client firm management in order to maximize their consulting opportunities. This double role made the auditor susceptible to blackmail and therefore compromised the auditor's independence. Namely, management could punish the auditor for a stance taken during the audit by dropping the auditor as a consultant or reducing its use of the audit firm's consulting services (Ronen & Yaari, 2008, 266). The problem of compromised auditor independence did not remain undetected. The SEC responded by revising regulation S-X which led to a reorganization of audit firms in order to enhance auditor

independence. The new regulation forced audit firms to divest a substantial portion of their consulting practice to third parties or public offering. Unfortunately the measures taken were not enough to prevent the accounting scandals that led to the SOX Act enactment and other provisions to ensure auditor independence (Ronen & Yaari, 2008, 269).

§3.2.2 The institutional setting in the Post-SOX period

The greatest change effected by the SOX Act is the founding of a new regulatory body with the ability to enforce its regulations on a market that was previously self-regulated. This is the Public PCAOB as previously discussed above. In the current situation the client firm still hires the auditor through the audit committee and the auditor audits the client, but now with oversight of the PCAOB. Management no longer engages the auditor; the dealings with the auditor now proceed through the audit committee. The audit committee has the authority to hire, remunerate and retain the auditor. It also has the responsibility to settle disputes between management and the auditor. The SOX Act has also stipulated that the auditor is required to communicate the following to the audit committee: (1) the details of the accounting policies used in the preparation of the financial reports, (2) the ramifications of choosing an accounting treatment from a set of GAAP alternatives, and (3) disclosure of other material written communications between the auditor and the firm's management (Ronen & Yaari, 2008, 270). Section 201 of the SOX Act is another safeguard of auditor independence by way of limiting the scope of consulting services an auditor can provide to its client. The nine limitations on non-audit services are as follows (http://www.sec.gov, 16-04-2013):

· Bookkeeping or other services related to the accounting records or financial statements of the company being audited;

· Design and implementation of financial information systems;

· Appraisal or valuation services, fairness opinions, or contribution-in-kind reports;

· Statistical services;

· Internal audit outsourcing services;

· Management functions or human resources;

· Broker or dealer, investment adviser, or investment banking services.

· Legal services and expert services unrelated to the audit

Tax services by the auditor are not among the list of barred services; however the auditor is not allowed to represent their client with regard to any taxation issue in the court proceedings. Other non-audit services, not among the barred services, need to be pre-approved by at least one member of the audit committee.

The SOX Act also put in place a mandatory cooling off period for auditors who would want to seek employment at a former client as CEOs, CFOs, controllers, and Chief Accounting Officers (CAOs). The cool off period is at minimum a year before the engagement. Other sections of the SOX Act have dealt with the retention of documents (Section 802), and officers improperly influencing the auditing process (Section 303). Section 203 and 207 stipulate the guidelines with regard to auditor tenure, with the former requiring that the engagement partner be rotated every 5 years and the latter invites further study with regards to audit firm rotation. The empirical evidence on audit tenure is mixed; there is no consensus on whether audit firm rotation enhances the quality of earnings information or not (Ronen & Yaari, 2008, 271).

 It has been established that the SOX Act has made major changes in the markets, especially with respect to how the auditor and its clients interact. The Financial Accounting Standards Board is no longer funded by its constituency, but is funded in the same way as the PCAOB. This development can be characterized as a loss of autonomy; however this loss has also lead to some gains. First, it must be noted that after the major accounting scandal, the general public was dissatisfied with the auditor; nowadays the stature of the auditor has been revitalized. Branson according to Ronen & Yaari (2008) formerly equated the auditor to porn merchants, which now has been exalted to new heights of power and prosperity. Secondly, the extra work that the SOX Act burdens the auditor with has been met with a rise in the fees by fifty percent. To summarize, the SOX Act has changed the way the auditor relates to its clients through regulation. The auditor is no longer intertwined with management by way of having to communicate and answer to the audit committee and the auditor was forced to drop their consulting role for their audit clients. In the next chapter earnings management will be treated with a focus on the auditor and earnings quality.

Chapter 4: Earnings Management

§ 4.1 Introduction

In this chapter we will base our study on a literature review of the extensive subject of earnings management. Due to the expansive extant literature on earnings management and the diverse related topics the scope of the discussion will be limited to: firstly, a conceptual review of earnings management as a research concept. Secondly, the various research methods of studying earnings management will be highlighted. Throughout this chapter the assumptions regarding earnings management in this thesis will be made explicit where applicable.

§ 4.2 A conceptual review of Earnings management

Earnings management is a broad concept and therefore it is necessary to break it down and highlight its various forms in order to obtain a proper understanding. Ronen & Yaari (2008) categorize earnings management in three separate categories. These categories are white, gray and black, forming basically an ordinal scale that arranges the various forms of earnings management based on their efficiency enhancing or pernicious character. Earnings management classified as white refers to earnings management that enhances the transparency of financial reports by taking advantage of the flexibility in the choice of accounting treatment to signal the manager's private information on future cash flows. Earnings management that is typified as gray concerns forms of earnings management that maximizes the utility of management (opportunistic) or is economically efficient. The black category of earnings management concerns the practice of using tricks to misrepresent or reduce the transparency of financial reports (Ronen & Yaari, 2008, 25).

 After evaluating the extant literature about earnings management it can be established that there are multiple recognized definitions for this concept. For example, we have the definition of Schipper (1989), which defines earnings management as follows:

"Earnings management is really disclosure management in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain as opposed to merely facilitating the neutral operation of the process."

Another definition produced by Healy and Wahlen (1999) gave a detailed definition of the term explaining that ""Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of a company or influence contractual outcomes that depend on reported accounting numbers."

In the first definition we see that Schipper emphasizes the purpose of earnings management as the fact of "obtaining some private gain", while Healy & Wahlen state that the main purpose is to "mislead some stakeholders" or "influence contractual outcomes". However, considering the former and the latter hold similar meaning, which leads to the conclusion that these two objectives are practically the same. So, both definitions reflect the opportunistic behavior and perspective of managers and executives using earnings management. There are two disadvantages to these definitions. Firstly, it does not set a clear boundary between earnings management and normal activities whose output is earnings. Secondly, not all earnings management is misleading, in some cases earnings management can be information enhancement.

Ronen & Yaari (2008) therefore compiled a new definition of earnings management that captures the concept in a broader sense. The definition is tri-partite and is as follows: Earnings management is a collection of managerial decisions that result in not reporting the true short-term, value-maximizing earnings as known to management. Earnings management can be: beneficial (it signals long-term value), pernicious (it conceals short- or long-term value) and it can be neutral (it reveals the short-term true performance). The managed earnings result from taking production/investment actions before earnings are realized, or making accounting choices that affect the earnings numbers and their interpretation after the true earnings are realized. The strong aspects of this definition are that it contains the aspects of the definitions of Schipper and Healy & Wahlen while also adding a dimension of subjective value to the concept of earnings management which can be positive, negative or neutral. In this thesis this definition will be used for there will be no judging of earnings management in terms of positive or negative, nor will the reasoning of management be judged. The legal or illegality of earnings management and the motivations behind earnings management will be discussed but not explored in the empirical research.

Earnings management is in fact a practice effectuated by almost every company where managers use accrual accounting to increase or decrease items - like deferred revenue, inventory, accounts receivable and accounts payable, prepaid expenses and accrued liabilities- in order to meet some stakeholder's expectation or to reach a certain level of profit.

The use of accruals to manage earnings is based on the ability that firms have to measure their liabilities in comparison to their expected cash revenues in the future. Previous literature established that accruals have an inverse effect over time, meaning that that the balances are eliminated by an equal amount as previously recorded in the ledgers. However, the fact that accruals do reverse predictably over time can be seen as a blessing to both investors trying to identify earnings management situations and corporate managers interested in regulating accruals behavior within companies (Dharan, 2003, 3).

