

Graduating Research

Master Accountancy, Auditing & Control

Earnings management and Audit Quality of public firms: Evidence from the US

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ABSTRACT

The purpose of this master research is to examine whether or not Big4 and Non-Big4 auditors constrain the same level of earnings management in companies listed in the NYSE and the NASDAQ stock exchange. To answer this question, the research first comments the ratification of the Sarbanes-Oxley Act in 2002 and its implications to the US business environment. The research continues presenting different earnings management estimation methods as those developed and used in previous researches. Moreover, it uses findings of previous relative researches, aiming to develop a deeper understanding on the subjects of earnings management motives, earnings management and Big4 and Non-Big4 auditors' differences.

The research investigates the level of the use of earnings management for NYSE and NASDAQ listed companies, in the pre and the post Sarbanes-Oxley Act era, and continues investigating the level of discretionary accruals related to both Big4 and Non-Big4 auditors. Finally, the research uses multivariable regression analysis to determine the relation between the discretionary accruals and a group of earnings management variables.

1. INTRODUCTION

1.1 Introduction

The Securities and Exchange Committee (SEC), through the enforced financial standards regulations of financial accounting, creates a secure environment. This secure environment provides a relatively low cost and credible form, for corporate managers, to report information related to the performance of their company, to external capital providers and to other stakeholders (Healy *and* Wahlen, 1999). Consequently, the ideal role of financial reporting in the economy is to assist the best performing firms to distinguish themselves and to facilitate the efficient and the timely decision-making of financial resources allocation (Healy *and* Wahlen, 1999).

For the before signaled reasons, both financial regulations and financial reporting are value adding activities, which enable financial statements to demonstrate in a timely, accurate and credible manner the changes and the differences of the companies' financial status and the performance position (Healy *and* Wahlen, 1999). However, financial reporting adds value in the firm's economic performance only when it fully complies with the financial regulations. Consequently, regulators and other enforcement bodies need to continue their important work ensuring the timely and the unbiased application of financial regulations and Generally Accepted Accounting Principles (GAAP).

Financial statements are useful and credible for external users when separated of the financial information they also contain managers' information related to the performance of the company (Lobo *and* Zhou, 2006; Healy *and* Wahlen, 1999). Consequently, managers need to exercise their better judgment in financial reporting, and select reporting methods, accruals, and disclosures that fit the economic performance, size, and strategy of their company and on the same time increase the credibility of their financial reports (Healy *and* Wahlen, 1999; Chang *et al.*, 2009). Nevertheless, management's discretion and judgment creates the right environment for the use of earnings management, where management's choice of financial reporting methods, accruals and disclosures, do not reflect accurately and timely the strategy and the economic performance of the company (Healy *and* Wahlen, 1999).

The information before, for the role of financial reporting, creates a crucial question for standard setters and regulators; “*what is the level of discretion exercised by management in its financial reporting activities?*”. To answer this question, standard setters and regulators might be interested in further evidence of the use of earnings management in the US, as well as the motives that create such behavior.

This research will focus on the use of earnings management in the US. In particular, this research will investigate the level of earnings management in NYSE and NASDAQ stock exchange listed companies being audited by Big4 and Non-Big4 auditors during the pre and post Sarbanes-Oxley Act periods.

Subsequently, the findings of this research expected to be of particular interest to investors, regulators and stakeholders not only in the US but also to other countries that share the same business and financial management culture. This research is motivated by two groups of researches, first, the researches of Chen *et al.* (2005) and Rusmin (2008), which investigate the tolerance of the use of earnings management in stock exchange listed companies, and report that Big4 auditors provide better quality audits because they can better constrain the use of earnings management practices. Second, the researches of Cohen *et al.* (2008) and Chambers *and* Payne (2011), which report that accruals based earnings management decline significantly after the mandatory adoption of the Sarbanes-Oxley Act, while the real actual earnings management increase.

1.2 Main Research Question and Sub-Questions

Previous researches have shown that investor protection policies and their enforcement are key institutional factors that help mitigate the incentives of insiders to use manage earnings and consequently restrict the use of earnings management (Leuz *et al.*, 2003). Investor protection policies enhance the trust of both investors and stakeholders on corporate financial reporting, while on the same time drive the demand and the supply of financial reporting quality in listed and non-listed companies (Van Tendeloo *and* Vanstraelen, 2008). Nevertheless, prior researches which have focused on the quality of financial reporting in US stock exchange listed companies report that accruals based earnings management have declined significantly since the mandatory adoption of the Sarbanes-Oxley Act. In addition, the Big4 international auditors which dominate the global auditing and assurance services

market continue to provide high quality audit services and constrain more effectively discretionary accruals and accruals based earnings management (Cohen *et al.*, 2008).

The institutional role of auditing companies is to provide assurance over the integrity of financial statements and enhance the trust of stakeholders in the corporate financial reporting. In addition, it is argued that the source of motivation for auditing firms to supply high quality audits derives from the risks of audit failure, litigation and damaged reputation (Chaney *et al.*, 2004).

The before arguments create to the primary research question;

What is the impact of the adoption of SOX and the tolerance of Big4 auditors and Non-Big4 auditors on the use of earnings management by NYSE and NASDAC quoted companies?

The primary research question is split into additional sub-questions.

- 1) *What is SOX?*
- 2) *What is the purpose of the implementation of SOX?*
- 3) *What are Big4 auditors and Non-Big4 auditors? What is the difference?*
- 4) *What is earnings management and why is earnings management used?*

1.3 Methodology

The first stage of this earnings management research consists of a literature review. The literature review presents findings of previous researchers related to; the ratification of the Sarbanes-Oxley Act and its implications, different earnings management estimation methods, earnings management, and Big4 and Non-Big4 auditors differences.

The second stage of this earnings management research is the quantitative analysis. Using the Compustat annual industrial and research files over the years 1999 to 2010 the research obtains an initial sample of 105,501 firm year observations. In this part of the research, are tested the two research hypotheses using the cross sectional modified Jones model as this is described by Dechow *et al.* (1995), and interpreted by Cohen *et al.* (2008). Finally, it is used a multivariable regression analysis to determine the

relation between the use of earnings management (identified as discretionary accruals) and the variables; audit quality, operating cash flow, firm size, leverage, absolute value of total accruals, SOX, growth and return on investment.

1.4 Value Added

This research investigates the level of earnings management for NYSE and NASDAQ stock exchange listed companies being audited by Big4 and Non-Big4 auditors.

One of the elements why this research is interesting is the timing; the research conducted nine years after the passage of the Sarbanes-Oxley Act and three years before the mandatory adoption of IFRS from the US. Consequently, this research is able to draw educational conclusions for the effects of Sarbanes-Oxley Act on the use of earnings management. Furthermore, another contribution of this research to the up to now literature will be the comparison of earnings management constrains provided by Big4 and Non-Big4 auditors in the US.

Because very few researchers have focused their interest in the behavior of earnings management during the entire post Sarbanes-Oxley Act period, this will be a breakthrough research.

For all the before reasons it is expected that the outcomes of this research will be of a great interest to investors, accounting professionals, academics involved in earnings management research and studies and finally the SEC regulatory authorities.

1.5 Limitations

This earnings management research copes with three main limitations; the first limitation is that earnings management is triggered by a large number of factors making hard to detect and predict all of them. The second limitation is that the cross sectional modified Jones model has been characterized by many researchers as a weak model, not able to capture and to predict the full magnitude of the use of earnings management. The final limitation of this research is that even though the multivariable regression analysis uses eight variables, those are not enough to fully explain and predict the use of discretionary accruals.

1.6 Structure

Chapter 2 will focus on the discussion of the theoretical economic framework of this research. Moreover, provides definitions on the term earnings management, the Sarbanes-Oxley Act, and the Big4 and Non-Big4 auditors.

In chapter 3 the ratification of the Sarbanes-Oxley Act and its implications will comments. In addition, reported the findings of previous researches related to; earnings management motives, earnings management, and the differences between Big4 and Non-Big4 auditors. Finally, in this chapter will presented different earnings management estimation methods and the variances of the modified Jones model.

Chapter 4 describes the main research question and the two research hypotheses.

Chapter 5 comments the quantitative characteristics of this research. Moreover, in this chapter presented the discretionary accruals estimation model, as well as the sample selection methodology. Finally, this chapter will describe the empirical research model in the research.

Chapter 6 is concentrated on the empirical research and the analysis of its results.

Chapter 7 contains the conclusions to the main question and the research hypotheses. The chapter continues with the discussion of the research limitations and ends presenting areas for further future research.

1.7 Summary

This chapter comments the importance of financial regulations and their enforcement to the creation of a secure and functional financial reporting environment, and introduces the main field of this research. Furthermore, it contains a first introduction to the main research question and signaled the main subjects that will be commented throughout the research. Finally, discusses the limitations and the contribution of this research to the up to now earnings management literature, and presents the structure of the research.

2. THEORETICAL FRAMEWORK

2.1 Introduction

This chapter contains the theoretical background of the research. In this chapter, analyses the differences between the positive accounting and the institutional theory, and explains the stakeholder theory. Furthermore, provides definitions for the term earnings management, the Sarbanes-Oxley Act, and the Big4 and Non-Big4 auditors.

2.2 Analysis of Theoretical Economic Frameworks

The financial accounting literature contains two main theories which explain accounting choice, and one main theory which explains the role of business stakeholders. Those theories are the positive accounting theory, the institutional theory, and the stakeholder theory.

Since the aim of this research is to investigate the use of earnings management practices in the US, which associated to specific accounting choices and consequences for the stakeholders, it is important to analyze further those theories.

2.2.1 Positive Accounting Theory Versus Institutional Theory

The accounting choices prediction strength of *positive accounting theory* derives from the use of agency costs of debt, compensation contracts and lobbying costs, which are used in the business process, aiming to create wealth for the stakeholders (Watts & Zimmerman, 1990; Collin *et al.*, 2009). The aim of wealth creation leads to agency conflicts and consequently to hypotheses explaining accounting choice (Watts & Zimmerman, 1990; Collin *et al.*, 2009).

The positive accounting theory (PAT) uses large samples and statistical testing analysis for the research data (Collin *et al.*, 2009). According to Demski (1988), positive accounting theory is concerned with “*the entire domain of financial reporting activities, ranging from choice of method through time, to audit arrangements, to political activities*”

On the other hand, the accounting choices prediction strength of the *institutional theory* derives from the assumption of corporate actors being victim of institutional, normative or mimetic pressure (Collin *et al.*, 2009). In order to test those assumptions and the accounting choices they create, institutional theory uses the tool of case

studies. Case studies make institutional theory a particularly useful and interesting theory for testing in large corporations, because of the presumably multiple institutional pressures corporate actors face in their daily operations (Collin *et al.*, 2009).

Finally, even though institutional theory found more frequently in this empirical area of research (Collin *et al.*, 2009), because positive accounting theory uses large samples and statistical testing analysis, it appears to be the right theoretical framework towards explaining and understanding the accounting choices of listed corporations. Moreover, another reason making the positive accounting theory the right theoretical framework for this research is the high possibility of agency conflicts during the decision making process (Collin *et al.*, 2009). One characteristic conflict of interest example is that CEOs and CFOs control the operations of their companies while on the same time their compensation depends on the choices they made (Watts & Zimmerman, 1990).

2.2.2 Stakeholder Theory

The stakeholder theory according to Freeman (2002) is a theory relating in which way in reality business works. In order for a business to succeed, it has to create value for its stakeholders. This implies that if the objectives of the firm are for the best of its stakeholders then these objectives are for the best of the firm (Freeman, 2002). Stakeholders are the customers, suppliers, employees and generally everyone that can affect or being affected by the company's way of doing business (Freeman, 2002). In addition, according to this theory the job of managers is to find and align the goals and interests of all stakeholders for the best of the business. Managers are those who will decide if the decisions taken in the organization are for the best of the stakeholders (Freeman, 2002). All stakeholders are important in the success of the business that is why their interests and goals should be aligned altogether (Freeman, 2002).

2.3 Definitions of Literature

This part presents different definitions of the term earnings management.

2.3.1 Earnings Management

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| <p>Definition: Earnings Management is “<i>the process of intentionally exploiting or violating the GAAP or the law to present financial statements according to one’s interest</i>”.</p> | <p>Research: This research investigates why, how, to what extent, and in what direction earnings management is practiced in Greece. The results obtained indicate that creative accounting is practiced in Greece frequently, especially the legitimate one, and to a considerable extent (<i>i.e. around 25 per cent of pre-managed earnings</i>). The motives that guide Greek companies to practice earnings management are; the large companies overstate profit in order to secure their access to external financing, while the small companies understate their profits in order to reduce income taxes.</p> |
| | <p>Measurement: Opinion research, survey concerning independent accountants, and certified auditors to investigate the reasons why Greek companies use earnings management. The survey sample consisted of 100 certified auditors and 100 independent accountants. The answers were ranked according to aggregated scores and the Spearman rank correlation coefficient test was applied.</p> |
| | <p>Accessibility: Baralexis, S. (2004). Creative accounting in small countries: the Greek case. <i>Managerial Auditing Journal</i>, (19,3) pp. 440-461</p> |

| | |
|---|--|
| <p>Definition: Earnings management “<i>occurs when managers use judgment in financial reporting and in structuring transactions to alter</i></p> | <p>Research: This research is a literature review on earnings management and its implications for standard setters and regulators. The primary purpose of this review is to summarize the implications of scholarly evidence on earnings management, to help accounting standard setters and regulators assess the pervasiveness of earnings management and identify fruitful areas of earnings</p> |
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| <p><i>financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”.</i></p> | <p>management future academic research.</p> |
| | <p>Measurement: n/a</p> |
| | <p>Accessibility: Healy, P.M. and, Wahlen, J.M. (1999). A review of the earnings management literature and its implications for standard setting, <i>Accounting Horizons</i>, (13,4) pp. 365-383</p> |

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| <p>Definition: Earnings management “<i>is the alteration of firms’ reported economic performance by insiders to either mislead some stakeholders or to influence contractual outcomes”.</i></p> | <p>Research: This analysis based on financial accounting data from 1990 to 1999 for over 8,000 companies from 31 countries. In order to measure earnings management by country, the researchers create four proxies that capture the extent to which managers use their accounting discretion to create misleading information about the economic performance of their company. Moreover, this research has design proxies, which capture a variety of earnings management practices such as earnings smoothing and accrual manipulations. In addition, this research creates a cluster analysis, which groups countries with similar legal and institutional characteristic. The three identified country groups are: (1) outsider economies with large stock markets, dispersed ownership, strong investor rights, and strong legal enforcement (e.g., United Kingdom and United States); (2) insider economies with less-developed stock markets, concentrated ownership, weak investor rights, and strong legal enforcement (e.g. Germany and Sweden); (3) insider economies with weak legal enforcement (e.g., Italy and India).</p> |
| | <p>Measurement: <i>The First</i> measure captures the accruals</p> |

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| | <p>calculating the country's median ratio of the firm-level standard deviation of operating earnings divided by the firm-level standard deviation of cash flow from operations. Scaling by the cash flow based on operations, controls for differences across firms in the variability of economic performance. <i>The Second</i> measure captures earnings smoothing, calculating the correlation between changes in accounting accruals and changes in operating cash flows. <i>The Third</i> measure uses the magnitude of accruals as a proxy for the extent to which insiders exercise discretion in reporting earnings. <i>The Fourth</i> measure that captures the extent insiders manage earnings to avoid report losses and computed as the ratio of small profits to small losses.</p> |
| | <p>Accessibility: Leuz, C., Nanda, D. and Wysocki, P. D. (2003). Earnings management and investor protection: an international comparison. <i>Journal of Financial Economics</i>, (69,3) pp. 505–528</p> |

2.3.2 Sarbanes-Oxley Act

The Sarbanes–Oxley Act is a US federal law, that established new and enhanced transparency standards for the board of directors, auditing committees, management and public accounting firms, of all US public quoted companies (SEC 33-8810; Aono and Guan, 2008; Chang *et al.*, 2009). The regulation was introduced as an answer to major financial, corporate and accounting scandals which caused investors substantial financial damage (SEC 33-8810; Aono and Guan, 2008; Chang *et al.*, 2009). The act consists of eleven sections, containing from additional corporate board and auditing committee responsibilities to criminal and financial penalties (SEC 33-8810; Aono and Guan, 2008; Chang *et al.*, 2009).

2.3.3 Big4 and Non-Big4 Auditors

The term Big Four referred to the “*small number of very large auditing firms which traditionally provided audit and attest services to the majority of public companies,*

particularly large national and international companies. The number of firms widely considered capable of providing audit services to large national and multinational companies decreased from (“the Big 8”¹) in the 1980s to four (“the Big 4”) today” (GAO-03-864). The group of Big 4 consists of Deloitte & Touche LLP, Ernst & Young LLP, KPMG LLP, and PricewaterhouseCoopers LLP (GAO-03-864, 2003; GAO-08-163, 2008).

The term *Non-Big4* includes “*any of the other more than 700 firms that are audit public companies*” (GAO-03-864, 2003; GAO-08-163, 2008).

2.4 Summary

This chapter presented the theoretical economic framework of this research, and commented the differences between the positive accounting and institutional theory. After the comments of the differences between those two theories and the presentation of the stakeholder theory, this chapter presented definitions found in the literature and related to the use of earnings management, the Sarbanes-Oxley Act and the Big4 and Non-Big4 auditors. This research continues with the next chapter “*Prior Research*”, that will present the findings of previous researches related to the topics of; the mandatory adoption of the Sarbanes-Oxley Act, the use of earnings management, Big4 and Non-Big4 auditors’ differences, and earnings management estimation methods.

¹ The Big 8; Arthur Andersen LLP, Arthur Young LLP, Coopers & Lybrand LLP, Deloitte Haskins & Sells LLP, Ernst & Whinney LLP, Peat Marwick Mitchell LLP, Price Waterhouse LLP, and Touche Ross LLP.

