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**Economic consequences: The effectiveness of the Sarbanes Oxley Act 2002 regarding the occurrence of fraud scenarios”.**

**Master Thesis**



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# Abstract

The financial scandals of Enron, WorldCom and some other large companies in the beginning of this century, encouraged Congress to introduce the Sarbanes Oxley Act (SOX) 2002 in order to fight the escalating commitment of financial statement fraud. The main objective of this legislation was to recover the investors’ trust in the American stock market, and enhancing the prevention and detection of corporate fraud. In this thesis I will be analyzing the effectiveness of SOX 2002 in preventing financial statement fraud, performing an empirical research based on restatement data from 1997 till 2006, corporate governance characteristics and effective internal control systems. The restatements data are originally from the GAO database, corporate governance characteristics were collected from the Risk Metrics database and internal controls information were obtained from the Audit analytics database. To perform this study a **logistic regression model** was used to examine whether the implementation of SOX have prevent fraudulent reporting through effective internal controls systems and some corporate governance components.

Finally, the results of the study showed that SOX has not been able to prevent or reduce the likelihood of financial statement fraud. The main changes in corporate governance characteristics, board structure and audit committee composition, did not show to have any influence on the probability of fraud scenarios after SOX’s implementation. However, the effectiveness of internal controls- a compliance requirement implemented by SOX- appeared to have a very significant impact on the prevention of corporate fraud. This means that some reforms are still needed on the level of corporate governance and other segments of SOX, in order to have a more efficient result from this law.

**Keywords: Fraud, SOX, Corporate Governance and Internal Controls**

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# 1. Introduction

Since the last 20 years the global economy has been facing a dramatic flow of accounting scandals committed by CEOs and managers of prestigious entities known all around the world. One of the most notorious fraud cases in the last decade was that of Enron where debts were hidden, revenues were inflated and the presence of corruption was uncovered. Other similar cases that also battered the accounting world were those of Adelphia Communications and Global, WorldCom, Parmalat, AIG and Tyco International. Most of these scandals took place during the latter years of the previous century and in the beginning of 2000. These actions obviously triggered a high level of uncertainty regarding the accuracy and reliability of financial statements by investors, creditors and other agents. Moreover, this also contributed to less confidence in the audit profession since one of the most well-known auditing and assurance firms, Arthur Andersen LLP, was involved in the Enron case. Consequently, this has put a lot of pressure and stress on the audit profession, because the whole world has dumped all the responsibility of the accurateness and completeness of financial statements on the auditors.

In order to combat and stop the harmful consequences caused by these fraudulent actions, the 26th chairman of the Securities and Exchange Commission (SEC), Harvey Pit, implemented the Act (SOX) in 2002 to restructure the lost confidence of the public in the accounting profession. As a supportive organ the quasi-public agency, Public Company Accounting Oversight Board (PCOAB), was created to regulate, observe, analyze and discipline the accounting firms in their duty as Certified Public Accountants. The requirements of this act contain regulations that enforce the structure of corporate governance, provide assessment of internal controls, emphasize the importance of the auditor’s independency, and aim for an enhanced disclosure of financial statements. As a reaction on fraudulent financial reporting, the senator Paul Sarbanes came up with the SOX act especially to prevent and detect intentional financial misstatements and reporting errors.

In 2002, the implementation of SOX seemed to give the accounting profession and the financial market hope to solve the fraud epidemic that was consuming and hitting the global economy. However, the costs of implementing the required information system by SOX was extremely high which made it extremely difficult, especially for small public firms, to introduce this legislation into all public companies. Several of these firms chose to go private in order to escape these high costs, since the benefits were totally unknown. According to the Financial Executives International survey, the amount of the initial compliance costs exceeded the amount of approximately four millions dollars for large companies. Nevertheless, these costs have decreased over time as companies gain more experience working with the implemented systems.

It has been already eleven years ago that SOX was introduced as an obligatory legislation which all publicly trading companies had to comply with. It was a tough struggle for many companies to fully comply with the comprehensive and costly requirements of this legislation. The main question now is whether the implementation of SOX has been effective after all these years and whether it achieved its goal of preventing financial statement fraud.

According to Patrick Taylor, CEO of the Oversight System, fraud has become more prevalent nowadays compared to 2002. He based his statement on surveys carried out by Oversight System in 2005 and 2007, where 76% of the respondents indicated that fraud was more widespread over the preceding five years. This includes the stock market bubble of 2000 and the scandals of 2002 (Oversight Systems, 2007). Moreover, only a minimum of 3% opinioned that fraud has diminished with the introduction of SOX, whilst 21% believe that the number of fraud events has not changed over these past years. On the other hand, there are some advocates of SOX that argue its implementation has improved and enhanced the quality and reliability of financial reporting, herein diminishing the amounts of fraud scenarios, because of the preventive controls established by SOX. The dramatic failures of Lehman Brothers in 2008 and Royal Ahold NV in 2010, made it apparent that the introduction of SOX may not have been useful after all. As a result of all these contradictory statements, this paper will performed a detailed analysis whether SOX has been able to accomplish its goal of preventing fraudulent financial reporting. The research question that will be leading this study is as follows, *“Did the Sarbanes Oxley Act accomplish its goal of reducing fraudulent reporting of financial statements after its implementation in 2002?”*

In order to answer this question we first start by analyzing several relevant publications relating to the effects of SOX in relation to fraud scenarios in the financial market. We provide the reader with sufficient relevant background information relating to the implications of SOX, by comparing different studies and different arguments. After this, we introduce some econometric estimation we use to analyse the impact of SOX. We discuss our results, as well as comparing our results with prior research. Any limitations encountered throughout our analysis will also be highlighted for future research. Finally, we also provide any concluding remarks in our last section.

## 1.1 Relevance and contribution of the topic

Considering that the implementation of SOX has been very costly and time-consuming, it is of great importance for all the participating members to know whether SOX has been effective in preventing restatements and irregularities that could lead to a materially misstated financial report. We try to study whether the SEC was powerful enough to regulate the accounting practice efficiently through the implementation of SOX, and if it was the adequate control measure to combat corporate fraud.

Principally investors, whom the act was introduced to benefit, are very curious to know whether the quality of financial reporting has improved after SOX’s enactment. Since they make their investment decisions based on the information revealed in financial statement, this is important information for this group. Taking into account that not only investors use financial reports as basis for their financial decisions, it illustrates that also creditors, lenders and other financial institutions may be interested in the results of this study. Knowing whether this legislation has been efficient or not will show all of these users, as well as regulators and standard setters, whether there are some significant gaps in the accounting system that should be altered or adjusted. Especially for regulators and standard setters it may be important to know whether SOX has been effective, so they can evaluate if it is worth it to maintain the regulation ongoing, if it should be abolished, or if it merely needs some stringent amendments. Our results also impact the perception of auditors on SOX, which have also experienced a lot of tightening rules regarding the performance of the audit process and related factors that could affect the reliability of their duties. Consequently, this made the audit profession much more expensive, intensive and stressful.

Until now, several researches have been done on the effectiveness of the several other segments of SOX and its impact on financial markets. However, there was only one researcher in 2006, named Debra L. De Vay, who analyzed the effectiveness of the Sarbanes Oxley Act 2002 in preventing and detecting fraud in financial statements. In order to perform her extensive research she followed a quantitative and a qualitative research method. To test the effectiveness of SOX, she used reports from the Corporate Fraud Task Force, reports of Administrative Proceedings that were available on the SEC website and other published statistics. Moreover, she also compared the restatements that were publically registered in the period pre and post SOX. She argued that many experts thought the costs related to the compliancy with SOX exceeded the benefits of a reliable accounting system. Moreover, her argues that SOX had not been effective in preventing and detecting financial statement fraud, regardless its qualitative measures and implications.

After eleven years from SOX’s implementation, not many researchers have addressed the impact of the implementation of SOX and its effectiveness regarding fraudulent financial reporting. The main reason for this was the difficulty to get data of registered fraudulent firms, and the complexity to data representing the period before SOX for all the acquainted variables. During the years the majority of companies have accustomed to the implications and procedures of SOX, while the costs of implementing the required systems have also decreased drastically. On the other hand, different fraud cases have been published in recent years, which make SOX’s effectiveness questionable. Therefore, considering the fact of data availability and the need for empirical research to test whether SOX’s changes in corporate governance and internal controls procedures have been effective to lower fraud events was the main reason we perform this specific inquiry using a time period from 1997 till 2006.

Moreover, as already mentioned, our study contributes to the literature since there has been virtually no study analyzing the effect of SOX on fraud events, due to changes implemented for corporate governance and internal controls. This analysis will be useful to show if SOX is giving the expected results to community or if it needs to be amended.

# 2. Fraudulent Financial statements

## 2.1Introduction

In this chapter we illustrate the perception of fraudulent financial statement and some academic definitions of this term. Only the most relevant aspects of fraud for this study will be addressed in this section. In the second paragraph we distinguish between two commonly known types of financial statement fraud. Next, in the third paragraph, an explanation of the incentives and motives to commit fraud will be provided in order to get a better understanding of this harmful habit.

## 2.2 The Implications of Fraud

We start by first elaborating on the meaning of fraud in this section in order to get a clear idea of the term fraud. Taking into account that fraud can be interpreted in different ways in the corporate world, it is important to clarify on which of these definitions this study is based. According to the ACFE ([Association of Certified Fraud Examiners](http://www.acfe.com/)), there are three particular methods used to perpetrate occupational fraud. The first one can be identified as “asset misappropriation such as false invoicing, payroll fraud and skimming”. The second one is “corruption, such as receiving or offering bribes, or extorting funds third parties” and the last category of fraud can be seen as financial statement fraud, which refers to “cooking the books by reporting fictitious revenues or concealing expenses or liabilities” (Amper, Politziner & Mattia LLP, 2009).

Moreover, we also have the SAS (Statement on Auditing Standards) No. 99 which describes fraud as a broad concept that depicts the intentional deception of financial statement users, with the intention to deprive them from their possessions. SAS No. 99 is known as an auditing statement established by the Auditing Standard Board of the AICPA (American Institute of Certified Public Accountants), which was published in 2002 as a replacement for SAS No. 82. This new statement was emitted, like SOX, as a response on all the notorious fraud cases that took place in the beginning of 2000. This standard is still one of the most rigorous laws for the audit profession, which thoroughly describes what is considered as financial statement fraud. SAS No. 99 makes a distinction between two types of fraud, namely misappropriation of assets and fraudulent financial reporting. A large scale of fraud cases can be placed by fraudulent financial reporting, where management has the tendency to overstate revenues in order to meet the investors’ expectations. Furthermore, there are also some cases where management chooses to understate rather than overstate the figures in order to reduce income taxes or to create a reserve (cookie jar reserves) as compensation for future earnings. Due to the reform and issuance of this law in the same period as the implementation of SOX 2002, it is notable that most of the references of fraudulent reporting mentioned by SOX 2002 were based on SAS No. 99. Hence, considering the description of fraud by this standard as the most prevalent and accurate one on the accounting field, is used as the basis for this study.

As suggested by several researchers, the underlying practice behind these fraud techniques is earnings management. One well-known researcher defined earnings management as follows: "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**" (**Healy and Wahlen, 1999). The majority of companies use accrual accounting to manage their earnings in the desired direction. So, the authentic practice of earnings management is legal and should not be related to fraudulent financial reporting. However, most malicious management takes advantage from this practice to carry out their pervasive actions to create an illusion that a firm is more prosperous and healthier than it is in fact (James A. Hall, 2010).

On the other hand, we also mentioned the misappropriation of assets as one of the common fraud techniques identified by SAS No. 99, where members of a firm have the tendency to smuggle the entity’s assets. Within this category you may also think of billing schemes (creating fictional companies and charging the employers for nonexistent work), skimming (when employees accept a payment by a costumer but do not report the sale), tampering and the submission of fraudulent expense reports (Amper, Politziner & Mattia LLP, 2009). The magnitude of fraud perpetrated in this case, most of the times, does not have a material effect on the financial statement. Like the ACFE report of 2010 presented, contrary to financial statement fraud, fraud caused by misappropriation of assets is more prevailing but counts only an average loss of 150,000 dollars according to the results of their investigation. Nevertheless, misappropriation of assets will always remain a point of attention for management since these small thefts can easily turn into stunning numbers of losses that may cause a material misstatement in the financial statement. This type of fraud is typically more common under lower levels of an organization’s hierarchy. However, there have been some notified cases where top management was implicated in the robbery of firm’s assets, but these are unusual events.

As already illustrated above, fraud regarding inappropriate revenue recognition is the most common fraud technique used by CEO’s to falsify financial statements. Looking back to the Enron case and some other big accounting scandals provides a perfect example of deceptive financial reporting where the company’s earnings were misrepresented and the balance sheet was modified in order to depict a positive financial performance (Healy & Palepu, 2003). According to the researchers Mack (2002) and Bratton (2002), who investigated the Enron case, the reporting method of Enron was not transparent enough and therefore it did not illustrate the company’s finances and operations explicitly. Furthermore, another publications of James Bodurtha emphasized that since 1997 until its failure, Enron’s primary motives for “accounting and financial transactions seem to have been to keep reported income and reported cash flow up, asset value inflated and liabilities off the books” (Bodurtha, 2003).

On the other hand we also look at WorldCom, which used fraudulent accounting methods to cover its decreasing returns by giving a fictitious picture of its financial growth and profitability to overstep its stock price (Beresford, 2003). So, in this particular case fraud was perpetrated due to underreported ‘line costs’ that were capitalized on the balance sheet rather than being expensed adequately. Thereby, WorldCom also inflated its revenues with artificial accounting entries from “corporate unallocated revenue accounts” (Beresford, 2003). WorldCom was accountable for inflating its assets with an amount of 11 billion dollars at the end of 2003, which made it one of the biggest accounting scandals in the American history.

## 2.3 Motives to commit Fraud

The underlying reason for people to commit fraud varies among each individual situation. A lot of studies have been completed to illustrate what are the incentives that trigger people to perpetrate fraud. One of the first researchers which created an identifiable scheme of possible risk factors was Cressey (1950). The results of this study were based on some interviews performed with individuals who had been convicted of embezzlement (Skousen C. J. Wright C.J., 2006). The outcomes established that there are three factors that could lead someone to effectuate fraud. Bringing these factors together formed the well-known fraud triangle which is globally used as a basis to assess fraudulent behaviour.

The first factor of the fraud triangle represented the incentives or pressures that management or employees have to commit fraud. Secondly, the circumstances that provide the opportunity for people to perpetrate fraud were indicated, and finally the schema denoted individuals who possess a character, attitude or a set of ethical values that permit them to rationalize the commitment of fraud (Cressey, 1950). As in the case of Enron and Ahold the pressure to meet the public’s expectation brought the executives to manipulate their financial statements. In the case of Enron the former president, Jeffrey Skilling, focused too much on meeting Wall Street’s expectations and boosted therefore the usage of mark-to-market accounting and he also put a lot of pressures on Enron’s executives to come up with new ideas that would cover up Enron’s large scale of debts (McLean & Elkind, 2003). Looking at the events at Ahold, it was publically announced that management intentionally booked higher promotional allowances to portray higher earnings in order to receive extra bonuses (.Knapp & McLaughlin, 2007). After announcing an estimated growth of 15 % over the sales of 2001, management had to achieve this target and meet the shareholders’ and investors’ expectations. Again it is notable that pressure to meet the public’s expectation pushed these executives to manipulate the figures and commit fraud. Another factor which triggered management to falsify the numbers was the opportunity to commit fraud to satisfy their own interest. Recalling that the executives cooked the books in order to get extra bonuses, illustrates their selfish interest to increase their income and that they had no obstacles limiting them to manipulate the earnings.

