

**The Changes In the Relation Between**

**Audit Quality and Earnings Management**

**After Financial Crisis**

Erasmus School of Economics

Master Thesis

**Abstract:** This paper mainly examines the changes in the relationship between earnings management and audit quality before and after financial crisis in the context of American firms from 2005 to 2010. Based on a sample of 3584 firm year observations, we find that there are changes concerning the relation between accrual-based earnings management and audit quality during the pre-crisis and post-crisis periods. However, the results do not provide enough evidence with regard to the variances in the association between real activities earnings management and audit quality during these two periods.

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# 1 Introduction

## 1.1 Prologue

Earnings management is regarded as an important aspect in the academic accounting area during the last few decades. Managers have the incentives to manipulate earnings to obtain self-benefit and also to meet or beat analyst estimation. Various studies on different subjects have been conducted in order to investigate its sources, the association with firms’ business operation condition and financial behavior, and its consequences on reporting quality, especially in terms of earnings quality. Among them, many studies have been focusing on the issue covering the incentives of management to carry out earnings management. (Bergstresser and Philippon 2006)

On the other hand, financial statements are the main sources of information on the company financial status obtained by external investors. However, due to the information asymmetry between the shareholders and managers (“insiders”), one of the consequences resulting from the earnings management is that it would, to some extent, lead to the misunderstanding from external investors’ perspective as they primarily rely on the financial statement to make investment decisions. Though earnings management is legal behavior by taking advantage of the flexibility of accounting standards, large-scale earnings management would mislead investors and bring them excessive, avoidable losses. Due to this reason, investors try to find an effective way to mitigate this gap. Consequently, the independent external auditors began to play more and more important role nowadays. In order to get more explicit and real financial information when deciding the investment strategies, such as valuating the firm as well as measuring the performance, investors take auditors’ judgment which can detect the behavior of earnings management as important reference. As a result, the topic covering whether auditors would detect earnings management or not, in other words, the audit quality related to earnings management, becomes a meaningful area worthy to be penetratingly explored. (Becker et al., 1998; Francis and Yu, 2009; Lin and Hwang, 2010)

In the meantime, the frequent occurrences of accounting scandals related to enterprise management, such as the bankruptcy of several renowned companies, those are Enron (2001), WorldCom (2002) and more recently Lehman Brothers (2008) have put rigorous challenges to corporate governance. In addition, the worldwide financial crisis has given a heavy blow to both the financial and the capital markets, bringing enormous losses to the affiliated parties. Moreover, an increased number of companies would additionally suffer from damaged reputation due to the unfavorable outcomes of misrepresenting financial reports (Karpoff and Lott Jr., 1993). As a consequence, all these phenomena push up the urgent need for high audit quality which can detect earnings management effectively and this has attracted more and more attention from both the academic area and social public worldwide, more particularly, from policy setters to market participants and from financial analysts to investors.

In conclusion, the subject of this research is to examine the changes in earnings management before and after financial crisis as an indication of variations in audit quality as well as the association between these two phenomenon. First of all, economic crisis definitely exert tremendous influences on the performance of companies in various industries, consequently lead to the higher likelihood of the decline in firms earnings. As a result, the issue covering the reactions of management towards the decreased earnings would be an interesting area to be explored. Secondly, since the auditors have the responsibility to detect excessive earnings management behavior before the disclosure of financial statements as well as to insure the reliability and transparency of financial reporting, it is worth to examining the changes in the relation between earnings management and audit quality before and after financial crisis since the macroeconomic conditions are different during these two periods. Lastly, this research mainly adopt four proxies for audit quality, those are audit firm size (Big-4), audit tenure and the industry specialization of auditors as well as audit independence. With respect to earnings management, cash flow from operations obtained from cash flow statements will be used to calculate total accruals and the Performance-Matching Discretionary Accruals model (Kothari et al. 2005) will be applied to get the amount of discretionary accruals in order to test the changes in the accrual-based earnings management. Besides, the Roychowdhury Model (2006) will be adopted to estimate the real activities earnings management.

## 1.2 Motivations

There are several motivations for this study which can be divided into two key areas.