3. PRIOR RESEARCH

3.1 Introduction

Despite the popular public opinion that companies use earnings management, proving the existence of earnings management in practice is a remarkably difficult task. The difficulty for researchers arise from the fact that in order to prove whether or not earnings have been managed, they first need to calculate the corporative earnings excluding any possible effects of earnings management practices (Healy *and* Wahlen, 1999).

This research uses the earnings management definition of Healy *and* Wahlen (1999) “*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 the company or to influence contractual outcomes that depend on reported accounting*”.

The main elements making the proof of earnings management challenging is the absence and the difficult sourcing of internal managerial information. Consequently, the first step of the earnings management proving process is the identification of conditions that increase the incentives of management to use earnings management practices (Healy *and* Wahlen, 1999).

After the identification of those conditions, follows the matching test between the identified manipulation theories and the volume of unexpected discretionary accruals (Healy *and* Wahlen, 1999). Consequently, the earnings management research consisted of two different steps; the first step is the identification of specific management incentives that create the use of earnings management, while the second is the identification of unexpected discretionary accruals and their effects in the financial reports.

Concerning the first step of the earnings management research, scholars have identified a number of incentives leading to earnings management decision making. Those incentives as identified from the current research are: agency conflicts of interest, management compensation, management’s bargaining power, and access to

capital, tax minimization, financial market expectations, reputation and insiders' financial benefit.

Concerning the second step of the earnings management research, scholars have identified a variety of unexpected discretionary accruals that are used to achieve the incentives of the use of earnings management. The unexpected discretionary accruals identified from the current research are: sudden increase - decrease of cash flow from operations, unexplained increase - decrease of account receivables, sudden increase – decrease of R&D expenses, large - small changes in depreciation amounts and sudden changes in depreciation methods.

Summarizing, this chapter presents the purpose and the impact of the Sarbanes Oxley Act, literature passages related to the topics of earnings management motives, earnings management, and Big4 and Non-Big4 auditors' differences. Finally, this chapter presents different earnings management estimation methods, as well as variations of the modified Jones model.

3.2 Literature Review Tables

In this part of the research a brief summary (*author name and object of study*) of all the prior research material used for the purposes of this research is presented. The full scale literature review tables that present the authors names, object of study, sample, methodology and research outcome, of all articles and books used for this research can be found in the appendix section, item 1.

| Articles and Reports | | |
|-----------------------------|-----------------|--|
| Aono and Guan (2008) | Object of study | The impact of Sarbanes Oxley Act on cosmetic earning management, Research in Accounting Regulation |
| | Outcome | Audit quality appears to increase with increased audit firm tenure. The audit tenure is significantly and negatively related to estimated discretionary accruals for small clients, while audit tenure is not significantly associated with estimated discretionary accruals for big clients. Audit company rotation may not increase audit quality but have the opposite results for some companies |
| Balsam <i>et al.</i> (2003) | Object of study | Auditor industry specialization and earnings quality |
| | Outcome | Clients of industry specialist auditors have higher earnings quality than clients of non-specialist auditors |
| Baralexis (2004) | Object of study | Creative accounting in small countries: the Greek case |
| | Outcome | Creative accounting is practiced in Greece frequently and to a considerable extent (i.e. around 25 per cent of |

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| | | pre-managed earnings). The large companies overstate profit while the small companies understate profit |
| Bartov, and Cohen (2008) | Object of study | The ‘Numbers game’ In the pre- and post-Sarbanes-Oxley eras |
| | Outcome | Test for a relation between the frequency of meeting or beating analysts’ earnings expectations with accrual-based earnings management, real earnings management, and earnings expectations management |
| Basu (1997) | Object of study | The conservatism principle and the asymmetric timeliness of earnings |
| | Outcome | Negative earnings changes are less persistent than positive earnings changes because of conservatism. In addition earnings sensitivity has increased more for negative news than for good news. This behavior is consisted with the increase of accounting conservatism over 1963-1990 |
| Becker <i>et al.</i> (1998) | Object of study | The effect of audit quality on earnings management |
| | Outcome | Big Six auditors are of higher quality than Non-Big 6 auditors |
| Chambers and Payne (2011) | Object of study | Audit quality and accruals persistence: evidence from the pre- and post-Sarbanes-Oxley periods |
| | Outcome | |
| Chaney <i>et al.</i> (2004) | Object of study | Self-selection of auditors and audit pricing in private firms |
| | Outcome | Accrual persistence increased significantly in the post-SOX period. Companies audited by Big-N auditors with lower-independence have the biggest improvement in accrual persistence |
| Chang <i>et al.</i> , 2009 | Object of study | Sarbanes Oxley Act, perceived earnings quality and cost of capital |
| | Outcome | Audit market of not listed firms is segmented across cost effective lines. Most clients do not see Big-5 auditing firms as providers of better audit quality audits, which can explain their higher fees |
| Chen <i>et al.</i> (2005) | Object of study | Audit quality and earnings management for Taiwan IPO firms |
| | Outcome | Big five auditing firms are related to less earning management in the IPO year in Taiwan. Higher quality auditors better constrain earnings management for Taiwanese IPO companies |
| Chi <i>et al.</i> (2009) | Object of study | Mandatory audit partner rotation, Audit Quality, and Market Perception: Evidence from Taiwan |
| | Outcome | The findings are inconsistent with the belief that compulsory auditor rotation improves audit quality. Those findings are consistent, with findings in the United States, that compulsory auditor rotation may not improve audit quality |
| Cohen <i>et al.</i> (2008) | Object of study | Real and accrual based earnings management in the pre- and post-Sarbanes-Oxley periods |

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| | Outcome | Accrual-based earnings management increased steadily from 1987 until the passage of SOX in 2002, and decline considerably after the passage of SOX. On the same time period, before the passage of SOX real earnings management activities were decreased while after the passage of SOX increased |
| Collin <i>et al.</i> 2009 | Object of study | Explaining the choice of accounting standards in municipal corporations: Positive accounting theory and institutional theory as competitive or concurred theories |
| | Outcome | Use of both positive accounting and institutional theories to create hypotheses in order to explain accounting choices made by municipal companies. The research proposes an integrative approach of both theories in an eclectic alternative |
| Davidson and Neu (1993) | Object of study | Association between audit firm size and audit quality |
| | Outcome | Larger auditing firms are associated with higher quality audits and larger forecast errors |
| DeAngelo (1986) | Object of study | Accounting numbers as market valuation substitutes: A study of management buyouts of public stockholders |
| | Outcome | The managers of the research firms systematically involved in earnings management practices attempting to decrease the profits of their companies and decrease the compensation of the buyout public stockholders |
| DeAngelo <i>et al.</i> (1994) | Object of study | Accounting choice in financially troubled companies |
| | Outcome | Managers' accounting choices primarily reflect their firms' financial difficulties, rather than attempts to inflate income |
| Dechow and Dichev (2002) | Object of study | The quality of accruals and earnings: The role of accruals estimation errors |
| | Outcome | Measurement of the accruals quality by observing the extent working capital accruals map into operating cash flow realizations, poor matching signifies low accrual quality |
| Dechow and Sloan (1991) | Object of study | Executive Incentives and the Horizon Problem: An Empirical Investigation |
| | Outcome | CEOs reduce the spending on R & D the last year they hold the position. Nevertheless, there is no direct evidence to suggest that this reduction in R & D caused because of economic performance or because the investments reduced in order to be capitalized |
| Dechow <i>et al.</i> (1995) | Object of study | Detecting earnings management |
| | Outcome | All models perform well when test random samples of firm years. All models provide low power tests. All test reject the hypothesis of zero earnings management when test samples of companies with extreme financial behavior |
| Dechow <i>et al.</i> (2003) | Object of study | Why are earnings kinky? An examination of the Earnings management explanation |
| | Outcome | Small profit firms have high discretionary accruals |

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| | | relative to other firms which means that systematically involved in earnings management. Small losses firms use earnings management aiming to report the smallest losses possible |
| Demski (1988) | Object of study | Positive accounting theory: A review |
| | Outcome | The research suggests that Watts and Zimmerman's <i>Positive Accounting Theory</i> contributes to accounting thought and try to document this opinion |
| Francis et al. (1999) | Object of study | The role of Big Six auditors in the credible reporting of accruals |
| | Outcome | Big auditors provide better assurance over earnings management, this is also the reason why companies choose them despite their high cost. High earnings management potential companies employees big auditor to signal that their financial statements are credible |
| Francis et al. (2005) | Object of study | The market pricing of accruals quality |
| | Outcome | Low accruals quality companies have higher ratios of interest expense to interest-bearing debt and lower debt ratings than companies with better accruals quality do. Companies with the best accruals quality have lower cost of debt. Companies with lower accruals quality have larger earnings-price ratios from the rest companies of their industry |
| GAO-08-163 (2008) | Object of study | Audits of Public Companies, Continued Concentration in Audit Market for Large Public Companies Does Not Call for Immediate Action |
| | Outcome | The Big4 auditing firms audit almost all large public companies. According to GAO's survey, 82% of big public companies think their auditor choice is limited, while almost 60% thinks the competition in the US auditing market is insufficient. Most small public companies say they are satisfied. |
| GAO-03-864 (2003) | Object of study | Public Accounting Firms, Mandated Study on Consolidation and Competition |
| | Outcome | Although GAO found no evidence of unfair competition to date, the important changes that have occurred in the auditing market may have implications for competition and public company choice, in the future. |
| Graham et al. (2005) | Object of study | The economic implications of corporate financial reporting |
| | Outcome | Managers avoid violating the GAAP in order to manipulate the earnings of their companies. 78% of the sample is willing to sacrifice long-term profits to smooth earnings. Managers, try to maintain predictability of earnings and financial disclosures. Managers make voluntary disclosures to reduce information risk and boost stock price while on the same time, try to avoid disclosure performance that will be difficult to maintain |
| Healy (1985) | Object of study | The effect of bonus schemes on accounting decisions |

| | | |
|----------------------------|-----------------|--|
| | Outcome | The accruals decision making of managers related to their compensation and bonus contracts, managers change the accounting procedures of their companies to fit their compensation and bonus plan |
| Healy and Wahlen (1999) | Object of study | A review of the earnings management literature and its implications for standard setting |
| | Outcome | Much of the academic research on earnings management have limited value to standard setters and regulators. Moreover the literature provides little evidence on questions, related to the frequency of earnings management, which accruals are managed, and effects on resource allocation |
| Hussainey (2008) | Object of study | The impact of audit quality on earnings predictability |
| | Outcome | Investors are able to expect more reliable future earnings when financial statements are audited by the big four accounting firms |
| Jones (1991) | Object of study | Earnings management during import relief investigations |
| | Outcome | Managers use earnings management to reduce the earnings of their companies during import relief investigations |
| Krishan (2003) | Object of study | Audit quality and the pricing of discretionary accruals |
| | Outcome | The association between stock returns and discretionary accruals is higher for companies audited by Big 6 auditors. Discretionary accruals of clients of Big 6 auditors have a higher association with future profitability |
| Leuz <i>et al.</i> (2003) | Object of study | Earnings management and investor protection: an international comparison |
| | Outcome | Outsider economies with discharge ownership, strong investor protection, and large stock markets have lower levels of earnings management than insider countries with concentrated ownership, weak investor protection, and less developed stock markets |
| Lobo and Zhou (2006) | Object of study | Did conservatism in financial reporting increase after the Sarbanes-Oxley act? Initial evidence |
| | Outcome | Companies are more conservative the first two years after the passage of SOX than they were two years before it |
| Manry <i>et al.</i> (2008) | Object of study | Does increased audit partner tenure reduce audit quality? |
| | Outcome | Audit quality appears to increase with increased audit firm tenure. The audit tenure is significantly and negatively related to estimated discretionary accruals for small clients, while audit tenure is not significantly associated with estimated discretionary accruals for big clients. Audit company rotation may not increase audit quality but have the opposite results for some companies |
| Rusmin (2010) | Object of study | Auditor quality and earnings management: Singaporean |

| | | |
|---|-----------------|---|
| | | evidence |
| | Outcome | The level of earnings management is lower for firms using specialist auditors than those don't use specialist auditors |
| Securities and Exchange Commission (2007) | Object of study | Commission Guidance Regarding Management's Report on Internal Control Over Financial Reporting Under Section 13(a) or 15(d) of the Securities Exchange Act of 1934 |
| | Outcome | N/A |
| Van Tendeloo and Vanstraelen (2008) | Object of study | Earnings management and audit quality in Europe |
| | Outcome | Privately held companies engage less in earnings management when they have a Big 4 auditor in countries with a high financial and tax accounting alignment |
| Wang <i>et al.</i> , (2010) | Object of study | The Sarbanes-Oxley Act and CEO, turnover, and risk aversion |
| | Outcome | CEOs become less willing to take risks after the passage of SOX. This could be the explanation why, after the mandatory adaption of SOX, the CEO tenure not significantly is shorten. Financial restatements affect the CEO tenure due to increased monitoring activities by both board and financial media in the post-SOX era. The increased monitoring also contributes to the declining will of CEO to take risks |
| Watts and Zimmerman, (1990) | Object of study | Positive accounting theory: A ten year perspective |
| | Outcome | Suggests ways to improve positive research in accounting choice. The most important suggested improvement is the stronger links between theory and empirical tests |
| Watts, (2003) | Object of study | Conservatism in Accounting; Part A: Explanations and Implications; Part B: Evidence and Research Opportunities, Accounting Horizons |
| | Outcome | A two parts literature review, the first part focus on accounting conservatism presenting different theories of conservatism and their implications. The second part makes a summary of conservatism evidence and grade the ability of those evidence to distinguish among conservatism explanations and between conservatism and non-conservatism explanations |
| Books | | |
| Brooks (2008) | Object of study | Introductory Econometrics for Finance |
| | Outcome | n/a |
| Freeman (2002) | Object of study | Stakeholder Theory of the Modern Corporation, Ethical Issues in Business: A Philosophical Approach, 7 th Edition |
| | Outcome | n/a |
| Miles and | Object of study | Qualitative Data Analysis: An Expanded Sourcebook, |

| | | |
|--------------------|---------|-------------------------|
| Huberman (1994) | | 2 nd edition |
| | Outcome | n/a |

3.3 Sarbanes Oxley Act 2002

In the aftermath of the corporate meltdown of Enron, WorldCom, Arthur Andersen, and other US corporations, the US business environment was characterized by uncertainty and little trust for the corporate financial disclosures. The high alert and sensitivity of authorities and investors towards any doubtful form of business practice, led their interest to earnings management and its implications to the business environment (Aono *and* Guan, 2008). On the same time, the public opinion was demanding regulations that would be able to create significant changes in the fields of management behavior, corporate governance and business practices (Wang *et al.*, 2010).

3.3.1 The Purpose of the Sarbanes-Oxley Act

The answer of US regulators to this fundamental crisis of trust among investors was the mandatory adoption of the Sarbanes-Oxley Act. The primary aim of this act was to protect the interest of investors, and restore their confidence on the integrity of the corporative financial reporting, by ensuring that corporations provide high quality, accurate and timely disclosures (Aono *and* Guan, 2008; Chang *et al.*, 2009). Other primary targets of the Sarbanes-Oxley Act were; the improvement of the corporate governance, and the purification of managers' and directors' role in the corporate governance (Wang *et al.*, 2010).

To achieve those goals the Sarbanes-Oxley Act increased the accountability of board members and changed the dynamics between board of directors and CEOs, introducing the mandatory independence of the auditing committee and the financial literate of its members (Chang *et al.*, 2009), influencing this way both CEO tenure and CEO risk aversion (Wang *et al.*, 2010).

Moreover, the Sarbanes-Oxley Act prohibited auditors to provide certain non-audit services and protected the impartiality of the audit profession (Chang *et al.*, 2009). Additionally the Sarbanes-Oxley Act was designed to improve the quality of financial reporting information, requiring both CEOs and CFOs of public traded companies to

certify and guarantee the accuracy and completeness of the issued financial statements (Lobo *and* Zhou, 2006). Moreover, the Sarbanes-Oxley Act imposed extensive penalties and fines on CEOs and CFOs for issuing false financial statements, the penalties could be as high as \$5 million in fines and 20 years imprisonment (Aono *and* Guan, 2008; Lobo *and* Zhou, 2006). Because of the severe penalties, this new regulation had a direct impact on the business practices.

3.3.2 Impact of SOX

Two important impacts of the Sarbanes-Oxley Act were; the decrease of discretionary accruals and the increase of accounting conservatism. This was possible because both the Sarbanes-Oxley Act and the law system, impose greater penalties for earnings overstatement than earnings understatement (Watts, (b) 2003), consequently CEOs and CFOs have greater motives to use their discretion in order to understate their profits instead of overstate them (Lobo *and* Zhou, 2006). On the other hand, because CEOs and CFOs have no longer great incentives to use aggressive accruals accounting practices, they are led towards a more conservative accounting approach (Lobo *and* Zhou, 2006). To that also helped the guidance of financial consultants, whom after the passage of the Sarbanes-Oxley Act, advised their clients to take a less aggressive and more conservative approach of accounting and financial reporting (Lobo *and* Zhou, 2006).

The fundamental principle of accounting conservatism is the timely recognition of losses and the less timely recognition of earnings (upon verification), under this principle earnings reflecting bad news (losses) faster than good news (profits) (Basu, 1997). This time asymmetry in the recognition of losses and profits, create systematic differences between good and bad news periods in the timeliness, continuity and integrity of earnings (Basu, 1997). Consequently, because of the recognition time asymmetry between earnings and losses, (*losses are recognized faster than profits, instead on the actual time they occur*), many scholars have linked accounting conservatism to both earnings management and income smoothing, and accuse accounting conservatism for being a negative accounting practice.