Considering these risks factors mentioned by Cressey, helped a lot of researchers and regulators of the accounting practice to come up with strategies and preventive measures to fight against fraudulent financial reporting. However, after all these years we have seen that financial statement fraud is still prevailing and it has harmed the financial market and the related investors dramatically. Evident examples are those of the above mentioned International food retailer, Ahold, and the American financial services firm Lehman Brothers. Therefore, in 2008, Tumpal Sitorus and Don Scott performed an extensive analysis regarding fraud risk factors in order to uncover new risk factors that regulators should take into consideration, so they can take the appropriate actions. Since there have been huge technological, social and environmental changes since 1950, Cressey’s model has become less representative nowadays and raises the need for further research on this field.

Sitorus and Scott’s study was based under consideration of the PCAOB (Public Company Accounting Oversight Board) for possible inclusion in the report in 2009. In their paper the PCAOB Standing Advisory Group Meeting (2004) posed the following two research questions:

1. “Were the examples of fraud risk factors provided by the auditing standards of value to the independent auditor?”

2. “Were there other significant fraud risk factors?” (Sitorus & Scott, 2009)

During their research, Sitorus and Scott found that collusion, justice avoidance, and organizational orientation vis-a-vis fraud are also actual fraud risk factors that are threatening the financial market (Sitorus & Scott, 2008). The outcome of this study is of great relevance for the accounting practice since it was based on an actual problem published by the PCOAB. These new fraud risk factors should be considered by standard setters and regulators to close possible present gaps in the financial market which give access to fraudulent actions. It is obvious that a lot of research has to be extended on this field in order to come up with new measures that will prevent or mitigate fraudulent actions. Identifying whether SOX has been effective may give an indication if these fraud risk factors were already covered by SOX’s legislations and procedures, or whether some amendments should be introduced. To be clear, this study is not going to examine the fraud risk factors in this thesis but the relevance of the mentioned risk factors lies in the fact that discovering whether there is less fraud than before SOX also indicates that SOX eliminated some fraud risk factors with its requirements.

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## 2.4 Earnings Restatements

In order to measure and define fraud, we will use financial statement restatements as one of the determinant to perform our study. This decision is based on some prior researches which have used restatements as the best predictive proxy for fraud. These researchers also made a distinction between errors (unintentional) and irregularities (intentional) to indicate the presence of financial statement fraud (Karen Hennes et al., 2006). Several researches have proven that irregularities are a strong indicator for fraudulent events. Since both are instigated by malicious intentional actions, we consider it one of the best ways to measure fraud. For this reason, it is important to define the substance of financial statement restatements and establish its direct link with corporate fraud. Firstly, The Financial Accounting Standard (FAS) statement section 154 paragraph 2j describes *restatements* as:

“The process of revising previously issued financial statements to reflect the correction of an error in those financial statements” (Lamount & Skalak, 2007). Moreover, FAS section 154 paragraph 2h elaborates on the further description of *an error* defining it as “An error in recognition, measurement, presentation, or disclosure in financial statements resulting from mathematical mistakes, mistakes in the application of GAAP, or oversight or misuse of facts that existed at the time the financial statements were prepared” (Lamount & Skalak, 2007). The term error also means the fact of changing a commonly accepted accounting principle for one that is not generally accepted. On the other hand we also have the Statement on Auditing Standards (SAS) No. 99 which makes a distinction between misstatements caused by an error and misstatements that resulted from fraud. Both of them can be categorized as material or immaterial. SAS No. 99 defines fraud “as an intentional act that results in a material misstatement in financial statements”, while an error is considered as “an unintentional misstatement of the financial statement”, (Randal J. Elder et al, 2010).

When an error is discovered, it is mandatory to restate the financial statement if the error is categorized as material. Furthermore, general accounting rules demand financial statements to be restated if a material misstatements is identified due to error or fraud (Amper, Politziner & Mattia LLP, 2009). Establishing whether an error is material or not, is of crucial importance in determining if a restatement should be done or not. The Financial Accounting Standard Board (FASB) No.2 defines materiality as follows “The magnitude of an omission or misstatement of accounting information that, in the light of surrounding circumstances, makes it probable that judgment of a reasonable person relying on the information would have been changed or influenced by the omission or misstatement”. Recalling the two categories of fraud mentioned by SAS No. 99, it is known that both types, financial reporting fraud and misappropriation of assets, are very harmful for the financial statement users. However, the difference between these two is that financial reporting fraud harms the users by giving them erroneous information for their decision making, while misappropriation of assets harms the stockholders, creditors and other third parties because the assets are no longer assessable to their owners (Randal J. Elder et al, 2010). The responsibility of establishing the materiality of a misstatement lies by the auditors according to auditing standards (AU 312). This decision is based on a preliminary judgment of the auditor, determining the maximum amount by which the statement could be misstated without affecting the decisions of the related users (Randal J. Elder et al, 2010). So, materiality is rather a relative than an absolute concept where a certain amount of misstatement can be considered as material for a small firm, while this same amount is not material for a large company.

For this study, we base the amount of fraud cases on the registered amount of restatements (irregularities) obtained from the GAO database. The occurrence of financial statement restatements is considered to be necessary when a *material* error or fraud is identified in the financial statement, which can influence the decision of the related users. This means that in this study we consider that restatements could had taken place as consequence of fraudulent financial reporting or misappropriation of assets.

## 2.5 Summary

This section mentioned the different interpretations of fraud in the financial market field in order to determine which the best definition to apply throughout this study. We used the definitions stipulated by the ACFE ([Association of Certified Fraud Examiners](http://www.acfe.com/)) and the SAS (Statement on Auditing Standards) in order to get the best suitable definition. Since SOX’s reforms and regulations originated basically from SAS No. 99, we elected to use SAS’s interpretation of fraud as basis for this research. According to SAS two types of fraud were identified, namely fraudulent reporting and misappropriation of assets. Additionally, we also mentioned that one of the most important characteristics of financial statement fraud was that it is an intentional act with the objective to deceit the users of the financial report.

Several motives behind the perpetuation of fraud were mentioned in this chapter. Based on the Fraud Triangle (Cressey, 1950), three factors were identified which can instigate someone to commit fraud. These are 1) the pressure to commit fraud, 2) the opportunity to perpetrate fraud and 3) the rationalization to effectuate fraud. Furthermore this section also elaborated on more recent researches regarding fraud risk factors in order to illustrate the gaps that standard setters and regulators should work on to combat fraudulent financial reporting. The most recent research performed on this field can be attributed to Sitorus and Scott, where they found that collusion, justice avoidance, and organizational orientation vis-a-vis fraud are also actual fraud risk factors that are threatening the financial market nowadays (Sitorus & Scott, 2008). Based on prior literature it was illustrated that restatements – irregularities, performed intentionally- are the best proxy to measure fraud. Many researches showed that restatements caused by irregularities were a strong indicator for fraudulent reporting. Therefore I will use irregularities in order to measure fraud.

# 3. The implementation of the Sarbanes Oxley Act

## 3.1 Introduction

This chapter contains the introduction of SOX 2002 and the main purpose of its implementation. Furthermore, we also discuss the procedures and regulations enforced by SOX and address the effects and ultimate results of their effectiveness. In the first paragraph some former regulatory bodies and legislations which were present prior to SOX in order to depict the progress and differences that SOX has bring for the financial market and its participants. Moreover the second paragraph denote the implications of SOX and mention the most known and important sections of the legislation. Finally the last paragraph of this section treats several publications which have already explored and examine the efficacy of SOX 2002.

## 3.2 Prior to The Sarbanes Oxley Act

The accounting profession was primarily built to give the public and users of financial statements the certainty that they could make their decisions undoubtedly based on the information published in financial reports. From decades it has been so that auditors are considered the main responsible parties for the accurateness and completeness of financial statements. On the other hand, fraud is also a living phenomenon which has always threatened the financial market and its participants, putting a lot of pressures and responsibility on auditors. Due to the need of reforms and improvements on the auditing field, the American Institute of Certified Public Accountants (AICPA) requested the composition of a new commission that would enforce and come up with suggestions that would enhance the audit profession. Consequently, the Cohen Commission was established in November 1974 with the intention to examine the entire audit model and make some relevant conclusions and recommendations that would emphasize the auditor’s responsibilities and independent positions during the auditing process (AICPA, 1977). Another reason for the AICPA to create this commission was any possible gaps between the supplied auditing services and the public’s expectations. After an extensive research based on interviews with auditors, managers and other parties involved in the audit process, the commission made a report where it expressed its findings and alternatives that would improve the audit process. One of the points mentioned by the commission was the importance for auditors to be totally independent from their clients. Furthermore, the results showed that the users of financial statements trusted that auditors would be alert with the probability of fraud or illegal acts performed by management, and that auditors would supervise management’s performance to improve the level and quality of financial statements. So, the research illustrated that according to the public, auditors were not fulfilling these expectations. Additionally, it was declared by the commission that management was the one responsible for the completeness and accurateness of financial statements and auditor were only accountable for the opinion issued on the audited information. For this reason, it was demanded that auditors should require management to have a valid argument when using a specific accounting principle or when they decided to not apply a certain rule.

Another important observation made was that according to their results a large proportion of financial statement users were of opinion that the most important aim of an auditor is the detection of financial statement fraud. Originally, this was not the prime objective stipulated by standard setters, but since the amounts of fraud scenarios had escalated enormously, integrands of the commission decided to reform the stipulated auditors’ responsibilities. During the years it had been clearer for regulators and other experts that there are some limitations that impede auditors to fully assure no fraud was going on in a company. Nevertheless, it was already evident for the commission since that time that regardless all existing limitations, it was necessary to compose the audit process in such a way to give reasonable assurance that the financial statement is free form material misstatements (AICPA, 1977). This means that auditors have the responsibility to search for fraud, and are expected to “detect those frauds that the exercise of professional skill and care would normally uncover” (AICPA, 1977). It is also expected that auditors should be able to uncover any questionable or illegal action caused by management by being professional and showing due care during the audit.

Besides, at that time the commission also addressed the importance for the auditor to state its announcements explicitly in the report, and emphasized the importance for auditors to avoid any action that could threaten their independent relationship with the client. Contrary to SOX, the commission did not see the need of introducing another regulatory body or oversight board individually from the AICPA to prepare auditing standards. The committee members were of opinion that this could lead to organizational and economic problems for the accounting profession. Finally, the AICPA noticed that the expectations of the financial statement users were beyond the actual requirements of the audit profession and accentuated the need for regulatory amendments to minimize this gap. Another issue was the fact that standard setters had to keep ahead with changes in the American financial market and adjust the accounting profession to avoid gaps that could endanger the reliability of financial statements (AICPA, 1977).

One of the first renowned regulatory bodies in the accounting field which was established to identify factors leading to fraudulent financial reporting, was the Treadway Commission. As an independent committee, the Treadway Commission had as goal “to identify causal factors that could lead to fraudulent financial reporting and steps to reduce its incidence.” (Leech T.J., 2003). The commission was created in 1985 and it was supported by the AICPA (American Institute of Certified Public Accountants), the AAA ( American Accounting Association), the FEI (Financial executives Institute), the IIA (Institute of Internal Auditors) and the NAA (National Association of Accountants). The committee published a report in October 1987, where it proposed top management of public companies to first identify, understand and assess the factors that may result in a fraudulently misstated financial statement in order to discharge their obligations to manage the financial reporting procedures (Leech T.J., 2003). Examining numerous of research studies from consulting experts –like the AICPA, SEC’s chairman, the ASB and the Public Oversight Board- and investigating case studies associated with fraudulent financial reporting helped the Treadway Commission to come up with significant recommendations and conclusions.

One of the points of awareness mentioned by the National Commission on Fraudulent Financial Reporting was that no firm, regardless their size or trading environment, is insusceptible from the possible occurrence of fraudulent financial reporting. Furthermore, the commission also stated that a lot of improvements had to be made on the field of fraudulent financial reporting and that due to the complexity of the problem, no one specific solution exists. Like SOX, the Treadway Commission also advised a reorganization of existing accounting regulations at that time, and emphasized the need for an oversight and review board approved by the SEC. However, due to a lot of counteractions from different related parties, these suggestions were not implemented. Subsequently, the five professional above mentioned bodies which supported the Treadway Commission decided to consider the proposed suggestions by the commission, and they created the well-known control framework named COSO (Committee of Sponsoring Organizations Internal). The COSO was developed with the intention to assist public companies, advisors, auditors and regulators in understanding the importance and utility of an effective control framework. Bottom of Form

After a lot of work and reforms, it was possible to release COSO in September 1992. Due to the prevailing necessity of anti-fraud measures, COSO also performed additional research on the study made by the Treadway Commission. Their study, “Fraudulent Financial Reporting; An Analysis of U.S. Public Companies”, was based on enforcement cases against public firms inspected by the SEC from 1987 till 1997. In order to perform this analysis, the commission based its research on Accounting and Auditing Enforcement Releases which were related to alleged violations of Rules 10(b)-5 and 17(a) of the Security Exchange Act of 1934 and 1933. The results showed that approximately 55% of fraudulent audited reports were provided of an unqualified opinion, while the majority of the remaining reports were considered very dubious concerning the going concern principle (COSO, 1999). Furthermore, COSO also suggested that auditors should review interim financial reports and perform continuous auditing in order to understand and detect fraud in a better way. The researchers who performed this study also stated that it is of great importance for auditors to be more critical and look beyond the information and numbers in the financial statement in order recognize and understand specific risks related to a client’s internal control, industry and management’s motives concerning aggressive reporting (COSO, 1999).

In 1998, increased responsibility and accountability of the audit profession regarding the accurateness of financial statements, SEC’s chairman ordered the Public Oversight Board (POB) to create a Panel that would analyze the existing audit model to determine its effectiveness and see whether some adjustments were needed to increase the audit quality. As demanded by the SEC, the POB composed a Panel named O’Malley which performed an extensive investigation on the independency of auditors during the audit process and on other significant fields of the audit profession. According to the Panel, completing this research would reveal the weaknesses and gaps of the audit profession that needed to be amended in order to enhance the quality and confidence in this profession. Moreover, they also were of opinion that their findings would increase the reliability and credibility of financial reports due to more effective audits, enhance investors’ confidence in the audit profession and increase the efficiency of capital markets. The report was released in 2000 and there were several suggestions raised by the Panel’s members to improve the whole auditing process. Based on the results, the Panel emphasized the importance of the audit profession and the quality of provided services to clients when it comes to giving a reasonable assurance on the accurateness of the financial statement. Hence, in the report they suggested primarily that auditors must complete some “forensic-type” actions during the audit to increase the probability of detecting fraudulent financial reporting (POB, 2000). Furthermore the Panel indicated that the quality and auditing control standards should be adjusted in a more definitive and specific way by the Auditing Standard Board and that audit firms should focus on the provision of high-quality audits to their clients. It was also proposed by the Panel that AICPS, POB, SEC and SECPS (SEC Practice Section) should settle on “a unified system of governance” for the auditing profession, resulting in a more independent and stringent Public Oversight Board that would control standard setting, professional discipline, special reviews and constant monitoring (POB,2000). Additionally, SECPS was recommended to reinforce its disciplinary practice, while audit committees were asked to pre-approve non-audit services that surpass the pre-established audit fee, and the IFA got the responsibility of creating a self-regulatory system that would be applicable for the international auditing profession. The success of putting these recommendations into practice needs the support, effort and collaboration of the audit profession, several oversight and regulatory bodies and the SEC. Thanks to the Panel, that desirable changes had been stimulated and that several firms and bodies have taken and considered the recommendations raised by the commission.