First of all, in the contemporary financial market, auditor plays an essential role in ensuring the validity and fairness of financial statements, therefore, to some degree, to constrain the earnings discretion behavior of management. There is a large number of published studies describing the relation between audit quality and earnings management which show that the higher audit quality can, to some extent, mitigate the earnings management. (Becker et al., 1998; Francis and Yu, 2009; Lin and Huang, 2010) Furthermore, regarding the various measures of audit quality, there are empirical evidences showing that auditor size (Big N), auditor specialization, audit tenure and auditor independence etc. have a negative relationship with earnings management. (Francis and Krishnan, 1999; Krishnan, 2003; Francis and Yu, 2009; Lin and Huang, 2010)

In an early research, Becker et al. (1998) examines the association between audit quality and earnings management, specifically, the effect that audit quality would exert on earnings management through discretionary accruals. Based on a large sample consisting of 10,397 firm year observations audited by Big Six auditors and 2,179 firm year observations audited by non-Big Six auditors, they got the conclusion that clients of non-Big Six auditors report more discretionary accruals that increase income relatively, compared to the discretionary accruals reported by clients of Big Six auditors and they also find that lower audit quality is associated with more accounting flexibility. Additionally, according to one of the recent studies, Chen et al. (2005) also set foot in the field regarding the relationship between audit quality and earnings management, especially for the IPO firms in Taiwan. They demonstrate that high quality auditors represented by big five auditors constrain earnings management; therefore, improve the quality of financial statements. However, Kim et al. (2003) found that Big 6 auditors are less effective than non-Big 6 auditors in detecting income-decreasing earnings management. Overall, the empirical evidence on the association between earnings management and audit quality represented by different proxies is mixed with contradictory findings. The purpose of this paper is to revisit this issue and further examine the relation between these two phenomenon, trying to give more empirical evidence in this research field.

Secondly, the worldwide financial crisis in 2008 has given a heavy blow to both the financial and the capital markets, bringing enormous losses to the affiliated parties. As a result, more and more attention has been drawn to the quality of financial statements and consequently, to the urgent demand for high audit quality which is supposed to be one of the main factors that affect the credibility and transparency of financial reports. Whether the behavior of managing earnings would increase and what the reaction of auditors with regard to earnings management would be an interesting research to be explored. This paper focuses on the change in the relationship between earnings management and audit quality before and after global economic crisis, aiming to find the impact of financial crisis on these two phenomenon.

## 1.3 Relevance

In the previous parts, the main subjects and motivations of this study have been stated. However, the question regarding the beneficiaries of this study remains: who would benefit from the research results? This section will give the answer to it by presenting the affiliated parties who would be interested in since this paper can be widely applicable to many concerned.

In the first place, external investors and shareholders can benefit from the findings as this paper can provide them with the information covering the reliability of the financial statements which they take as important references when they evaluate the firm and assess the performance. Hence, this study can, to some degree, help them to judge whether auditors adequately play the role of assuring the transparency, credible and high quality of financial reports, in other words, whether the financial statements are trustful which can reveal the true performance of the firm operation condition.

Secondly, the findings in this research would be of interest to standard setters. Whether the auditors can detect earnings management before the disclosure of financial reporting is important for affiliated parties, such as shareholders and external investors. According to the results of this study, the policy makers can decide if they need to make some modification of the standards, of which can constrain the behavior of auditors by making them work under more highly ethical regulations, and consequently improve audit quality, especially those parts related to earnings management.

## 1.4 Contribution

As compared to the previous literature, one of the unique characteristics of this study is that it mainly focuses on the change in the association between earnings management and audit quality before and after the financial crisis. The previous studies mainly examine the relationship in terms of earnings management and audit quality. (Becker et al., 1998; Francis and Yu, 2009; Lin and Huang, 2010) In this research, the economic crisis is regarded as a key factor that could influence audit quality related to earnings management. Concerning this aspect, this study differs from the prior performed research that only concern about the relationship between audit quality and earnings management. It is regarded as the first attempt to explicitly and directly test the effect of financial crisis, and the results are expected to be different and consequently unique from the previous researches.

## 1.5 Research Question

This paper focuses on the changes in the relation between audit quality and earnings management before and after financial crisis. Based on the previous literatures and fundamental theories, the main research question is stated as:

*Main question: Are there any changes in earnings management before and after financial crisis as an indication for variations in audit quality?*

In order to provide enough evidence to seek the solution for this problem specification, the following sub-questions have been formulated:

*Sub-question 1: What is earnings management and how is it measured?*

*Sub-question 2: What is audit quality and how is it measured?*

*Sub-question 3: Which model is most appropriate for measuring earnings management?*

*Sub-question 4: Are there any differences between accrual-based earnings management and real activities earnings management regarding audit quality?*

*Sub-question 5: Are there any variances concerning the income-increasing and income-decreasing earnings management?*

*Sub-question 6: What are the results of prior research on earnings management and audit quality?*

*Sub-question 7:What are the hypotheses for the research of this thesis?*

*Sub-question 8: What is the research design of this thesis?*

*Sub-question 9: What are the results of this thesis?*

*Sub-question 10: What are the analyses of those results?*

## 1.6 Methodology

The main purpose of this part is to present the research methods applied in this study.