Furthermore, one other effect of the Sarbanes-Oxley Act was the mandatory five-year rotation of the lead and concurring partners of the audit firm (Chi *et al.*, 2009). The main aim of this policy was to strengthen the audit quality, by weakening the relation

between the auditor and the auditee, and obstructing auditors from concealing information (Chi *et al.*, 2009). However, this fundamental assumption has not been tested systematically because of the lack of partner attendance information in the US audit reports.

Unlike the US, audit reports in Taiwan contain both auditing firm and auditing firm partner or auditor name (Chi *et al.*, 2009). Moreover, compulsory audit partner rotation is effective since 2004 following the US example (Chi *et al.*, 2009). Under those conditions Chi *et al.* (2009) tested the hypothesis, that mandatory five-year partner rotation enhances the audit quality, and found a negative relation between the audit quality and the five-year mandatory audit partner rotation.

Nevertheless, according to Leuz *et al.* (2003), the Sarbanes-Oxley Act and the measures it imposed over businesses and management, strengthened the financial reporting quality and the investor protection environment in the US market which “*results in less earnings management because insiders enjoy fewer private control benefits and hence have lower incentives to conceal firm performance from outside investors*”. Moreover, they also suggested that controls that restrict the private control benefits of insiders increase the level of investors’ protection in the economy and consequently increase the trust of investors over the market, promoting the economic activity (Leuz *et al.*, 2003).

Even though accounting regulations have the ability to restrict insiders’ actions aiming to distort reported earnings and financial statements, the extent to which accounting regulations affect the quality of reported earnings or financial statements depends on the degree and the effectiveness of those regulations enforced (Leuz *et al.*, 2003; Van Tendeloo *and* Vanstraelen, 2008). Consequently, it is expected that countries with strong enforcement and high investor protection regulations are capable to enforce more effectively their financial regulations, and restrict the use of earnings management practices.

Consistent to the before opinion Leuz *et al.* (2003) argue that “*Anglo-American countries have stricter accounting rules with respect to explicit accounting choices than Continental European countries with less effective investor protection*”. Consequently, it is possible to support that the enforcement of Sarbanes-Oxley Act,

consists an important arsenal against the use of earnings management and accounting manipulations.

3.4 Earnings Management Literature

3.4.1 Earnings Management Motives

The extensive use of financial accounting information for internal (*contractual obligations, sales targets, compensation*) and external corporate purposes (*investors, financial analysts, creditors, suppliers, tax authorities and other stakeholders*) creates powerful incentives on managers to manipulate the reporting earnings of their companies (Healy *and* Wahlen, 1999). Furthermore, Healy *and* Wahlen (1999) report that buyout companies manipulate their earnings prior to a management buyout, in an effort of their management to increase their bargaining power and achieve a better buyout price for their company.

Nevertheless, on the same research Healy *and* Wahlen (1999) present evidences from prior earnings management researches which argue that management uses income increasing accruals prior to seasoned equity offers, initial public offers, and stock financed acquisitions. In conformity with the research of Healy *and* Wahlen (1999), Chen *et al.*, (2005) report that going public is a major corporate event for both companies and managers; companies have a unique opportunity to raise additional capital to fund their future growth, while managers have a great opportunity to build their reputation. Those conditions create powerful incentives able to motivate the management of every company to be engaged in opportunistic earnings management prior to an initial public offer (Chen *et al.*, 2005).

Moreover, Healy *and* Wahlen (1999) report the use of reversal accruals following initial public offers and stock financed acquisitions. They also report that firms use earnings management techniques to meet or beat the expectations of the markets, the analysts, and the shareholders. The before arguments are consistent with the researches of Rusmin (2010) and Chen *et al.* (2005). More analytically, firms manage their earnings upwards to avoid report a financial performance that will be lower than the market expectations. The firms, which receive buy or sell recommendations, often manage their earnings in such a way that they can meet the analysts' expectations (Healy *and* Wahlen, 1999). Finally, in their research Healy *and* Wahlen (1999)

document that companies manage their earnings upwards when management cannot meet the corporate forecast, one popular way for companies to manage their earnings upwards is the misrepresentation of the R&D spending.

Another research by Baralexis (2004) presents findings that declare that large firms prefer to overstate their profits aiming better access to the capital through the stock market, while small firms prefer to understate their profits aiming to reduce their income tax.

In a similar earnings management research Van Tendeloo *and* Vanstraelen (2008) report that “*managers want to mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers*”. According to the outcomes of their research the most common motives for earnings management are; tax minimization, bank financing, and better terms of trade with suppliers, clients and government (Van Tendeloo *and* Vanstraelen, 2008). Later, in their earnings management analysis they report that bank financing is a major source of capital for private companies, leading to agency conflicts between the financial institutions and the company owners or managers (Van Tendeloo *and* Vanstraelen, 2008).

In addition, Leuz *et al.* (2003) report that the use of financial statements and reporting earnings for tax and financial accounting purposes increase the incentives of insiders to use earnings management. Finally, they add that insiders, such as controlling owners or managers, have strong incentives to use their controlling power to benefit themselves, through corporate consumption or even transfer of the firm’s wealth to other insiders, companies or their families (Leuz *et al.*, 2003).

Nevertheless, the findings of Dechow *et al.* (2003) suggest that small loss avoidance is a very powerful incentive, able to motivate managers to use their discretionary power and increase the reporting earnings of their companies in order to report a small profit instead of a small loss. Their findings also suggest that since the majority of the small loss reporting companies have positive discretionary accruals, they are also driven by powerful incentives, which motivate their managers to report the smallest possible loss (Dechow *et al.*, 2003).

Finally, their findings indicate that meeting the analysts' forecasts has become a very powerful incentive for earnings management practices (Dechow *et al.*, 2003). In addition, Rusmin (2010) underlines that information asymmetry between managers and the rest of stakeholders, is a condition that promotes earnings management enabling managers to use their discretion power and manipulate earnings for their benefit.

3.4.2 Earnings management

Accounting is frequently based on assumptions and discretion estimations, which if not accurate need to be corrected in future accruals and earnings (Dechow *and* Dichev, 2002), for this reason accruals often are used as vehicle of the use of earnings management. One sign that signals the possible use of earnings management practices is the poor accruals quality of a company.

Due to the information asymmetry, business outsiders and stakeholders have difficulty to distinguish between honest estimation errors and opportunistic use of accruals, which aim to window-dress or mislead the external users of the financial statements (Dechow *and* Dichev, 2002).

To clear the difference between honest estimation errors and opportunist use of accruals Dechow *and* Dichev (2002) avoid distinguishing between intentional and unintentional estimation errors because both imply a low quality of the accruals and the earnings. Instead, they suggest that accrual estimation accuracy, as well as the managerial intention to affect the frequency and the magnitude of accruals estimation errors, is systematically related to business fundamentals characteristics, such as the complicity of transactions, the business environment predictability, and the operational structure (Dechow *and* Dichev, 2002).

Dechow *and* Dichev (2002) underlines the following relation between the accruals quality and the specific firm characteristics: *“The longer the operating cycle, the lower accrual quality. The smaller the firm, the lower the accrual quality will be. The greater the magnitude of accruals, the lower the accrual quality will be. The greater the magnitude of cash flow volatility, the lower the accrual quality will be. The greater the magnitude of accrual volatility, the lower the accrual quality will be. The*

greater the magnitude of earnings volatility, the lower the accrual quality will be. The greater the frequency of reporting negative earnings, the lower the accrual quality will be. The greater the magnitude of sales volatility, the lower the accrual quality will” (Dechow and Dichev, 2002).

Chen *et al.* (2005) report that business environment characteristics is a key element in the use of earnings management, indicating that information asymmetry between management, investors and stakeholders consist a nursery for earnings management. In alignment with Chen *et al.* (2005), Baralexis (2004) writes that his findings indicate the existence of two distinctive earnings management practices, one that does not break the existing GAAP and law regulations moving in the grey area between the law and the law enforcement (legal), and a second that breaks the existing GAAP and the law regulations (illegal).

In their research, Cohen *et al.* (2008) support that business environment characteristics is essential on the earnings management practices used by companies. More precisely, the empirical findings of their research in the US market indicate, that prior the Sarbanes-Oxley Act the volume of accruals based earnings management were increasing, reaching a peak during the years 2000-2001 when the major financial Wall Street scandals took place (Cohen *et al.*, 2008).

The same research indicates that after the passage of the Sarbanes-Oxley Act, the accruals based earnings management decline and substituted by real activities earnings management (Cohen *et al.*, 2008). According to Graham *et al.* (2005) companies substitute accruals based earnings management with real activities earnings management, because even though real activities earnings management is more expensive to implement is harder to be detected.

Dechow *et al.* (2003) argue that the most popular way for companies to practice earnings management is through the manipulation of accruals. Their findings suggest that companies which report small earnings have significantly high accruals and operating cash flows, while the larger a firm’s current assets and liabilities in relation to its assets, the greater the ability to boost earnings (Dechow *et al.*, 2003).

The results of Deschow et al. (2003) underline that companies, which manipulate their earnings, compared to other companies are; younger, less leveraged and they have significantly high current assets, liabilities, and strong indicators suggesting a poorer future performance than other companies do.

According to Dechow *et al.* (2003), the report of small losses is another earnings management indicator. Their findings indicate that discretionary accruals of small loss companies differ little from the accruals of small profit companies signaling the use of earnings management practices. The characteristics of small loss companies are; significant earnings declines, and negative future performance (Dechow *et al.*, 2003).

Leuz *et al.* (2003) argue that other indicators signaling the existence of earnings management are the legal and enforcement systems which are in place. To support their theory, they conduct a cluster country analysis, grouping countries with similar legal and institutional characteristics in three groups;

- 1) the “*outsider economies with large stock markets, dispersed ownership, strong investor rights, and strong legal enforcement*” (Leuz *et al.*, 2003),
- 2) the “*insider economies with less-developed stock markets, concentrated ownership, weak investor rights, but strong legal enforcement*” (Leuz *et al.*, 2003),
- 3) in addition the “*insider economies with weak legal enforcement*” (Leuz *et al.*, 2003).

The findings of Leuz *et al.* (2003) suggest that; the outsider economies display the lowest levels of earnings management, while the insider economies with weak legal enforcement display the highest levels of earnings management. According to Leuz *et al.* (2003) this outcome can be explained, because both legal and enforcement systems protect the interests of investors, and reduce the capability and willingness of insiders to conceal or manipulate the accounting information.

Van Tendeloo *and* Vanstraelen (2008) in their research support that companies located in countries with strong law and enforcement systems are less likely to be involved in earnings management practices than companies which located in countries with weak law and enforcement systems. According to their interpretation this happens because the authorities of strong law and enforcement countries scrutinize

financial statements more, increasing the danger of detection and punishment (Van Tendeloo *and* Vanstraelen, 2008).

The same authors further expand their research suggesting that the tax system of a country could be a strong earnings management indicator (Van Tendeloo *and* Vanstraelen, 2008). In their analysis they demonstrate that in countries with high alignment between financial reporting and tax accounting, companies and managers are less willing to be involved in earnings management, because tax authorities have a strong interest enforcing the accounting regulations (Van Tendeloo *and* Vanstraelen, 2008).

3.4.3 Big4 Auditors and Non-Big4 Auditors Differences

The association between the use of earnings management, audit quality and auditor industry specialization was studied by Balsam *et al.* (2003). They support, that firms which are audited by industry specialist auditors, appear to have lower level of discretionary accruals and higher level of earnings response coefficient, compared to firms audited by non-specialists. The positive impact from specialists' auditors is more intense in the services industry, mining, construction, transportation, and trade sections (Balsam *et al.*, 2003).

In alignment to the before research Chen *et al.* (2005) investigate the relationship between the audit quality (*auditor size & industry specialization*) and unexpected accruals prior initial public offerings. The empirical evidence of their research suggests that audit quality (*in the form of Big4 auditors*) constrain the incentives of managers or other insiders to perform opportunistic earnings management prior initial public offerings (Chen *et al.*, 2005). Audit quality was also found to reduce the adverse impact of information asymmetry between management and investors, and is essential to the success of the initial public offerings (Chen *et al.*, 2005).

In addition, the relationship of the use of earnings management and audit quality does not differ for the market of Singapore as well. Rusmin (2010) reports that firms being audited by Big4 auditors indicate lower magnitude of the use of earnings management than firms that are audited by Non-Big4 auditors. Moreover, Rusmin (2010) suggests that auditor's specialization is related to earnings management in a negative way.

Moreover, Francis *et al.* (1999) argue that companies with tendency to generate large volumes of accruals prefer to hire Big4 auditors, because Big4 auditors increase the reliability of their financial reports, enhancing the confidence of their investors and stakeholders.

The research of Van Tendeloo *and* Vanstraelen (2008) underline that Big4 auditors are providers of premium quality audits, because constrain more effectively earnings management. Nevertheless, their research indicates that Big4 auditors provide higher quality auditing services, only in countries that are characterized by high investor protection, strong financial regulations enforcement, and have high tax alignment between financial reporting and taxable income (Van Tendeloo *and* Vanstraelen, 2008).

According to the research of Becker *et al.* (1998), clients of Non-Big auditors' report 1.5% - 2.1% (based on total assets) higher discretionary accruals than those of the Big4 auditors' clients do. Similarly, Krishan (2003) finds that discretionary accruals reported by Big auditors' clients are related in higher degree with future profitability, compared to those reported by Non-Big4 auditors' clients.

The findings of Hussainey (2008) indicate that Big4 auditing firms retain their audit quality advantage compared to other accounting firms. Consequently, investors rely more on financial statements when these are audited by Big4 auditors. Additionally, Davidson *and* Neu (1993) in their research underline that because larger auditors are linked with larger forecast errors, they face larger litigation and audit failure risks, which lead them to provide higher quality audits compared to smaller auditors.

Likewise, Rusmin (2010) reports that companies, which are audited by Big4 auditors, indicate lower magnitude of earnings management than companies audited by Non-Big4 auditors. These findings suggest that auditor's specialization is related to earnings management in a negative way. The research of Manry *et al.* (2008) adds that auditors of small auditing firms improve their performance and become providers of higher constraints towards aggressive financial statements as the audit tenure increases, while the audit quality of the large audit firms remain unaffectedly high through time.

3.5 Earnings Management Estimation Methods

Existing earnings management estimation models range “*from simple models in which discretionary accruals are measured as total accruals, to more sophisticated models that attempt to separate total accruals into discretionary and nondiscretionary components*” (Dechow *et al.*, 1995). Those models presented in this passage of the literature.

3.5.1 Healy Model (1985)

The research of Healy (1985) tests for the use of earnings management using the comparison of the mean total accruals scaled by lagged total assets with the earnings management partitioning variable (Dechow *et al.*, 1995; Healy, 1985). The differentiation of this earnings management approach is the prediction that systematic earnings management occurs during all the business periods (Dechow *et al.*, 1995; Healy, 1985). The earnings management variable of this approach divides the sample in three groups of companies, one group that contains companies which manage their earnings upwards and two others groups that contain companies which manage their earnings downwards (Dechow *et al.*, 1995; Healy, 1985). Then, the mean total accruals of the group of companies that predicted to manage their earnings upwards are compared to each of the two groups of companies that predicted to manage their earnings downwards (Dechow *et al.*, 1995; Healy, 1985). The mean total accruals of the investigation period are used as measure for the non-discretionary accruals. The Healy (1985) non-discretionary accruals estimation model is:

$$NDA_{\tau} = \sum_{\tau} TA_{\tau} / T$$

Where:

NDA = non-discretionary accruals

TA = total accruals scaled by lagged total assets

t = time period

τ = one year of the event period

3.5.2 DeAngelo Model (1986)

By measuring the differences in the total accruals, the research of DeAngelo (1986) tests for the use of earnings management. “*By assuming that the differences have an expected value of zero under the null hypothesis of no earnings management*” (Dechow *et al.*, 1995; DeAngelo, 1986). The DeAngelo model uses as measure for

non-discretionary accruals the total accruals of the last period divided by the lagged total assets (Dechow *et al.*, 1995; DeAngelo, 1986). The DeAngelo model estimated as:

$$NDA_{\tau} = TA_{\tau-1}$$

Where:

NDA = non-discretionary accruals

TA = total accruals scaled by lagged total assets

τ = one year of the event period

The DeAngelo model has similarities to the Healy Model, consequently can be considered as a variation of the Healy model (Dechow *et al.*, 1995; DeAngelo, 1986). One common element of those two models is that they both use total accruals to estimate the expected non-discretionary accruals, if non-discretionary accruals are stable during the estimation period and discretionary accruals have a mean of zero during the same period, then, both models will calculate the non-discretionary accruals without error (Dechow *et al.*, 1995). If the non-discretionary accruals are not stable and change during the investigation period, then, both models will calculate the non-discretionary accruals with error (Dechow *et al.*, 1995).

3.5.3 Industry Model (1991)

This model is used by Dechow *and* Sloan (1991) and is similar to the Jones model using the assumption that non-discretionary accruals used all the time and their use never stops. Moreover, the industry model uses the assumption that the characteristics that create the use of earnings management are common among companies in the same industry, and does not identify the individual earnings management indicators (Dechow *et al.*, 1995; Dechow *and* Sloan, 1991).

The Industry model estimated as:

$$NDA_{\tau} = \gamma_1 + \gamma_2 \text{median}_1(TA_{\tau})$$

Where:

$\text{median}_1(TA_{\tau})$ = median volume of total accruals divided by lagged assets for all non-sample companies with the same 2-digit SIC code.

γ_1 and γ_2 calculated using OLS on the observations of the estimation period (Dechow *et al.*, 1995).

The industry model minimizes measurement errors as it removes only the nondiscretionary accruals that are common in companies in the same industry. At the same time, removes the discretionary accruals variations that are related to companies of the same industry, which can create calculation problems (Dechow *et al.*, 1995; Dechow and Sloan, 1991).