On the other hand, there were also other researchers who discovered that managers prefer to use real activities instead of accruals to influence the reported earnings. Two examples of researchers who found evidence to support this fact were Roychowdhury (2003) and Graham et al (2003). During his research endeavors Roychowdhury observed that executives manage real activities to achieve specific earnings offsets, Graham et. al. noticed that most executives manage real activities rather than accruals. However in this thesis the effects of real earnings management will not be considered.

Another crucial point to address is the motive behind the use of earnings management. Anterior researches have shown that the following factors motivate executives to manage earnings (Healy & Wahlen, 1999, 367):

- To influence stock market perceptions;
- To increase management's compensation;
- To reduce the likelihood of violating lending agreements and;
- To avoid regulatory intervention

Focusing on the fact that our main goal is to establish the connectivity between earnings management and financial distress trough this paper, we will put more attention on the third point stated above. It is generally known that accounting information is a tool to observe and modify the contracts between a company and its numerous stakeholders. Lending contracts for example, are written to restrain management's actions that benefit the company's stockholders at the expense of its creditors (Watts & Zimmerman, 1986).

According to their theory, contracts like these would generate incentives for managers to manage earnings because it seems to be expensive for creditors and compensation committees to "reverse" earnings management. Furthermore, standard setters seem to be very interested in earnings management originated by contractual purposes, because earnings management can easily lead to fraudulent financial statements that on its time will affect resource allocation. Thereby, financial reporting is developed as a communication tool between managers and all the company's investors, thus it should provide a true and fair view of the firm's performance enabling users to make correct decisions based on the information in the financial statements.

§ 4.3 Legal versus illegal earnings management

It is very common for people to think immediately in a negative way, like fraudulent actions, when the topic of earnings management is introduced. However, earnings management can also be characterized as reasonable and legal management decision making and reporting intended to achieve stable and predictable financial results. Hence, legally performed earnings management is when earnings are managed in full accordance with the financial reporting standards. So, it should not be confounded with illegal actions where the financial statement is manipulated and the reported information does not give a true or fair view of the company. There is a borderline that stipulates when earnings management is performed within the stated regulations and when it has turned into a pernicious phenomenon. Dechow & Skinner (2000) categorized the different shades of earnings management as depicted in the table below:

Table 1.0

Reporting Type	Accounting Choices under GAAP
"Conservative accounting"	* Overly aggressive recognition of provisions or reserves * Overstatement of restructuring charges and asset write-offs
"Neutral accounting" (not earnings management)	* Earnings that result from neutral operations

"Aggressive accounting"	* Understatement of the provision for bad debts * Drawing down provisions or reserves in an overly aggressive manner
	Accounting choices violating GAAP
"Fraud"	* Recording sales before they are "realizable" * Overstating inventory by recording fictitious inventory

Conservative accounting refers to earnings management strategies that lead to systematically reporting a lower value than the short term true value (as ascertained by management), earnings in this case are therefore called conservative or deflated. Neutral accounting implies that there is no managing of earnings; the earnings reflect the short term true value. Firms can also overstate their earnings, this is called aggressive accounting. When earnings management is so severe that there are clear violations of GAAP, then it is denominated as fraud which is illegal (Ronen & Yaari, 2008, 29). Firms can manage their earnings through various mechanisms. For example, by making an arbitrary choice from a menu of accounting treatments which are accepted under GAAP, such as the choice between LIFO and FIFO for inventory valuation. Another possibility is timing the decision when to adopt a new standard, or making a judgment call when GAAP requires an estimate from management and management is in the unique position of giving a relevant statement on this issue. The methods for earnings management are not limited to these options; however this thesis will not further examine methods for earnings management.

§ 4.4 Methodology for measuring Earnings management

In this chapter the methodology used for testing earnings management will be discussed and analyzed before finally formulating the particular model used for testing the hypotheses that were presented above. The entire body of work with respect to earnings management as a subject for research is too vast to be discussed exhaustively. For the purpose of this thesis it will suffice to summarize the most important methods of research which relate to the chosen methodology

for this thesis. Firstly, it is necessary to touch upon the subject of accruals, for most of the research has identified earnings management by focusing on the detection of accruals.

§ 4.4.1 The concept of accruals

One definition by Ronen and Yaari (2008) of accruals is "Accruals arise when there is a discrepancy between the timing of cash flows and the timing of the accounting recognition of the transaction. One notable example involves the recognition of revenues." These accruals can be further specified in discretionary and nondiscretionary accruals. The former arise when transactions are made in a specific manner or specific accounting treatments are chosen to manage earnings. The latter arise from transactions made in the current period that are normal for the firm given its performance level and business strategy, industry conventions, macro-economic events, and other economic factors (Ronen & Yaari, 2008, 372). It is important to keep in mind that the managing of these accruals by management is not necessarily pernicious, on the contrary they can be beneficial or neutral. In the next segment the focus will be on the accruals methodology that has been developed over time and a description of their relative success at modeling earnings management.

§ 4.4.2 The Accruals Methodology

In this section the various accruals methodology will be discussed. The various methods can be segregated in two separate categories, namely in research performed before the development of the Jones model and research after it. The milestones in research that attempted at modeling normal accruals viewed from the perspective of Ronen & Yaari (2008) contains the work of:
• Ronen and Sadan (1981);
• Healy (1985);
• DeAngelo (1986, 1988b); and
• Dechow and Sloan (1991).

The merits of mentioning the work of these authors is three fold. Firstly they provide a benchmark against the Jones model. Secondly, they can provide new insights of modeling normal accruals that can be used in modern insights. And thirdly, these also offer research opportunities. Further down an elaboration will follow on why these approaches have been

bypassed in favor of the discussion of an iteration of the Jones model. In the next subsection however we will discuss the classical model as formulated by Jennifer T Jones (1991) in her study 'Earnings Management During Import Relief Investigations'.

§ 4.4.3 The Jones Model

Jones (1991) investigated whether firms would benefit from import relief by managing earnings downwards during import relief investigations by the United States International Trade Commission (ITC). Import relief is meant to protect domestic producers against competition by foreign firms through measures such as tariff increases, quota reductions, market agreements that limit imports etcetera. The ITC based its decisions on accounting earnings, inventory levels, and unused capacity. If there were a significant worsening in these accounts it would warrant granting import relief. This incentivizes management to the strategy of managing earnings downwards in order to convey the impression that the foreign competition is harmful to the national producer. This strategy is especially attractive because the ITC does not adjust financial figures to reflect accounting choices (Ronen & Yaari, 2008, 404).

Jones' work can be characterized as an event study, whereby a firm's earnings are assumed to be unmanaged before the event. Therefore the time series of a firm's earnings can be partitioned into two sub periods, the estimation period where discretionary accruals (DA) are equal to 0, and the event period. Jones followed the following testing procedure:

Stage 1: Estimation period

$$\text{NDA}_{it}/A_{it-1} = \text{TA}_{it}/A_{it-1} = \alpha_i[1/A_{it-1}] + \beta_{1i}[\Delta\text{REV}_{it}/A_{it-1}] + \beta_{2i}[\text{PPE}_{it}/A_{it-1}] + \varepsilon_{it},$$
(1.0)

where
TA = total accruals;
A = assets;
REV = revenues;
PPE = gross property, plant, and equipment;
ε = error term;
i = index for firm, i=1,2,…,N.

T = index for the period (year) in the estimation period,

t=1,2,…,*T*.

Δ = change in a given variable.