First of all, regarding the theoretical framework and the literature review section, the fundamental concepts of earnings management and audit quality will be elaborated in detail which are obtained from the previous researches and academic books. Following, the relationships between earnings management and audit quality would be developed by studying the prior research.

Secondly, in terms of the hypotheses development part, again, the previous researches will be used to help establish the hypotheses of this paper.

Thirdly, to perform the empirical analysis of this study, all the data will be collected from the Erasmus Data Center. In order to test the changes in earnings management before and after the financial crisis as an indication for the variation in audit quality, the data will be under U.S. set as the economic crisis stems from America. Consequently, the public listed companies on NYSE Stock Exchange will be selected as the original sample. The period adopted will be from 2005 to 2010 of which the financial crisis divides the period into two parts, those are three years before and after the economic crisis respectively.

Fourthly, concerning the research methods, the Performance-Matching Discretionary Accruals Model (Kothari et al. 2005) will be applied to calculate the discretionary accruals as proxy for accrual-based earnings management. It is regarded as an effective and reliable way to capture management choices and discretion reflected in the financial statements since it takes firm performance into consideration which can better reflect discretionary accruals. In their study, Ronen and Yaari (2008) argue that the Performance Matching Model yields stronger results than the Jones Model. Similarly, Dechow et al. (2012) also mention that the Performance Matching Model can to some extent mitigate model misspecification which is better than the Modified Jones Model that is widely used in the previous studies.

On the other hand, in terms of real activities manipulation, I adopt the model developed by Roychowdhury (2006) through three main manipulation methods, which are sales manipulation, reduction of discretionary expenditures and overproduction, or increasing production to report lower COGS.

Following, I try to measure the quality of audit from four main aspects; those are audit firm size, audit tenure, industry specialization of auditor and audit independence applied in the prior researches, of which will be illustrated in Chapter 2. (Becker et al., 1998; Francis and Krishnan, 1999; Krishnan, 2003; Francis and Yu, 2009; Lin and Huang, 2010)

Lastly, aims to investigate the relations between the different variables in this research, a regression analysis in SPSS would be performed according to all the data collected which will be described in Chapter 7.

## 1.7 Limitations

This study is subject to some limitations. First of all, in terms of earnings management measurement, managers can manipulate earnings in various patterns and consequently no one can really find the perfect proxy to accurately indicate the behaviors of earnings management. This paper examines the earnings management from two main aspects, accrual-based and real activities earnings management by using Performance-Matching Discretionary Accruals Model and Roychowdhury Model, respectively, in order to capture earnings management in a precisely way. (Kothari et al., 2005; Roychowdhury, 2006) Secondly, this research mainly focuses on the American financial market; whether it can be extended to other markets and how to apply it world-widely need further study as U.S. American markets is under higher investor protection mechanism.

## 1.8 Structure

The remainder of the thesis is structured as follows: In the Chapter 2, theoretical framework and the main subjects will be stated, which will answer the sub-questions one to three. Chapter 3 provides an intensive literature review of previous studies on earnings management, audit quality and related aspects, of which the answer for sub-question six will be known. The main and sub hypotheses stated as sub-question seven will be developed in the chapter 4. Following, the main research design and statistical model as well as the sample selection and data attainability will be presented in Chapter 5, which answers the sub-question eight. In the Chapter 6, descriptive statistics and empirical results will be described as the answer for sub-question four and five as well as nine and ten. Finally, Chapter 7 will provide the conclusion of this paper along with the research limitations and recommendations for the further study.

# 2 Theoretical Framework

In this section, the main theories and subjects applied to the study will be clearly stated. Firstly, the elaboration of two dominant theories, agency theory and positive accounting theory are presented since they are the primary theoretical foundation that can interpret earnings management and to some extent to explain the derivation of auditors. After that, the main subjects will be described in detail, including earnings management which is composed of four aspects, definition, incentives, patterns and measurements as well as audit quality that contains the meaning of audit and audit quality, the role of audit and the measurements of audit quality. Hence, obtaining a clear and broad view of these theories and academic terms is essential for the comprehensive and thorough understanding of the previous literature studies in the next chapter.