3.5.4 Jones Model (1991)

The research of Jones (1991) introduces a new model for the calculation of the discretionary accruals. This model is based on two assumptions, the assumption that managers use their discretion to manage earnings, and the assumption that non-discretionary accruals are constant. This model aims to control the effects caused from the changes of the company's economic performance on non-discretionary accruals (Jones, 1991). The Jones Model estimated as:

$$NDA_{\tau} = a_1 (1 / A_{\tau-1}) + a_2 (\Delta REV_{\tau}) + a_3 (PPE_{\tau})$$

Where:

ΔREV_{τ} = revenues in year τ less revenues in year $\tau-1$ scaled by total assets at $\tau-1$

PPE_{τ} = gross property plant and equipment in year τ scaled by total assets at $\tau-1$

$A_{\tau-1}$ = total assets at $\tau-1$

a_1, a_2, a_3 = firm specific parameters

The firm specific parameters estimated using the model: $TA = \alpha_1 (1 / A_{\tau-1}) + \alpha_2 (\Delta REV_{\tau}) + \alpha_3 (PPE_{\tau}) + u_t$

Where:

$\alpha_1, \alpha_2, \alpha_3$ indicate the OLS calculation of a_1, a_2, a_3

TA = total accruals scaled by lagged total assets

The results of the Jones model denote that the model is able to explain approximately one quarter of the total accruals variations (Dechow *et al.*, 1995). One limitation of this model is the fundamental assumption that revenues are not discretionary. This assumption implies to the removal of parts of the managed earnings from the

discretionary accruals proxy and decrease the explanation power of the model (Dechow *et al.*, 1995; Jones, 1991).

3.5.5 Modified Jones Model (1995)

Dechow *et al.* (1995) introduce a new variation of the Jones Model. The modification “*is designed to eliminate the conjecture tendency of the Jones Model to measure discretionary accruals with error when discretion is exercised over revenues*” (Dechow *et al.*, 1995). This new model estimates discretionary accruals as:

$$NDA_{\tau} = a_1 (1 / A_{\tau-1}) + a_2 (\Delta REV_{\tau} - \Delta REC_{\tau}) + a_3 (PPE_{\tau})$$

Where:

ΔREC_{τ} = net receivables in year τ less receivables in year $\tau-1$ scaled by total assets at $\tau-1$.

The modified Jones Model obtains the same estimates for the a_1 , a_2 , a_3 , and non-discretionary accruals as the Jones model for estimations, which no earnings management is hypothesized. The only modification in relation to the Jones model “*is that the change in revenues is adjusted for the change in receivables in the event period*”. Hence, the major difference between the modified Jones model and the Jones model is the next. “*That the modified Jones model implicitly assumes that all changes in credit sales in the event period result from earnings management while the Jones model implicitly assumes that discretion is not exercised over revenue in either the estimation period or the event period*” (Dechow *et al.*, 1995).

3.5.6 Leuz *et al.* Model (2003)

Leuz *et al.* (2003), in their research develop four different country-level measures aiming to capture the different dimensions of the use of earnings management, and avoid the problem of bended accounting rules from insiders. The *first* earnings management measure they use, focuses on management’s reporting choices, consequently captures the reduced variability of reported earnings through accruals, and calculated as the “*country’s median ratio of the firm-level standard deviation of operating earnings divided by the firm-level standard deviation of cash flow from operations*” (Leuz *et al.*, 2003). This measure is scaled in accordance to the cash flow from operations, to control the firms’ variability of economic performance. The low values of this measure indicate the existence of earnings management activity (Leuz *et al.*, 2003).

The cash flow from operations is calculated indirectly, withdrawing the accruals element from the earnings. The accruals element of earnings calculated as:

$$\text{Accruals}_{it} = (\Delta\text{CA}_{it} - \Delta\text{Cash}_{it}) - (\Delta\text{CL}_{it} - \Delta\text{STD}_{it} - \Delta\text{TP}_{it}) - \text{Dep}_{it}$$

Where:

ΔCA_{it} = change in total current assets

ΔCash_{it} = change in cash/cash equivalents

ΔCL_{it} = change in total current liabilities

ΔSTD_{it} = change in short term debt included in current liabilities

ΔTP_{it} = change in income taxes payable

Dep_{it} = depreciation and amortization expense for firm *i* in year *t*.

Because they relate to financial transactions, as opposed to financial activities, the changes in short term debt are not included in the accruals. In cases of unreported taxes payable or short-term debt, the change in both variables assumed to be zero (Leuz *et al.*, 2003).

The *second* earnings management measure captures earnings smoothing. It measures the correlation differences between changes in the accounting accruals and the changes in the operating cash flows. Both accruals and operating cash flow elements are calculated on the same way as in the first measure equation, while the correlation is calculated over the overall number of firms per country (Leuz *et al.*, 2003).

The *third* earnings management measure uses the magnitude of the accruals as a proxy aiming to capture the degree of exercised discretion over the reported earnings. This measure is calculated as “a country’s median of the absolute value of firms’ accruals scaled by the absolute value of firms’ cash flow from operations”. The scaling provides control over the differences in firm size and performance (Leuz *et al.*, 2003).

The *fourth* earnings management measure uses the ratio of small reported profits to small reported earnings, aiming to capture the intention of management to manage its earnings and avoid report small losses. This ratio calculated “for each country, using after-tax earnings scaled by total assets. Small losses are defined to be in the range of (0.01 and 0.00) and small profits are defined to be in the range of (0.00 and 0.01)”

(Leuz *et al.*, 2003). According to Leuz *et al.* (2003), the ratio is reliable only when contains at least five small losses observations per country.

Moreover, in order to manage possible calculation errors, Leuz *et al.* (2003) designed an overall earnings management average measure per country. The countries ranked in declining order consequently, the higher the score the higher the level of the use of earnings management. Finally, the aggregated earnings management grade is calculated by the mean of the four individual earnings management measures.

3.5.7 The Model of this Research

The empirical research of Dechow *et al.* (1995) presented evidence, which demonstrate that the modified Jones model is the most powerful model for detecting the accruals based earnings management. Since then, the modified Jones model is the model of choice of the most researchers that focus on the use of earnings management. Because of the before reasons, this research will use the cross sectional modified Jones model as this is described by Dechow *et al.* (1995), and interpreted by (Cohen *et al.*, 2008).

3.6 Modified Jones Model Variations

This part of the literature presents variations of the modified Jones model as those developed during the last years.

3.6.1 Dechow *et al.* (2003)

This research is based on prior literature findings indicating that too few companies report small losses while on the same time too many companies report small profits. The primary focus of Dechow *et al.* (2003) is on discretionary accruals and whether compared to all the other firms and the small loss companies, small profit companies have higher percentage of discretionary accruals.

For the purpose of their research, Dechow *et al.* (2003) use the Jones model, because all models of discretionary accruals can be criticized for misclassification of nondiscretionary accruals as discretionary. They introduce additional variables, which improve the explanatory power of the Jones model and use four build in accrual models. They begin their research using the cross sectional modified Jones model. The difference of the model they use from the simple Jones (1991) is that while the

simple Jones model assumes that changes in revenues are free of managerial discretion, the cross sectional modified Jones model distinguishes the credit sales from the change in revenue Dechow *et al.* (2003). The estimation of the cross sectional modified Jones model is as follows:

$$\text{Total Accruals} = a + b_1 (\Delta\text{Sales} - \Delta\text{REC}) + b_2\text{PPE} + \varepsilon$$

(All variables are divided by average total assets; The model is estimated for each two-digit SIC-years)

Where:

Total Accruals = *the difference between operating cash and income before extraordinary items as reported on the statement of cash flows*

ΔSales = *the change in sales from the previous year to the current year*

ΔREC = *the difference in accounts receivable from the start to the end of the year*

PPE is *the end of year property, plant and equipment* Dechow *et al.*, (2003).

For the second model, they make an adjustment, which captures the expected increase in credit sales. This regression is estimated as:

$$\Delta\text{REC} = a + k\Delta\text{Sales} + \varepsilon \text{ (The model is estimated for each two-digit SIC-years)}$$

$$\text{Total Accruals} = a + b_1 ((1+k) \Delta\text{Sales} - \Delta\text{REC}) + b_2\text{PPE} + \varepsilon$$

(The model is estimated for each two-digit SIC-years)

The differentiation of this model from the cross sectional modified Jones is that while the modified Jones assumes all credit sales are discretionary, forcing a positive correlation between the discretionary accruals and sales growth. The adapted model of Dechow *et al.* (2003) using the added slope coefficient (k) captures the expected change in accounts receivable for a given change in sales, estimating as discretionary accruals only the unexpected change in accounts receivable Dechow *et al.* (2003).

For their third model Dechow *et al.* (2003) consider that some parts of accruals can be predicted taking in to account the accruals of last year. Consequently, they include in their model the lagged value of total accruals (LagTA) aiming to capture the predictable component of the accruals. This regression is estimated as:

$$\text{Total Accruals} = a + b_1 ((1+k) \Delta\text{Sales} - \Delta\text{REC}) + b_2\text{PPE} + b_3\text{LagTA} + \varepsilon$$

(The model is estimated for each two-digit SIC-years)

For the fourth and final accruals estimation model of their research Dechow *et al.* (2003) take under consideration the accruals related to future sales growth of firms. Consequently, they include a measure (*GR_Sales*) aiming to identify and to capture the future sales growth aspect of accruals. This new measure is estimated as the change of sales from the present to the next year divided by the current sales. This regression is estimated as:

$$\text{Total Accruals} = a + b_1 ((1+k) \Delta\text{Sales} - \Delta\text{REC}) + b_2\text{PPE} + b_3\text{LagTA} + b_4\text{GR_Sales} + \varepsilon$$

(The model is estimated for each two-digit SIC-years)

3.6.2 Chen *et al.* (2005)

This research focuses its interest in audit quality and the use of earnings management prior initial public offerings in the Taiwanese capital market. The aim of this research is to measure the magnitude of earnings management. To measure earnings management Chen *et al.* (2005) focus their interest in discretionary accruals using the modified Jones model. The main reason for their choice to use the modified Jones model is evidence supporting that the modified Jones is the most powerful model for earnings management detection (Chen *et al.*, 2005). The model estimated as follows:

$$\text{TACC}_{it} = (\Delta\text{CA}_{it} - \Delta\text{CASH}_{it} - \Delta\text{CL}_{it} - \Delta\text{STD}_{it} - \text{DEP}_{it}) / \text{TA}_{it-1}$$

$$\text{TACC}_{it} = a_1(1/ \text{TA}_{it-1}) + a_2(\Delta\text{REV}_{it} - \Delta\text{REC}_{it}) / \text{TA}_{it-1} + a_3\text{PPE}_{it} / \text{TA}_{it-1} + \varepsilon_{it}$$

(The model is estimated cross-sectionally for each two-digit SIC-years)

Where:

TACC_{it} = total accruals for firm *i* in year *t*, defined as above

ΔCA_{it} = change in current assets for firm *i* in year *t*

ΔCASH_{it} = change in cash for firm *i* in year *t*

ΔCL_{it} = change in current liabilities for firm *i* in year *t*

ΔSTD_{it} = change in short-term debt for firm *i* in year *t*

DEP_{it} = change in depreciation for firm *i* in year *t*

ΔREV_{it} = change in revenue for firm *i* in year *t*

ΔREC_{it} = change in receivables for firm *i* in year *t*

PPE_{it} = net property, plant and equipment for firm *i* in year *t*

TA_{it-1} = total assets for firm i in year $t-1$ (Chen *et al.*, 2005).

3.6.3 Cohen *et al.* (2008)

In this research Cohen *et al.* (2008) focus their interest in earnings management during the pre and the post Sarbanes-Oxley Act periods. They investigate two different types of earnings management; the classic and the most spread accruals earnings management and the real activities earnings management. For the estimation of the accruals based earnings management they use a variation of the cross sectional modified Jones model. The model they use estimated as follows:

$$TA_{it} / Assets_{it-1} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} / Assets_{it-1}) + (k_3 PPE_{it} / Assets_{it-1}) + \varepsilon_{it} \quad (1)$$

(The model is estimated cross-sectionally for each two-digit SIC-years)

Where:

t = fiscal year

i = firm

TA = total accruals

$TA_{it} = EBX_{it} - CFO_{it}$

where EBX = earnings before extraordinary items and discontinued operations;

CFO = operating cash flows

$Assets_{it-1}$ = total assets

ΔREV_{it} = change in revenues from last year

PPE_{it} = gross value of property plant and equipment (Cohen *et al.*, 2008).

In the second step of their earnings management estimation process, they use the coefficient estimates of the before equation and calculate the company specific normal accruals (NA_{it}) for the sample companies. This model estimated as follows:

$$NA_{it} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} - \Delta AR_{it}) / Assets_{it-1} + k_3(PPE_{it} / Assets_{it-1}) \quad (2)$$

(The model is estimated cross-sectionally for each two-digit SIC-years)

Where:

ΔAR_{it} = the change in accounts receivable from last year

During the calculation of normal accruals Cohen *et al.* (2008) adjust the reported revenues of the sample for the change in accounts receivable, aiming to capture the possible earnings management activity sourced from credit sales. Discretionary

accruals is the difference between the total accruals and the fitted normal accruals; $DA_{it} = (TA_{it} / Assets_{it-1}) - NA_{it}$. After that, they calculate the absolute value of discretionary accruals and use it as proxy a for the use of earnings management.

In the third step of their approach, Cohen *et al.* (2008) use directional test, which consisted of two alternative measures. One of the two alternative measures estimated as follows:

$$TA_{it} / Assets_{it-1} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} - \Delta AR_{it}) / Assets_{it-1} + (k_3 PPE_{it} / Assets_{it-1}) + \varepsilon_{it} \quad (3)$$

Using the estimated coefficients of the before equation they compute the volume of the normal accruals (NA_{it}) as a percentage of the lagged total assets. They repeat the test using the second alternative measure which is based on the performance-matched discretionary accruals, “*matching each firm-year observation with another from the same two-digit SIC code and year with the closest return on assets in the current year, ROA_{it} (net income divided by total assets)*” (Cohen *et al.*, 2008).

For the estimation of the real activities earnings management Cohen *et al.* (2008) consider the abnormal levels of cash flow from operations (CFO), discretionary expenses, and production costs. Nevertheless, Cohen *et al.* (2008) focus on three earnings management methods and their effects on the before variables. Those are: “*Acceleration of the timing of sales through increased price discounts or more lenient credit terms; Reporting of lower cost of goods sold through increased production; Decreases in discretionary expenses that include advertising expense, research and development, and SG&A expenses*” (Cohen *et al.*, 2008).

The first step of the real activities earnings management estimation process is to express the normal cash flow from operations as a linear function of sales and the change in sales. This model is estimated as follows:

$$CFO_{it} / Assets_{i,t-1} = k_1(1 / Assets_{i,t-1}) + k_2(Sales_{it} / Assets_{i,t-1}) + k_3(\Delta Sales_{it} / Assets_{i,t-1}) + \varepsilon_{it} \quad (4)$$

(the cross-sectional regression is estimated for each industry and year)

Abnormal *CFO* = actual *CFO* - normal level of *CFO* (calculated using the estimated coefficient from Equation 4). The production costs = the sum of *COGS* + change in inventory during the year. *COGS* is modeled as a linear function of the contemporaneous sales:

$$COGS_{it} / Assets_{i,t-1} = k_{1t}(1 / Assets_{i,t-1}) + k_2(Sales_{it} / Assets_{i,t-1}) + \varepsilon_{it} \quad (5)$$

Next, they model inventory growth as:

$$\Delta INV_{it} / Assets_{i,t-1} = k_{1t}(1 / Assets_{i,t-1}) + k_2(\Delta Sales_{it} / Assets_{i,t-1}) + k_3(\Delta Sales_{i,t-1} / Assets_{i,t-1}) + \varepsilon_{it} \quad (6)$$

Equations 5 and 6 used to calculate the normal amount of production costs as:

$$Prod_{it} / Assets_{i,t-1} = k_{1t}(1 / Assets_{i,t-1}) + k_2(Sales_{it} / Assets_{i,t-1}) + k_3(\Delta Sales_{it} / Assets_{i,t-1}) + k_4(\Delta Sales_{i,t-1} / Assets_{i,t-1}) + \varepsilon_{it} \quad (7)$$

Then the normal level of discretionary expenses modeled as:

$$DiscExp_{it} / Assets_{i,t-1} = k_{1t}(1 / Assets_{i,t-1}) + k_2(Sales_{it} / Assets_{i,t-1}) + \varepsilon_{it} \quad (8)$$

However, modeling discretionary expenses as a function of the current sales creates a functional problem when companies manage their sales upwards aiming to report increased earnings. To mitigate this malfunction Cohen *et al.* (2008) model discretionary expenses as a function of the lagged sales and use the following equation to measure the normal amount of discretionary expenses.

$$DiscExp_{it} / Assets_{i,t-1} = k_{1t}(1 / Assets_{i,t-1}) + k_2(Sales_{i,t-1} / Assets_{i,t-1}) + \varepsilon_{it} \quad (9)$$

Where:

CFO = cash flow from operations in period *t*

Prod = the production costs in period *t*, defined as the sum of *COGS* and the change in inventories

DiscExp = discretionary expenditures in period *t*, defined as the sum of advertising expenses; *R&D* expenses (annual Compustat data item 46), *SG&A* (annual Compustat data item 189). The abnormal *CFO* (*R_CFO*), abnormal production costs

(R_PROD) and abnormal discretionary expenses (R_DISX) are computed as the difference between the actual values and the normal levels predicted from Equations (4), (7), and (9) (Cohen *et al.*, 2008). Those three variables used as proxies for real earnings management.

To capture the effects of the real earnings management through these three variables Cohen *et al.* (2008) compose and calculate a single variable combining the three real activities earnings management variables. More analytically, they calculate RM_PROXY as the sum of the standardized variables, R_CFO , R_PROD , and R_DISX . However, the three individual variables have different effects on earnings, which are possible to alter the results in case of using the RM_PROXY alone (Cohen *et al.*, 2008). To cope with this difficulty, Cohen *et al.* (2008), report the results according to the single real activities earnings management proxy (RM_PROXY) as well as the three different real activities earnings management proxies (R_CFO , R_PROD , and R_DISX) (Cohen *et al.*, 2008).