After running the regression, the outcomes for the parameters are plugged into equation (1.0). The residual accruals (the equation's prediction error) are the abnormal accruals, which are fully equated with discretionary accruals. In order to perform the Jones model testing it is important to know how to compute the total accruals. Total accruals are calculated from the balance sheet: Δcurrent assets (Compustat #4) – Δcash (Compustat #1) – [Δcurrent liabilities (Compustat#5) – Δcurrent maturities of long-term debt (Compustat #44) – Δincome taxes payable (Compustat #71)] – depreciation and amortization expense (Compustat #14). Jones deflates all variables by the beginning-of-the-year assets to overcome heteroskedasticity (Ronen & Yaari, 2008, 406). But how does the Jones model perform as a measuring tool? Ronen and Yaari go out of their way to explain how the Jones model is susceptible to both Type I and Type II errors, however it is also important to judge the model based on its performance relative to its counterparts. Unfortunately there is no consensus on whether the Jones model is robust. Researchers such as Dechow, Sloan, and Sweeney (1995), and Bartov, Tsui, and Gul (2001), as well as others, provide compelling evidence that the Jones model outperforms the simple models of Healy and DeAngelo, as well as Dechow and Sloan's Industry Model. However other researchers such as Guay, Kothari, and Watts (1996), find that there is a high correlation between the discretionary accruals for all models, so it can be posited that there is no difference between using these models or an arbitrary procedure for testing earnings management (Ronen & Yaari, 2008, 431). In the next section we will discuss modifications to the Jones model which will mitigate the aforementioned susceptibility to Type I and Type II errors. There have been various innovations with regard to the Jones model implemented by various researchers. For practical purposes we will focus on the modified Jones model (1995) which has become the baseline model for earnings management research using accruals.

§ 4.4.4 The modified Jones model

In this section we will discuss the modified Jones model by Dechow, Sloan & Sweeny (1995). The original Jones model focused on normal accruals, for it relates accruals to changes in

"revenues" and "Property, plant & equipment" (PPE). The former determine changes in working-capital accruals, such as accounts receivable, inventory, and accounts payable. The latter determine the accrual of the depreciation expense (Ronen & Yaari, 2008, 433).

The novelty of the modified Jones model is the treatment of accounts receivable; namely if the firm does not manage earnings in the estimation period and manages accounts receivable in the event period, then accruals of credit sales are normal in the estimation period and abnormal in the event period. This is reflected in the modified Jones model by the following adjustment, the first stage of estimating normal accruals during the estimation period is the same as before, thus leads to equation (1.0) as shown previously above:

$$\text{NDA}it\,/\text{A}it{-}1 = \text{TA}it\,/\text{A}it{-}1 = \alpha i\,[1/\text{A}it{-}1] + \beta1i[\Delta\text{REV}it/\text{A}it{-}1] + \beta2i[\text{PPE}it/\text{A}it{-}1] + \varepsilon it\,,$$

In the second stage (the event period), normal accruals (NDA) are calculated by multiplying the estimated coefficient of the change in sales by the change in cash sales (the change in revenues minus the change in accounts receivable) instead of the change in sales. The NDA of firm i in the event period p are computed as follows:

$$\text{NDA}ip = \hat{\alpha}i\,[1/\text{A}ip{-}1] + 1i\,\hat{\beta}\,[(\Delta\text{REV}ip - \Delta\text{AR}ip)/\text{A}ip{-}1] + 2i\hat{\beta}\,[\text{PPE}ip/\text{A}ip{-}1],\,(2.0)$$

Where

NDAip = normal, non-discretionary accruals of firm i in period p;

$Aip{-}1$ = lagged assets of firm i;

REV = revenues;

AR = accounts receivable;

PPE = PP&E;

Δ = change;

$1i\hat{\beta}$= the coefficient of total revenues in the estimation period. It is estimated from the regression of accruals on ΔREVi and PPEi.

In this chapter earnings management and the most common research method for studying this concept have been introduced. The model used in this thesis is also based on the modified Jones model as discussed above with the addition of a few specific variables. In the next section the empirical research will be covered including a discussion with respect to the data, hypotheses, the model used for testing and finally a discussion of the test results.

Chapter 5: Empirical Testing

§ 5.1 Introduction

In the previous chapters extant literature has been discussed on the subjects of the SOX Act, the role of the auditor and earnings management. In this chapter the empirical research conducted will be discussed, starting with a description of the data, and then followed by the hypotheses formulated for testing, the model used to calculate the accruals, and last but not least and analysis of the results and limitations of the research.

§ 5.2 Data

The data has been collected from the COMPUSTAT North America database using annual data. The data has been collected over the time period ranging from 1996 to 2006. This period has been chosen in this way so there would be an almost equal amount of time in both the Pre-SOX as in the Post-Sox time period. Firms have been selected using Central Index Key (CIK) codes, eliminating all banking institutions while including firms belonging to the manufacturing, trade and service industries. The coding of the data into variables will be covered in the discussion of the model.

§ 5.2.1 Development of the Hypotheses

In the previous chapters we have focused on the SOX act and its impact on the American financial system, some light was also shed on one of the primary gatekeepers of the financial system, namely the auditor. The role of the auditor and how this relates to earnings management has been described. The reader of the literature review might have questions regarding the effectiveness of the SOX Act in terms of curbing earnings management within American public firms. Some of these questions might relate to how the auditor has been influenced by the SOX Act. In order to answer these questions it is necessary to perform empirical research which has lead to the formulation of the following hypotheses:

H0: Earnings are not being managed differently from the Pre-Sox period in comparison with the Post-Sox period.

What this entails is that the SOX act has had no statistically significant effect that can be measured using the specified research method of detecting earnings management. If the results

point to the contrary the null hypothesis will be rejected. The expectation is that this hypothesis will be rejected. The enactment of the SOX Act entails that there is an increase in the measures firms are required to take to implement and maintain a proper internal control framework and proper control over financial reporting. Lobo & Zhou (2008) discovered that firms report earnings more conservatively and appeared to engage in less earnings management.

H1: Earnings management has decreased in the Post-Sox period versus the level of earnings management in the Pre-Sox period.

This expectation is based upon the extant literature with regards to the SOX act. The stringent requirements of the legislation and the socio-economic backdrop of the previously mentioned accounting scandals such as the demise of Enron and its accountant Arthur Anderson substantiate the basis for this hypothesis. At face value this hypothesis seems to hold, it would be reasonable to assume that earnings management has decreased in the Post-Sox period. The findings of Lobo & Zhou (2008) once again validate this expectation.

H2: Earnings management for firms audited by the Big 4 group in the Pre-Sox period is lower than for firms audited by the Non-Big 4 group.

By testing this hypothesis it can be discerned whether there is a difference in audit quality between the Big 4 auditors and others. There is no absolute consensus on whether the Big 4 auditors provide a higher quality audit service, however most researchers find that there is evidence that audit quality of Big 4 auditors might be higher (Ronen & Yaari, 2008). However the purpose of this research endeavor is not to investigate the quality of the audit service as provided by the Big 4 auditors and Non-Big 4 auditors, it is exogenous to the used model. The goal is to discern whether there is a statistically significant difference in earnings management between firms audited by the Big 4 or Non-big four. The assumption is that a lower level of earnings management would be associated with a higher level of audit quality and a higher level of earnings management with a lower level of audit quality.

H_3: The effects of Big 4 group on earnings management become more pronounced and significantly negative in the Post-Sox period

The testing for this hypothesis is similar to the previous one, but now after the enactment of the SOX act it would be interesting to examine whether there is a difference between the levels of earnings management of Big 4 audited firms and non-Big4 audited firms. The expectation is that after the enactment of the SOX act it will be clear that earnings management has decreased more for firms audited by the Non-Big 4 audit firms. This seems very plausible as Lobo & Zhou (2008) have found that both discretionary accruals and absolute values of accruals are negatively related to auditor type, which suggests that Big 5 auditors are associated with higher levels of conservatism and less earnings management. In the next section we will discuss the research model used for testing the aforementioned hypotheses.

§ 5.2.2 The Research Model

For the testing of the hypotheses we use an adaptation of the modified Jones model as discussed above. This model has been selected due to its reputation in academics as the baseline model for testing earnings management using accruals. Furthermore, this model has stood the test of time and is therefore easier to employ due to the exhaustive theses and research papers having been published by academic researchers. The calculation of the total accruals has been performed in similar fashion as described above. The first stage of the modified Jones model; estimating the normal accruals in the estimation period has also been duplicated as formerly described. The model in the second stage can be defined as a regression of the dependent variable (non-discretionary accruals) on the dependent variables depicted in the table below.