## 2.1 Theory

### 2.1.1 Agency Theory

In the 1976, Jensen and Meckling (1976) illustrate their understanding of the agency relationship by defining it as “*a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent”.* They point out that both the agents and the principals have their own goals based on the different starting points and benefits. It leads to the conflicts of interest in an agency relationship between these two parties that derive from the separation of ownership and control. This separation causes information asymmetry and these two parties tend to behave on their own self-interest. As a result, there is an agency cost which consists of the monitoring expenditures by the principal, the bonding expenses by the agent and the residual loss that is described as the divergences between the agent’s decisions and those choices maximizing the welfare of the principal. (Jensen and Meckling, 1976)

Similarly, in his study, Eisenhardt (1989) argues that agency theory indicates the mechanisms regarding cutting down the agency loss. He also discusses the two main concerns in the agency relationship that agency theory deals with and attempts to resolve. One is the agency problem due to the conflicts of self-interest resulting from the different goals of agents and principals, and the other one relates to the risk preferences between these two parties.

### 2.1.2 Positive Accounting Theory

The Positive Accounting Theory (PAT) tries to explain and predict the actual accounting choices of managers. This theory may be helpful to explain the observed accounting phenomenon of earnings management and make predictions about the unobserved accounting practices. (Watts and Zimmerman, 1978, 1986, 1990) In their comprehensive study, Watts and Zimmerman (1986) propose the definition of positive accounting theory, that is, “*it is concerned with predicting such actions as the choice of accounting policies by firm managers and how managers will respond to proposed new accounting standards”*. In contrast to normative theory concerning what should be or ought to be, positive theory deals with what is or will be.

According to the positive accounting theory, managers seek to choose the accounting policies that would benefit their own interests as well as attain firm governance objectives, in the meantime, under the goal of reducing contracting costs in terms of the opportunistic perspective, so the PAT Theory is using the agency theory. As a result, different types of hypotheses are stated to explain the underlying reason on the motives that managers choose one accounting policy rather than another. Following, the main three hypotheses are described below:

*Bonus plan (Management compensation) hypothesis*

The bonus plan hypothesis is related to the compensation that managers may receive which is positively associated with the firm performance. Consequently, managers tend to choose the most beneficial accounting policies and methods that can maximize the current earnings and make it better than it originally is on the financial statements, and therefore increase their own remuneration. This hypothesis highly reflects the philosophy of opportunistic perspective of positive accounting theory which demonstrate that managers have incentives to manage earnings towards the direction of their self-interest. (Watts and Zimmerman, 1986)

*Debt hypothesis*

Similar to the bonus plan hypothesis, managers is motivated to select accounting policies that shift the reported earnings from future periods to the current period in order to reduce the possibilities of technical faults which is related to the high debt/equity ratio. By doing this, managers are inclined to enhance the creditworthiness of the firm that can appeal to more creditors (capital providers) and also the external investors. (Watts and Zimmerman, 1986) In their study, Dichev and Skinner (2002) adopt a large database aiming to find empirical evidence on the debt covenant hypothesis and get the conclusion that managers tend to make financial disclosing decisions which can avoid debt covenant violations.

*Political cost hypothesis*

Compared to previous two hypotheses, political cost hypothesis presume that the managers have incentives to decrease profits, especially under the situation of high current earnings. Since the high profit performance may attract attention of both the government and social media who are inclined to concern about the high earnings domains, management of the firm may choose accounting policies to make earnings look plausible. (Watts and Zimmerman, 1986)

The Positive Accounting Theory will be used in this thesis to formulate the hypotheses and to explain the results of the empirical research.

### 2.1.3 Summary

This section mainly discusses the theory of this study within the science of financial reporting and accountancy which are based on the agency theory and Positive Accounting Theory. According to these two theories, the derivation of earnings management behavior and the appearance of auditors can be recognized.

## 2.2 Main Subjects

### 2.2.1 Earnings Management

#### 2.2.1.1 Definition of Earnings Management

Earnings management is a widely discussed topic in the contemporary accountancy area. In order to get a proper view of earnings management, it is essential to understand what earnings mean. Earnings refer to the amount of profit that the company produces during a specific business period which can reflect the profitability of the firm and is regarded as the most important figure in the financial statements indicating the firm performance. The timely and precise reporting of earnings is of significant importance for different stakeholders, such as shareholders, creditors, external investors and so on. (Schiller, 2005)

Therefore managers have incentives to manage income to meet analyst earnings forecast and in the meantime to avoid the decline in stock price brought by the substantial fluctuations of earnings. The use of earnings management is taken place within the bound of Generally Accepted Accounting Principals (GAAP) by taking advantages of regulation flexibility. In addition, one of the primary goals of managing earnings is to mislead external investors by making use of the information asymmetry between internal managers and external stakeholders to obscure or mask the true firm performance and economic conditions. (Schipper, 1989; Healy and Wahlen, 1999; Beneish, 2001)

Since earnings management is a concept widely discussed in the financial fields, many researchers have tried to give an explicit explanation on it. However, there is still no consensus on the definition of earnings management in the academic field. Several representative literatures that stated their viewpoints of earnings management have been selected.