3.6.4 Rusmin (2010)

In this research Rusmin (2010), investigates the association between the audit quality and the use of earnings management in the Singaporean capital market. For the investigation purposes of this research, the author measures the level of discretionary accruals using the modified Jones model. The model he uses is estimated as follows:

$$TAC_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta LTD_{it} - \Delta ITP_{it}) - DPA_{it}$$

Where:

TAC_{it} = total accruals for firm i in time period t

ΔCA_{it} = change current assets for firm i from time period $t - 1$ to t

$\Delta Cash_{it}$ = Change cash balance for firm i from time period $t - 1$ to t

ΔCL_{it} = change current liabilities for firm i from time period $t - 1$ to t

ΔLTD_{it} = change long-term debt included in current liabilities for firm i from time period $t - 1$ to t

ΔITP_{it} = change income tax payable for firm i from time period $t - 1$ to t

DPA_{it} = depreciation and amortization expense for firm i from period to t (Rusmin, 2010).

Then TAC decomposed into normal accruals (NAC) and discretionary accruals (DAC) using the cross-sectional modified Jones (1991) model. NAC has defined as the fitted values from the first equation while DAC has defined as the residual value TAC -NAC (Rusmin, 2010). This model estimated as follows:

$$TAC_{it} / TA_{ik,t-1} = \alpha_{it} (1/TA_{ik,t-1}) + \beta_{it} ((\Delta REV_{ik,t} - \Delta REC_{ik,t}) / TA_{ik,t-1}) + \gamma_{it} (PPE_{ik,t} / TA_{ik,t-1}) + \varepsilon_{ik,t}$$

Where:

$TAC_{ik,t}$ = TAC for firm i in industry k in year t

$TA_{ik,t-1}$ = are total assets for firm i in industry k at the end of year $t - 1$

$\Delta REV_{ik,t}$ = change net sales for firm i in industry k between years $t - 1$ and t

$\Delta REC_{ik,t}$ = change in receivables for firm i in industry k between years $t - 1$ and t

$PPE_{ik,t}$ = gross property, plant and equipment for firm i in industry k in the year t

α_i , β_i , γ_i = industry specific estimated coefficients; and ε_i = error term (Rusmin, 2010).

3.7 Summary

The use of earnings management is a complicated activity that has its roots based on the information asymmetry between the business insiders and the external stakeholders. The information asymmetry between those two groups, create that the detection and the measurement of earnings management is a particular difficult task which has create hundreds of earnings management researches around the world. (Rusmin, 2010; Dechow *and* Dichev, 2002).

Information asymmetry creates the opportunity to business insiders to use earnings management at will. Consequently, in order to develop reliable earnings management detection models, the research needs a deeper understanding of the motives creating the use of earnings management. Some of the earnings management incentives described in this chapter are; management compensation, insiders' opportunistic behavior, tax minimization, access to capital and the market expectation.

Even though earnings management may appear easy to detect, it often follows various patterns that create that its detection is challenging. The most usual earnings management technique is the manipulation of the discretionary accruals such as; accounts receivable, inventory, expenses and depreciation (Dechow *et al.*, 2003).

However, the evidence of prior earnings management researches indicate that the mandatory adoption of the Sarbanes-Oxley Act in the US, has led to a significant decline of the accruals based earnings management, and the increase of accounting conservatism (Cohen *et al.*, 2008). On the same time it is noticed that companies in the US have shift from accruals based earnings management to real activities based earnings management (Cohen *et al.*, 2008).

During the last twenty-five years researchers have developed a variety of earnings management detection models. The most well-known models are: The Healy model (1985), the DeAngelo model (1986), the industry model of Dechow *and* Sloan (1991), the Jones model (1991), and the modified Jones model of Dechow, Sloan and Sweeney (1995). The most appreciated earnings management detection model is the modified Jones model, consequently is the model that has been used in the most earnings management researches since its development.

The research continues with the chapter “*Hypotheses*”, where will be presented the two hypotheses of this research.

4. HYPOTHESES

4.1 Introduction

This chapter presents the core research question and the two hypotheses of this research.

4.2 Research Hypotheses

Prior researches have focused on the financial reporting quality of stock exchange listed companies. Those researchers have found reliable evidence, which demonstrates that while regulators have concentrated their efforts improving the informativeness, integrity and the reliability of financial reporting information. Companies continue to use questionable financial accounting techniques aiming to conceal their financial performance from business outsiders and meet or beat the market expectations (Healy *and* Wahlen, 1999; Lobo *and* Zhou, 2006; Chang *et al.*, 2009).

The same researches have produced evidence supporting that Big4 auditors are providers of supreme audit quality and their services outrun the performance of the Non-Big4 auditing firm (Healy *and* Wahlen, 1999; Lobo *and* Zhou, 2006; Chang *et al.*, 2009).

In a heavily regulated financial market as this of the US, financial analysts, regulators, stock exchange authorities, and the constant risks of audit failure, litigation and damaged reputation, provide all auditors of stock exchange listed companies, with powerful motives to perform audits of high quality standards (Chaney *et al.*, 2004).

Audit quality is a fundamental element of financial reporting for both listed and non-listed companies, providing assurance for the integrity of financial statements to shareholders and the other interested parties (Chaney *et al.*, 2004).

The evidence before implies the two research hypotheses:

H1.

After the passage of the Sarbanes-Oxley Act auditors exhibit less tolerance in earnings management of NYSE and NASDAQ listed companies.

H2.

Big-4 and Non-Big4 auditors of NYSE and NASDAQ listed companies constrain the same level of earnings management.

4.3 Summary

This research uses two research hypotheses; the first research hypothesis investigates the tolerance of the use of earnings management in NYSE and NASDAQ listed companies after the mandatory adoption of the Sarbanes-Oxley Act. While, the second research hypothesis investigates possible differences in earnings management constrain between Big4 and Non-Big4 auditors.

Next, follows the chapter “*Research Design*”, in this chapter will be presented the quantitative and the qualitative analysis theories, the sample selection methodology, the selected earnings management estimation method, and the empirical model of this research.

5. RESEARCH DESIGN

5.1 Introduction

This chapter presents the methodology used in this research. More specifically, it presents the differences between quantitative and qualitative analysis, the selected discretionary accruals estimation model, the process of data collection and sampling, and finally explains the empirical research regression model.

5.2 Quantitative Versus Qualitative Analysis

Two main types of research analysis exist, the qualitative and the quantitative.

Quantitative analysis uses statistical models and data in the form of numbers and statistics, aiming to examine the hypotheses and the developed research questions (Miles *and* Huberman, 1994). This implies that because they relate to actual data, existing in databases in a quantitative analysis the goals are objective (Miles *and* Huberman, 1994). In addition, the goals of a quantitative analysis developed at the beginning of the research analysis, before the models are regressed and analyzed (Miles *and* Huberman, 1994). Furthermore, the outcomes of the research are precise, and the conclusions withdrawn from these results are more valuable and accurate than the ones relating to the qualitative analysis (Miles *and* Huberman, 1994).

On the other hand, qualitative analysis is not related to models and statistical data which feeding those models (Miles *and* Huberman, 1994). It is concerned more with subjective goals rather than objective (Miles *and* Huberman, 1994). Qualitative analysis uses surveys and usually the researcher is responsible for gathering the data for his analysis (Miles *and* Huberman, 1994). Moreover, the withdrawn conclusions of qualitative analysis tend to be more subjective rather than objective and cannot be generalized compared to those of a quantitative analysis (Miles *and* Huberman, 1994). Furthermore, the goals and the research design of a qualitative analysis evolved while the research proceeds to further steps (Miles *and* Huberman, 1994).

Based on the before differences between qualitative and quantitative analysis, and taking under consideration the objectives of this research, it is determined that this research will use the quantitative analysis approach.

5.3 Sample

The sample of this research is obtained from the Compustat annual industrial and research files over the years 1999 to 2010. The initial sample consists of all NYSE and NASDAQ listed companies. All companies included in the sample need to have their financial and audit firm data available in the Compustat database and being audited in the US for more than one time during the period of the research.

Consistent with previous earnings management researches, from the final sample of listed companies will be excluded all banks, insurance companies, other financial holdings, public administrative institutions and all mining and utilities companies (Van Tendeloo *and* Vanstraelen, 2008; Becker *et al.*, 1998; Leuz *et al.*, 2003). Banks, insurance companies, and other financial holdings are excluded because companies of those sectors are subject to different regulatory requirements that could excessively affect the discretionary accruals (Rusmin, 2010; Becker *et al.*, 1998). Public administrative institutions are excluded because their special accounting practices make the outcome of the conclusions problematic (Manry *et al.*, 2008). Mining and utilities companies are excluded because the industry regulations can unduly affect discretionary accruals, which are able to reduce the reliability of the conclusions (Becker *et al.*, 1998).

From the sample are excluded all firm year observations with missing data (*e.g. auditors' information, CFO, total current assets, sales, PPT, EBIT, EBITDA*), which are vital for the calculation of the discretionary accruals estimation model and multivariable regression. In order to reduce the possibility of a contamination of the results, extreme accounting firm year observations (*top and bottom two percent*), have also been excluded from the data pool (Van Tendeloo *and* Vanstraelen, 2008). The final sample consists of 66,609 firm year observations.

5.4 Research Methodology

This part of the research analyses the methodology used to test the two research hypotheses.

In order to test the research hypothesis 1:

The research uses the cross sectional modified Jones model as described by Dechow *et al.* (1995), and interpreted by (Cohen *et al.*, 2008), to calculate the level of

discretionary accruals for all NYSE and NASDAQ listed companies for the years 1999 to 2010.

The first step towards the testing of the *H1* is the calculation of Total Accruals using the model:

$$TA_{it} / Assets_{it-1} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} / Assets_{it-1}) + k_3(PPE_{it} / Assets_{it-1}) + \varepsilon_{it} \quad (1)$$

After the calculation of Total Accruals, the second step is the calculation of Normal Accruals using the equation:

$$NA_{it} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} - \Delta AR_{it}) / Assets_{it-1} + k_3(PPE_{it} / Assets_{it-1}) \quad (2)$$

The third step is the calculation of Discretionary Accruals, using the equation:

$$DA_{it} = (TA_{it} / Assets_{it-1}) - NA_{it}. \quad (3)$$

This model calculates Discretionary Accruals as the difference between Total Accruals and Normal Accruals. After the calculation of Discretionary Accruals for all firm year observations, the research groups all the results in chronological order, and calculates the median volume of the Total, Normal and Discretionary accruals for each research year. Next, it uses the median volume of the Total, Normal and Discretionary accruals to construct graphs and tables, which demonstrate their movement for the years 1999 to 2010.

In order to test the research hypothesis 2:

The research groups the sampled firm year observations in two distinctive groups, those that use Big4 as their external auditor and those that use Non-Big4 as their external auditors. After this grouping, it uses the cross sectional modified Jones model as described by Dechow *et al.* (1995), and interpreted by (Cohen *et al.*, 2008), to calculate the level of discretionary accruals for the two distinctive groups of firm year observations for the years 1999 to 2010.

The first step towards the testing of the *H2* is the calculation of Total Accruals for the two distinctive groups of firm year observations using the model:

$$TA_{it} / Assets_{it-1} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} / Assets_{it-1}) + k_3(PPE_{it} / Assets_{it-1}) + \varepsilon_{it} \quad (1)$$

After the calculation of Total Accruals, the second step is the calculation of Normal Accruals for the two distinctive groups of firm year observations using the equation:

$$NA_{it} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} - \Delta AR_{it}) / Assets_{it-1} + k_3(PPE_{it} / Assets_{it-1}) \quad (2)$$

The third step is the calculation of Discretionary Accruals, using the equation:

$$DA_{it} = (TA_{it} / Assets_{it-1}) - NA_{it}. \quad (3)$$

This model calculates Discretionary Accruals as the difference between Total Accruals and Normal Accruals. After the calculation of Discretionary Accruals for the firms which use Big4 as their external auditor and those which use Non-Big4 as their external auditors, the research groups all the results of the two distinctive pools of firm year observations in chronological order, and calculates the median volume of the Total, Normal and Discretionary accruals for each research year. Next, it uses the median volume of the Total, Normal and Discretionary accruals to construct graphs and tables, which demonstrate their movement.

5.4.1 Modified Jones Calculation

The cross sectional modified Jones model is calculated for every two-digit SIC-years as follows:

$$TA_{it} / Assets_{it-1} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} / Assets_{it-1}) + k_3(PPE_{it} / Assets_{it-1}) + \varepsilon_{it} \quad (1)$$

(The model is estimated cross-sectionally for each two-digit SIC-years)

Where:

t = fiscal year

i = firm; TA = total accruals

$$TA_{it} = EBXI_{it} - CFO_{it},$$

EBXI = earnings before extraordinary items and discontinued operations (Compustat item 123)

CFO = operating cash flows (Compustat item 308)

Assets_{it-1} = total assets (Compustat item 6)

ΔREV_{it} = change in revenues from last year (Compustat item 12)

PPE_{it} = gross value of property plant and equipment (Compustat item 7)

(Cohen *et al.*, 2008)

In the second step of the discretionary accruals estimation process, the research will use the coefficient estimates of the before equation and will calculate the company specific normal accruals (*NA_{it}*) for the sample companies. This model estimated as follows:

$$NA_{it} = k_1(1 / Assets_{it-1}) + k_2(\Delta REV_{it} - \Delta AR_{it}) / Assets_{it-1} + k_3(PPE_{it} / Assets_{it-1})$$

(2)

(The model is estimated cross-sectionally for each two-digit SIC-years)

Where:

ΔAR_{it} = the change in accounts receivable from last year (Compustat item 2)

(Cohen *et al.*, 2008)

During the calculation of normal accruals the research adjust the reported revenues of the sample for the change in the accounts receivable aiming to capture possible earnings management activity sourced from credit sales. Finally, discretionary accruals are estimated as the difference between the total accruals and the fitted normal accruals as follows (Cohen *et al.*, 2008);

$$DA_{it} = (TA_{it} / Assets_{it-1}) - NA_{it}. \quad (3)$$

5.5 Empirical Model

The empirical model of this research relates earnings management in the form of discretionary accruals, with NYSE and NASDAQ stock exchange listed companies and their Big4 and Non-Big4 auditing partners. Furthermore, it relates the discretionary accruals to the pre and the post Sarbanes-Oxley Act era. The dependent variable of this regression analysis is discretionary accruals. This regression analysis

incorporates a series of control and independent variables aiming to calculate the influences of all those variables on the dependent variable.

The *first* control variable of this regression analysis is audit quality (AQ), for the purposes of this research audit quality is a dichotomous variable depending upon auditor size, consequently if the auditor is one of the Big Four auditors it will take the value 1; 0 otherwise (Chen *et al.*, 2005 and Van Tendeloo *and* Vanstraelen, 2008).

The *first* independent variable included in this regression analysis is the operating cash flow (CFO), according to Becker *et al.* (1998), “*operating cash flows differ for Big Six and non-Big Six audited firms and should be included in the regression model*”. This independent variable calculated as CFO deflated by lagged total assets.

The *second* independent variable included in this regression analysis is firm size (FS). According to (Rusmin, 2010; Becker *et al.*, 1998) large companies have fewer incentives to be involved in earnings management because their financial statements are reviewed and analyzed by financial specialist third parties. This variable calculated as the natural logarithm of the total book reported assets.

The *third* independent variable of this regression analysis will be the leverage (LEV). Becker *et al.* (1998), based on DeAngelo *et al.* (1994), that connects the level of leverage to incentives for perpetrating the corporate financial statements. This variable will calculated as the company’s ratio of long term debt to total assets.

The *forth* independent variable of the research, is the absolute value of the total accruals (AVTA). According to Chen *et al.* (2005) and Rusmin (2010), because higher absolute values of total accruals can implies higher discretionary accruals, this is an important control variable. This variable will calculated as the value of the total accruals divided by the total assets of the company at the end of the last year.

To better adjust this model to the US environment a *second* control variable (SOX) is introduced. This control variable will be a dummy that separates the firm-year observations in two groups, those that were marked before 2002, and those that were marked after 2002. It is important for the empirical model of this research to implement a control that will capture the differences of accruals level reported by businesses before and after the introduction of the Sarbanes-Oxley Act in 2002.

Finally, to calculate the variances in the performance this research incorporates the independent variable growth (GR) which is calculated as the annual percentage change in sales, and the independent variable return on investment (ROI), which is calculated as the ratio of earnings before extraordinary items to book value of lagged total assets.

The model that will be tested is:

$$DA = b_0 + b_1AQ_t + b_2CFO_{t-1} + b_3FS_t + b_4LEV_t + b_5AVTA_{t-1} + b_6SOX_t + b_7GR_t + b_8ROI_{t-1} + e \quad (4)$$

Where

DA = discretionary accruals

AQ_t = audit quality (1 Big-4, 0 otherwise)

CFO_{t-1} = operating cash flows (CFO for company *i* during year *t* deflated by total assets of end year *t-1*)

FS_t = firm size (natural logarithm of the total reported assets of company *i* for the fiscal year *t*)

LEV_t = leverage (ratio of total liabilities to total assets of company *i* for the fiscal year *t*)

AVTA_{t-1} = absolute value of total accruals (AVTA for company *i* divided by total assets of company *i* in year *t-1*)

SOX_t = prior or post SOX era (1 post SOX, 0 pre SOX)

GR_t = growth (annual percentage change in sales)

ROI_{t-1} = return on investment (ratio of earnings before extraordinary items of company *i* for fiscal year *t* to book value of total assets of company *i* in year *t-1*)

b₁, b₂...b₈ = coefficients

e = error term

5.6 Summary

For the estimation of discretionary accruals, this research uses the cross sectional modified Jones model as used by Dechow *et al.* (1995) and Cohen *et al.* (2008). The

research data will collect from the Compustat annual industrial and research files. For the purposes of the empirical part of this research a multivariable regression analysis will used.