Table 2.0

Independent Variables	Calculation or Coding
Firm size proxies	-Log value of Market value (Log M/V) -Log value of Sales (Log Sales) -Log value of Assets (Log Assets) All values in millions of USD.
SOX Act dummy variable (SOX)	(Pre-Sox=0; Post-Sox= 1)
Return on Assets (ROA)	Net income divided by Assets

Market to Book ratio (M/B ratio)	Market value divided by Assets and Liabilities
Auditor dummy variable (Auditor)	(Non Big 4= 0; Big 4= 1)
SOX * Auditor interaction term (SOX*Auditor)	(IF Post-Sox and Big 4 auditor=1; IF NOT= 0)
Industry dummy (SIC)	(SIC not applicable=0; SIC applicable-1)

For the second stage testing the following model should be considered as the the baseline model:

NDAip=$Log Assets + ROA + M/B ratio+ Auditor + Industry dummy +\varepsilon it$, where εit is the error term for firm i in period t.

The results given by this model will be contrasted by the regression of four other configurations using the independent variables described in the table above. For a full overview of all the iterations of the modified Jones models used, please refer to the appendix.

In the next section the results with respect to the testing of the hypotheses will be posted, starting with a discussion of the common issues encountered during empirical research pertaining to the normality of the distribution of residuals, multicollinearity, explanatory power of the test and robustness testing.

§ 5.2.3 The Results

Before the results are discussed with regards to the testing of the hypotheses it is important to be aware of circumstances which may influence the validity and reliability of the results. Firstly, it is important to analyze the distribution of the residuals of the model and test whether the residuals are homo-skedastically or hetero-skedastically distributed. In the Appendix (F2) we can see that there is evidence of a hetero-skedastic distribution of the non-discretionary accruals indicated by a Kolmogorov-Smirnov value of 0.476 which is statistically significant (p=0.000). However, due to the use of a large sample size (N= 14550) it will not severely affect the outcome of the tests. Secondly, there is no evidence of multicollinearity between variables, it can be observed that the variance inflation factor is within acceptable bounds. All VIF values are approximately one, the calculated average also approximates this values and there are no reciprocal values (1/VIF) below 0.2 (Field, 2005, 175. Therefore it can be argued that there is no

multicollinearity in this set of variables. Thirdly, the explanatory power of the model is usually very important to document. The models formulated and tested for this thesis have a very low R^2 value, but this is mostly the case with iterations of the modified Jones model. Ronen & Yaari (2008) mention that the modified Jones model reports a R^2 value of 9,2%. Thirdly, as table 2.0 denotes, three proxies have been used to denote size. By testing the models using the proxies it has been determined that Log Assets is the proxy variable with the greatest statistically significant results. The log values of a firm's market value or its sales have proven to be weaker proxies. The industry dummy variable has typically weakened the predictive value of the models by reducing the overall significance of the model during analysis of variance testing. The only industry which showed a statistically significant relationship with the non-discretionary accruals was the business services industry (SIC 73). However, although the sample size was large it must be noted that the distribution of firms across the various industry sector was uneven. The sector of business services was strongly represented in the sample, this automatically means that other sectors were underrepresented which might explain the lack of statistically significant relationships between the other industry dummies and the dependent variable. With respect to the hypotheses, the following has been established:

The null-hypothesis H_0: *Earnings are not being managed differently from the Pre-Sox period in comparison with the Post-Sox period*, is rejected because the evidence (depicted in the appendix [T6]) shows that the mean value of the non-discretionary accruals has changed from a positive value to a negative value. Furthermore there is now a more significant relationship between the auditor and the non-discretionary accruals. The correlation coefficient changed from -0,325 to -2,725. This coefficient was not statistically significant in the Pre-Sox period, but is significant in the Post-Sox period (p=0.01). Therefore the conclusion is that there is a change in the way earnings are managed and that there is a stronger negative relationship now between the auditor and earnings management. With regards to hypothesis H_1: *Earnings management has decreased in the Post-Sox period versus the level of earnings management in the Pre-Sox period,*. is accepted based on the fact that the mean value of non-discretionary accruals has decreased from 0.217 in the pre-Sox period to -0.333 in the Post-Sox period. The next hypothesis, *H_2: Earnings management for firms audited by the Big 4 group in the Pre-Sox period is lower than for firms audited by the Non-Big 4 group* is rejected since the results show that in the Post- SOX period, the effect of big 4 auditor is stronger than that in the Pre-SOX period (the coefficient changes

from -0.19 to -0.53). But more importantly, the result in the Pre-SOX period is not statistically significant in contrast with the Post-SOX period result as described above.   The final hypothesis H_3: *The effects of Big 4 group on earnings management become more pronounced and significantly negative in the Post-Sox period*, is accepted based on the same result. The switch from a statistically insignificant result to a significant result substantiates this. In the next section the limitations imposed on this research will be exposed and discussed.

§ 5.2.4 Limitations

In the same vein as any undertaking one is faced with constraints when doing research. During this thesis I have experienced a number of limitations which may have also limited the degree of possible extrapolation to the real world. First of all, the operationalization of the model does not capture the full spectrum of changes that SOX has brought about. More specifically, the relationship studied between non-discretionary accruals, the SOX act and the auditor exists, but there could be other variables at play that are exogenous to the model, that might strengthen or weaken the observed relationships. Secondly, the firms included in the dataset are all American public firms; this could mean that the observed relationships might be varying in a different economic/accounting setting. So it can be tricky when one tries to extrapolate the results to the European or Asian environment. However, this risk is somewhat reduced due to the international character of the firms and auditors. Thirdly, this thesis uses the modified Jones model, which is the standard for this type of accrual research, but unfortunately this model has been succeeded by more advanced models such as the synthesis model by Ye (Ronen & Yaari, 2008, 433). These are the most pronounced limitations of this thesis. The question that then remains is: what is the contribution of this thesis. This will be discussed in the following section.

§ 5.2.5 Contribution to Science

In this section an attempt will be made to clarify and defend what the contribution is of this thesis.Firstly, this thesis had the objective to prove that there has been a change in the way firms manage their earnings after SOX and to describe how the auditor is related to this. It has been proven that there was indeed a change in the way earnings are being managed. This is a corroboration of the work done by professionals in academics. Thirdly, the findings in this thesis can be easily replicated and it is also possible to add to it by including other factors such as the

size of the board, the presence of financial experts in the audit committee and other factors. Another way this thesis lends itself to further inquiry is to change the focus of research from earnings management to conservatism, which has been done for example by Lobo & Zhou (2006). As already mentioned in the introduction, investors can take away that there is less earnings management in big four audited firms. They could use this knowledge in their investment decision-making. Regulators can learn that legislation is an effective tool to change the conditions in the financial market, since the evidence shows that there is less earnings management in the Post-Sox Period. The thesis also affirms the importance of the role of the auditor, evidence points out that big four auditors have a negative correlation with earnings management that has been reinforced in the Post-Sox period.

Summary

This thesis has established that after a period of major accounting scandals such as Enron it was necessary for the government to step in and take action through legislation. This resulted in the regulatory framework we know as the Sarbanes Oxley Act. This act has changed the accounting landscape and has influenced the way the auditor, one of the prime gatekeepers of the financial system interacts with its clients. The main research question in this thesis was: what has been the effect of the SOX Act on the relationship between earnings management and the auditor? The empirical evidence produced indicates that firms now manage their earnings differently in the Post-Sox period than in the Pre-Sox period. The test results show that earnings management has decreased in the Post-Sox period versus the level of the earnings management in the Pre-Sox period. Furthermore, earnings management for firms audited by the Big 4 group in the Pre-Sox period is lower than for firms audited by the Non-Big4 group. Finally, the results show that the effects of the Big 4 auditors on earnings management of their client firms become more pronounced and significantly negative in the Post-Sox period. The possibility to extrapolate the findings to the real world is constrained by the fact that any model is an abstraction of reality and therefore might not capture all the influencing factors. The data set is also limited to American public firms which might not be similar to their European or Asian counterparts. The modified Jones model to test the data is robust, but its power is weak. However the contributions of the thesis as explained above are clear and robust.