## 3.3 Implementing the Sarbanes Oxley Act 2002

The well-known Sarbanes Oxley Act was introduced by Congress on July 30 of 2002, as consequence of a large scale of accounting and corporate scandals in the beginning of the 21st century. The Act is a federal law of the United States enacted to enhance regulations for all United States’ public firm boards, public accounting firms and management, but the act is not applicable to privately held firms. The ones who established the act were U.S. Senator [Paul Sarbanes](http://en.wikipedia.org/wiki/Paul_Sarbanes) and U.S. Representative [Michael G. Oxley](http://en.wikipedia.org/wiki/Michael_G._Oxley). Furthermore, the act consists of 11 sections that focus on the structure of organizational corporate governance, internal controls, audit independency, criminal penalties and it also imposed the SEC ([Securities and Exchange Commission](http://en.wikipedia.org/wiki/United_States_Securities_and_Exchange_Commission)) to implement guidelines on requirements in order to comply with the new legislation.

The founders of SOX also saw the importance of having an independent body that would be responsible to oversee, regulate, inspect and discipline accounting firms to assure that they were completing their roles as public auditors. Therefore, SOX created the PCAOB (Public company Accounting Oversight Board) which was responsible to effectuate those duties.

Regulators were aiming to reinforce professional responsibility and corporate accountability in order to recover investors’ confidence in financial reporting. Their initial purpose was to improve corporate governance, enhance the quality of financial reporting, promote the audit effectiveness, create the PCAOB (Public Company Accounting Oversight Board) to amend the audit profession, and increase civil and criminal liability for violations of Security Laws (Jain & Rezaee, 2004). SOX also addressed the professional accountability and conduct of those who compose, attest, audit, examine, and utilize financial information. Finally, the Act also assists public firms in identifying and monitoring conflicts of interest, providing them with the opportunity and incentives to become more alert and transparent in publishing financial information.

As already mentioned, SOX consists of 11 sections of which section 302, 401, 404, 409, 802 and 906 are considered to be the most important ones. Firstly we have section 302, which is listed under Title III of SOX and falls under “Corporate Responsibility for Financial Reports". This section requires that chief executive officers and chief financial officers certify in every annual or quarterly report, that the internal controls of the firm have been evaluated properly “as of a date within 90 days prior to the report”, and that the conclusions made regarding the effectiveness of the internal controls were fairly presented in the report (Sarbanes Oxley, 2006). Furthermore the section also emphasizes the officer’s responsibility for the accurateness and completeness of the information stated in the financial statement, and accentuates the officer’s obligation to implement effective internal control to assure that the financial statement information is free from material misstatements and therefore reliable. In addition, there is section 401 “(Enhanced Financial Disclosures)” which is part of Title IV of the act and pertains to “Disclosures in Periodic Reports”. This section denotes that management is responsible to publish a financial statement that is accurate and free from any false statement. These statements also contain every “material off-balance sheet liabilities, transactions or obligations”. On the other hand we have one of the most important and well-known sections, which is SOX section 404 “(Enhanced Financial Disclosures)”. Also SOX 404 can be found under Title IV and it pertains to “Management Assessment of Internal Controls”. Beside of being one of the most important parts of this legislation, SOX 404 is also notorious for being extremely expensive and causing financial difficulties for smaller and mid- size firms that did not have sufficient capacity to afford the costs of implementing adequate internal controls. Thus, section 404 requires all publicly held companies to establish internal controls and financial reporting procedures, and it demands the documentation, examination and maintenance of those procedures and controls to in order to assure their effectiveness. Next, section 409 “(Enhanced Financial Disclosures)”, “Real Time Issuer Disclosures”, demands management to immediately disclose all information concerned to material amendments in their operations or financial statement. It is also of great importance that the disclosed information can be understandable and easy to interpret for the users. Also, Section 809, “Criminal Penalties for Altering Documents” at the other hand is a totally new condition introduced by SOX. This section describes the imposition of stringent penalties and/or imprisonment up to 20 years if documents are changed, falsified or destructed intentionally to influence or preclude a legal enquiry. And finally, section 906 requires that every periodic report containing financial statements filed by the SEC must come with a written assertion of the company’s CEO and CFO. Due to the importance and relevance of the above mentioned sections, a brief description has been provided in order to illustrate the overall implications of SOX.

Fraudulent financial reporting has been an ongoing issue for regulators and standard setters for decades. Naturally, SOX was not the first legislation introduced by SEC to fight corporate fraud. However, it was obvious after the accounting scandals in the beginning of 2000 that the existing regulations and oversight bodies had to be amended and that some new rules should be enacted. In the following paragraph I will mention former regulatory bodies and legislations that were present prior to SOX in order to depict the progress and differences that SOX has bring for the financial market and its participants.

## 3.4 A Review of Prior Researches

The main goal of this thesis is to evaluate and determine SOX’s effectiveness for the whole accounting profession and the financial market. As was mentioned in the previous paragraph, several commissions introduced many regulatory solutions – similar to those proposed by SOX- to improve the audit process and the expectations related to this duty, however none accomplished the goal of eliminating financial statement fraud. During all these years many experts and regulators have been questioning the quality and efficacy of the legislation. It is also the question whether the enactment of this legislation will be enough to prevent fraud. Since the legislation was introduced rapidly as a reaction on the hilarious amounts of fraud scenarios, many professionals indicated that SOX was composed and enacted to fast causing a big impact on the audit profession and the overall financial market. Paul E. Kanjorski, a member of the House Financial Services Committee, addressed that it was not necessary to rush the legislation. Additionally another member of this committee expressed that from his point of view it was better to get the introduction of such a legislation right, instead of hurrying the whole process (House Financial services Committee, 2002). Besides, some Senate witnesses of the committee perceived that the legislation by itself would not be sufficient to eliminate fraud. Therefore, for that to be possible, all the participants of the law should compromise themselves to comply totally with the requirements established by this legislation and maintain an impeccable attitude towards their professional duties (Williams, 2002). Additionally, Ruder (2002) also gave its comment on the legislation saying that “the government and other regulatory bodies are not able to implement or legislate good morals into people, and that the efforts made to do so may hinder innovation”.

Millstein (2002) also argue that despite all the efforts done by standard setters and legislators, the ultimate choice left is to trust in people’s integrity. Off course, Sarbanes declared in one of his presentations that he was convinced of the fact that SOX 2002 would restore the accounting profession and put it back on the place it was in the past (Senate, 2002). At the other side Senator Bryon L. Dorgan declared that “we can change the law, but if we do not have a tough, no nonsense regulator, then it will not work” (Senate, 2002). One of the proponents of the Act, Senate Wellstone, declared that this was the best governmental oversight system ever and that he was proud to sustain this particular legislation (Senate, 2002). As well as the Act is, there will be always a group that will criticize the law instead of looking to the improvements that have been achieved on the accounting field. As I mentioned before, most of the raised critics on the Act have been on the costs related to SOX Section 404 (Management Assessment of Internal Controls). These costs were indeed extremely high, causing some compliancy limitations for smaller firms that did not have enough capital to finance the costs for implementing the required internal controls. Therefore, it was announced by Senator Richard Santorum that we should be worried about the consistency of small firms, because the regulations and rules stipulated by SOX are extremely expensive and heavy, and it may also weaken their financial position on the financial market (Senate, 2002-7). Other Senators like Dianne Feinstein, Orrin Hatch and Christopher Dodd expressed that SOX would not be the final solution for investor confidence and the complexities of fraud, but it could be seen as a critical reform of the accounting profession.

Besides, other researches and followers of the accounting field indicated that SOX would not be able to have a big effect on the commitment of fraud because no one is capable to legislate ethical behavior or ethics. Specifically when individuals act in a selfish way focusing and working in their own interests, it will remain a problem to influence their principles and ethical behavior (Miller, 2004). As a supportive comment on Miller’s expression, Kurlantzick (2003) agreed with the statement rose by Miller and added the fact that people legislate almost everything but they would not be able to “legislate morality”. Moreover, according to Brand’s paper (2004) there are still some prevailing obstacles for the prevention and detection of financial statement fraud like; “1) stock options, 2) auditors still viewing themselves as working for management and not for the shareholders, and 3) boards of directors still rubber stamping the desires of management”. According to some experts like Pellet (2003) and Berlau (2004), SOX has brought the most significant reform on financial reporting since the Act of SEC in 1934; however it is still evident that many firms are spending money to comply with Section 404 of the legislation while the benefits for the shareholders are very small and questionable. One year after the enactment of SOX it was already known that 63% of the American listed companies became private as a result of the high compliancy costs of SOX.

On the 30th of July 2003, one year after the enactment of SOX, many examinations were completed about its effectiveness. One important study in that period was the publication of Coates (2003). Coates performed his study with the intention to measure the impact that SOX had on the field of corporate ethics after that year. He used surveys in order to collect the required data about employee’s perception of ethical principles in companies from 2000 till 2003. According to his findings, managers had become more ethical at that time in comparison to 2000. He also emphasized that this change could be clarified by the higher amount of ethical programs that had been created in many firms and the fact that unprofessional conduct was also reported regularly, especially at the larger companies. Two years after the enactment of this legislation, The House Financial Services Committee, held a particular hearing where different witnesses who experienced the passage of SOX were interviewed. During this hearing, the enormous cost to comply with this legislation was the topic that got most of the attention of all the participants, and they were wondering whether the benefits exceeded the costs. Oxley declared at that time that the returns on the law were positive, however, there is no law that can eliminate the occurrence of fraud totally. Moreover, Oxley also expressed that maybe the firms that experienced SOX (especially Section 404) as an expensive standard, were not efficient enough in that specific area. Additionally, he enunciated that from surveys that were performed on the effect of SOX, most corporate directors opined that SOX had a positive influence on their firms and boards. At the other hand, Quiqley (2004) expressed that from his point of view a lot of advance has been made due to SOX. Especially the audit committees showed a great progress in their performance and their overall efficiency in this profession. According to the survey completed by Quigley (2004), the amount of annual meetings of the audit committee increased more than 50% after SOX. He also stated that SOX will be able to bring major changes in the corporate world, if we give it the chance to develop and reach its total potential. Also Hills (2004) suggested that SOX already had shown its valuable effect on corporate governance, mentioning the progress that has been observed from the audit committee and its responsibilities. Hills (2004) and some chief accounting officers of large companies also commented on the costs of complying with Section 404 of SOX, saying that the required compliancy with this section is well worth the hard work.

Three years after SOX, in 2005, a dissertation named “Economic Consequences of the Sarbanes-Oxley Act 2002” examined the market sensitivity on SOX’s enactment. This inquiry was performed by Zhang and his main purpose was to measure the variations of the market index during the passage of SOX. From his study he observed that “the cumulative abnormal return around all the significant rulemaking events related to SOX were significantly negative” (Zhang, 2005). Zhang concluded that investors consider SOX, especially Section 404, to be very expensive which makes it a negative factor for enterprises. In 2006 Agami completed a research where he tested the effect of the Act (SOX) on capital markets. The results of his study established that the stock prices of firms that have disclosed material weakness in internal controls dropped with 5 to10 percent (Jonas et al, 2006). As supporting material for Agami’s study, another research made by the Stanford Law School showed that firms that presented detailed disclosures about their material weaknesses had a significantly smaller decrease in their stock prices in comparison to firms that did not disclose these types of information (Agami, 2006).

Furthermore, a paper that was published in 2009 declared that till then different opinions were expressed about the effectiveness of SOX. The paper titled “The Sarbanes Oxley act of 2002: a five-year retrospective”, aimed to deliberate the usefulness and effectiveness of the reforms established by SOX to the accounting profession. The findings of this paper showed that after 5 years, distinct opinions exist about the outcomes and influence of the reforms on financial reporting, the accounting profession, capital markets and investors’ confidence (Steven P.T. & Gerasimos L., 2009). There were some analysts that opined that the reforms were helping to recover investor’s confidence in financial reporting while some others expressed the costs of complying with the Act (SOX) surpassed the benefits. Hence, after all these years it seems to be difficult to get a concrete answer and result that gives a clear conclusion as of whether SOX has been effective in fraud prevention and if the benefits outweighed the compliancy costs.

## 3.5 Compliance with SOX 404 and changes in Corporate Governance

As mentioned in paragraph 2.3, SOX was introduced to bring many changes in the corporate governance structure of the U.S financial market. One of the major changes that SOX incorporated through its legislation was the compliancy obligation with SOX Section 404. Taking into account that the major impact that SOX has caused on the financial market was due to the compliancy requirements of internal controls and some elements of corporate governance, I will focus and deliberate these specific amendments introduced by SOX regarding these two segments.

There are a lot of changes SOX triggered on corporate governance level, such as higher penalties for executive officers that perpetrated fraud or violated the ethical accounting principles. The Act (SOX) also imposed more timely disclosures on the effectiveness of internal controls and company processes, and demanded independency of the audit committees. SOX also created an oversight board named PCOAB to supervise the performance of the audit firms and required a majority of the board directors to be independent. Additionally, it established that the audit committee should consist of only independent members of the corporate board. These were some of the most crucial changes brought by SOX on corporate governance level. In order to perform and test the effectiveness of SOX in the prevention of corporate fraud, we take two of the most prevailing factors in the corporate governance segment to measure its influence on financial fraud. These will be the board of directors’ composition -focusing on the degree of independent members in the board-, and the composition of the audit committee -focusing on the proportion of independent directors that are part of the audit committee.

SOX’s new legislation describes the responsibilities, authority and composition of the audit committee in S-O § 301. As mentioned before one of the points stipulated by Rule 10A-3 was that only independent directors could be able to be part of the audit committee. Furthermore there were also some other additional conditions required by Rule 10A-3 like:

* the audit committee should be directly accountable for the appointments, retention, compensation and oversight of the firm’s outside auditor
* every audit committee must stipulate rules for handling disputes regarding internal accounting controls, accounting, or auditing issues
* every audit committee should have the power to engage independent lawyers and other advisers to manage its duties
* each firm must offer adequate funding, as established by the audit committee, “for payment of compensation to independent counsel and other advisers by the audit committee” (Scott C. Budlong, 2005).

The above mentioned requirements established for the audit committee were just introduced to give an overall view of the new rules implemented by SOX. However, it is clear that the most crucial condition stipulated for the audit committee was to be independent in every position that they took. For this reason we take this object as one of the main variables as a component of corporate governance.