One of the most common definition was stated by Schipper (1989): “Earnings management occurs when managers use judgment in financial reporting and structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers.”

Healy and Wahlen (1999) identify earnings management as a process of altering the accounting transactions by managers who use their power upon the financial reporting in order to misguide some stakeholders about the actual performance of company at one period or to affect the result of contract based on the short-term financial accounting information. Specifically, a few important points are noted with respect to this definition. First of all, managers can exert their influence on the financial statements in different ways, for instance, different accounting methods needed to be chose in terms of the same economic issues as well as the judgment on working capital management etc. Secondly, the authors point out that the main intention of earnings management is to mislead external stakeholders about the real operation condition of business, to some extent, through private (insider) information that manager obtains; as a consequence, manager’s behavior that does not present a right view on the firm performance would affect the decision-making process of outside users. However, on the contrary, accounting judgment can be used to convey more information to outside investors. Lastly, they lay stress on the advantages and disadvantages of managers’ judgment. On the one hand, it can, to some degree, help improve the credibility of information via the communication between managers and outsider users. On the other hand, it may disrupt the resource allocation in the economy.

In his major study, Beneish (2001) compared various authoritative interpretations of earnings management provided by previous literatures (Davidson et al., 1987; Schipper, 1989; Healy and Wahlen, 1999) and gave their own opinion on earnings management. They concluded that earnings management is carried out under the context of financial reporting, as well as timing real investments and financial decisions which are applied to some of earnings management. In addition, the objective of earnings management is illustrated as to mislead outside users by hiding the real economic performance of firms. Besides, they also point out two important perspectives concerning earnings management: on the one hand, managers tend to mislead outsider stakeholders arisen from opportunistic perspective which is widely used in the academic area; on the other hand, managers carry out accounting discretion aiming to provide their own estimation of firm’s future cash flows to investors.

Nevertheless, there are also several literatures arguing about the benefit that earnings management would bring to financial statements users. In their major study, Arya et al. (1998) identify that earnings management can be beneficial to shareholders even though it doesn’t show the true fact by hiding information.

#### 2.2.1.2 Incentives of Earnings Management

After the elaboration of the definition of earnings management in the last section, it comes to the question: why do managers carry out earnings management? What is the underlying motivation of managing earnings? A considerable amount of literatures set foot in this area. In their analysis of earnings management, Healy and Wahlen (1999) as well as Jackson and Pitman (2009) illustrate three incentives of earnings management respectively; those are capital market motivation, contracting motivations and regulatory motivations.

In terms of stock market incentive, management of the firm tends to manipulate earnings around the equity offerings and on the other hand, to meet the specific benchmark, such as the analyst earnings forecast. In order to avoid letting investors down, managers would carry out earnings management. (Healy and Wahlen, 1999) In support of this viewpoint, Jackson and Pitman (2009) demonstrate that managers are inclined to manipulate earnings especially during the period of initial public offerings and seasoned equity offerings to influence the perspective of external investors since there is an apparent association between reported earnings and stock price. In the meantime, it is of great risks if firms miss the analyst or management earnings expectations.

Regarding the second incentive based on the contracts between firms and other affiliated parties, Press et al. (2012) figure out that debt contract and insider-trading incentives drive the manipulation of income-increasing earnings management. From another perspective, management compensation agreements are also the source of managing income since managers can benefit from the better financial status which relates to their bonus awards as well as job security. (DeAngelo, 1988; Dechow and Sloan, 1991) Similarly, Healy and Wahlen (1999) also classify contracts into two types, those are lending contracts that deal with the potential technical default in which managers choose to increase earnings to avoid it, and the other one is management compensation contracts which implies that managers use accounting discretion aiming to boost performance-related compensation.

Lastly, in the context of regulatory motivations, Jackson and Pitman (2009) put forward a point that the reported earnings highly connects to the degree of public scrutiny and the impact of rules of which is prevalent among the pharmaceutical and oil industries. Healy and Wahlen (1999) mainly focus on two patterns of regulatory, of which are industry as well as anti-trust and other governmental regulations. In terms of the first incentive, some specific industries, such as banking, insurance and utility industries, are under stringent capital requirements, therefore, managers tends to carry out earnings management to divert the attention of administrational scrutiny. Besides, additional subsidies and potential benefits from government induce management to carry out accounting discretion. (Jones, 1991)

#### 2.2.1.3 Patterns of Earnings Management

*Accrual-based earnings management and real activities earnings management*

According to the previous studies, there are two major patterns of earnings management, which are accrual-based earnings management and real activities earnings management. (Ziv, 1998; Gunny, 2010)