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Appendix

In this section an overview will be given of the results and an interpretation of these results.
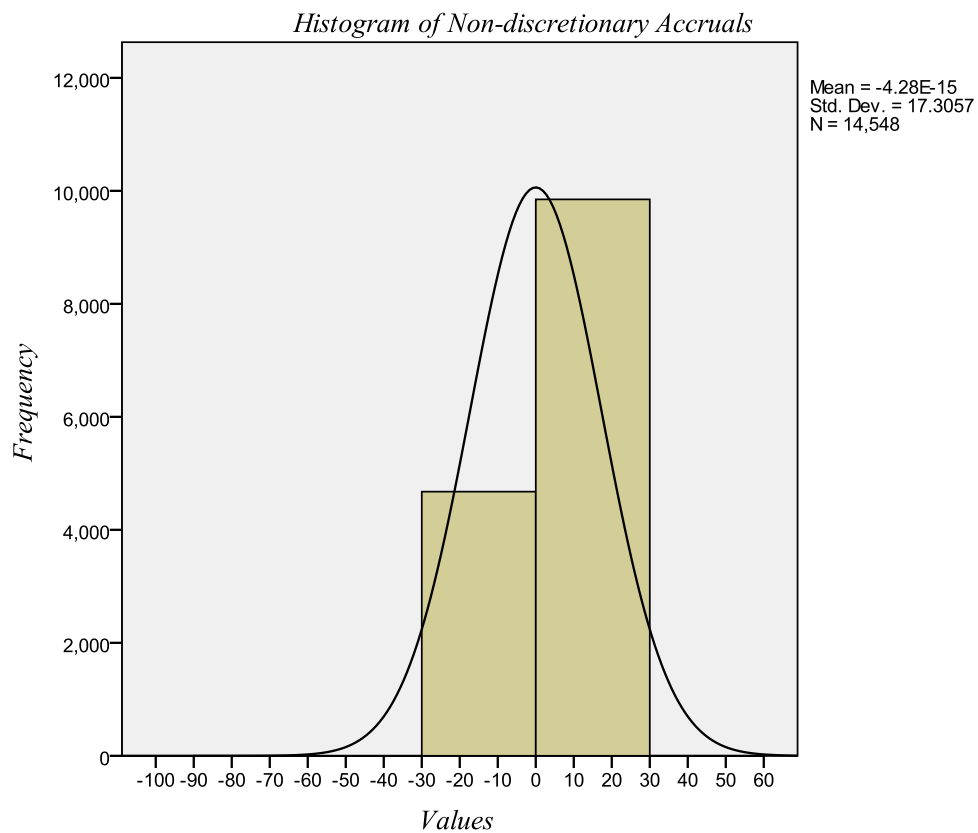
F1 Histogram of the Non-discretionary accruals

In the table below an overview is given of the residuals as obtained by solving the equation 1.0 as depicted in the main text in chapter four. In the data set 14548 residuals are calculated of which 2 are missing values due to data unavailability.

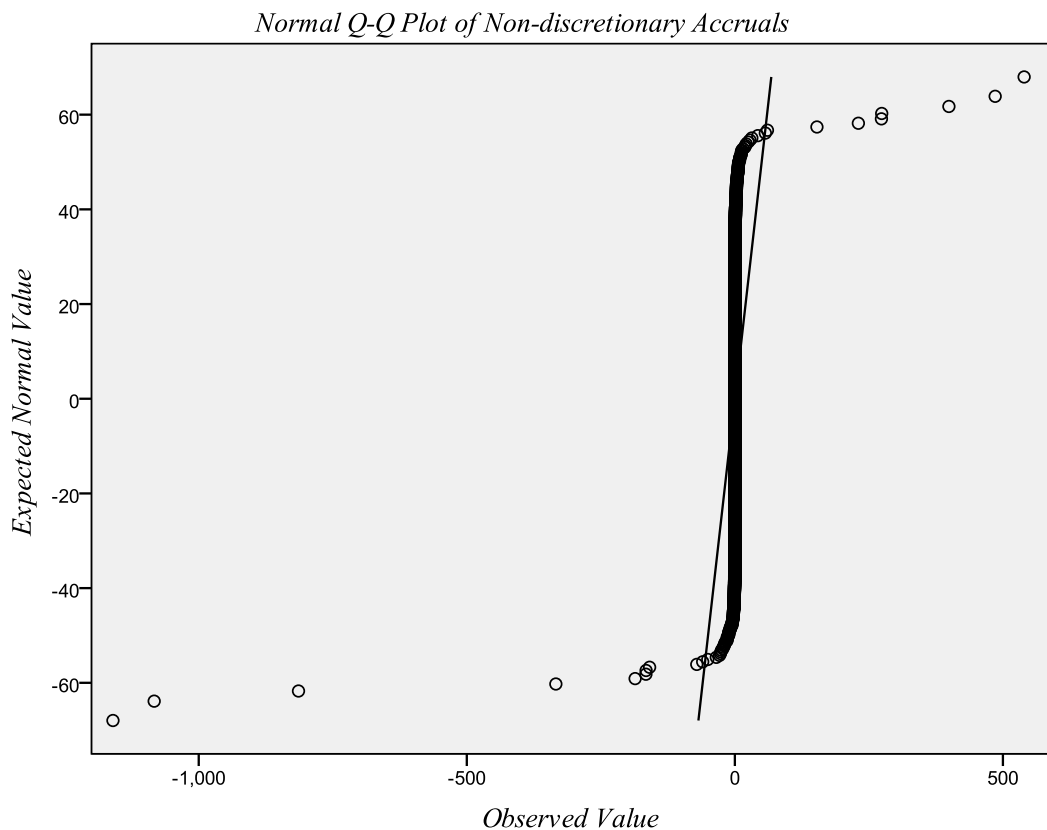*Statistics*

Non-Discretionary Accruals

N	*Valid*	*14548*
	Missing	*2*

Histogram of Non-discretionary Accruals

Mean = -4.28E-15
Std. Dev. = 17.3057
N = 14,548

*Frequency* (y-axis)

Values (x-axis)

In the figure above one can see a frequency distribution in the form of a bar chart. As expected the mean value is close to zero (accruals are debit or credit balances that reverse over time to zero). The distribution is leptokurtic; however this is largely due to a selection bias of the sample. Only large public firms are included and this explains the clustering of data around the mean.

F2 Normal QQ-Plot of the non-discretionary accruals

In the graphs below one can see the Normal QQ-plot and a de-trended Normal QQ-plot. One can see that there is no straight diagonal line formed by the data points. There is an indication that the distribution of the residuals might not be normal. However, as postulated above this was to be expected due to the selection bias of the sample. A normal distribution of the residuals is assumed in the population.