Generally, most of the recent improvements made in the corporate governance structure of U.S. companies, were basically changes on the field of board composition or committee composition. As mentioned before, many of these changes focused and accentuated the greater role of independent directors and the fact that board committees consisted since that moment of independent directors. These changes were aimed to guard shareholders benefits by increasing the supervision on senior managers and CEOs and balancing the relationship between them.

The law (SOX) stipulated that all listed corporations should have a majority of independent directors (Budlong et al, 2005). The description of independent director was denoted as a director who has no material relationship with the company, where the firm is required to disclose the identity of independent directors and has to confirm that the relationship is not material (Scott C. Budlong, 2005). The ability to determine this, should be supported by categorical regulations selected by the board and disclosed by the firm (Scott C. Budlong, 2005).

Beside the reforms and requirements adopted for the board and audit committee composition another important change brought by SOX was the compliance with section 404 of Internal Controls. There are many definitions available for the word ‘internal control’, but generally most of the firms and all the CPA firms use the definition adopted by COSO. According to them, internal controls can be defined as follows, “Internal control is broadly defined as a process, effected by an entity’s board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following categories: effectiveness and efficiency of operations reliability of financial reporting compliance with applicable laws and regulations” (The Institute of Internal Auditors, 2008).

Before the implementation of SOX 404, companies were only enforced to provide disclosure over internal control deficiencies if they had changed of auditor. This means that it was not mandatory to disclose any information regarding the internal control effectiveness. Looking to the importance of this information to investors and other users of the financial statements, SOX made it obligatory to disclose information of the internal controls effectiveness. The rules for Internal Controls over Financial Reporting were implemented in 2003 and they were adjusted in 2007 and after this in 2010. The changes made in 2007 consisted of eliminating the requirements for external auditors to evaluate management´s process of reviewing the system of Internal Controls over Financial Reporting. Also the definitions material weakness and significant deficiency were modified. Due to many criticism about the high compliancy costs of SOX 404, president Obama signed the Financial Reform Bill into law removing the obligation for smaller reporting firms (with a market cap under $ 75 million) to comply with SOX section 404 (Peterson Sullivan LLP, 2010). According to the legislation management should be responsible for a formal evaluation of the internal controls over financial reporting, including assessments that prove the effectiveness of the design and operations of the controls. Management should also include such an assessment in their annual report and the external auditor is required to give an opinion on these reports. Furthermore, the rules stipulated by SEC require a firm’s annual report to contain a management’s report over internal control where the effectiveness of the internal controls is reported and supported by the related assessments used to test it. It is required that the assessment should contain disclosures of any material weakness identified in the firm’s internal controls over financial reporting. If one or more material weakness is identified by management, they are not allowed to conclude that the internal controls over financial reporting are effective. There must be also a statement that indicates that the public accounting firm which audited the financial statement has issued an attestation report on the firm’s internal controls over financial reporting.

The legislation also remarks clearly that management is totally accountable for the system of internal controls and not the external/internal auditor or CFO. However, the effectiveness of this whole system is the responsibility of the CEO, CFO and the whole senior executive team (The Institute of Internal Auditors, 2008). Research performed by Collins et al (2009) showed that in the years after SOX’s implementation, CFOs appeared to be more accountable for their actions. This is explained by the fact that CFO compensation depends significantly on the quality of internal controls implemented in a firm. This behavior is also supported by the agency theory, which indicates that boards and other compensation committees use observable performance metrics to assess CFO’s compensation. Also, Mirela Dobre (2011) argue that there is a positive relationship between internal controls disclosure and investor’s confidence in the quality of financial reporting. According to her results, this positive relationship is based on the fact that internal control disclosure reduces information asymmetry between management and the shareholder’s, which consequently gives investors more confidence in the information stated in the financial statement.

The assessment of the effectiveness of internal controls over financial reporting should be performed based on an acknowledged framework of internal controls. Almost all U.S firms use the COSO (Committee of Sponsoring Organizations of the Treadway Commission) framework to assess the effectiveness of internal controls; however there are some other companies that use the COBIT (Control Objectives for Information and related Technology) framework. SEC demands an attestation report which denotes that the external auditor has assessed management’s evaluation on internal controls. The main objective of this whole system is to attest and prove that no material weaknesses were found by management in the internal controls and that the external auditors have also assessed management’s evaluation. In the next chapter we introduce our research design explaining how to test our hypotheses, including variables used in our models.

## 3.6 Summary

In this chapter, the reforms introduced by the Sarbanes Oxley Act 2002 were assessed and we looked at the regulations and laws leading the norms of financial reporting in the period prior to SOX. As showed in the first paragraph there were many laws and regulatory bodies established before SOX, which had the same goal of preventing and combating financial statement fraud. The AICPA was one of the first commissions formed to support the effectiveness of the audit profession in 1974. Later on in 1985 another committee named the Treadway Commission was composed to identify causal factor that could be an indication for fraudulent financial reporting. They developed the well-known COSO framework in order to make public companies, advisors, auditors and regulators aware of the importance and utility of an efficient control framework. Due to the rapidly evolving financial market and the growing need for more regulatory reforms for financial reporting, in 1998 the POB composed a Panel named O’Malley. The aim of this Panel was to monitor the independency degree of auditors during the audit process and other significant aspects of the audit profession. After this panel, the Sarbanes Oxley Act 2002 was introduced as consequence of a high scale of accounting scandals in the beginning of 2000. The Act consists of 11 sections, with SOX 404 (Internal Controls disclosures) and other reforms regarding Corporate Governance dominating the other sections. Furthermore, we see form the literature analyzed that the opinions regarding the effectiveness of SOX were diverse. Some argue that the costs to comply with SOX 404 exceeded the benefits of the law significantly. On the other hand, others testified that after some years of the introduction of this law especially big companies have seen the benefits of this legislation and it has also help auditors in the detection of suspicious acts into companies.

# 4. Research Design

## 4.1 Introduction

In this part of the thesis we discuss the hypothesis development, methodology and the process of the data collection. The sources that were used to collect the data will be presented accompanied by the number of the data sample that I used to test the given hypotheses. Moreover, a thorough explanation will be given of the dependent, independent and control variables used in the methodology to perform the tests.

## 4.2 Hypothesis development

As already mentioned, the aim of this thesis is to investigate and establish whether the introduction of SOX 2002 has accomplished its purpose to prevent financial statement fraud. Several studies have examined the influence of the different individual segments of SOX and its effectiveness in preventing corporate fraud, but little research has focused on specifically the two main characteristics- Corporate Governance reform and Internal Controls efficiency- of SOX, in order to evaluate is effectiveness. A lot of researches have been performed to measure the improvements and effectiveness of internal controls, board of director’s composition and the creation of the audit committee by SOX, to see whether these elements have contribute to an enhanced and reliable system of financial reporting.

There are several articles that have studied the influence of SOX on corporate governance and the board composition of public companies. It is notable that in many of these studies the researchers have focused more on the ethical improvements that SOX has been able to impose on firms, rather than SOX’s influence on corporate governance regarding an accurate accounting information system that would be able to prevent fraudulent reporting. Two years after SOX’s enactment, David B. Farber examined the “association between fraud detection and subsequent improvements in the quality of the board of directors and audit committee activities” (Farber D.B., 2005). From his results he got evidence that there is a positive relationship between fraud identification and an enhanced quality of the board of director and the activities of audit committees. Furthermore, Alix Valenti investigated in 2006 whether a significant change in the board’s structure was notable due to the stipulated reforms of SOX. From his results he got the confirmation that the majority of the firms were following the imposed conditions of SOX in order to make the monitoring capacity of their boards stronger (Valenti A., 2008).

There was also another research done in 2010 that investigated the relationship between board characteristics and earnings management before and after the enactment of SOX (Ghosh et al, 2010). Considering the fact that aggressive earnings management was the most common reason of fraud scenarios at the end of the 20th century and the beginning of this century, it is easy to see the association of this study with fraudulent reporting. The results of this study showed in contrast with the prior mentioned papers that the presence of earnings management does not alter with a change in the board structure and composition, or with audit committee structure, ownership and expertise (Ghosh et al, 2010). At the other hand they observed that the board size and the audit committee’s size, activities and tenure are correlated to earnings management. Additionally, the outcomes of their research established that this correlation was weaker in the years after SOX than the years prior to SOX. Obeua S. Persons (2005) examined the relationship between the probability of fraudulent reporting and some corporate governance characteristics imposed by SOX 2002. They used a logit regression model to perform this study and had a sample of 111 fraud and non-fraud firms. Their results indicated that board director independency, audit committee independency and expertise are not significant factors in reducing the likelihood of financial statement fraud. The statements relating to Corporate Governance characteristics are not congruent regarding the significance of board and audit committee independency on the reduction of fraud. Additionally it is also the question whether these characteristics have shown a variance during the periods before and after SOX.

Besides, there were also some papers that examined the importance and relationship of efficient internal controls and the prevention of fraud within companies. Recent research performed by Moffet & Grant (2011) investigated the association between fraud prevention and internal controls, and their results established that an effective system of internal control is an essential part in fraud prevention. To investigate this association, the researchers gathered data of 41 publicly traded firms that notified fraud in their auditors’ and management notification of SOX 404 from Audit Analytics between 2004 and 2008. The results of the investigation confirmed that internal controls are a very crucial preventative measure for financial statement fraud; however it is possible that management’s conduct will either strengthen or weaken this system. For example, override or collusion on management level is one of the dangerous threats that can violate an effective internal control system and fail to prevent fraud (Moffet & Grant, 2011).

Besides, many regulatory bodies as the ACFE and COSO have emphasized the importance of efficient internal controls and adequate audit procedures regarding fraud prevention and detection. Nevertheless, they also remarked the fact that it should be impractical to think that these two factors could be totally effective in preventing fraud. Ethical values and integrity of top management are also crucial factors that should be considered when dealing with the probability of fraud events (Salierno, 2005). According to a study performed by the ACFE in 2005, 46 percent of business failures and fraud scenarios took place in the financial market due to poor internal controls. Additionally, another 40 percent of fraud events were possible due to a negligent attitude towards inefficient controls.

Also Tackett, Wolf and Claypool performed a research to determine the relation between the costs and the benefits of Section 404 of SOX 2002. For their research they used a deductive reasoning approach and a qualitative research method to measure the net benefits of SOX 404 towards the security markets (Tackett et al, 2007). From their qualitative test they conclude that the implemented internal control conditions required by SOX had “negative net benefits to the securities markets” due to very high costs and ambiguous interpretations. Consequently, they recommended the extermination of a formal internal control system as stipulated by SOX Section 404. It is notable that many firms were struggling with the high costs related to the implementation of effective internal controls -and some of them only implemented these systems partly-, which could not give a satisfactory result and overpass the benefits of SOX 404 by preventing fraud.

Considering the fact that there is still not a clear and congruent opinion regarding the impact and effectiveness of the components of SOX on the prevention of corporate fraud, made me come to the following hypotheses. First of all I would like to prove whether Corporate Governance characteristics have a negative significant influence on fraudulent reporting and additionally, I would like to know whether this influence has shown any deviation in the years pre and post SOX. The following hypothesis will be able to give an indication of whether SOX has been able to improve corporate governance into public companies eliminating gaps and factors that could make the perpetuation of financial statement fraud feasible. For this reason we test the following hypothesis;

**H1: The implementation of SOX 2002 has been effective in preventing corporate fraud through an enhanced structure of corporate governance**

 On the other hand, internal controls were also one of the most crucial parts of this legislation. Recalling that there were a lot of criticism and opponents against SOX Section 404 in the beginning- due to the high costs related to its implementation-, it is important to know whether this part of the legislation has been able to minimize the event of fraud into US firms and foreign related US companies. Several studies have been done on determinants of internal control weaknesses, or on the improvements of the total amounts of internal control weaknesses that are published. However, until now limited evidence or study have illustrate whether the disclosure requirements of Internal controls’ effectiveness implemented by SOX 2002, have help to prevent fraudulent reporting. Therefore, we test the following hypothesis:

**H2:** **The implementation of effective internal control systems stipulated by SOX 2002** **has been effective in preventing fraud**

 Furthermore, based on comments that have been raised by several professionals, researchers and companies since the enactment of SOX, we want to get evidence if it was effective after all these years. Going back to the first two years of the legislation, there were a lot of criticism and opposition coming from a wide range of experts related to the new requirements demanded by SOX. One year after the passage of SOX, a researcher named Coates performed an analysis where he tested whether SOX had a positive impact on corporate ethics. In his paper he argue the importance of ethical norms and values regarding the accurateness of financial statements and thus the probability of fraudulent reporting (Coates, 2003). To perform his study, Coates used surveys to gather enough data as basis for his analysis. The results of Coates’ study showed that generally management had become more ethical than the years before SOX, leading management to act in a more responsible and reliable manner. According to his findings, this change was due to more ethical programs that were organized for management awareness regarding reliable financial reporting (Coates, 2003). At the other side, the results also pointed the high costs of SOX that made its effectiveness questionable for many firms complying with the new legislation.

Another reason for testing SOX’s effectiveness after eleven years is due to the published reports of the Oversight System, which gathered information to prove that SOX had not succeed in preventing fraud, but instead has make it more prevalent nowadays. As mentioned in the introduction, the Oversight System made two investigations, one in 2005 and the other in 2007 and they found a deteriorating effect of SOX’s efficacy in fraud prevention between these years.

In 2009, Steven & Gerasimos completed a study where they discussed the usefulness and effectiveness of the reforms stipulated by SOX on the investing community and the accounting profession. To accomplish this study, they inspected several components of SOX 2002 in detail and focused more on those elements dealing with internal controls and corporate governance. They also discussed with different accounting professionals and public companies that were related to the reforms of SOX to get their opinions on the effects caused by the legislation. The results of the analysis showed that there is not a congruent opinion of the effects that SOX has brought on financial reporting, the accounting profession, capital markets and investor’s confidence (Steven & Gerasimos, 2009). According to some of the interviewed experts, the reforms are helping to recover investor’s confidence in financial reporting, but at the other side others opined that the compliancy costs of the Act exceed its benefits. Another paper which has focused on the total effect of SOX was the one of De Vay (2006). During her research she analyzed whether SOX has been effective in preventing and detecting fraud after the past three years. She used statistical methodology and a survey to examine her hypotheses. The results of the survey and statistical research have shown that a wide range of professionals were dissatisfied with the costs of SOX 404 and felt that the costs were not worth the benefits. Besides, her findings also confirmed that SOX was not effective in preventing and detecting financial statement fraud till that time.

Seeing that there was little research completed on the individual effect of SOX 2002 on financial statement fraud, we want to prove whether the introduction of SOX by itself have been effective in the prevention of financial statement fraud- showing reduction in fraud events in the years after SOX. In order to do this, we developed the following hypothesis:

**H3: SOX has been effective in the prevention of financial statement fraud.**

Obtaining a result from the above mentioned hypotheses will enable me to accept or reject them and finally come to a solid answer for our research question; **Did the Sarbanes Oxley Act accomplish its goal of reducing fraudulent reporting of financial statements after its implementation in 2002?”**

Out of our three hypotheses, the two most important reform aspects of SOX were denoted in H1 and H2. We also looked to SOX’s effect on fraud events in H3, with the intention to illustrate whether fraud events have significantly decrease in the years after SOX’s enactment. Focusing on hypothesis three, we argue that this statement generally answers the research question and it focuses on specifically SOX’s influence on financial statement fraud. H1 and H2 can be seen as a bridge to see whether one of the two SOX components - Internal Controls or Corporate Governance- has shown a significant influence on the prevention of fraud in the years after SOX’s enactment. Being able to do this will lead to a more insightful conclusion of whether both of the components implemented by SOX has been able to diminish financial fraud, or if only one of the segments have shown a significant effect on fraudulent reporting.