The first measurement of earnings management, accrual-based earnings management is related to the discretion of management through accounting policies and methods selection procedure without changing in cash flow. (Ziv, 1998; Roychowdhury, 2006) Accrual-based earning management deals with accounting choices which depict the operating activities within the bound of generally accepted accounting principals in order to conceal the underlying financial status of companies. (Dechow and Skinner, 2000; Gunny, 2010)

On the other hand, real activities earnings management means that managers choose operation activities, consequently changes the cash flow in order to affect the financial reporting. In his major study, Roychowdhury (2006) defines real activities earnings management as “*departures from normal operational practices, motivated by managers’ desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations*”. Compared to accrual-based earnings management, real activities earnings management is hard to be detected and scrutinized by auditors and regulators which is in favor of management nowadays. (Baber et al., 1991; Bartov, 1993; Bens et al.; 2002; Roychowdhury, 2006; Zang, 2012)

*Income-decreasing and income-increasing earnings management*

From another point of view, there are two directions of earnings management, those are income-increasing and income-decreasing earnings management which depends on the intentions of managing earnings from the management of the firm.

According to the big bath theory, in response to the bad news, the managers would prefer to take a bath by decreasing the current profit in order to gain improved earnings in the following years. (Kirschenheiter and Melumad, 2001) Similarly, Jordan et al. (2010) also gave evidence on the use of big bath of earnings management by taking more write-downs.

By contrast, Beneish (2001) argues that managers have the incentives to increase earnings for the sake of preventing the expenses of covenant violations based on the debt agreements. He also point out that increase-income management happens during the procedure of security offerings.

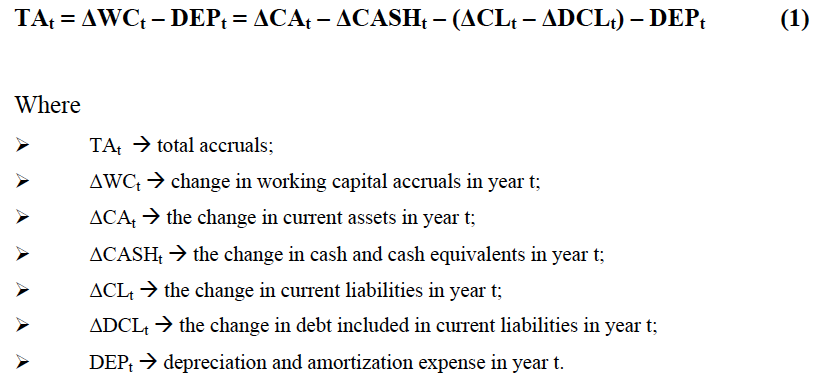
#### 2.2.1.4 Measurement of Earnings Management

*Accrual-based earnings management*

Since earnings management is widely discussed in the accounting academic area, there are different accrual-based models applied in various studies, such as Healy Model, DeAngelo Model, the Jones Model, the Modified Jones Model and KS Model, etc. (Healy, 1985; DeAngelo, 1986; Jones, 1991; Dechow et al., 1995; Kang and Sivaramakrishnan, 1995; Beneish, 1997) A basic cornerstone of all these approaches is that they attempt to calculate discretionary accrual that is regarded as proxy for earnings management through different methods.

First of all, in order to understand the previous models, it is necessary to start with the meanings of accruals. Accruals are built upon the accrual-basis accounting which distinguishes between the receiving and recognizing of revenues as well as the paying and recognizing of expenses. Compared to the cash-basis accounting, it records income items when they are earned and records deductions when expenses are incurred, in other words, records revenues and costs at the time when the transactions occurs. Hence, “accruals arise when there is a discrepancy between the timing of cash flows and the timing of the accounting recognition of the transaction.” (Ronen and Yaari, 2008) The total accruals include several temporal items on the balance sheet, such as accounts payable, accounts receivable, depreciation, deferred tax liability and so on. According to their research, Ronen and Yaari (2008) classify the accruals into three parts; those are discretionary accruals, non-discretionary accruals and reversals, of which the first item is regarded as an indication of earnings management.