This research continues with the chapter "*Empirical Research*". In this chapter both the analysis of the discretionary accruals models and the analysis of the empirical model of this research will be presented.

6. EMPIRICAL RESEARCH

6.1 Introduction

This chapter presents and analyzes the results of the discretionary accruals as they were found by the use of the cross sectional modified Jones model, and continues with the presentation and the analysis for the results obtained from the empirical research model. During the two steps, analysis conclusions are drawn related to the two research hypotheses.

6.2 Accruals analysis

6.2.1 Accruals Analysis

The first stage of the empirical research is the analysis of the accruals equation outcomes, and the drawing of conclusions related to H1 and H2.

It is important to signal, that due to the properties of the cross sectional modified Jones model and the sample selection methodology followed, the outcomes of this research are not affected by the companies' industry classification or the size of the companies included in this research. Because of the before reasons, the outcomes of this research are useful for the drawing of general conclusions. Those conclusions related to the behavior of discretionary accruals and earnings management for NYSE and NASDAQ quoted companies, audited by Big4 and Non-Big4 auditors in the pre and the post Sarbanes-Oxley Act period.

The analysis begins with the measurement and the interpretation of the median volume movement of total, normal and discretionary accruals. The analysis contains data from all the final sample included NYSE and NASDAQ stock exchange listed companies, over the years 1999 to 2010. The table below illustrates the median volume movement of accruals, for all the final sample included companies, over a twelve years period. The total accruals column depicts the movement of the median total accruals over the years 1999 to 2010. While the normal and discretionary accruals columns, represent the movement of the median normal and median discretionary accruals respectively.

Table 1 Accruals Movement 1999 - 2000

| YEAR | Total Accruals | Normal Accruals | Discretionary Accruals |
|-------------|-----------------------|------------------------|-------------------------------|
| 1999 | -0.0033 | -0.0538 | 0.0458 |
| 2000 | -0.093 | -0.1226 | 0.0456 |
| 2001 | -0.2048 | -0.134 | -0.014 |
| 2002 | -0.1817 | -0.1445 | -0.0005 |
| 2003 | -0.1565 | -0.1518 | 0.0176 |
| 2004 | -0.1337 | -0.1361 | 0.0454 |
| 2005 | -0.1188 | -0.1203 | 0.0286 |
| 2006 | -0.1155 | -0.1166 | 0.0315 |
| 2007 | -0.1339 | -0.1186 | 0.0139 |
| 2008 | -0.1602 | -0.1075 | -0.0117 |
| 2009 | -0.203 | -0.1235 | -0.022 |
| 2010 | -0.155 | -0.1262 | 0.0259 |

Graph 1 Accruals Movement 1999 - 2000



Figure one depicts that total accruals decline sharply from 1999 to 2000 following a smooth increase peaked in 2004. In 2005, the median volume of total accruals remains almost stable figuring a slight increase. In the years 2006 and 2007, the median volume of total accruals declined further and finally stabilized during the last three years of the investigation period. One possible explanation for the sharp decline of total accruals during the years 1999 and 2000 might be the financial crisis of 1998. This explanation could be a possibility, because during financial turmoil periods companies restrict their expenses trying to save the more resources possible for future use.

Furthermore, one possible explanation for the increase of total accruals during the years 2002 and 2005 might be the increased use of real accruals and the adaptation of businesses in the new regulations. Chambers *and* Payne (2011); Bartov *and* Cohen (2009); Cohen *et al.* (2008); in their studies support the opinion that companies never stop using accruals to manage their financial statements but simply shift from the use of discretionary accruals to the use of real accruals.

Two possible explanations for the decline of total accruals between the years 2006 and 2009 might be; the adaptation of auditors and other regulatory bodies to the financial practices used by companies to conceal their financial performance, and second the impact of the financial crisis that hit the US economy during the second half of 2008. Finally, one possible explanation for the small increase in the volume of total accrual during 2010 might be the attempt of US companies to shape their financial performance and meet the market expectations. In favor of the before possible explanations, Dechow *et al.* (2003) reports that companies manage their earnings upwards to meet or beat the analysts' expectations.

The second line illustration of figure one depicts the movement of the median volume of normal accruals; normal accruals starts declining in 1999. This trend stops in 2002, when the line of normal accruals, meets the line of total accruals. Then, both lines follow an almost identical increase, up to the year 2005. During 2006, the volume of normal accruals remains stable, following a small increase in the years 2007 and 2008, and a small decline the last two years of the investigation period.

The first possible explanation for the decline of normal accruals during the years 1999 to 2002 might be the global financial crisis of 1998. During that period companies faced a tight economic environment where their revenues were decreasing, forcing them to minimize their expenses in order to keep their profitability.

However, in the period from 2003 until the end of 2010 the volume of normal accruals follows a smooth increase. This increase might be explained through the work of Chambers *and* Payne (2011); Bartov *and* Cohen (2009) and Cohen *et al.* (2008) who report that companies replace the suspicious and easy to detect discretionary accruals with the more expensive to deploy but harder to detect real activities accruals.

The third illustrated line of figure one, depicts the movement of the median volume of the discretionary accruals. The level of discretionary accruals stays stable during the years 1999 to 2000, followed by a sharp decline in 2001. The decline reverses later and discretionary accruals reach a peak in mid-2003. After this peak, for the next five years discretionary accruals have a smooth decline, which reaches a negative point in mid-2008. After mid-2008 and for the next two years discretionary accruals have a sharp increase.

One possible explanation for the decline of discretionary accruals during 2001 might be the anticipation of the Sarbanes-Oxley Act. After a series of financial scandals, which shake the corporate US, companies were, expecting the regulation and the severe penalties could impose upon certain businesses practices. Consequently, is highly possible that companies took immediate action to minimize their exposure to the new regulation.

Nevertheless, from 2002 until the end of 2010 discretionary accruals have a parallel and almost identical behavior as total accruals. This could be a normal behavior because discretionary accruals is a functional part of the total accruals, consequently the volume of discretionary accruals depend on the volume of total accruals and follows its increasing or decreasing movement.

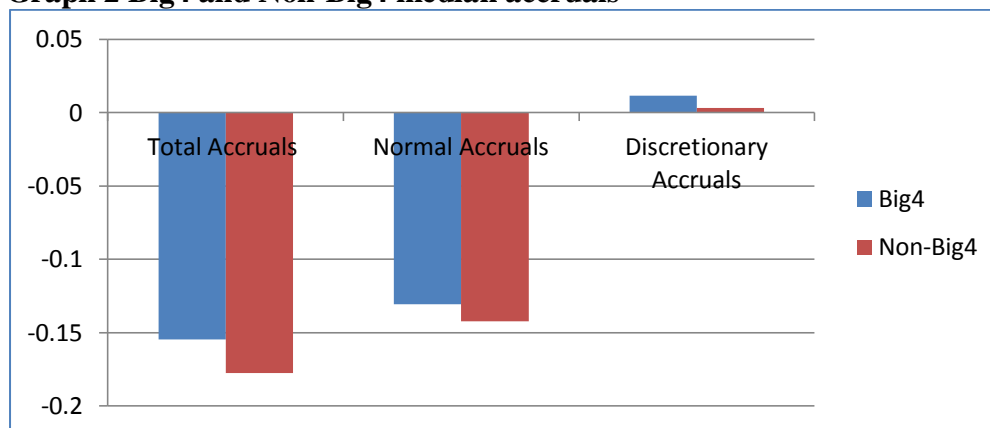
Regarding the first hypothesis of the research, the before evidence show that since the passage of the Sarbanes-Oxley Act in 2002, the volume of discretionary accruals have drop significantly and have never reach its pre Sarbanes-Oxley Act level.

Further evidence for the two hypotheses, is provided in table 2 and graph 2. Table 2 and graph 2, illustrate the median volume of total, normal, and discretionary accruals, originated in the financial statements of the sample companies, audited by Big4 and by Non-Big4 auditors for the years 1999 till 2010.

Table 2 Big4 and Non-Big4 median accruals

| | Total Accruals | Normal Accruals | Discretionary Accruals |
|-------------------|-----------------------|------------------------|-------------------------------|
| B4 Median | -0.1546 | -0.1305 | 0.0116 |
| NB4 Median | -0.1774 | -0.1421 | 0.0032 |

Graph 2 Big4 and Non-Big4 median accruals



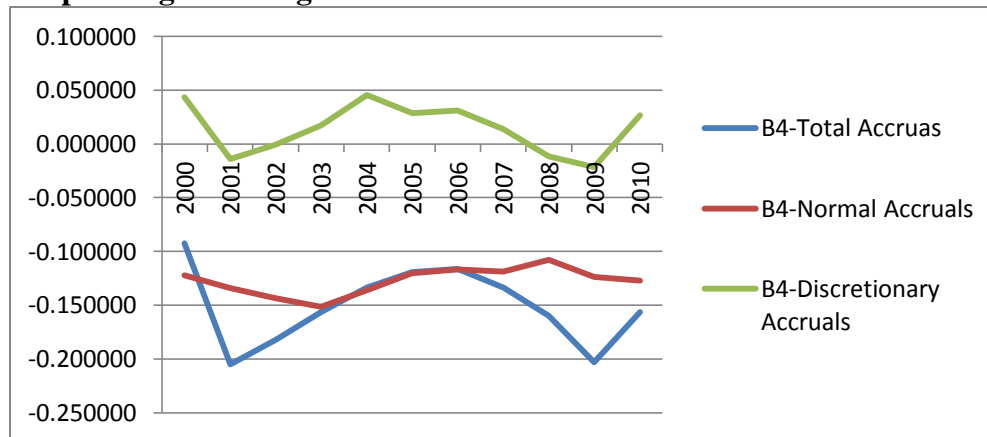
Both graph 2 and the values in table 2, demonstrate that the absolute median volume of total and normal accruals, for companies audited by Big4 auditors is smaller than the absolute median volume of total and normal accruals for companies audited by Non-Big4 auditors. This outcome is in line with previous researches arguing that Big4 auditors are more capable to constrain the aggressive use of accruals (Rusmin, 2010).

Moreover, the third pair of columns representing discretionary accruals illustrates that the absolute median volume of discretionary accruals for companies audited by Big4 auditors is higher than the absolute volume of discretionary accruals for companies audited by Non-Big4 auditors. This outcome is consistent with findings of previous researches Cohen *et al.* 2008; Francis 1999; Chen *et al.* 2005, supporting that because large companies have the tendency to create large volume of total and discretionary accruals, prefer to commission their annual audits to Big4 auditors (Hussainey, 2008), using them as an assurance mechanism which adds credibility to their financial statements.

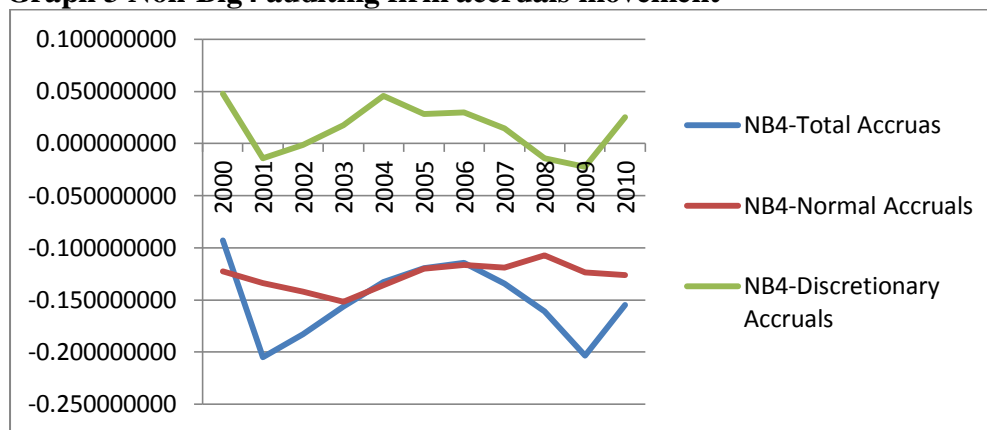
Consequently, according to Cohen *et al.*, (2008); Francis (1999); Chen *et al.* (2005) and Hussainey (2008), since the clients of Big4 auditors use larger volumes of discretionary accruals in their accounting process and financial statements the following situation exists. It is rational, that the proportion of discretionary accruals used by clients of the Big4 auditors is larger than the proportion of discretionary accruals used by clients of the Non-Big4 auditors.

6.2.2 Big4 / Non-Big4 Accruals Analysis

Graph 2 Big4 auditing firm accruals movement



Graph 3 Non-Big4 auditing firm accruals movement



This part of the research provides further evidence, which answers the two research hypotheses. Figures 3 and 4, illustrate the annual movement of all Big4 and Non-Big4 auditors total, normal and discretionary accruals of the sample companies, for the years 2000 to 2010. The year 1999 is absent from the graphs of both figures 3 and 4 due to the small number of individual Big4 and Non-Big4 firm year observations.

The most striking outcome of the comparison between the two graphs is their similarities. In both Big4 and Non-Big4 discretionary accruals graphs, the volume of discretionary accruals decline reaching a negative point in 2001. In 2002 both Big4 and Non-Big4 discretionary accruals, increase steadily up to 2004 where they reach a peak. After 2004, both Big4 and Non-Big4 concerning the discretionary accruals start declining steadily, reaching their lowest volume in the first half of 2009. In the second half of 2009 and for all 2010, both Big4 and Non-Big4 auditors related to the discretionary accruals increasing.

The first thing observed from the regressed discretionary accruals, is that after the mandatory adoption of the Sarbanes-Oxley Act in 2002, the volume of the discretionary accruals for both Big4 and Non-Big4 clients has dropped significantly (except 2004) and has never reached the pre Sarbanes-Oxley Act level. This observation supports the first research hypothesis, revealing that discretionary accruals and earnings management have been reduced in the post Sarbanes-Oxley Act era.

In addition, while the two graphs appear to be identical, in reality the performance of Big4 auditors is slightly better than the performance of the Non-Big4 auditors (*the regression results can be found in appendix items 2 and 3*). The regressed discretionary accruals results provide evidence, which answer the second research hypothesis, that Big4 and Non-Big4 auditors may constrain the same level of aggressive earnings management.

Nevertheless, it is observed that even though Big4 auditing firms provide better constrain for earnings management, the performance of Non-Big4 auditing firms is almost the same. This implies that, the services of all auditing firms in the US are of high standards and such firms make a big effort in order to keep discretionary accruals and earnings management in low levels.

6.3 Multivariable Regression Analysis

In order to find the relationship between discretionary accruals and the rest independent variables this research estimates the regression (4).

$$DA = b_0 + b_1AQ_t + b_2CFO_{t-1} + b_3FS_t + b_4LEV_t + b_5AVTA_{t-1} + b_6SOX_t + b_7GR_t + b_8ROI_{t-1} + e \quad (4)$$

Table 3 Variables of the multivariable regression

| Variable | Coefficient | Std. Error | t-Statistic | P-value |
|--|-------------|------------|-------------|---------|
| b₀ | 34.490 | 0.5560 | 6.20 | 0.000 |
| b₁AQ_t | -0.3520 | 0.4070 | -3.32 | 0.001 |
| b₂CFO_{t-1} | 0.0005 | 0.0001 | 4.51 | 0.000 |
| b₃FS_t | -0.8800 | 0.0800 | -11.02 | 0.000 |
| b₄LEV_t | 0.0084 | 0.0070 | 1.29 | 0.198 |
| b₅AVTA_{t-1} | 0.5300 | 0.0085 | 62.89 | 0.000 |
| b₆SOX_t | -0.0890 | 11.100 | -1.38 | 0.005 |
| b₇GR_t | 0.0140 | 0.0040 | 26.30 | 0.000 |
| b₈ROI_{t-1} | 0.0034 | 0.0040 | 4.06 | 0.000 |

AQ = audit quality; CFO_{t-1} = operating cash flow; FS_t = firm size; LEV = leverage; AVTA = absolute value of total accruals; SOX = Sarbanes-Oxley act; GR = growth; ROI = return of investment

Nevertheless, it is vital to underline that due to the regression data grouping process as well as the sampling process, the results of the before regression are not subjects to any limitations sourced to the companies' industry classification or the size of the companies included in this research. Because of the before reasons, the outcomes of this research are useful for the drawing of general conclusions.

Based on the P-values and the coefficients of the regression, it is observed that the variable AQ is highly significant at $p < 0.01$ level and has a negative relationship with the discretionary accruals suggesting that Big4 auditors are associated with lower level of discretionary accruals. Those findings are in line with the findings of Balsam *et al.* (2003); Rusmin (2010) and Chen *et al.* (2005), reporting that Big4 auditors are providers of premium quality audits and have the capability to better constrain earnings management practices. This result is in dispute with the second research

hypothesis and provides evidence that Big4 auditors better constrain the use of discretionary accruals and the use of aggressive earnings management.

Nevertheless, the low volume of negative coefficient is consisted with the findings of the equation (3) indicating that the performance of Big4 auditors constraining earnings management is slightly better than the performance of Non-Big4 auditors. One possible explanation for this small difference of performance among Big4 and Non-Big4 auditors is that US financial reporting market is heavily regulated, challenging all auditing firms that provide services in listed companies to perform their duties in the highest possible standards. Furthermore, auditing firms, which provide services in listed companies, are associated with high litigation risks and reputation damage in case of an audit failure; those facts provide all auditing firms with strong incentives to conduct audits of high quality standards (Chaney *et al.*, 2004).

Moreover, the findings of the regression indicate that the variable CFO is highly significant since $p < 0.01$ and has a positive relationship with the discretionary accruals. Those findings can be translated to a direct link between cash flow from operations and the use of discretionary accruals, they in addition suggest that the higher the cash flow from operations for a firm the higher the volume of discretionary accruals they use.