If all the three hypotheses seem to have a significant impact on fraud and the results indicate that we cannot reject these hypotheses, the conclusion on the research question is than that SOX has been able to decrease the probability of fraudulent events in the U.S. financial market. However, rejecting H1 and accepting the other two hypotheses illustrates that SOX by itself has been able to prevent fraud events, reducing the amount of irregularities registered in the years after SOX. Additionally it also indicates that internal control effectiveness decrease the probability of fraud, and since this disclosure requirements have been implemented by SOX, we could conclude that internal controls effectiveness enacted by SOX reduce the probability of fraud scenarios. However, reforms in Corporate Governance structure have not been able to imply any significant effect on the prevention of financial statement fraud. Related to the research question I would argue than that SOX has been able to reduce the likelihood of fraud and this impact could be mainly explained by the effectiveness of internal controls implemented by after SOX 2002. On the other hand taking the same situation into account and only considering that H3 is rejected will indicate that SOX by itself have not been effective and its introduction has not been able to induce any significant impact on the prevention of fraud. However, Internal controls effectiveness implemented especially by SOX, seem to reduce the probability of fraud, but apparently not significantly enough to denote a difference in fraud events between the period pre and post SOX- which refers to H3.

## 4.3 Sample and Data collection

In order to complete this study we focused on the U.S. financial market since the reform and implications of SOX are principally required for all public companies trading on the U.S capital market and for foreign companies affiliated with the American stock market. Since the aim of this paper is to investigate whether SOX has been able to combat fraud from the companies trading or affiliated with the U.S market, we used restatement data of publically trading companies on the U.S. financial market and searched the needed data for the main variables (Corporate Governance components and the Internal Control effectiveness) and the control variables on the required databases using a the TICKER EDGAR codes. For this test we took a sample period of approximately 8 years, beginning from 1997 till 2006. This time period consists of a pre SOX period of 5 years (1997-2002) and a post SOX period of 3 years (2003-2006). Due to limited data availability it was not possible to take a larger post SOX period in this test.

In order to test the first hypothesis (Corporate Governance characteristics) mentioned in the previous paragraph we use a sample of 268 firms that were involved in earnings restatement during the period 1997 till 2006. In order to perform the test, a distinction is made between restatements performed by errors and irregularities. As mentioned before in this thesis, fraud is indicated by the observation of irregularities illustrated in this dataset. Based on this dataset I will be able to evaluate whether Corporate Governance characteristics lowers the probability of financial statement fraud, by comparing the board characteristics of firms affiliated to fraud and non-fraud firms. Additionally, a comparison will be made between the Pre and Post SOX period, to establish whether possible significant influences are related to the introduction of SOX 2002.

Besides another sample of 55 fraud firms and non-fraud firms is used to evaluate whether internal controls effectiveness have diminish the likelihood of financial statement fraud in the years that SOX has been applicable.

Taking into account that FRAUD is the main factor that has to be investigated, we looked for registered restatements that were available on the personal website of Professor Andrew Leone. This professor obtained the restatement data from the GAO database and divided them into two categories as errors versus irregularities. Since the focus of this thesis is based on fraud, I took the registered irregularities from the GAO database as a proxy for fraud. Till today there is not a specific database with registered fraud cases over a large time period, so based on this and on several studies performed on fraudulent reporting we chose to use irregularities as a an indicator for fraud. A study performed over the importance of distinguishing “Errors” from “Irregularities” in restatement research found that most of the restatements classified as irregularities, were followed by fraud-related class action lawsuits in comparison to only one lawsuit in the group of restatements classified as errors (Karen M. Hennes et all, 2008). Also a paper written by [Ken Askelson](http://eur.summon.serialssolutions.com/search?s.dym=false&s.q=Author%3A%22Ken+Askelson%22) in 2009, “Fighting High-tech Fraud”, emphasized that fraud covers a wired range of irregularities and illegal acts defined by intentional deception or misrepresentation of financial figures (Ken Askelson, 2009). These two papers emphasize that irregularities are the best and most used indicators for fraud in the accounting and financial reporting field. We used the **Compustat Database** to look for different other variables like the **SIC** code, **Common Shares Outstanding** and **Price Close - Annual – Calendar** to calculate the market capitalization, **Total Assets** and **Net Income** to compute the ROA (Return on Assets). Furthermore we used the database of **Risk Metrics** to search for data about the **Age, Gender, Affiliation** of the **Board of Directors** and the amount of **Independent** board of directors that were part of the **Audit Committee**. Finally we also used the database of **Audit Analytics** to get some data of the section **SOX 404 Internal Controls.** From section **404 Internal Controls** we chose the variable **IC\_IS\_EFFECTIVE** **–** it indicates according to the assessment of disclosure controls whether controls were found to be effective. The intention of using this variable in this research is to measure its relationship with FRAUD to see whether this requirement stipulated by SOX has given indications to be decisive in reduction of fraud events.

## 4.4 Methodology

To test and establish the desired relationship of the above mentioned hypotheses, I will use the Predictive validity framework, best known as the Libby boxes (Libby, 1981), to set up the research study and research design. The aim of this framework is to give more insight regarding the structure of the hypothesis development in order to get the desired results through the research design. The model also gives an effective definition of the hypothesis testing process, enabling me to focus on the significant determinants of the external and internal validity of the research design. To obtain the desired result from this research we developed three hypotheses as they were already mentioned above. Since we test the effect of SOX, Internal Control effectiveness and Corporate Governance characteristics on Fraud using the same control variables for each model, we developed one Predictive Validity Framework where all the variables are included.

The following model was designed:

The Predictive Validity Framework (libby 1981) to test the hypotheses:

 **Independent variables** **Dependent Variables**

**Conceptual**

Concept A:

Implementation of SOX 2002 (Corporate Governance reform & effectiveness of Internal Controls (SOX 404))

Concept B:

Registered Fraud events (irregularities)

**Operational**

\*SOX= 0 or 1

\*IC\_effectiveness = 1 or 0

\*Audit Committee Independency= % of independent directors participating in the AUC

\*Board Independency = E (employee) or I (independent)

\*Director Genderr= F (female) or M (Male)

\*Director Age= age of board directorn / N

Fraud = 0 or 1

 **Control variables**

\*Industry\_type= SIC

\*Firm\_size: SP\*SQ

\*Firm performance: NI/ TA

The first hypothesis was:

Each of the variables mentioned in the Libby box above, is explained and discussed below for each of the developed hypotheses.

**H1: The implementation of SOX 2002 has been effective in preventing and detecting corporate fraud through an enhanced structure of corporate governance**

One of the major reforms that SOX brought on the level of corporate governance was for the composition of the board of directors. They also saw the need to compose an independent audit committee that would oversee the actions of the board of directors. During these last years also the diversity of more female members in the board of directors has become more important in order to reinforce the mission and vision of the board structure. Taking into account that all these components are parts of the corporate governance structure of a firm, I choose to measure the board independency, audit committee independency, board’s diversity and director’s age, and use them as the main variables to test the effect of corporate governance on fraud. The industry type, firm size and firm performance can be seen as the control variables to test the first hypothesis.

To measure this hypothesis the following econometric estimation will be estimated:

**FRAUD = α + β1SOX + β2 BI + β3ACI+ β4Dir\_Age+ β5Dir\_Gender + β6Industry\_Type+ β7Firm\_Size + β8Firm\_Performance + ε**

For a better understanding of the variables given in the estimation, we will describe the interpretation of each below.

**FRAUD**: a dummy variable which contains a one or higher when an irregularity is observed, and it contains a zero when an error is observed.

**SOX:** a dummy variable which denotes one for the years where SOX was implemented, and it indicates a zero for the years before SOX

**BI**: Board of Director Independency which denotes an *E* when the director is an employee of the firm and an *I* when the director is independent. For the regression formula I calculated the percentage of independent directors that were part of the board.

**ACI:** Audit Committee Independency denotes the percentage of independent board directors that are part of the audit committee.

**Dir\_Age:** The average age of the participants of the Board of Directors

**Dir\_Gender:** The gender of the Board of Directors which indicates a *F* when the director is a female and a *M* for when the director is a male. I calculated the proportion of female members participating in the board of directors.

**Industry-Type**: SIC code, the Standard Industrial Classification Code which denotes a firm’s type of business.

**Firm\_Size**: This was measured by the Market Capitalization (multiplying the share price with the shares outstanding).

**Firm\_Performance**: The ROA (Return on Assets) was used to measure the size of each firm. In this case we used Net Income/ Total Assets

The variables **Indusrty\_Type, Firm\_Size and Firm\_Performance** are the control variables that we have chosen to clarify or assess the [relationship](http://www.businessdictionary.com/definition/relationship.html) between FRAUD and the other independent variables that represent changes in U.S Corporate Governance. This means that the main independent variables of this formula are **SOX, BI, Dir\_Gender, Dir\_Age** and **ACI** which we expect to have a significant influence on FRAUD.

Based on previous publications and theory, we expect the outcomes of these variables as follows:

**SOX:** will be negatively related to fraud which indicates that due to the introduction of SOX, less fraud has been prevalent in the firms since its implementation. Till now there was no empirical research found that has tested the direct association between SOX and Fraud.

The above mentioned expectations are based on the initial intentions of the implementation of this legislation by SEC, which was to combat fraudulent reporting and enhance the quality of financial reporting. Internal control systems were implemented in several firms in order to prevent fraudulent actions within firms, resulting in a reliable and accurate financial reporting. Also the reforms in regards to Corporate Governance were established to decrease the probability of fraud events into entities. From this perspective we expect to see that SOX had a preventive influence on the occurrence of fraud into companies.

**BI:** will be negatively related to Fraud which denotes that firms with a higher (>50%) proportion of independent board directors, have a lower probability of fraud events. This assumption is based on the paper of Beasley M.S. 1996 which tested whether a larger proportion of independent board directors significantly diminish the probability of financial statement fraud. His findings confirmed that companies with a significantly higher percentage of independent directors are less likely to have fraud in comparison to companies with significantly less independent directors. Another paper that examined approximately a similar test also found that the likelihood of financial statement fraud decreases with a higher percentage of independent board directors (Uzun H. Et al, 2004). Furthermore, another research completed by David B. Farber confirmed that fraudulent firms seems to have lower numbers of outside board members, a lesser amount financial experts in the audit committee and less independent board members (David B. Farber, 2005)

**ACI:** will be negatively related to Fraud which means that the higher the percentage of independent directors in the audit committee, the lower the probability of fraud in a company. This is based on the paper of Abbott L.J et al 2000 which examined the role of audit committee’s independence and activity in mitigating corporate fraud. Their findings showed that audit committees that congregate at least twice a year and are composed of independent directors are less involved in sanctions regarding fraudulent reporting (Abbott L.J et al, 2000). Another inquiry which examined the effectiveness of Cressey’s fraud risk factor framework regarding the detection of financial statement fraud, also found evidence that an increase of independent audit committee members is negatively related with the occurrence of fraud (Skousen C.J. et al, 2009). Based on these facts I expect to see a negative relationship between **ACI** and **FRAUD**.

**Dir\_Age:** We expect that the age of the board directors will be negatively related with the occurrence of Fraud, meaning that firms with older board directors are less likely to have fraud in their firms. According to earlier studies performed by Cornett M.M et al 2007 and Alderfer 1986, older CEOs are more likely to understand the business and industry of a firm which give them the opportunity to run a company effectively diminishing the probability of earnings management.

**Dir\_Gender:** We expect that a board of directors with higher diversity of female and male members will reduce the likelihood of fraud into firms. This means that a higher percentage of female members on the board is negatively related to fraud events. An enquiry performed by Erhardt N.L. et al (2003), where the association between demographic diversity on the board of directors and a firm’s financial performance was examined, showed that there is a positive relationship between board diversity and a firm’s financial performance. Furthermore according to a study performed by Ferdinand A.Gul et al in 2007, there is evidence that the presence of at least one female in the board of directors leads to less earnings management and a superior earnings quality in a firm. Their test also proofed that this association is more intensive with a higher proportion of female members in the board committee.

**Industry\_Type:** There is evidence from prior studies that there are some industries were the likelihood of fraud events is higher than others. For example, the study completed by Wang T.Y & Winton A. (2010) showed that technology firms, service companies and firms operating in the trade industry have a higher concentration of fraudulent events compared to firms in other industrial area. Taking this into consideration, I decided to also introduce this variable as a control factor in the formula. For this study I will focus more on the significance level of the industry type on fraud and denote which are the industries which appear to be significantly related to fraud.

**Firm\_size:** We expect a positive relationship between Firm\_Size and FRAUD which means that I assume that the larger the size of a firm is, the greater the probability is to have fraud into a firm. Many studies like those of Dechov et al (2010) and COX & Thomas (2003) have found evidence that larger firms are more involved in fraud scenario’s than smaller firms. Moreover according to a research performed by Yangseon Kim et al, where the relationship of firm size and firm performance was measured, medium- and large-sized firms are more involved in aggressive earnings management compared to small-sized companies. Their study has proven that large firms are more related to aggressive earnings management in order to elude the reporting of decreasing earnings of the company.

 **Firm\_Performance:** Based on earlier studies we expect a negative relationship between firm performance and fraud. This means that I expect that a firm with a high or good performance will be less inclined to commit fraud than a firm with a poor performance. From a study performed by Elka Johansson and Peter Carey in 2010 there is evidence that ROA is negatively correlated with fraud. Based on these results they suggested that this negative relationship was explained by the fact that profitability may have a simultaneous impact on the effectiveness of internal control systems, resulting in less fraud detection in profitable firms. Also based on the fraud Triangle of Cessey and the incentives that instigate people (firms) to commit fraud **,** I think that a firm having a high ratio of ROA would not have any pressure or needs to rationalize the commitment of fraud. Firms in a distressed financial position would be more likely to have these incentives compared to healthy financially firms.

After establishing the relationship between corporate governance and fraud, the next model will be identifying the likelihood of fraud events when companies have an effective internal control system. To test the second hypothesis we only use one main variable which is named Internal Control’s effectiveness. Due to some limitations of the data availability it was not possible to add other main variables that could strengthen the elements to test the effect of internal controls on fraud. Furthermore, since this disclosure requirement was introduced by SOX in 2002, there is only data available starting 2004. Therefore, it was not possible to obtain data regarding the effectiveness of Internal controls for the years prior to the introduction of SOX. Directly, it will not be possible to compare the Pre and Post SOX effects of internal controls effectiveness on fraud in order to say that SOX have effectuate an influence of fraud. However, since this specific disclosure and implementation requirement was enacted particularly by SOX, we will be able to argue hypothetically that it was SOX that influenced the probability of fraud in a certain direction.

The control variables used in this model are the same variables that were used in the first model, except for the **SOX** variable.