Normal Q-Q Plot of Non-discretionary Accruals

Detrended Normal Q-Q Plot of Non-discretionary Accruals
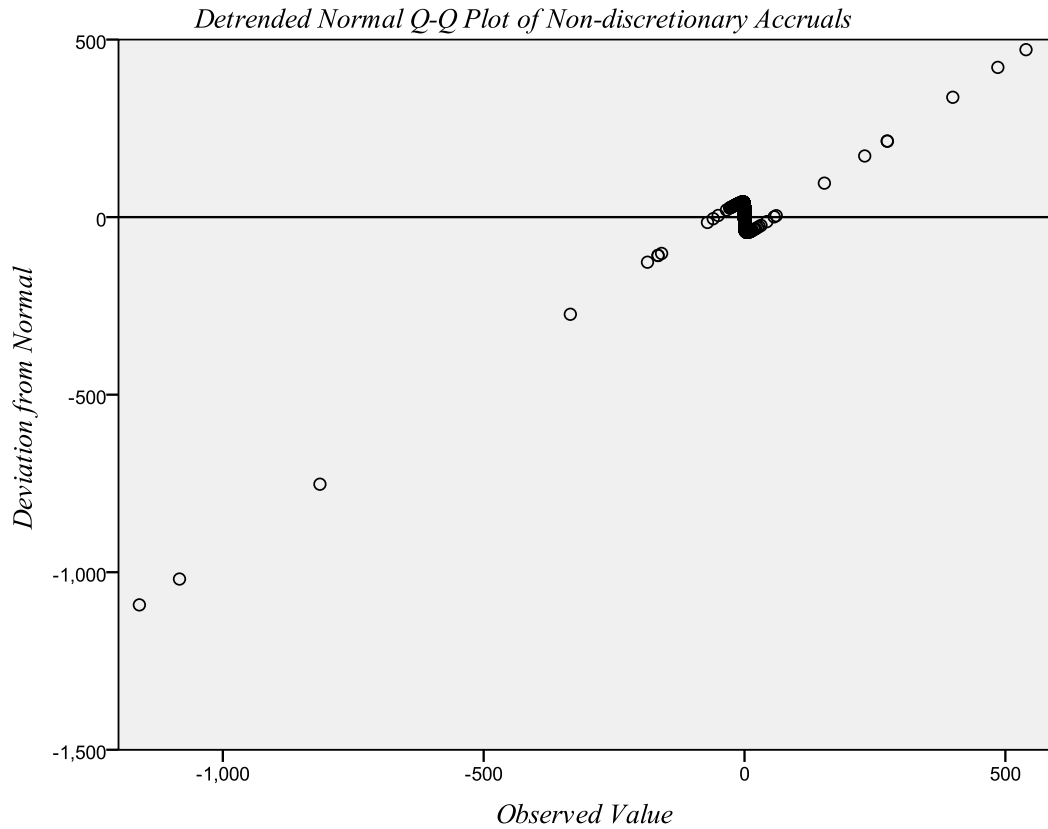
T1 Summary Statistics

The tables below give information about the distribution of the non-discretionary accruals and the frequency distribution of the variables endogenous to the models used for testing the hypotheses. Note that the missing values are caused by data unavailability in the COMPUSTAT database.

Statistics

		Non Discretionary Accruals	Standard Industrial Codes (SIC)	Company Legal Name	Log Market Value	Log Sales	Log Assets	Sarbanes Oxley Act	Return on Assets	Market to Book Ratio	Data Year - Fiscal	Auditor
N	Valid	14548	14550	14550	11393	14082	14411	13204	14377	11370	14550	14376
	Missing	2	0	0	3157	468	139	1346	173	3180	0	174
Mean		.000000			5.174700	5.543362	5.409808	.34	-.225623	2.268456		.78
Median		.091758			5.211670	5.796293	5.585524	.00	.035675	1.620918		1.00
Std. Deviation		17.3057036			2.8427848	2.7774027	2.7444561	.474	8.3182271	149.799358		.416
Percentiles	25	-.018157			3.098738	3.724548	3.531699	.00	-.020644	.893551		1.00
	50	.091758			5.211670	5.796293	5.585524	.00	.035675	1.620918		1.00
	75	.248407			7.246568	7.502421	7.379596	1.00	.077627	2.873483		1.00

Sarbanes Oxley Act

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	*Pre-Sox*	8721	59.9	66.0	66.0
	Post-Sox	4483	30.8	34.0	100.0
	Total	13204	90.7	100.0	
Missing	*System*	1346	9.3		
Total		14550	100.0		

The table above shows the distribution of the SOX dummy variable, it is unfortunate that there is no equal split of firm years over the Pre-Sox and Post-Sox period. However due to the large N of both data splits there is no cause to believe that it would substantially affect the results.

Auditor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	*Non-Big 4 Auditor*	3204	22.0	22.3	22.3
	Big 4 Auditor	11172	76.8	77.7	100.0
	Total	14376	98.8	100.0	
Missing	*System*	174	1.2		
Total		14550	100.0		

The table above denotes the distribution of the auditor variable. First, it is very apparent that very few companies are audited by Non-Big 4 auditors. This is inherent to the company profile of firms being included in the sample. Secondly it should be noted that the definition of Big 4 auditor also includes the Big 5 group in the years before the collapse of Arthur Andersen in 2002. The firm years stemming from 2002 are therefore excluded to exclude any noise in the data.

T2 Model 1 with Lagged Assets

Below are the tables showing the results with regards to the regression of the independent variables (Log assets, Return on Assets, Market to Book ratio and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R2 is 0.009), but is statistically significant at a p=0.001 level. The Constant, Log Assets, Return on Assets and the industry dummy Sic 73 variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.094	.009	.005	18.4702017	.741

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34192.399	49	697.804	2.045	.000
	Residual	3847812.252	11279	341.148		
	Total	3882004.650	11328			

Coefficients

Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	-1.928	.610	-3.162	.002		
	Log Assets	.494	.071	6.931	.000	.821	1.218
	Return on Assets	-.070	.020	-3.475	.001	.986	1.014
	Market to Book Ratio	.001	.002	.355	.723	.998	1.002

T2 Model 2 with Log Assets

Below are the tables showing the results with regards to the regression of the independent variables (Log assets, Sarbanes Oxley Act, Return on Assets, Market to Book ratio and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.009), but is statistically significant at a p=0.001 level. The Log Assets, Sarbanes Oxley Act, Return on Assets and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.097[a]	.009	.004	19.2821814	.738

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35238.036	50	704.761	1.896	.000
	Residual	3734384.500	10044	371.803		
	Total	3769622.536	10094			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-1.567	.688	-2.277	.023		
	Log Assets	.526	.079	6.647	.000	.815	1.227
	Sarbanes Oxley Act	-1.115	.392	-2.847	.004	.988	1.013
	Return on Assets	-.074	.021	-3.480	.001	.987	1.014
	Market to Book Ratio	.001	.002	.260	.795	.998	1.002

T2 Model 3 with Log Assets

Below are the tables showing the results with regards to the regression of the independent variables (Log Assets, Return on Assets, Market to Book ratio, Auditor and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.004), and the model is not statistically significant. The Log Assets and Sic 73 (industry dummy) are the only statistically significant variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.062	.004	-.001	15.0840282	1.259

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9938.888	50	198.778	.874	.723
	Residual	2560144.010	11252	227.528		
	Total	2570082.898	11302			

Coefficients

Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	-.414	.515	-.804	.421		
	Log Assets	.295	.070	4.189	.000	.565	1.770
	Return on Assets	.015	.017	.903	.367	.986	1.015
	Market to Book Ratio	.000	.002	.259	.795	.998	1.002
	Auditor	-.708	.419	-1.690	.091	.639	1.564

T2 Model 4 with Log Assets

Below are the tables showing the results with regards to the regression of the independent variables (Log Assets, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.005), and the model is not statistically significant. The Log Assets, Auditor, Sarbanes Oxley Act and Sic 73 (industry dummy) are statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.070	.005	.000	15.9747968	1.259

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12602.684	51	247.111	.968	.538
	Residual	2556534.808	10018	255.194		
	Total	2569137.492	10069			

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-.114	.595	-.191	.848		
	Log Assets	.372	.081	4.624	.000	.546	1.832
	Return on Assets	.013	.018	.743	.457	.986	1.014
	Market to Book Ratio	.000	.002	.168	.866	.998	1.002
	Auditor	-1.057	.480	-2.204	.028	.612	1.633
	Sarbanes Oxley Act	-.868	.333	-2.605	.009	.940	1.064

T2 Model 5 with Log Assets

Below are the tables showing the results with regards to the regression of the independent variables (Log Assets, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act, SOX*Auditor interaction term and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.006), and the model is not statistically significant. The Log Assets, Auditor, Sarbanes Oxley Act, the SOX*Auditor interaction term and Sic 73 (industry dummy) are statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.074	.006	.000	15.9704280	1.258