Secondly, with regard to the amount of accruals, it is not an observable item that can be directly obtained from balance sheet. Several methods are applied to calculate total accruals, but there is no accurate one that can exactly determine it. This thesis will adopt the method which is used in many researches. (Healy, 1985; Jones, 1991; Dechow et al., 1995). The formula is stated as follows:

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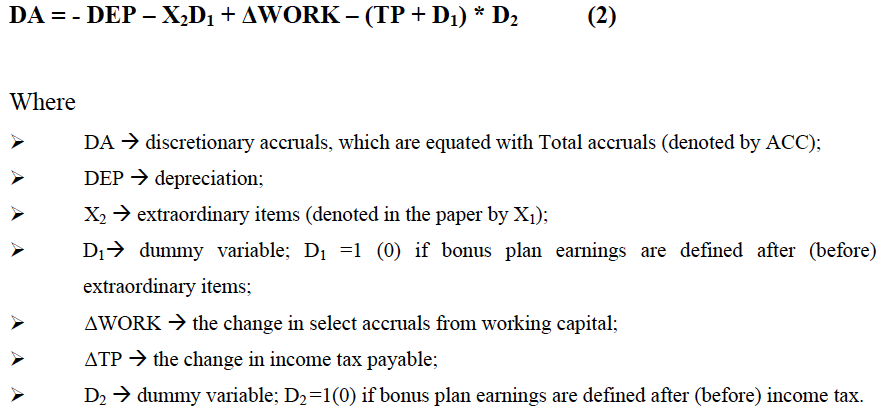
Through Formula (1), we can get the amount of total accruals for a firm in year t. In particular, the total accruals are usually scaled by lagged total assets to reduce heteroscedasticity. Following, the Jones Model, the Modified Jones Model and the Performance Matching Discretionary Accruals Model will be discussed which all adopt this formula to calculate total accruals.

Thirdly, after solving the calculation of total accruals, it comes to the question covering how to distinguish non-discretionary accruals from discretionary accruals. As illustrated in their study, Ronen and Yaari (2008) define non-discretionary accruals as “*accruals that arise from transactions made in the current period that are normal for the firm given its performance level and business strategy, industry conventions, macro-economic events, and other economic factors*” while discretionary accruals are “*accruals that arise from transactions made or accounting treatments chosen in order to manage earnings*”. One remarkable feature that differs discretionary accruals and non-discretionary accruals is the discretion of management. Since the discretionary accruals are the results from the behaviors of managing earnings, it is regarded as an effective proxy for earnings management. Schiller (2005) gives his opinion on discretionary accruals, of which is managed to meet the desired level of income that reflects one incentive of earnings management.

In the past few decades, numerous studies have attempted to find an accurate approach to calculate discretionary accruals. According to his review of discretionary accruals approaches, Schiller (2005) points out two types of aggregated accruals methods, the stationary discretionary accruals models which presume that non-discretionary accruals are independent of the influence of changing economic circumstances (Healy, 1985; DeAngelo, 1986) and the performance-based discretionary accruals models which argues that the non-discretionary accruals are highly associated with the performance of firms, and hence connect to financial conditions. (Jones, 1991; Dechow et al., 1995) Among these models, the Jones Model (1991) is considered as the first relatively effective method that can capture earnings management. As follows, the Healy Model (1985) and the DeAngelo Model (1986) will be briefly introduced and then the original Jones Model (1991) and the Modified Jones Model (Dechow et al., 1995) as well as the Performance Matching Discretionary Accruals Model (Kothari et al., 2005) which is applied as the main accruals model for this thesis will be presented in detail below.

*Healy Model (1985)*

Healy (1985) makes the first attempt to calculate the amount of discretionary accruals as proxy for earnings management. On the basis of his study, the mean total accruals from an estimation period stand for the measure of the non-discretionary accruals during the event period. (Dechow et al., 1995, p. 197) The formula is stated below: (Ronen and Yaari, 2008)



The Healy model interprets that total accruals are discretionary accruals presenting earnings management since non-discretionary accruals equals to 0, of which is still applied in earnings management research. Another interpretation is that non-discretionary accruals doesn’t equal to 0. (Ronen and Yaari, 2008) Through the comparison of their mean total accruals among three group samples, one group of upward earnings management during the estimation period and two downward earnings management groups from the event period, Healy detect earnings management. The mean total accruals from the group where earnings are predicted to be managed upwards during the estimation period are the presentation of non-discretionary accruals.