**H2:** **The implementation of effective Internal control systems stipulated by SOX 2002** **has been effective in preventing fraud**

We use the following regression model to test this hypothesis:

**FRAUD = α + β1 IC\_Effectiveness + β2Industry\_Type + β3 Firm\_Size+ β4 Firm\_Performance + ε**

Most of the variables are the same as in the previous model, except the variable **IC\_Effectiveness.** For a description of the variables which are the same as model (1), please refer to the above mentioned definitions.

**IC\_Effectiveness=** Is a dummy variable which indicates whether the assessment of internal controls has been found to be effective or not. 1= YES, internal controls were found to be effective; 0= NO, internal controls were not found to be effective

We expect the following relationship between these variables and the FRAUD:

**IC\_Effectiveness:** A more effective internal control system will diminish the probability of Fraud into a firm. This means that theeffectiveness of internal control systems and fraud will be negatively related with each other. Our assumption is based on the paper of Bell and Carcello (2000) who tested the effectiveness of some risk factors presented in SAS No.53 making a distinction between fraud and no-fraud firms. Their findings showed that fraud and a weak internal control environment are positively related to each other. Besides, a study completed by the Treadway Commission established that the registered fraud events between 1987 and 1997 were due to a poor internal control environment (Goh B.W. & Dan L., 2009)

Last but not least, our third hypothesis measures SOX’s individual effect on fraud reporting. The hypothesis introduced was:

**H3: SOX has been effective in the prevention of financial statement fraud.**

To measure this hypothesis the following regression will be used:

**FRAUD = α + β1SOX + β2Industry\_Type+ β3Firm\_Size + β4Firm\_Performance + ε**

Since the above mentioned regression contains some variables which were incorporated in H1 and H2, the descriptions of each variable can be obtained in these sections. The next section discuss our main findings and relate our findings with previous publications.

# 5. Findings

## 5.1 Introduction

In this section of the thesis I will discuss the results obtained from the logistic regression model used to test the regressions associated with the hypotheses mentioned in chapter three. To perform this test I used one of the most used software for data and statistical analysis named R-Project. is known as an alternative to SPSS, especially when it has to deal with more advanced statistical techniques. It provides an extensive support for analysis of time series, panel / longitudinal data (cross-sectional time series), repeated measurements, endurance data (cohort studies, case control and matched case-control), categorical target parameters and complex survey data. Besides, it is used to support many researches done on the fields of economics, sociology, political science, pharmacy and epidemiology.

In the next paragraph I will be elaborating on the outcomes of the tests in order to get the proper conclusion for the research question. Thereby I will compare my findings with existing literature in order to establish the differences and similarities between this study and other studies.

## 5.2 Findings

Hypothesis 1:

As known from previous chapters, the first hypothesis that I wanted to test was whether

the implementation of SOX 2002 has been effective in preventing corporate fraud through an enhanced structure of corporate governance. I used a logistic regression to get evidence of whether I should accept or reject this hypothesis. As shown in Table 1.2 in the Appendix, We can see that all the coefficients denote that none of the variables used in this model have a significant effect on fraud. Since all the coefficients are explained by a number below zero, you can see that neither the main variables, nor the control variables seem to have any influence on the probability of financial statement fraud. We also excluded some variables from the model to see whether this would contribute to any significant results, however this was not the case.

Therefore, the first hypothesis expressing whether Corporate Governance Characteristics had been effective in preventing corporate fraud after the implementation of SOX, will be rejected.

These results are not completely in line with some prior literature, however there are two papers that performed a comparable research and they found the same outcomes. For example we have The paper written by Gosh et al. in 2010 where a study was performed on the relationship between board characteristics and earnings management before and after the enactment of SOX, showed evidence that that the presence of earnings management does not alter with a change in the board structure and composition, or with audit committee structure, ownership and expertise. Considering the fact that aggressive earnings management was the most common reason of fraud scenarios at the end of the 20th century and the beginning of this century, it is easy to see the association of this study with fraudulent reporting. He also used a logit regression to establish this relationship between the periods Pre and Post SOX. He used almost the same period as we used in this research and he used a sample size of 111 fraud firms and non-fraud firms. Compared to this research, my sample size is bigger, however it does not seem to have any difference among the results.

Another paper that also performed a comparative study was the one of Obeua S. Persons in 2005. In his paper he examined the relationship between the probability of fraudulent reporting and some corporate governance characteristics imposed by SOX 2002. The same as in this research, he also used a logit regression to test this relationship. His paper found evidence that board director independency, audit committee independency and expertise are not significant factors in reducing the likelihood of financial statement fraud.

Based on the results obtained from the logistic regression performed in this study and also the above mentioned papers, I conclude that Corporate Governance characteristics have not been effective in reducing the probability if corporate fraud.

Hypothesis 2:

The second hypothesis expressed in this thesis suggested that the implementation of effective Internal control systems stipulated by SOX 2002, has been effective in preventing fraud. The same logistic analysis was completed to test this hypothesis. The results showed that the effectiveness of internal controls have a significantly negative impact on the probability of fraud events. In Table 1.3 in the Appendix, where the regression model is depicted you can see that I excluded the Control variable from this model. The reason why we did this was because IC\_Effectiveness appeared to have a high significance level without this variable in the model.

Taking a look to Table 1.3 in the Appendix shows that he odds of incorporating effective Internal Control systems in order to reduce fraud, are 0.12 times the odds of when Internal Controls systems were not incorporated. This means that effective Internal Control systems reduce the occurrence of fraud. Based on these results we can accept hypothesis 2 and suggest that the implementation of effective Internal control systems stipulated by SOX 2002, has been effective in preventing fraud.

Furthermore the model also illustrates that ROA has a significant influence on the occurrence of fraud. We can see that for every increase in ROA the odds of fraud increased by 0.05 times. This means the if ROA increases, it less likely that fraud will occur.

Based on prior literature we also got evidence that internal controls effectiveness are a very crucial preventative measure for financial statement fraud. This was obtained from a study performed by Moffet & Grant in 2011. In this research they looked to the association between

fraud prevention and internal controls, and found that an effective system of internal control is an essential part in fraud prevention. To investigate this association, they also gathered data of 41 publicly traded firms that notified fraud in their auditors’ and management notification of SOX 404 from Audit Analytics between 2004 and 2008. The researcher used a Case Study to obtain an overall conclusion from his study.

Another study that also showed similar outcomes was that of Bell and Carcello in 2002. They tested the effectiveness of some risk factors presented in SAS No.53 making a distinction between fraud and no-fraud firms. Their findings showed that fraud and a weak internal control environment are positively related to each other.

Looking to the type of test performed by several prior researchers I think that this test have an additional power to say that indeed Internal control effectiveness reduces the likelihood of fraud. This is based on the data selected to perform this test and also the regression analysis used in this study.

There are limited researches found which analyzed the influence of effective Internal controls systems using a logit regression or any regression model yet. However there are many studies and qualitative researches performed that illustrates this relationship.

Hypothesis 3:

The third hypothesis stated in this study suggested that SOX has been effective in the prevention of financial statement fraud. The results showed that SOX has not been able to reduce the likelihood of corporate fraud. Taking a look to Table 1.4. in the Appendix shows that the model with the predictors SOX, ROA and Mcap did not fit the data well (chi square 2.26 with 3 degrees of freedom yielding a p-value of 0.5202271). For this dataset the variables SOX, ROA and Mcap did not show any effect on the occurrence of fraud.

Based on these results I reject the third hypothesis and conclude that SOX by itself has not affected fraud reporting in any sense in order to prevent or reduce the likelihood of financial statement fraud. Furthermore.

Based on prior research performed on the effectiveness of SOX, these results are congruent with the test performed by Debra L. De Vay in 2006. She focused also on the total effect of SOX on the U.S. financial market. During her research she analyzed whether SOX has been effective in preventing and detecting fraud after the past three years. She used statistical methodology and a survey to examine her hypotheses. The results of the survey and statistical research showed that a wide range of professionals were dissatisfied with the costs of SOX 404 and felt that the costs were not worth the benefits. Besides, her findings also confirmed that SOX was not effective in preventing and detecting financial statement fraud till that time.

On the other hand Steven & Gerasimos performed a study in 2009, where they studied the usefulness and effectiveness of the reforms stipulated by SOX on the investing community and the accounting profession. They inspected several components of SOX 2002 in detail and focused more on those elements dealing with internal controls and corporate governance. They also discussed with different accounting professionals and public companies that were related to the reforms of SOX to get their opinions on the effects caused by the legislation. The results of the analysis showed that there is not a congruent opinion of the effects that SOX has brought on financial reporting, the accounting profession, capital markets and investor’s confidence (Steven & Gerasimos, 2009). According to some of the interviewed experts, the reforms are helping to recover investor’s confidence in financial reporting, but at the other side others opined that the compliancy costs of the Act exceed its benefits.

Since the researches performed on the effectiveness of SOX regarding the prevention of fraud, is limited. There is not a definite paper that could support this result empirically. However, qualitative studies performed by many experts have shown that it is not clear till today whether SOX has been effective or not. The majority of the studies performed stressed that the implementation of SOX has been not effective, and that the costs outweighed the benefits related to this legislation

## 5.3 Limitations

After an extensive analysis and self-review of the outcomes displayed in the models, I have been able to conclude what were the main effects of SOX on the financial market regarding fraudulent reporting. As I mentioned in the beginning of this study, there was no research performed on this field. This made the ability to know which test to perform and how to combine the test variables quite difficult at the beginning. Also the possibility to obtain literature from prior researches was limited due to the scarcity in empirical investigations performed on the relationship between SOX and fraud. However, after searching on different databases I got many supporting articles and written papers to base my theory on. Nevertheless, empirical supporting evidence was very limited and not found for this specific study. The only empirical research that was found about the effect of SOX on the detection and prevention of fraud, was that of Debra L. de Vay. However, the method that she used to perform was not practical for my research but only useful for the examination of existing literatures.

The Intention of this research was to compare the fraud cases reported before and after SOX. For my sample I wanted to take the fraud cases till the most recent year, which was 2011, but on the GAO database there only was information available till 2006. Another option was to get the data for the following years from the Audit analytics database, but again also the data from RiskMetrics- data for the corporate governance variables- was limited till 2006. For this reason I had no other option to complete this research using data from 1997 till 2006, having 6 years prior to SOX and 4 post SOX.

Furthermore, another limitation was the fact that there were no information available about internal control effectiveness in the years before SOX. This made it impossible to take a Pre-SOX period to test the effect of SOX on fraud through the effectiveness of internal control systems.

These limitations should be taken into account for further research and improvement measures have to be taken into consideration in order to eliminate these limitations.

After discussing the limitations observed during this research I will comment on the findings observed and deliberate about the implications that this may have for further research.

## 5.4 Recommendations

Based on the findings and limitations discussed in the previous paragraphs, I will take the opportunity to give some recommendations for further research that could be useful to improve the Sarbanes Oxley Act and also the methods for further research. My first recommendation is based on the limited data availability for variables that concern the board composition. Such important information should be registered and updated regularly for every listed company in the United States. This makes it possible to review whether the companies are complying with the stipulated law in order to perform further research on this field. Maybe it is an option for the SEC to take this into consideration and ensure that this kind of information is registered and available on a secured database.

 Since the effectiveness of SOX is still questioned by many regulators, shareholders and other third parties, this means that there is a high need for extensive and further research. The outcomes will help to uncover the deficiencies of the legislation and in this case, also standard setters will be able to restructure and adjust the law. The fact that a large group is dependent on the reliability of financial statements, it is of great importance for them to know that the legislation guarding over the accuracy of their financial decisions, is totally trustful.

Besides, according to my findings it seemed that the reforms made in corporate governance by SOX have not been competent enough to influence the probability of fraud scenarios into companies. This means that the standard setters and regulators of the law have to re-evaluate the requirements established for the board and audit committee composition to decide what is the best action to do to restore this part of the legislation. Doing this could strengthen the impact and effectiveness of SOX, and this will consequently increase the trust of every related party in the law.

Even though internal controls seemed to diminish the likelihood of fraud significantly, I think that further research could be performed to find another way to get information from Pre SOX period. If there is data available of fraudulent firms in the years after 2006, it would be great to look how the effectiveness of internal control systems have developed itself during the last years.

If more data becomes available for Corporate Governance components, fraud events and Internal controls effectiveness, it would be great to perform a study where the aggregate effect of these two components of SOX are tested in relation to fraud.

Last but not least, there are many other sections of SOX which are also important for the prevention of fraud. Empirical investigation about these sections is required in order to get a better view whether SOX has been completely effective or not. This will uncover gaps in the law that should be adjusted in order to increase the public’s trust in the Act.

## 5.5 Summary

This chapter showed the findings obtained from the logistic regression model for the three hypotheses developed in this thesis. Also a comparison of these results with prior research was performed in order to have a clear view of the differences observed between my research and other studies.

After discussing the limitations of this study and giving some recommendations for future research, I will give a little recapitulation of the main aspects of this research. In the following chapter I will mention the research question and the related hypotheses in order to give a summarized conclusion based on the findings treated in this chapter.

# 6. Conclusion

After a large and extensive examination of several literatures and supporting evidence for this thesis I have been able to come to a rational answer for my research question. As was given in the beginning of this thesis, the main research question leading this thesis was the following one:

**“Did the Sarbanes Oxley Act accomplish its goal of reducing fraudulent reporting of financial statements after its implementation in 2002?”**

In order to answer this main question I made 3 Hypothesis that would help come to the right answer for the research question. My hypotheses were;

**H1: The implementation of SOX 2002 has been effective in preventing corporate fraud through an enhanced structure of corporate governance**

**H2: The implementation of effective Internal control systems stipulated by SOX 2002 has been effective in preventing fraud**

**H3: SOX has been effective in the prevention of financial statement fraud.**

Beginning with the first Hypothesis, the main objective was to get evidence whether reforms in the board and audit committee composition- main characteristics of corporate governance- reduced the probability of fraud reported. Confirming this would make it possible to state whether SOX have been able to prevent fraud through the reforms made in the board structure. In the previous chapters I mentioned several studies that investigated the relationship between the board structure and fraud. David B. Farber was one researcher who proved in 2004, that there is a positive relationship between fraud identification and an enhanced quality of the board of director and the activities of audit committees. At the other hand, in 2010 Ghosh et al proved that the presence of earnings management does not alter with a change in the board structure and composition, or with audit committee structure, ownership and expertise. Similar to this last mentioned paper, according to the findings of the tests performed in this thesis no evidence was found to state that the changes made in the board and audit committee composition have led to the prevention of fraud. The findings affirm that there is no significant relationship between the board structure, audit committee composition and a lower probability of financial fraud. Thus, the changes made in those aspects of corporate governance by SOX seemed not to have an influence on the occurrence of financial statement fraud. Consequently, the first hypothesis was rejected and the conclusion was that the implementation of SOX 2002 has not been effective in preventing corporate fraud through an enhanced structure of corporate governance.

Furthermore looking to hypothesis two, there were some articles that I mentioned above where the association between internal controls and fraud was examined. For example, a recent study performed by Moffet & Grant in 2011, established that an effective system of internal control is an essential part in fraud prevention. Other supporting researches performed on this field were those of Bell and Carcello (2000) and the Treadway Commission (1978-1997). The results representing hypothesis 2 established that an effective internal control system, significantly reduces the likelihood of fraud scenario’s. The findings denoted that the effectiveness of internal control systems is negatively correlated to fraud. So, I accepted this hypothesis. Since the compliance requirements with SOX 404 (Internal controls) were initially implemented by the law (SOX), hypothetically we can suggest that the implementation of SOX 404 has been able to diminish the likelihood of corporate fraud.