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14255.874	52	274.151	1.075	.331
	Residual	2554881.618	10017	255.055		
	Total	2569137.492	10069			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	.712	.678	1.050	.294		
	Log Assets	.365	.081	4.535	.000	.545	1.835
	Return on Assets	.014	.018	.808	.419	.986	1.015
	Market to Book Ratio	.000	.002	.107	.915	.998	1.002
	Auditor	-1.982	.602	-3.294	.001	.389	2.570
	Sarbanes Oxley Act	-2.325	.662	-3.511	.000	.237	4.211

	Sox * Auditor	1.936	.760		2.546	.011	.211		4.732

T3 Model 1 with Log Market Value

Below are the tables showing the results with regards to the regression of the independent variables (Log Market Value, Return on Assets, Market to Book ratio and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.006), but is statistically significant at a p= 0.05 level. Log Assets, Return on Assets and the industry dummy Sic 73 variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.078	.006	.002	18.4962277	.740

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23341.026	49	476.347	1.392	.036
	Residual	3858663.625	11279	342.110		
	Total	3882004.650	11328			

Coefficients

Model		Unstandardized Coefficients				Collinearity Statistics	
		B	Std. Error	t	Sig.	Tolerance	VIF
1	(Constant)	-.826	.595	-1.389	.165		
	Log Market Value	.265	.066	4.023	.000	.871	1.147
	Return on Assets	-.059	.020	-2.940	.003	.995	1.005
	Market to Book Ratio	.000	.002	.182	.856	.999	1.001

T3 Model 2 with Log Market Value

Below are the tables showing the results with regards to the regression of the independent variables (Log Market Value, Return on Assets, Market to Book ratio, Sarbanes Oxley Act and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.007), and is not statistically significant. The Log Market Value, Return on Assets, Sarbanes Oxley Act and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.081[a]	.007	.002	19.3095013	.736

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24648.437	50	492.969	1.322	.064
	Residual	3744974.099	10044	372.857		
	Total	3769622.536	10094			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-.461	.672	-.686	.493		
	Log Market Value	.292	.074	3.958	.000	.855	1.170
	Return on Assets	-.063	.021	-2.976	.003	.995	1.005
	Market to Book Ratio	.000	.002	.112	.911	.998	1.002
	Sarbanes Oxley Act	-1.092	.394	-2.768	.006	.977	1.024

T3 Model 3 with Log Market Value

Below are the tables showing the results with regards to the regression of the independent variables (Log Market Value, Return on Assets, Market to Book ratio, Auditor and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.003), and is not statistically significant. The Log Market Value and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.052[a]	.003	-.002	15.0928383	1.260

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6947.425	50	138.948	.610	.986
	Residual	2563135.473	11252	227.794		
	Total	2570082.898	11302			

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-.037	.510	-.073	.942		
	Log Market Value	.130	.062	2.097	.036	.656	1.525
	Return on Assets	.021	.016	1.250	.211	.994	1.006
	Market to Book Ratio	.000	.002	.160	.873	.998	1.002
	Auditor	-.146	.401	-.364	.716	.699	1.431

T3 Model 4 with Log Market Value

Below are the tables showing the results with regards to the regression of the independent variables (Log Market Value, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.003), and is not statistically significant. The Log Market Value, Sarbanes Oxley Act and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.059	.003	-.002	15.9864093	1.260

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8884.486	51	174.206	.682	.960
	Residual	2560253.006	10018	255.565		
	Total	2569137.492	10069			

Coefficients

Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	.247	.591	.418	.676		
	Log Market Value	.187	.072	2.608	.009	.624	1.602
	Return on Assets	.020	.018	1.119	.263	.995	1.005
	Market to Book Ratio	.000	.002	.067	.947	.998	1.002
	Auditor	-.406	.460	-.882	.378	.667	1.499

Sarbanes Oxley Act	-.765	.336	-2.277	.023	.925	1.081

T3 Model 5 with Log Market Value

Below are the tables showing the results with regards to the regression of the independent variables (Log Market Value, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act, SOX*Auditor and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.004), and is not statistically significant. The Log Market Value, Auditor, Sarbanes Oxley Act, SOX*Auditor interaction term and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.064	.004	-.001	15.9817320	1.260

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10637.843	52	204.574	.801	.847
	Residual	2558499.649	10017	255.416		
	Total	2569137.492	10069			

Coefficients

Model		Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
		B	Std. Error			Tolerance	VIF
1	(Constant)	1.094	.673	1.625	.104		
	Log Market Value	.181	.072	2.525	.012	.624	1.604

Return on Assets	.021	.018	1.180	.238	.994	1.006
Market to Book Ratio	1.097E-5	.002	.006	.996	.998	1.002
Auditor	-1.363	.587	-2.321	.020	.409	2.446
Sarbanes Oxley Act	-2.266	.664	-3.412	.001	.237	4.225
Sox * Auditor	1.993	.761	2.620	.009	.211	4.731

T3 Model 1 with Log Sales

Below are the tables showing the results with regards to the regression of the independent variables (Log Sales, Return on Assets, Market to Book ratio and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.009), but is statistically significant at a p= 0.001 level. The Constant, Log Sales, Return on Assets and the industry dummy Sic 73 variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.094	.009	.004	18.0253483	.636

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32015.527	49	653.378	2.011	.000
	Residual	3590615.584	11051	324.913		
	Total	3622631.111	11100			

Coefficients

			Unstandardized Coefficients				Collinearity Statistics	
Model		B	Std. Error	t	Sig.	Tolerance	VIF
1	(Constant)	-1.722	.599	-2.873	.004		
	Log Sales	.384	.070	5.525	.000	.807	1.239
	Return on Assets	-.150	.029	-5.089	.000	.990	1.010
	Market to Book Ratio	.001	.002	.366	.714	.998	1.002

T3 Model 2 with Log Sales

Below are the tables showing the results with regards to the regression of the independent variables (Log Sales, Return on Assets, Market to Book ratio, Sarbanes Oxley and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.01), but is statistically significant at a p= 0.001 level. The Constant, Log Sales, Return on Assets and the industry dummy Sic 73 variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.098	.010	.005	18.7979568	.633

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33919.174	50	678.383	1.920	.000
	Residual	3476740.333	9839	353.363		
	Total	3510659.506	9889			

Coefficients

Model		Unstandardized Coefficients				Collinearity Statistics	
		B	Std. Error	t	Sig.	Tolerance	VIF
1	(Constant)	-1.428	.675	-2.116	.034		
	Log Sales	.415	.077	5.378	.000	.802	1.248
	Return on Assets	-.167	.032	-5.233	.000	.992	1.008
	Market to Book Ratio	.001	.002	.276	.783	.998	1.002
	Sarbanes Oxley Act	-1.013	.386	-2.623	.009	.986	1.014

T3 Model 3 with Log Sales

Below are the tables showing the results with regards to the regression of the independent variables (Log Sales, Return on Assets, Market to Book ratio, Auditor and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.004), and is not statistically significant. The Log Market Value and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.060	.004	-.001	14.4485040	1.198

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8389.460	50	167.789	.804	.838
	Residual	2302405.954	11029	208.759		
	Total	2310795.414	11079			

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8389.460	50	167.789	.804	.838
	Residual	2302405.954	11029	208.759		
	Total	2310795.414	11079			

Coefficients

Model		Unstandardized Coefficients				Collinearity Statistics	
		B	Std. Error	t	Sig.	Tolerance	VIF
1	(Constant)	-.680	.498	-1.365	.172		
	Log Sales	.233	.067	3.479	.001	.562	1.781
	Return on Assets	.031	.024	1.289	.197	.990	1.010
	Market to Book Ratio	.001	.002	.302	.763	.998	1.002
	Auditor	-.412	.406	-1.014	.310	.654	1.528