The analysis of the regression (4) continues with the results of the variable FS, this variable is highly significant at 1% level and has a negative relationship to the discretionary accruals. Those findings indicate that the use of discretionary accruals and the use of earnings management is generally related to the firm size, consequently the smaller the company the more they use discretionary accruals and earnings management. Those findings are in line with the results of Francis *et al.* (2005), who reports that the size of a firm in term of sales is essential to its decision to be or not to be involved in earnings management, with small firms to be more active and systematically to engage more earnings management.

The next variable of the analysis is LEV, this variable is insignificant, and perhaps it can be omitted from the regression. This finding indicates that the satisfaction of debt requirements is not a strong incentive for companies to be engaged in earnings

management and future researchers should continue their work towards understanding earnings management using different variables.

The analysis of the results of the regression (4) continues with the outcomes of the variable AVTA, this variable is highly significant at $p < 0.01$ level and has a positive relationship to discretionary accruals. Those findings indicate a direct link between the volume of the discretionary accruals and the volume of the total accruals, suggesting that discretionary accruals are indistinctive part of total accruals and the higher the volume of the total accruals used by a firm the higher the volume of discretionary accruals in its financial statements.

Moreover, the results of the variable SOX indicate that this variable is significant at $p < 0.05$ level and has a negative relationship to discretionary accruals, suggesting that in the post Sarbanes-Oxley Act period companies incorporate less discretionary accruals and earnings management. Those results are in consistence with findings of previous researches conducted by Cohen *et al.* (2008); Lobo *and* Zhou (2006) and Bartov *and* Cohen (2009). In addition, those results provide supportive evidence in the first hypothesis of the research, that in the post Sarbanes-Oxley Act era auditors show less tolerance in discretionary accruals and earnings management.

However, the significance of just 5% instead of 1% as it was expected in combination with the low value of the negative coefficient of SOX, is consistent with the results of the equation (3). That shows that even though discretionary accruals have dropped significantly after the mandatory adoption of the Sarbanes-Oxley act, and their volume never returned to the pre Sarbanes-Oxley Act levels, they continue to be used (Cohen *et al.*, 2008; Chambers *and* Payne, 2011; Bartov *and* Cohen, 2009). A possible explanation for the use of discretionary accruals is that companies never stopped to use earnings management instead, they shift to less detectable earnings management techniques (Chambers *and* Payne, 2011).

The next variable of the analysis will be GR, this variable is highly significant at $p < 0.01$ level and has a positive relationship with the discretionary accruals. Those findings indicate that the use of discretionary accruals and the use of earnings management in generally have a direct link to the company's growth rate indicating that the more a company grows since the previous year the more likely is that this

firm will use discretionary accruals and earnings management to feed a proportion of this growth.

The final variable of the analysis is ROI; this variable is highly significant at 1% and has a positive relationship with the discretionary accruals. Those findings indicate that the volume of return on investment presented by companies in their annual financial statements has a direct link to the use of earnings management, consequently companies use discretionary accruals to shape their reported results of return on investment at will.

Table 4 Correlation matrix

| | DA | AQ | CFO | FS | LEV | AVTA | SOX | GR | ROI |
|-------------|---------|---------|---------|---------|---------|---------|--------|---------|--------|
| DA | 1.0000 | | | | | | | | |
| AQ | 0.0036 | 1.0000 | | | | | | | |
| CFO | 0.0035 | 0.1247 | 1.0000 | | | | | | |
| FS | 0.0020 | 0.6074 | 0.3538 | 1.0000 | | | | | |
| LEV | -0.2524 | -0.0582 | -0.0069 | -0.1467 | 1.0000 | | | | |
| AVTA | -0.6869 | -0.0517 | -0.0061 | -0.1096 | 0.3679 | 1.0000 | | | |
| SOX | 0.0077 | 0.0603 | -0.0328 | -0.0696 | -0.0085 | 0.0101 | 1.0000 | | |
| DR | -0.0030 | -0.0134 | 0.0020 | -0.0128 | -0.0008 | 0.2768 | 0.0346 | 1.0000 | |
| ROI | 0.5440 | 0.0399 | 0.0888 | 0.0888 | -0.2241 | -0.7253 | 0.0043 | -0.0704 | 1.0000 |

In this part, the correlation coefficients of the regressions are presented (4). From the table before it is observed that all the variables of the regression, with the exception of the cases of (FS to AQ; AVTA to DA; ROI to AVTA) have low level of correlation between them. This low interaction to each other implies that they are suitable measure variables for the detection of the use of earnings management.

Lastly, the values of R^2 and the adjusted- R^2 are examined. The most common goodness of fit statistic is R^2 , which is the correlation between the values of the dependent variables and the corresponding fitting values of the model. Since R^2 must lie between zero and one if the correlation is high the model fits the data well. Otherwise if R^2 is close to zero the model does not provide a good fit for the data (Brooks, 2008).

Table 5 R-squared and Adj R-squared

| | |
|----------------------|--------|
| R-squared | 0.5227 |
| Adj R-squared | 0.5191 |

The R^2 and the adjusted- R^2 of the before discretionary accruals regression are 0.52 and 0.51 respectively; This implies that 52% of the variability of DA can be explained

by the variability of the explanatory variables in the regression, while the rest 48% cannot be explained. To cure this inefficiency and further increase the explanatory power of the regression model it is possible to add or remove some variables in the regression model. In respect to the previous argument, the variable AVTA should be omitted from the regression because its p -value indicates that is insignificant for the purpose of this research and in its place, it should be added the variable ownership concentration. Overall, the explanatory power of the model used in this discretionary accruals analysis is satisfactory and the model is appropriate for future use.

6.4 Summary

The empirical research chapter presents and analyses the findings of the cross sectional modified Jones model and the discretionary accruals multivariable regression. Those findings are; Companies use less discretionary accruals after the mandatory adoption of the Sarbanes Oxley Act in 2002, Big4 auditors better constrain the use of discretionary accruals in the US than Non-Big4 auditors do.

The research continues with the next chapter “*Conclusions*”, where the findings of the research that are related to the main research question and the two research hypotheses are presented.

7. CONCLUSIONS

7.1 Summary

In this part, it is presented a summary of the results related to the main research question.

To start with, the results of the equation (3) demonstrate that the mandatory adoption of the Sarbanes-Oxley Act had a negative impact on the discretionary accruals and the use of earnings management. More analytically, the results indicate that in the year 2002, when the Sarbanes-Oxley Act legislation was introduced by the congress, the level of discretionary accruals declined reaching the level of -0.005. Apart of 2001, the results of 2002 demonstrate the second lowest level of discretionary accruals for the investigation period 1999 to 2010. After the year 2002 and the introduction of Sarbanes-Oxley Act the levels of discretionary accruals have remained low (*except year 2004 which reached the level of 0.0454*) and in no case reached or surpassed the levels of the years 1999 and 2000 which were 0.0458 and 0.0456 respectively. Moreover, the results of the regression (4) reveal that the control variable (SOX) has a P-value of 0.005 and a negative coefficient of -0.0890. Those results implies that this variable is significant in the 5% level and has a negative relation with the discretionary accruals.

To continue with, the results of the equation (3) demonstrate that during the investigation period the Big4 auditors constrain better the use of discretionary accruals. More specific, the results (*appendix items 2 and 3*) indicate that Big4 auditors better constrain the use of discretionary accruals for eight (8) out of the eleven (11) years of the period. In the year 2005 Big4 and Non-Big4 auditors constrain the same level of discretionary accrual. Non-Big4 auditors perform better than Big4 auditors do only during the years 2006 and 2010. Nevertheless, the results based on the regression (4) reveal that the control variable (AQ) has a P-value of 0.001 and a negative coefficient of -0.3520. This implies that (AQ) is highly significant and has a negative relation to discretionary accruals.

7.2 Conclusions to the Research Hypotheses:

This research produces evidence, which shows that in the post Sarbanes-Oxley period, companies, use less discretionary accruals. This evidence provides answers to the first

research hypothesis implying that in the post Sarbanes-Oxley era, auditors of NYSE and NASDAQ listed companies exhibit less tolerance for earnings management by their clients.

In addition, the research also produces evidence that shows that the clients of the Big4 auditors use less discretionary accruals in their financial statements, than the clients of the Non-Big4 auditors do. Those findings answer the second research hypothesis implying that the Big4 auditing firms better constrain the use of earnings management. Nevertheless, based on the small volume difference of the discretionary accruals between the clients of Big4 and Non-Big4 auditors, it is possible to argue that both Big4 and Non-Big4 auditors constrain the use of earnings management.

Moreover, the data produced from the cross sectional modified Jones model demonstrate that even though the use of discretionary accruals has declined significantly in the post Sarbanes-Oxley era, their decline is not stable and companies still use discretionary accruals to manage their earnings.

In addition, the analysis of the variable SOX in the multivariable regression (4) produces evidence, which answers the first research hypothesis. The results analysis indicate that the variable SOX is negatively important, implying that in the post Sarbanes-Oxley Act period, companies involved in significantly less earnings management than the period before. This finding is in line with the results of previous researches conducted by Cohen *et al.* (2008); Lobo and Zhou (2006), and Bartov and Cohen (2009). In addition the results of the multivariable regression analysis show that companies continue to use discretionary accruals to manage their earnings.

Finally, the analysis of the variable AQ in the multivariable regression (4) provides the answer to the second research hypothesis. The analysis results show that Big4 auditors better constrain the use of discretionary accruals and the use of earnings management. This finding supported from the researches by Balsam *et al.* (2003); Rusmin (2010) and Chen *et al.* (2005).

7.3 Limitations

The findings of the research are subject to a number of limitations; the first limitation is that the use of earnings management is characterized by a natural difficulty to detect and to measure. This happens because the use of earnings management is

triggered by a combination of factors that are hard to identify, and in a variety of forms that adapt to the changes of the business environment. The second limitation of this research is the measurement model of the use of earnings management; the cross sectional modified Jones model has been subject of criticism by many scholars, who support that the model cannot measure effectively the magnitude of the earnings management.

Since the cross sectional modified Jones model is the model of choice for this earnings management research, any of its weaknesses to capture the magnitude of earnings management will affect the reliability of the outcomes. Finally, another limitation of this research comes from the empirical model itself. Earnings management is a complicated activity, affected by a large number of variances. Consequently, due to the limited number of variables used in the multivariable regression analysis, a physical limitation exists that restricts the empirical model to predict and include all the factors contribute to the use of earnings management. Despite the before limitations, is expected that the outcomes of this research will be useful and will contribute to the further understanding of the use of earnings management.

7.4 Suggestions for Future Research

This research investigates the behavior of earnings management for NYSE and NASDAQ listed companies, audited by Big4 and Non-Big4 auditors, nine years after the mandatory adoption of the Sarbanes-Oxley Act. Due to the timing and the research subject, this research sets the foundations for a future research that will investigate the magnitude differences of the use of earning management and the persistence of accruals in US stock exchange listed companies, using a different earnings management estimation model.

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Appendix

Item.1

ARTICLES & REPORTS

| | | |
|----------------------|-----------------|--|
| Aono and Guan (2008) | Object of study | The impact of Sarbanes Oxley Act on cosmetic earning management, Research in Accounting Regulation |
| | Sample | The sample covers the years 2000 – 2004, and consisted of 10,413 observations for the pre-SOX period and 9,809 observations for the post-SOX period |
| | Methodology | Using the Benford's law compares the distribution of second digits in annual net incomes of US stock exchange listed companies two years before and two years after the passage of SOX in 2002 |
| | Outcome | The empirical results suggesting that two years before the passage of the Sarbanes-Oxley Act companies were using earnings management. After the passage of SOX earnings management through manipulation of net income has significantly decreased |

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|-----------------------------|-----------------|---|
| Balsam <i>et al.</i> (2003) | Object of study | Auditor industry specialization and earnings quality |
| | Sample | The sample consisted of companies audited by the Big 6 and later 5 auditing firms for the years 1991-1999. From the sample excluded companies with less than 90 observations. The final sample consists of 19091 firm year observations |
| | Methodology | Cross-sectional version of the Jones (1991) model as in DeFond and Jiambalvo (1994), industry specialists are identified following Palmrose (1986) |
| | Outcome | Clients of industry specialist auditors have higher earnings quality than clients of non-specialist auditors |

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| Baralexis (2004) | Object of study | Creative accounting in small countries: the Greek case |
| | Sample | Randomly selected sample. 100 senior auditors out of 425 members ICPA, 100 independent accountants out of the 544 members of the AIAT. Responses by 50 auditors and by 58 independent accountants |
| | Methodology | The questionnaire follows the literature (e.g. Fowler, 1988; Oppenheim, 1997). The examples were ranked and the Spearman rank correlation coefficient test was applied |
| | Outcome | Creative accounting is practiced in Greece frequently and to a considerable extent (i.e. around 25 per cent of pre-managed earnings). The large companies overstate profit while the small companies understate profit |

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|--------------------------|-----------------|---|
| Bartov, and Cohen (2008) | Object of study | The ‘Numbers game’ In the pre- and post-Sarbanes-Oxley eras |
| | Sample | The sample consists of 262,754 firm quarter observations from January 1987 to December 2006 |
| | Methodology | Test for a relation between the frequency of meeting or beating analysts’ earnings expectations with accrual-based earnings management, real earnings management, and earnings expectations management |
| | Outcome | The intention to meet or beat analyst expectations has declined significantly after the passage of SOX. Moreover, in the post-SOX period the use accruals management has decline, while the use of real earnings management has remain unchanged in relation to the preceding seven years |

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|-------------|-----------------|--|
| Basu (1997) | Object of study | The conservatism principle and the asymmetric timeliness of earnings |
| | Sample | The sample consists of 34,266 firm-year observations from 1963 to 1990. A sample of 36,394 firm-year observations from 1964 to 1990. A sample of 28,376 firm-year observations from 1964 to 1990 and a sample of 28,923 firm-year observations from 1963 to 1990 |
| | Methodology | All variables, deflated by the opening stock price to control for heteroskedasticity. All tests are replicated using opening book value of assets or equity as deflator, t-statistics used for heteroskedasticity control |
| | Outcome | Negative earnings changes are less persistent than positive earnings changes because of conservatism. In addition earnings sensitivity has increased more for negative news than for good news. This behavior is consisted with the increase of accounting conservatism over 1963-1990 |

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|-----------------------------|-----------------|--|
| Becker <i>et al.</i> (1998) | Object of study | The effect of audit quality on earnings management |
| | Sample | 10,379 Big Six and 2,179 Non-Big Six firm years (1989-1992) |
| | Methodology | Cross-sectional version of the Jones (1991) model |
| | Outcome | Big Six auditors are of higher quality than Non-Big 6 auditors |

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|---------------------------|-----------------|---|
| Chambers and Payne (2011) | Object of study | Audit quality and accruals persistence: evidence from the pre- and post-Sarbanes-Oxley periods |
| | Sample | All NYSE, AMEX, NASDAQ listed companies over 1997 to 2007, with available industry, audit firm and total sales information |
| | Methodology | Comparison of accruals persistence in the pre- and post-SOX periods for clients of low and high independence audit firms |
| | Outcome | Accrual persistence increased significantly in the post-SOX period. Companies audited by Big-N auditors with lower-independence have the biggest improvement in accrual persistence |

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|-----------------------------|-----------------|---|
| Chaney <i>et al.</i> (2004) | Object of study | Self-selection of auditors and audit pricing in private firms |
| | Sample | The sample consist of a yearly median 15225 private firm observations |
| | Methodology | Two stage process in order to estimate the self-selection model. The first stage uses a Probit regression to estimate the inverse Mills ratios, while the second stage uses an OLS regression to estimate the audit fee selection |
| | Outcome | Audit market of not listed firms is segmented across cost effective lines. Most clients do not see Big-5 auditing firms as providers of better audit quality audits, which can explain their higher fees |

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|----------------------------|-----------------|---|
| Chang <i>et al.</i> , 2009 | Object of study | Sarbanes Oxley Act, perceived earnings quality and cost of capital |
| | Sample | The sample consists of 11,159 firm year observation over 1999 to 2005. Financial firms and observations from 2002 are excluded |
| | Methodology | Use of empirical data to identify measures for earnings quality and the ex-ante cost of capital. The measures for 2001 (pre-SOX) are compared to the measures for 2003 (post-SOX) |
| | Outcome | In the post-SOX period, the market's earnings quality has improved, while the cost of equity capital for companies has reduced |

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|---------------------------|-----------------|--|
| Chen <i>et al.</i> (2005) | Object of study | Audit quality and earnings management for Taiwan IPO firms |
| | Sample | 367 new IPOs issues over 1999 and 2002 in Taiwan |
| | Methodology | Use of the modified Jones model to measure earnings management during the IPO process. Auditor type and industry specialization used to measure audit quality |
| | Outcome | Big five auditing firms are related to less earning management in the IPO year in Taiwan. Higher quality auditors better constrain earnings management for Taiwanese IPO companies |

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|--------------------------|-----------------|--|
| Chi <i>et al.</i> (2009) | Object of study | Mandatory audit partner rotation, Audit Quality, and Market Perception: Evidence from Taiwan. |
| | Sample | The sample consists of 493 companies in 2004. Divided in two groups those their auditor was rotated and those their auditor didn't rotated |
| | Methodology | Test for discretionary accruals using the 1991 modified Jones model. Test the hypothesis relating earnings management and audit quality using OLS regression |
| | Outcome | The findings are inconsistent with the belief that compulsory auditor rotation improves audit quality. Those findings are consistent, with findings in the United States, that compulsory auditor rotation may not improve audit quality |