Finally testing the last hypothesis where the individual effect of SOX on fraud events was tested, showed that SOX on itself has not shown to have a significant effect on the prevention of fraud. Therefore, I rejected this Hypothesis concluding that SOX has not been effective in the prevention of financial statement fraud.

Nevertheless, answering the main research question we can conclude that SOX has not accomplished its goal of preventing financial statement fraud by lowering the probability that such an event can occur.

Based on the results I conclude that there are still some gaps on corporate governance level and generally also in the other segments of the Law (SOX) that should be amended in order to get more efficient results at the end of the day.

However, considering all the criticism made on this legislation, especially on SOX 404 (Internal controls), we can say that all the costs made for the improvements of an enhanced internal control system have been worth it. Since this part of the legislation appeared to reduce the probability of fraud events into firms, I think that it should be maintained and enforced in the future.

Standard setters and regulators should think about more rigid rules or create other rules that may strengthen the impact of SOX and also Corporate governance on fraud.

For the shareholders and investors it is great to know that all the millions spent on internal control systems was not in vain, but that it helps to improve the quality of financial reporting. Hopefully after more reforms in the Law (SOX), evidence will show after some years that it has become effective in preventing corporate fraud.

For lenders and other third parties it is on one side a satisfaction to know that the quality of financial reporting can be trusted based on an effective controls of each company. Nevertheless, there should be more review and reforms stipulated for the board and audit committee composition.

As I mentioned in the beginning of this thesis I think that there are a lot of people and groups that would be interested in the outcomes of this study. For example investors, lenders, stakeholders, standard setters and regulators are some of the groups that would like to know whether SOX has been effective or not. After the conclusion that SOX has succeeded in partially in preventing financial statement fraud through the implementation of qualified internal control systems, this gives the regulators and standard setters enough signs that they should brainstorm and deliberate which pieces are missing in order to enhance also the Corporate Governance elements that could influence the perpetuation of fraud significantly. The results were also based on limited data from the RiskMetrics database. In order to obtain more reliable results, the registered variables defining Corporate governance should be also available in the academic databases. Maybe the SEC could function as an oversight board that assures that all the listed companies report these important information to a certain corporation in order that this data can be available for future research.

Additionally I think that the company owners and directors in general have a greater satisfaction with the results this study, since it proves that internal control had a significant negative influence on fraud. This only confirms that all the efforts and money spent in competent IC-systems, was not in vain. It did help improve the quality of financial reporting and also the trust of investors in the audited financial statements.

To conclude I only have to say that there is still some work to do for the standard setters and regulators of SOX on the field of Corporate Governance, while companies only have to focus on the improvement of their internal control systems in order to detect each fraudulent act that could harm their reputation and the reliability in their financial statements. The relevance of this research has also been able to show auditors that all their additional work regarding “interim audits” have help to improve the quality and trust in financial statements. The implementation of internal controls has facilitate the possibility of detecting any fraudulent act into companies during an audit, which also gives the public a new confidence in the audit profession.

I’m glad that I have completed this interesting research and that I could contribute to the improvement of the regulations stipulated by SOX. I hope to see some developments in the future regarding SOX’s law, where the standards setters have come with more effective regulations that will improve the components of Corporate Governance and also the other segments in general. Achieving this will contribute a stronger regulatory system against fraudulent reporting where the confidence in financial reporting is recovered.

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# References

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| Abbott, L.J et al (2000), "The Effects of Audit Committee Activity and Independence on Corporate Fraud", *Managerial Finance,* Volume 26, Issue 11, pg. 55-68. (http://www.emeraldinsight.com/journals.htm?articleid=865720&show=abstract) |
| Agami, A.M. (2006), "Reporting on internal control over financial reporting", *The CPA Journal*, Vol. LXXVI No. 11. (http://www.nysscpa.org/cpajournal/2006/1106/essentials/p32.htm)  |
| Alderfer, C.P. (1986), "The Invisible Director on Corporate Boards", *Harvard Business Review*, Volume 64, pp. 38-52. (http://www.sciencedirect.com/science/article/pii/S0304405X07001651#sec3.4) |
| Amper, Politziner & Mattia LLP (2009), "Insights: Amper's Litigation & Valuation Newsletter", Retrieved July 29, 2011, from (http://eisneramper.com/uploadedFiles/Resource\_Center/Articles/Articles/Lit-Val-AmperFall2009.pdf) |
| Anonymous (2005), "Fraud Detection And Prevention: Transactional Analysis For Effective Fraud Detection: C&FM the National Magazine of Business Fundamentals", *Business Credit*, Volume 107, Issue 2, pg. 68-71. (http://search.proquest.com/docview/230147579)  |
| Beasley, M.S. (1996), "An Empirical Analysis of the Relation Between the Board of Director Composition and Financial Statement Fraud", *The Accounting Review*, Volume 71, Issue 4, pg. 433-465. (http://www.jstor.org/stable/248566)  |
| Beresford, D.R. et al (2003)"Report of Investigation by The Special Investigative Committee of the Board of Directors of Worldcom, Inc.", *SEC*, Retrieved July 27,2011, from (http://www.concernedshareholders.com/CCS\_WCSpecialReportExc.pdf) |
| Berlau, J. (2004), "Sarbanes-Oxley is Business Disaster: Passage of the Sarbanes-Oxley Corporate Reform Act was supposed to stop corporate abuses, but instead it has strangled small business and slowed job growth", Retrieved August 25, 2011, from (http://findarticles.com/p/articles/mi\_m1571/is\_2004\_Feb\_2/ai\_112723160/) |
| Bodurtha, James N., Jr. (2003), "Unfair Values - Enron's Shell Game", Washington, D.C.:McDonough School of Business, p. 2. |
| Bratton, W.W. (2002), "Does Corporate Law Protect the Interests of Shareholders and Other Stakeholders?: Enron and the Dark Side of Shareholder Value", *Tulane Law Review*, pg. 1-61.  |
| Budlong et al (2005), "Major Changes in U.S. Corporate Governance Under the Sarbanes-Oxley Act and NYSE and Nasdaq Rules", pg. 1-105. (http://www.debevoise.com/files/Publication/1a8b6eca-af5c-475e-af38-b51b4c4dbe49/Presentation/PublicationAttachment/b47782ad-331d-4091-8d3a-33048cbfe2c1/Major%20Changes%20Memo.pdf)  |
| Collins et al. (2009), “The effect of SOX internal control deficiencies on firm risk and cost of equity”, *Journal of Accounting research,* Volume47, Issue 1, pg 1-43. |
| Committee of Sponsoring Organizations of the Treadway Commission (COSO) (1999) , "Fraudulent Financial Reporting: 1987-1997 - An Analysis of U.S. Public Companies", Retrieved August 5, 2011, from (http://www.coso.org/publications/FFR\_1987\_1997.PDF) |
| Cornett, M.M et al. (2007), "Corporate governance and pay-for-performance: The impact of earnings management", *Journal of Financial Economics*, Volume 87, Issue 2, pg. 357-373 <http://www.sciencedirect.com/science/article/pii/S0304405X07001651#sec3.4> |
| Cressey, D. R. (1950), "The Criminal Violation of Financial Trust", *American Sociological Review*, Vol. 15, Issue 6, pg. 738-743. |
| David B. Farber (2005), "Restoring Trust after Fraud: Does Corporate Governance Matter?", *The Accounting Review* Volume 80, Issue 2, pg. 539-561. from: <http://www.jstor.org/stable/pdfplus/4093068.pdf?acceptTC=true> |
| Dechow, P.M. & Sloan, R.G. (1991). "Executive Incentives and the Horizon Problem", *Journal of Accounting and Economics*, Volume 14, pp. 51-89. (http://www.sciencedirect.com/science/article/pii/S0304405X07001651#sec3.4) |
| Erhardt N.L. et al. (2003),"Board of Director Diversity and Firm Financial Performance". Corporate Governance: An International Review, Volume 11, Issue 2, pg 102-111 (http://onlinelibrary.wiley.com/doi/10.1111/1467-8683.00011/pdf ) |
| Ferdinand A.Gul et al. (2007), "Do female directors enhance corporate board monitoring? Some evidence from earnings quality", *Accounting Research Conference*, pg 1-49. <http://www.isb.edu/AccountingResearchConference/File/GulSrinidhiTsui.pdf> |
| Ghosh et al. (2010), “Corporate Boards, Audit Committees, and Earnings Management: Pre- and Post-SOX Evidence", *Journal of Business Finance & Accounting*, Volume 37, Issue 9-10, pg. 1145-1176. (http://onlinelibrary.wiley.com/doi/10.1111/j.1468-5957.2010.02218.x/full) |
| Goh, B.W. & Dan, L. (2009), "The Disciplining Effect of the Internal Control Provisions of the Sarbanes Oxley Act on the Governance Structures of Firms". *Social Science Research Network*, pg. 1-59. (http://www.business.illinois.edu/accountancy/research/vkzcenter/conferences/greece/papers/Goh\_Li.pdf) |
| Hall, J.A. (2010). "Accounting Information Systems", Sixth Edition, pg. 1-837 |
| Healy, P. M., & Wahlen, J. M. (1999), "A Review Of The Earnings Management Literature And Its Implications For Standard Setting", *Accounting Horizons*, Volume 13, Issue 4, pg. 365-383. |
| Jonas et al. (2006), "The Second Year of Section 404 Reporting on Internal Control", Moody's Investors Service: Special Comment, pg. 1-34. (http://www.nd.edu/~carecob/April%202007%20Conference/Internal%20Control%20Special%20Comment%20-%20Year%202.pdf) |
| Johansson E. & Carey P. (2010), “Deterring within-firm fraud: The role of the anonymous reporting chanel”, *Accounting and Finance Association*, pg 1-48. |
| Karen M. Hennes et al. (2007), "The Importance of Distinguishing Errors from Irregularities in Restatement Research: The Case of Restatements and CEO/CFO Turnover", *The Accounting Review*, Volume: 83, Issue: 6, pg 1487-1519. |
| Ken Askelson (2009), "Fighting High-tech Fraud", *The Internal Auditor*, Volume 66, Issue 3, pg. 1-19. |
| Knapp, M.C & Knapp C.A. (2007), "Europe's Enron: Royal Ahold, N.V.", *Issues in Accounting Education*,Volume: 22, Issue: 4, pg. 641-660. |
| Lamount, G. & Skalak, S. (2007), "Restatements and Materiality", Retrieved August 2, 2011, from (http://10b5.pwc.com/PDF/RESTATEMENTS%20AND%20MATERIALITY%20-%20GRACE%20LAMONT%20AND%20STEVE%20SKALAK.PDF) |
| Leech, T.J. (2003), "Sarbanes-Oxley Sections 302 & 404: A White Paper Proposing Practical, Cost Effective Compliance Strategies", Retrieved August 4, 2011, from (http://www.sec.gov/rules/proposed/s74002/card941503.pdf) |
| Mack, T. (2002). "The Other Enron Story", Forbes. Retrieved July 27, 2011, from (http://www.webcitation.org/5tZ0qQyoO) |
| McLean, B. & Elkind, P. (2005), "The Smartest Guys in the Room;The Amazing Rise and Scandalous Fall of Enron", pp. 132-133.  |
| Miller, G.G. (2004), "Letter to Ms. Debbie Yabrof", Washinton DC |
| Miller, R. (2004)," The Dallas Morning News Robert Miller Column", *The Dallas Morning News*, Retrieved August 20, 2011, from (http://planfund.org/doc/DMN%20Robert%20Miller%20-%20PLAN%20Fund%20and%20PEP%20-%202011.pdf) |
| Mirela Dobre (2011), “Stock investor’s response to disclosures of material weaknesses in internal control”, *Accounting and Management Information Systems*, Volume 10, Issue 3, pg. 397-423. |
| Moffet, R.C. & Grant, G.H. (2011), "Internal Controls and Fraud Prevention", *Internal Auditing,* Volume 26, Issue 2 , pg. 3-12. (http://search.proquest.com/docview/863454394) |
| Pellet J., 2003. "Audit angst", Highbeam website, Retrieved August 15, 2011, from (http://www.highbeam.com/doc/1G1-111163603.html) |
| Peterson Sullivan LLP, 2010, "Financial reform bill signed into law, eliminating SOX 404(b) internal control audit requirement for smaller reporting companies". Retrieved August 2, 2012. http://www.pscpa.com/news/sox-404b-permanent-exemption/ |
| Public Oversight Board (2000), "Panel on Audit Effectiveness Releases Exposure Draft", Retrieved August 5, 2011, from (http://www.pobauditpanel.org/press2.html) |
| Public Oversight Board (2000), "The Panel on Audit Effectiveness Report and Recommendations" , Retrieved August 7, 2011, from (http://www.iasplus.com/resource/pobaudit.pdf ) |
| Randal J. Elder et al. (2010),"Auditing and Assurance Services: An Integrated Approach", *The International Journal of Accounting*, Volume 46, Issue 2, pg. 232-235. |
| Rezaee, Z. & Jain, P.K. (2004), "The Sarbanes-Oxley Act of 2002 and Security Market Behavior: Early Evidence", University of Memphis (Working Paper), *Contemporary Accounting Research*, Volume 23, Issue 3, pg. 1-56. |
| Sarbanes Oxley, (2010), "The Vendor-Neutral Sarbanes-Oxley Site", Retrieved August 4, 2011, from (http://www.sox-online.com/act\_section\_404.html) |
| Scott C. Budlong( 2005), "Major Changes in U.S. Corporate Governance under the Sarbanes-Oxley Act and NYSE and Nasdaq Rules". Debevoise & Limpton LLP. Pg 1-30 <http://www.debevoise.com/files/Publication/1a8b6eca-af5c-475e-af38-b51b4c4dbe49/Presentation/PublicationAttachment/b47782ad-331d-4091-8d3a-33048cbfe2c1/Major%20Changes%20Memo.pdf> |
| Senate (2002)," Public Company Reform and Investor Protection Act of 2002", Retrieved August 27, 2011, from (http://www.cbo.gov/doc.cfm?index=3571&type=0) |
| Sitorus, TW & Scott D.R. (2008), "The roles of collusion, organisational orientation, justice avoidance, and rationalisation on commission of fraud: a model based test", *Review of Business Research*, Volume 8, Issue 1, pp. 132-147. |
| Skousen, C.J. et al. (2009), "Detecting and Predicting Financial Statement Fraud: The effectiveness of the fraud triangle and SAS No. 99 ", *Advances in Financial Economics*, Volume 13, pg. 53-81. (http://www.emeraldinsight.com/books.htm?chapterid=1791250&show=html) |
| Steven, P.T. & Gerasimos, L. (2009),"The Sarbanes-Oxley Act of 2002: a five-year retrospective", Corporate Governance: International Journal of Business in Society, Volume 9, No. 2, pp. 120-132(13) (http://www.ingentaconnect.com/content/mcb/268/2009/00000009/00000002/art00002) |
| Tackett et al. (2007), "Internal control under Sarbanes-Oxley: a critical examination", Managerial Auditing Journal, Vol. 21, Issue 3 , pg. 317-323. Retrieved August 16, 2011, from (http://search.proquest.com/docview/274531481/131C340B3F595A1502/1?accountid=13598 \ |
| The Institute of Internal Auditors, 2008. "Sarbanes-Oxley Section 404: A Guide for Management by Internal Controls Practitioners. Pg 5-78. |
| Uzun, H. Et al (2004). "Board Composition and Corporate Fraud", *Financial Analysts Journal*, Volume 60, pg. 33-43. (http://www.jstor.org/stable/4480570) |
| Valenti, A. (2008), "The Sarbanes-Oxley Act of 2002: Has It Brought About Changes in the Boards of Large U. S. Corporations?", *Journal of Business Ethics*, Volume 81, Issue 2, pages 401-412. |
| Wang T.Y & Winton A. (2011), "Competition and Corporate Fraud Waves", pg. 1-52 (http://www.csom.umn.edu/finance/conferences/documents/TracyWangpaper12-15-10.pdf) |
| Williams, H.M. (2002), "Prepared Statement of the Honorable Harold M. Williams, Chairman, Securities and Exchange Commission 1977-1981", Retrieved September 4, 2011, from (http://www.gpo.gov/fdsys/pkg/CHRG-107shrg87708/html/CHRG-107shrg87708-vol2.htm) |
| Yangseon Kim et al, 2003, "The Relation of Earnings Management to Firm Size", *College of Business Administration University of Hawai'i*, pg. 1-30. <http://www.google.nl/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CFEQFjAA&url=http%3A%2F%2Fciteseerx.ist.psu.edu%2Fviewdoc%2Fdownload%3Fdoi%3D10.1.1.200.9183%26rep%3Drep1%26type%3Dpdf&ei=r4MPUJSdEKrB0QXjvIH4Cg&usg=AFQjCNG7XAsxjTbAb_TfrnvLUuASgpxWJg&sig2=_m13pxA88NgoCJT_aMMKmQ> |