T3 Model 4 with Log Sales

Below are the tables showing the results with regards to the regression of the independent variables (Log Sales, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.004), and is not statistically significant. The Log Market Value, Sarbanes Oxley Act and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.067	.004	-.001	15.3053810	1.197

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10342.992	51	202.804	.866	.740
	Residual	2299912.527	9818	234.255		
	Total	2310255.518	9869			

Coefficients

Model		Unstandardized Coefficients				Collinearity Statistics	
		B	Std. Error	t	Sig.	Tolerance	VIF
1	(Constant)	-.473	.576	-.821	.412		
	Log Sales	.296	.076	3.874	.000	.544	1.837
	Return on Assets	.030	.026	1.129	.259	.992	1.008
	Market to Book Ratio	.000	.002	.204	.838	.998	1.002
	Auditor	-.677	.464	-1.458	.145	.629	1.589
	Sarbanes Oxley Act	-.727	.322	-2.254	.024	.941	1.063

T3 Model 5 with Log Sales

Located on the next page are the tables showing the results with regards to the regression of the independent variables (Log Sales, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act, SOX*Auditor and the industry dummies) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.005), and is not statistically significant. The Log Market Value, Auditor, Sarbanes Oxley Act, SOX*Auditor interaction term and Sic 73 (industry dummy) variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.071	.005	.000	15.3020357	1.198

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11582.425	52	222.739	.951	.574[a]
	Residual	2298673.093	9817	234.152		
	Total	2310255.518	9869			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-.473	.576	-.821	.412		
	Log Sales	.296	.076	3.874	.000	.544	1.837
	Return on Assets	.030	.026	1.129	.259	.992	1.008
	Market to Book Ratio	.000	.002	.204	.838	.998	1.002
	Auditor	-.677	.464	-1.458	.145	.629	1.589
	Sarbanes Oxley Act	-.727	.322	-2.254	.024	.941	1.063

T3 Model 2 with Log Assets without Industry dummies

Below are the tables showing the results with regards to the regression of the independent variables (Log assets, Sarbanes Oxley Act, Return on Assets and the Market to Book ratio variable) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.006), but is statistically significant at a p=0.001 level. The Constant, The Log Assets, Sarbanes Oxley Act and the Return on Assets variables are each statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.076	.006	.005	19.2734903	.735

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21516.181	4	5379.045	14.481	.000
	Residual	3748106.355	10090	371.467		
	Total	3769622.536	10094			

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-2.375	.453	-5.239	.000		
	Log Assets	.492	.072	6.824	.000	.980	1.020
	Return on Assets	-.070	.021	-3.286	.001	.989	1.012
	Market to Book Ratio	.001	.002	.258	.796	1.000	1.000
	Sarbanes Oxley Act	-1.077	.391	-2.758	.006	.992	1.008

T3 Model 3 with Log Assets without Industry dummies

Below are the tables showing the results with regards to the regression of the independent variables (Log Assets, Return on Assets, Market to Book ratio, and the Auditor variable) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.002), and the model is statistically significant at a p=0.001 level. The Constant and Log Assets variable are the only statistically significant variables.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.044	.002	.002	15.0677415	1.258

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5020.743	4	1255.186	5.529	.000[a]
	Residual	2565062.155	11298	227.037		
	Total	2570082.898	11302			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-1.016	.340	-2.991	.003		
	Log Assets	.283	.066	4.306	.000	.646	1.547
	Return on Assets	.017	.016	1.051	.293	.988	1.012
	Market to Book Ratio	.000	.002	.264	.792	.999	1.001
	Auditor	-.683	.414	-1.649	.099	.652	1.533

T3 Model 4 with Log Assets without Industry dummies

Below are the tables showing the results with regards to the regression of the independent variables (Log Assets, Return on Assets, Market to Book ratio, Auditor, and the Sarbanes Oxley Act variable) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.003), and the model is statistically significant at a p=0.001 level. The Log Assets, Auditor, and Sarbanes Oxley Act are statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.053	.003	.002	15.9552876	1.257

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7132.925	5	1426.585	5.604	.000[a]
	Residual	2562004.567	10064	254.571		
	Total	2569137.492	10069			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-.817	.405	-2.020	.043		
	Log Assets	.356	.075	4.736	.000	.623	1.605
	Return on Assets	.016	.018	.874	.382	.988	1.012
	Market to Book Ratio	.000	.002	.165	.869	1.000	1.000
	Auditor	-1.021	.474	-2.151	.031	.625	1.601
	Sarbanes Oxley Act	-.836	.332	-2.520	.012	.945	1.058

T3 Model 5 with Log Assets without Industry dummies

Below are the tables showing the results with regards to the regression of the independent variables (Log Assets, Return on Assets, Market to Book ratio, Auditor, Sarbanes Oxley Act, and the SOX*Auditor interaction term) on the independent variable, the non-discretionary accruals. The model is weak (R^2 is 0.003), and the model is statistically significant at a p=0.001 level. The Log Assets, Auditor, Sarbanes Oxley Act variable, and the SOX*Auditor interaction term) are statistically significant.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.058	.003	.003	15.9510093	1.257

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8761.139	6	1460.190	5.739	.000[a]
	Residual	2560376.353	10063	254.435		
	Total	2569137.492	10069			

Coefficients

Model		Unstandardized Coefficients B	Std. Error	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)	-.041	.508	-.081	.936		
	Log Assets	.349	.075	4.636	.000	.622	1.607
	Return on Assets	.017	.018	.936	.349	.988	1.012
	Market to Book Ratio	.000	.002	.103	.918	.999	1.001
	Auditor	-1.932	.596	-3.244	.001	.396	2.524

Sarbanes Oxley Act	-2.275	.658	-3.455	.001	.240	4.171
Sox * Auditor	1.913	.756	2.530	.011	.213	4.695

T6 Pre-Sarbanes Oxley Act versus Post- Sarbanes Oxley Act

Below are the results with respect to the regression test of model 3 while splitting the file in a Pre-SOX (1996 to 2001) and Post-SOX segment (2003 to 2006). Note that the year 2002 is excluded since this year might distort the results by way of a noise effect (year of the collapse of Arthur Andersen and ratification of the SOX act). The highlights are that the mean of the nondiscretionary accruals shifted from positive to negative. Furthermore the relationship between the auditor and the non-discretionary accruals shifted. In the Pre-SOX period this relationship was statistically insignificant and in the Post-SOX period this relationship is significant at a significance level of p=0.01. The negative relationship between the auditor and non-discretionary accruals has also become stronger (the coefficient decreased from -.325 to -2.725).

Pre-SOX:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.048[a]	.002	.002	6.5498275	1.921

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	572.550	4	143.137	3.337	.010[a]
	Residual	251738.613	5868	42.900		
	Total	252311.163	5872			

Coefficients

Model		B	Std. Error	t	Sig.	Tolerance	VIF
		Unstandardized Coefficients				Collinearity Statistics	
1	(Constant)	.921	.216	4.262	.000		
	Log Assets	-.084	.039	-2.135	.033	.690	1.449
	Return on Assets	-.002	.007	-.263	.793	.988	1.012
	Market to Book Ratio	.000	.001	-.350	.726	.998	1.002
	Auditor	-.325	.260	-1.248	.212	.696	1.437

Post-SOX:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.112	.013	.012	23.3576213

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29020.850	4	7255.212	13.298	.000
	Residual	2287064.950	4192	545.578		
	Total	2316085.800	4196			

Coefficients

Model		B	Std. Error	t	Sig.	Tolerance	VIF
		Unstandardized Coefficients				Collinearity Statistics	
1	(Constant)	-3.787	.852	-4.446	.000		
	Log Assets	.951	.179	5.314	.000	.540	1.853

Return on Assets	.433	.115	3.780	.000	.964	1.038
M/B Ratio	.000	.004	-.037	.970	.998	1.002
Auditor	-2.725	1.063	-2.565	.010	.553	1.810