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| Cohen <i>et al.</i> (2008) | Object of study | Real and accrual based earnings management in the pre- and post-Sarbanes-Oxley periods |
| | Sample | Sample consists of all US companies over 1987–2005. Excluded all financial companies |
| | Methodology | Cross sectional modified Jones model (Jones 1991) as described in Dechow <i>et al.</i> (1995) |
| | Outcome | Accrual-based earnings management increased steadily from 1987 until the passage of SOX in 2002, and decline considerably after the passage of SOX. On the same time period, before the passage of SOX real earnings management activities were decreased while after the passage of SOX increased |

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|------------------------------|-----------------|---|
| Collin <i>et al.</i> 2009 | Object of study | Explaining the choice of accounting standards in municipal corporations: Positive accounting theory and institutional theory as competitive or concurred theories |
| | Sample | 932 out of 1283 municipal companies. Final sample of 545 companies |
| | Methodology | Regression of qualitative variables. Application of logic model as estimated via the maximum likelihood technique, creating an S-shape curve with asymptotes at 1 and 0 |
| | Outcome | Use of both positive accounting and institutional theories to create hypotheses in order to explain accounting choices made by municipal companies. The research proposes an integrative approach of both theories in an eclectic alternative |

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|----------------------------|-----------------|--|
| Davidson and Neu (1993) | Object of study | Association between audit firm size and audit quality |
| | Sample | 112 firms traded in Toronto Stock Exchange |
| | Methodology | Difference between forecasted and reported income is used as a proxy for audit quality |
| | Outcome | Larger auditing firms are associated with higher quality audits and larger forecast errors |

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|--------------------|-----------------|---|
| DeAngelo (1986) | Object of study | Accounting numbers as market valuation substitutes: A study of management buyouts of public stockholders |
| | Sample | The final sample contains 64 companies whose managers decide to go private during 1973 and 1982 |
| | Methodology | This research tests for earnings management by measuring the differences in total accruals. The used model calculate nondiscretionary accruals dividing total accruals to the lagged total assets |
| | Outcome | The managers of the research firms systematically involved in earnings management practices attempting to decrease the profits of their companies and decrease the compensation of the buyout public stockholders |

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|----------------------------------|-----------------|---|
| DeAngelo <i>et al.</i> (1994) | Object of study | Accounting choice in financially troubled companies |
| | Sample | 76 non-financial NYSE firms with at least three years of negative net income over 1980-1985 |
| | Methodology | Cash flow is measured as funds from operations, minus accounts receivable, minus inventories, minus other current assets, plus accounts payable, plus taxes payable, plus other current liabilities |
| | Outcome | Managers' accounting choices primarily reflect their firms' financial difficulties, rather than attempts to inflate income |

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|--------------------------------|-----------------|---|
| Dechow and Dichev (2002) | Object of study | The quality of accruals and earnings: The role of accruals estimation errors |
| | Sample | 27204 firm years observations over the years 1987 - 1999 |
| | Methodology | Measurement of the accruals quality by observing the extent working capital accruals map into operating cash flow realizations, poor matching signifies low accrual quality |
| | Outcome | Accrual quality is negatively related to the absolute magnitude of accruals, the length of operating cycle, the loss incidence, and the standard deviation of sales, cash flows, accruals, and earnings, and positively related to firm size. There is a positive relation between accrual quality and earnings persistence |

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|--------------------------------------|-----------------|--|
| Dechow <i>and Sloan</i> (1991) | Object of study | Executive Incentives and the Horizon Problem: An Empirical Investigation |
| | Sample | The sample consisted of 517 firm year observations between 1979 and 1989 |
| | Methodology | This research uses a new accruals detection model that focus on the industry characteristics of the companies |
| | Outcome | CEOs reduce the spending on R & D the last year they hold the position. Nevertheless, there is no direct evidence to suggest that this reduction in R & D caused because of economic performance or because the investments reduced in order to be capitalized |

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|-----------------------------|-----------------|---|
| Dechow <i>et al.</i> (1995) | Object of study | Detecting earnings management |
| | Sample | Four distinct samples. First; a randomly selected 1000 firm years. Second; 1000 firm years with extreme financial performance. Third; 1000 firm years with a fixed and known amount of accruals manipulation. Fourth; 32 companies investigated by SEC for overstating annual earnings in 56 firm years |
| | Methodology | Comparison of different accruals based earnings management models. |
| | Outcome | All models perform well when test random samples of firm years. All models provide low power tests. All test reject the hypothesis of zero earnings management when test samples of companies with extreme financial behavior |

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|-----------------------------|-----------------|---|
| Dechow <i>et al.</i> (2003) | Object of study | Why are earnings kinky? An examination of the Earnings management explanation |
| | Sample | All Compustat firm year observations over 1988 – 2000. 47,847 firm-years observations |
| | Methodology | Build on the research of Burgstahler and Dichev (1997a). Testing of discretionary accruals using the modified Jones model with four different adaptations in order to improve it explanatory power |
| | Outcome | Small profit firms have high discretionary accruals relative to other firms which means that systematically involved in earnings management. Small losses firms use earnings management aiming to report the smallest losses possible |

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|--------------|-----------------|---|
| Demski, 1988 | Object of study | Positive accounting theory: A review |
| | Sample | n/a |
| | Methodology | n/a |
| | Outcome | The research suggests that Watts and Zimmerman's <i>Positive Accounting Theory</i> contributes to accounting thought and try to document this opinion |

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|------------------------------|-----------------|---|
| Francis <i>et al.</i> (1999) | Object of study | The role of Big Six auditors in the credible reporting of accruals |
| | Sample | All US stock exchange listed companies over 1974 - 1994. Containing 74390 company observations |
| | Methodology | In the first part, this research measures firm specific characteristics that lead companies to choose a big auditing firm for their annual reporting. In the second part of the research the paper examines the levels of discretionary accruals in companies choose big auditing firms for their financial reporting |
| | Outcome | Big auditors provide better assurance over earnings management, this is also the reason why companies choose them despite their high cost. High earnings management potential companies employees big auditor to signal that their financial statements are credible |

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|------------------------------|-----------------|---|
| Francis <i>et al.</i> (2005) | Object of study | The market pricing of accruals quality |
| | Sample | All US stock exchange listed companies with available data over 1970 - 2001 |
| | Methodology | Use of the Dechow and Dichev's (2002) model as basis of the accruals quality measurement |
| | Outcome | Low accruals quality companies have higher ratios of interest expense to interest-bearing debt and lower debt ratings than companies with better accruals quality do. Companies with the best accruals quality have lower cost of debt. Companies with lower accruals quality have larger earnings-price ratios from the rest companies of their industry |

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|-------------------|-----------------|---|
| GAO-08-163 (2008) | Object of study | Audits of Public Companies, Continued Concentration in Audit Market for Large Public Companies Does Not Call for Immediate Action |
| | Sample | Random sample of almost 595 large, medium, and small public companies |
| | Methodology | Questioner, interviews, special developed econometric models |
| | Outcome | The Big4 auditing firms audit almost all large public companies. According to GAO's survey, 82% of big public companies think their auditor choice is limited, while almost 60% thinks the competition in the US auditing market is insufficient. Most small public companies say they are satisfied. |

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|-------------------|-----------------|---|
| GAO-03-864 (2003) | Object of study | Public Accounting Firms, Mandated Study on Consolidation and Competition |
| | Sample | 148 out of 250 randomly sampled Fortune 1000 public companies, 20 chairs of audit committees of Fortune 1000 companies |
| | Methodology | Questioner, interviews, simple model of pure price competition to assess the condition of the US market, special developed econometric models |
| | Outcome | Although GAO found no evidence of unfair competition to date, the important changes that have occurred in the auditing market may have implications for competition and public company choice, in the future. |

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|-----------------------------|-----------------|---|
| Graham <i>et al.</i> (2005) | Object of study | The economic implications of corporate financial reporting |
| | Sample | 421 financial executives |
| | Methodology | Survey among financial executives and additional interviews |
| | Outcome | Managers avoid violating the GAAP in order to manipulate the earnings of their companies. 78% of the sample is willing to sacrifice long-term profits to smooth earnings. Managers, try to maintain predictability of earnings and financial disclosures. Managers make voluntary disclosures to reduce information risk and boost stock price while on the same time, try to avoid disclosure performance that will be difficult to maintain |

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|--------------|-----------------|---|
| Healy (1985) | Object of study | The effect of bonus schemes on accounting decisions |
| | Sample | the sample consists of 1527 firm year observations from fortune 250 companies over the years 1930 to 1980 |
| | Methodology | This research tests for earnings management making comparison of the mean total accruals scaled by lagged total assets with the earnings management partitioning variable |
| | Outcome | The accruals decision making of managers related to their compensation and bonus contracts, managers change the accounting procedures of their companies to fit their compensation and bonus plan |

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|-------------------------|-----------------|--|
| Healy and Wahlen (1999) | Object of study | A review of the earnings management literature and its implications for standard setting |
| | Sample | n/a |
| | Methodology | Review of the academic empirical literature on earnings management |
| | Outcome | Much of the academic research on earnings management have limited value to standard setters and regulators. Moreover the literature provides little evidence on questions, related to the frequency of earnings management, which accruals are managed, and effects on resource allocation |

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|------------------|-----------------|---|
| Hussainey (2008) | Object of study | The impact of audit quality on earnings predictability |
| | Sample | 4,417 observations of UK non-financial firms (1996-2002) |
| | Methodology | Collins et al. (1994) returns-future earnings regression model |
| | Outcome | Investors are able to expect more reliable future earnings when financial statements are audited by the big four accounting firms |

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|--------------|-----------------|---|
| Jones (1991) | Object of study | Earnings management during import relief investigations |
| | Sample | The sample of this research is restricted to import relief investigations of five industries: automobiles, carbon steel, stainless steel, copper, and footwear. The final sample consists of 23 companies from the five industries |
| | Methodology | This research introduces a new introduces model for the calculation of discretionary accruals, which based on the assumptions that managers use their discretion to manage earnings. The research also makes the assumption that nondiscretionary accruals are constant |
| | Outcome | Managers use earnings management to reduce the earnings of their companies during import relief investigations |

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| Krishan (2003) | Object of study | Audit quality and the pricing of discretionary accruals |
| | Sample | 18658 firm-year observations representing 4098 firms (1989-1998) |
| | Methodology | Cross-sectional variation of the Jones model used by DeFond and Jimbalvo (1994) |
| | Outcome | The association between stock returns and discretionary accruals is higher for companies audited by Big 6 auditors. Discretionary accruals of clients of Big 6 auditors have a higher association with future profitability |

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|------------------------------|-----------------|---|
| Leuz <i>et al.</i> (2003) | Object of study | Earnings management and investor protection: an international comparison |
| | Sample | Financial accounting data from 1990 to 1999 for over 8,000 companies from 31 countries |
| | Methodology | Creation of four proxies that capture the extent managers use their accounting discretion to manipulate the economic performance of their company. The proxies capture a variety of earnings management practices such as earnings smoothing and accrual manipulations. In addition this research creates a cluster analysis which groups countries with similar legal and institutional characteristic |
| | Outcome | Outsider economies with discharge ownership, strong investor protection, and large stock markets have lower levels of earnings management than insider countries with concentrated ownership, weak investor protection, and less developed stock markets |

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|-------------------------|-----------------|--|
| Lobo and Zhou (2006) | Object of study | Did conservatism in financial reporting increase after the Sarbanes-Oxley act? Initial evidence |
| | Sample | Initial sample of 20669 firm year observation, after elimination of top and bottom observations and requiring equal firm year observations for pre and after SOX the sample further reduces in 14396 firm year observations |
| | Methodology | Use of two methods to compare conservatism two years before and two years after SOX. The first approach makes comparison of discretionary accruals across those two periods. The second approach uses the Basu 1997, method. |
| | Outcome | Companies are more conservative the first two years after the passage of SOX than they were two years before it |

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|-------------------------------|-----------------|--|
| Manry <i>et al.</i> (2008) | Object of study | Does increased audit partner tenure reduce audit quality? |
| | Sample | The study uses an initial sample of 202 audit clients, from which excludes the 112 using a final sample of 90 companies |
| | Methodology | Use of one variance of the modified Jones discretionary accruals model. Furthermore, the research use a regression analysis to determine the relation between discretionary accruals and factors that affect audit quality |
| | Outcome | Audit quality appears to increase with increased audit firm tenure. The audit tenure is significantly and negatively related to estimated discretionary accruals for small clients, while audit tenure is not significantly associated with estimated discretionary accruals for big clients. Audit company rotation may not increase audit quality but have the opposite results for some companies |

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| Rusmin (2010) | Object of study | Auditor quality and earnings management: Singaporean evidence |
| | Sample | 301 non-financial firms listed on the two principal listing Boards, Main board and Sesdaq, over 2003 |
| | Methodology | Cross-sectional modified Jones model. Audit firm industry specialization to proxy auditor quality |
| | Outcome | The level of earnings management is lower for firms using specialist auditors than those don't use specialist auditors |

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|--|-----------------|--|
| Securities and Exchange Commission (2007) | Object of study | Commission Guidance Regarding Management's Report on Internal Control Over Financial Reporting Under Section 13(a) or 15(d) of the Securities Exchange Act of 1934 |
| | Sample | N/A |
| | Methodology | Guidance report of internal controls over financial reporting |
| | Outcome | N/A |

| | | |
|--|-----------------|--|
| Van Tendeloo and Vanstraelen (2008) | Object of study | Earnings management and audit quality in Europe |
| | Sample | 64,831 firm-year observations of private firms in six EU countries (1998–2002) |
| | Methodology | Aggregate measure of earnings management behavior, as developed by Leuz et al. (2003) |
| | Outcome | Privately held companies engage less in earnings management when they have a Big 4 auditor in countries with a high financial and tax accounting alignment |

| | | |
|--------------------------------|-----------------|---|
| Wang <i>et al.</i> , (2010) | Object of study | The Sarbanes-Oxley Act and CEO, turnover, and risk aversion |
| | Sample | All the 1606 CEO turnovers included in the Execucomp database from 1999 to 2005. Excluded turnovers from utility, financial firms, subsidiaries, and turnovers due to death or health problems |
| | Methodology | The sample divided into pre-SOX and post-SOX periods, the analysis compares the characteristics of CEOs, boards, and other firm characteristics between the two periods |
| | Outcome | CEOs become less willing to take risks after the passage of SOX. This could be the explanation why, after the mandatory adaption of SOX, the CEO tenure not significantly is shorten. Financial restatements affect the CEO tenure due to increased monitoring activities by both board and financial media in the post-SOX era. The increased monitoring also contributes to the declining will of CEO to take risks |

| | | |
|-----------------------------|-----------------|--|
| Watts and Zimmerman, (1990) | Object of study | Positive accounting theory: A ten year perspective |
| | Sample | n/a |
| | Methodology | Review and comments of positive accounting theory literature following the publication of Watts and Zimmerman (1978, 1979) |
| | Outcome | Suggests ways to improve positive research in accounting choice. The most important suggested improvement is the stronger links between theory and empirical tests |

| | | |
|---------------|-----------------|---|
| Watts, (2003) | Object of study | Conservatism in Accounting; Part A: Explanations and Implications; Part B: Evidence and Research Opportunities, Accounting Horizons |
| | Sample | n/a |
| | Methodology | Literature review |
| | Outcome | A two parts literature review, the first part focus on accounting conservatism presenting different theories of conservatism and their implications. The second part makes a summary of conservatism evidence and grade the ability of those evidence to distinguish among conservatism explanations and between conservatism and non-conservatism explanations |

Books

| | | |
|------------------|-----------------|---------------------------------------|
| Brooks (2008) | Object of study | Introductory Econometrics for Finance |
| | Sample | n/a |
| | Methodology | Book |
| | Outcome | n/a |

| | | |
|-------------------|-----------------|---|
| Freeman (2002) | Object of study | Stakeholder Theory of the Modern Corporation, Ethical Issues in Business: A Philosophical Approach, 7 th Edition |
| | Sample | n/a |
| | Methodology | Book |
| | Outcome | n/a |

| | | |
|---------------------------------|-----------------|--|
| Miles and Huberman (1994) | Object of study | Qualitative Data Analysis: An Expanded Sourcebook, 2 nd edition |
| | Sample | n/a |
| | Methodology | Book |
| | Outcome | n/a |

Item.2

| Year | B4-Total Accruals | B4-Normal Accruals | B4- Discretionary Accruals |
|-------------|------------------------------|-------------------------------|---|
| 2000 | -0.0927 | -0.1221 | 0.0434 |
| 2001 | -0.2048 | -0.1340 | -0.0140 |
| 2002 | -0.1820 | -0.1433 | -0.0007 |
| 2003 | -0.1565 | -0.1515 | 0.0173 |
| 2004 | -0.1337 | -0.1361 | 0.0454 |
| 2005 | -0.1195 | -0.1201 | 0.0284 |
| 2006 | -0.1164 | -0.1166 | 0.0312 |
| 2007 | -0.1339 | -0.1186 | 0.0139 |
| 2008 | -0.1600 | -0.1076 | -0.0116 |
| 2009 | -0.2032 | -0.1238 | -0.0216 |
| 2010 | -0.1563 | -0.1273 | 0.0265 |

Item.3

| Year | NB4-Total Accruals | NB4-Normal Accruals | NB4- Discretionary Accruals |
|-------------|-------------------------------|--------------------------------|--|
| 2000 | -0.0930 | -0.1226 | 0.0476 |
| 2001 | -0.2049 | -0.1339 | -0.0142 |
| 2002 | -0.1832 | -0.1419 | -0.0013 |
| 2003 | -0.1565 | -0.1518 | 0.0176 |
| 2004 | -0.1326 | -0.1361 | 0.0458 |
| 2005 | -0.1195 | -0.1201 | 0.0284 |
| 2006 | -0.1144 | -0.1166 | 0.0299 |
| 2007 | -0.1345 | -0.1188 | 0.0143 |
| 2008 | -0.1611 | -0.1074 | -0.0139 |
| 2009 | -0.2032 | -0.1234 | -0.0221 |
| 2010 | -0.1546 | -0.1261 | 0.0255 |