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# Appendix

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| **Article (Author, Title, year of publication)** | **Hierarchy of evidence** | **Analysis**  | **Methodology used**  | **Results/Conclusion** |
| Debra L. De Vay,“The Effectiveness Of The Sarbanes-Oxley Act Of 2002 In Preventing And Detecting Fraud In Financial Statements”, 2006. | Qualitative & Quantitative research; Surveys and Unpaired T-test.  | The writer analyzed the effectiveness of the Sarbanes Oxley Act 2002 in preventing and detecting fraud in financial statements. | To test the effectiveness of SOX, she used reports from the Corporate Fraud Task Force, reports of Administrative Proceedings that were available on the SEC website and other statistics that were published on this site. Additionally, she also compared the restatements that were publically registered in the period pre and post SOX | The findings of the study showed that for 65%, no differences exists between the pre and post SOX data regarding fraud prevention or detection. From the survey’s performed, significant evidence was obtained that SOX improved the audit process performed by auditors and the way that firms perform their internal accounting duties. However, 79% of the respondents felt that SOX is not effective in the prevention and detection of fraud. To conclude 88.5% opined that SOX should be amended, while 73.1% declared that it should be eliminated. |
| Farber D.B., “Restoring Trust after Fraud: Does Corporate Governance Matter?", 2005. | Empirical research: Logit regression analysis  | The writer examined the “association between fraud detection and subsequent improvements in the quality of the board of directors and audit committee activities. | To test this association the writer used a sample size of 87 firms, focussing on firms that have been involved in fraudulent financial reporting registered by SEC. | His results shows that that there is a positive relationship between fraud identification and an enhanced quality of the board of director and the activities of audit committees.Emphasizing the following aspects; \*Fraud firms have poor governance compared to a control sample in the year prior to fraud detection. Specifically, fraud firms have fewer numbers and percentages of outside board members, fewer audit committee meetings, fewer financial experts on the audit committee, a smaller percentage of Big 4 auditing firms, and a higher percentage of CEOs who are also chairmen of the board of directors |
| Alix Valenti, The Sarbanes-Oxley Act of 2002: Has It Brought About Changes in the Boards of Large U. S. Corporations?", 2008. | Empirical research  | This researcher investigated whether a significant change in the board’s structure was notable due to the stipulated reforms of SOX. | The writer used a sample of 120 firms coming from the best Fortune 400 firms in 2005. To evaluate whether the expected changes in board composition had taken place after the introduction of SOX, They evaluated the proxy statements filed by these firms through SEC and other electronically data available in the EDGAR system.  | His results showed that the majority of the firms were following the imposed conditions of SOX in order to make the monitoring capacity of their boards stronger.  |
| Johansson E. & Carey P., “Detecting within-firm fraud: The role of the anonymous reporting channel”, 2010. | Empirical research: logit regression model. Based on tests performed by prior researchers they performed a regression analysis to measure the association of the desired variables.  | The researcher investigated whether the existence of anonymous reporting channel affects within-firm fraud results. In this research they also got evidence that anonymous reporting channels are a potential within-firm fraud detection tool. In this research FRAUD was the dependent variable and ROA was one of the control variables. The association between these two variables was also discussed in this paper.  | They used a sample of 231 public companies that completed the KPMG surveys of 2004, 2006, 2008 and 2010. If data was available for board and audit committee, than it was included into the test sample.  | Regarding the association between FRAUD and ROA, the researchers found that profitable firms have the capacity to implement qualitative internal control systems which facilitates the detection of within-firm fraud. This explains the negative relationship between FRAUD and ROA. |
| Moffet, R.C. & Grant, G.H., "Internal Controls and Fraud Prevention", 2011. | Case study of the selected sample. | This researcher tested the relationship between internal controls and fraud | He used a sample of 41 publicly traded companies that reported fraud according to auditors’ SOX 404 and their management. The selected data was collected for the period 2004 till 2008. The data was collected from the Audit Analytics database. | The results showed that an effective internal control system is an important element for fraud prevention and, however management interaction can either strengthen of corrupt the system.  |
| Beasley, M.S., "An Empirical Analysis of the Relation Between the Board of Director Composition and Financial Statement Fraud”, 2006 | Empirical research performed by a logit regression analysis | This paper tests that larger proportions of outside board of director members, significantly decreases the probability of financial statement fraud.  | The researcher used a sample 150 publicly traded firms (75 fraud firms and 75 non fraud firms) firms to perform  | The results of this study showed that no fraud firms have a higher percentage of independent board members compared to fraud firms, and that the presence of an audit committee does not have a significant effect on financial statement fraud.  |
| Bell and Carcello, “A decision Aid for Assessing the likelihood of Fraudulent Financial Reporting”, 2000 | Empirical research; logistic regression model for fraud risk | They tested the effectiveness of some risk factors presented in SAS No.53 making a distinction between fraud and no-fraud firms | They used a sample of 77 firms where fraud was present and 305 firms that were not related to fraud.  | Their results showed that internal control weakness and some other factors as company growth and inconsistent profitability are the most significant risk factors for fraud occurrence.  |
| Abbott, L.J et al (), "The Effects of Audit Committee Activity and Independence on Corporate Fraud" Managerial Finance, 2000 | Empirical: Logit regression model.  | They examined the role of audit committee’s independence and activity in mitigating corporate fraud. | There sample selection was based on firms that were sanctioned by the SEC for aggressive accounting or fraud during the years 1980-1996. Their ultimate sample size 78 firms.  | They found that audit committees that congregate at least twice a year and are composed of independent directors are less involved in sanctions regarding fraudulent reporting. |
| Obeua S. Persons, “The Relation between the New Corporate Governance Rules and the Likelihood if Financial Statement Fraud”, (2005) | Empirical research; logit regression analysis | This researcher investigated the relationship between the probability of financial statement fraud and some Corporate Governance Characteristics.  | He used a sample of 111 matched fraud firms and non-fraud firms .  | His results showed that board independency, audit committee independency and expertise are not significant factors in reducing the probability of fraud.  |
| Ghosh et al, “Corporate Boards, Audit Committees, and Earnings Management: Pre- and Post-SOX Evidence”, 2010 | Empirical research: Regression analysis  | They examined the role of board and audit committees in preventing earnings management, and whether there is a significant change in the period pre and post SOX. | They used a sample of 9.290 observations of publically traded firms on the US financial market. They used a time period of 1998 till 2005.  | The results showed that earnings management does not change with the board’s structure and composition, or with audit committee independency and expertise. However, board size, audit committee size and activities, and also tenure are correlated to earnings management.  |

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| **Table 1.2: Logistic Model for Corporate Governance and N-FRAUD** |
|   |   |   |   |   |   |
| **Deviance residuals:**  |  |  |  |  |
|  |  |  |  |  |  |
| Min | 1Q | Median | 3Q | MAX |  |
| -15.745 | -0.8720 | -0.4946 | 10.407 | 20.889 |  |
|  |  |  |  |  |  |
|   |   |   |   |   |   |
| **Coefficients:**  |  |  |  |  |
|  |  |  |  |  |  |
|  | **Estimate**  | **Std.**  | **Error Z** | **Value Pr(>|z|)** |
| **(Intercept)** | -1,73E+04 | 3,76E+06 | -0.005 | 0.996 |  |
| **SOX** | 2,38E+00 | 3,45E+02 | 0.007 | 0.994 |  |
| **meanage** | -2,19E+01 | 3,80E+01 | -0.576 | 0.565 |  |
| **femperc** | -1,73E+03 | 1,87E+03 | -0.924 | 0.356 |  |
| **audit** | -1,67E+03 | 1,24E+03 | -1.352 | 0.177 |  |
| **board** | 6,82E+02 | 1,07E+03 | 0.639 | 0.523 |  |
| **ROA** | 9,93E+01 | 3,53E+02 | 0.282 | 0.778 |  |
| **mcap** | 4,97E-08 | 9,24E-08 | 0.537 | 0.591 |  |
| **SIC212** | 6,83E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC213** | 1,72E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC216** | -1,30E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC220** | 1,81E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC224** | 4,60E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC225** | 3,81E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC226** | 1,91E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC227** | 3,39E+02 | 5,94E+06 | 0.000 | 1.000 |  |
| **SIC228** | 1,81E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC229** | 3,97E+02 | 5,92E+06 | 0.000 | 1.000 |  |
| **SIC232** | 4,14E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC233** | 3,60E+02 | 4,74E+06 | 0.000 | 1.000 |  |
| **SIC234** | 3,77E+04 | 7,53E+06 | 0.005 | 0.996 |  |
| **SIC235** | 1,83E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC236** | 1,80E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC237** | 1,68E+04 | 3,76E+06 | 0.004 | 0.996 |  |
| **SIC238** | 1,79E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC245** | 1,74E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC247** | 2,82E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC248** | 4,67E+01 | 4,58E+06 | 0.000 | 1.000 |  |
| **SIC249** | 1,83E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC250** | 1,90E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC251** | 1,96E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC252** | 3,49E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC253** | 3,44E+02 | 4,97E+06 | 0.000 | 1.000 |  |
| **SIC254** | 1,96E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC255** | -4,26E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC256** | 2,87E+02 | 4,33E+06 | 0.000 | 1.000 |  |
| **SIC257** | 1,60E+02 | 5,31E+06 | 0.000 | 1.000 |  |
| **SIC258** | -1,57E+01 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC259** | 1,78E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC260** | 1,82E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC261** | 1,61E+02 | 5,32E+06 | 0.000 | 1.000 |  |
| **SIC262** | 4,13E+02 | 5,32E+06 | 0.000 | 1.000 |  |
| **SIC263** | 1,80E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC265** | 3,72E+04 | 7,53E+06 | 0.005 | 0.996 |  |
| **SIC267** | 5,68E+02 | 7,53E+06 | 0.000 | 1.000 |  |
| **SIC273** | 1,89E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC287** | 1,81E+04 | 3,76E+06 | 0.005 | 0.996 |  |
| **SIC299** | 3,81E+04 | 7,53E+06 | 0.005 | 0.996 |  |
|  |  |  |  |  |  |
| **Dispersion parameter for binomial family taken to be 1)** |  |
|  |  |  |  |  |  |
| **Null deviance: 313.75 on 261 degrees of freedom** |  |  |
| **Residual deviance: 252.51 on 214 degrees of freedom** |  |
| **(6 observations deleted due to missingness)** |  |  |
| **AIC: 348.51** |  |  |  |  |  |

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| **Table 1.3: Logistic Model for IC\_effectiveness and N-FRAUD** |  |
|   |   |   |   |   |
| **Deviance Residuals:**  |  |  |  |  |
|  |  |  |  |  |
| **Min** | **1Q** | **Median** | **3Q** | **Max** |
| -13.026 | -0.5214 | -0.4053 | -0.3187 | 23.143 |
|  |  |  |  |  |
|  |   |   |   |   |
| **Coefficients:** |  |  |  |  |
|  | **Estimate**  | **Std.**  | **Error Z** | **Value Pr(>|z|)** |
| **(Intercept)** | -3,59E+02 | 3,60E+02 | -0.996 | 0.319422 |
| **IC.new** | -2,13E+03 | 5,56E+02 | -3.832 | 0.000127 |
| **ROA** | -3,07E+03 | 1,72E+03 | -1.788 | 0.073709 |
| **mcap** | 1,66E-07 | 2,14E-07 | 0.776 | 0.437990 |
| --- |  |  |  |  |
| **Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1**  |  |
|  |  |  |  |  |
| **(Dispersion parameter for binomial family taken to be 1)** |  |
|  |  |  |  |  |
| **Null deviance: 113.401 on 105 degrees of freedom** |  |
| **Residual deviance: 91.033 on 102 degrees of freedom** |  |
| **AIC: 99.033**  |  |  |  |  |

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| **Table 1.4: Logistic Model for SOX and N-FRAUD** |  |  |  |
|   |   |   |   |   |   |
| **Deviance Residuals:** |  |  |  |  |
|  |  |  |  |  |  |
| **Min** | **1Q** | **Median** | **3Q** | **Max** |  |
| -11.553 | -0.7593 | -0.7529 | -0.6907 | 17.602 |  |
|  |  |  |  |  |  |
|   |   |   |   |   |   |
| **Coefficients:** |  |  |  |  |  |
|  | **Estimate**  | **Std.**  | **Error Z** | **Value Pr(>|z|)** |  |
| **(Intercept)** | -1,10E+03 | 1,11E+02 | -9.961 | <2e-16 |  |
| **SOX** | -1,98E+02 | 1,92E+02 | -1.029 | 0.303 |  |
| **ROA** | -9,52E+01 | 1,03E+02 | -0.922 | 0.357 |  |
| **mcap** | 3,80E-08 | 6,65E-08 | 0.571 | 0.568 |  |
| --- |  |  |  |  |  |
| **Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1** |  |  |  |
|  |  |  |  |  |  |
| **(Dispersion parameter for binomial family taken to be 1)** |  |  |
|  |  |  |  |  |  |
| **Null deviance: 783.98 on 705 degrees of freedom** |  |  |  |
| **Residual deviance: 781.72 on 702 degrees of freedom** |  |  |
| **(17 observations deleted due to missingness)** |  |  |  |
| **AIC: 789.72** |  |  |  |  |  |
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