*DeAngelo (1986)*

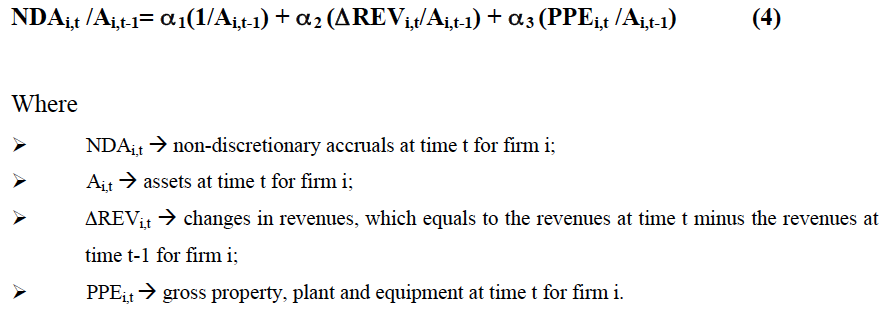
The DeAngelo Model assumes that discretionary accruals follow a random walk process. Consequently, she uses the lagged total accruals as a proxy for the expected non-discretionary accruals during the current period; as a result, the discretionary accruals are the changes in accruals between two consecutive years. (Schiller, 2005) The formula is presented as follows:



One unique feature of these two models is that they are tested under the assumption: non-discretionary accruals are constant and the discretionary accruals are around mean of zero during the estimation period. However, these two assumptions are hard to obtain in reality, hence the estimation of discretional accruals cannot be accurate since they don’t take the economic circumstances which change all the time into account.

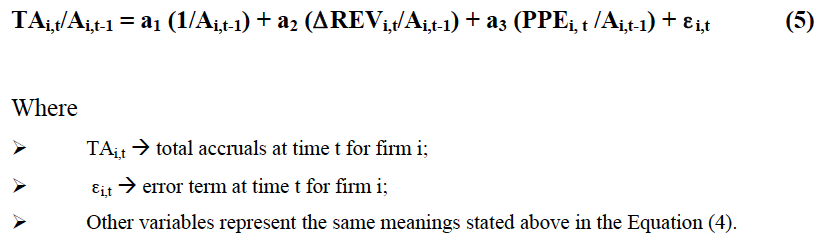
*The Jones Model (Jones, 1991)*

Compared to the prior two models, the remarkable difference of Jones model lies in the relaxation of the assumption from Healy (1985) and DeAngelo (1986)’ studies that non-discretionary accruals are constant over time. Jones (1991) takes the influences of the changing economic circumstances on the discretionary accruals into account. For example, the term assets are used to describe the size of the company and revenue is an indication of firms’ activities. Besides, the term gross property, plant and equipment imply the companies’ fix investments. The new model is built as follows:



Firstly, the estimated sign of three coefficients is discussed. With regard to the coefficient on gross property, plant and equipment, it is negative since PP&E is associated with income-decreasing part of total accruals, such as depreciation and amortization expense. Theoretically speaking, it is hard to tell the sign of the revenue coefficient, as it can be either positive or negative which depends on the direction of working capital accruals related to sales. However, most empirical researches provide evidence on the positive direction on coefficient of revenue. (Schiller, 2005; Ronen and Yaari, 2008)

Secondly, in terms of the calculation of these parameters α1, α2, α3, we adopt the model below:



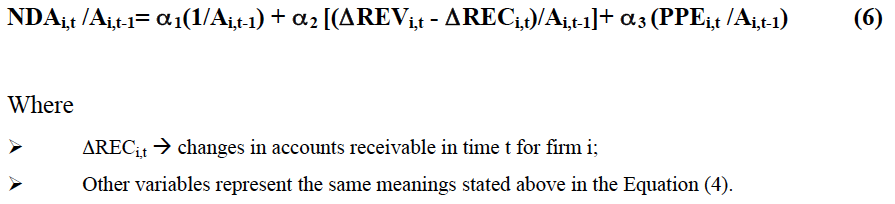
According to this regression model, we input the historical data of each firm from estimation period, including the Total Accruals obtained from the Equation (1), Revenue, PP&E as well as Assets. Consequently, the estimation of firm-specific regression coefficients α1, α2, α3 can be calculated through ordinary least squares approach.

Lastly, the discretionary accruals equals to total accruals (obtained from Equation (1)) minus non-discretionary accruals, as obtained from Equation (4).



*The Modeified Jones Model (Dechow et al., 1995)*

Based on the original Jones Model (1991), Dechow et al. (1995) bring forward an innovation point that is including changes in the accounts receivable into the equation for the calculation of changes in cash sales. In her study, Jones (1991) assumes that the revenue is nondiscretionary, which implies that revenues are free from the discretion of management. However, that is not necessarily the case since managers have the incentives to manage revenues through accounts receivable in the event period. Hence, the Modified Jones Model (1995) can mitigate this weakness to some extent. Instead of using the changes in sales to represent earnings management, Dechow et al. (1995) adopt the change in cash sales which is calculated as the change in revenues minus the change in accounts receivable. The Modified Jones Model (1995) is undertaken as:



*The Performance Matching Discretionary Accruals Model (Kothari et al., 2005)*

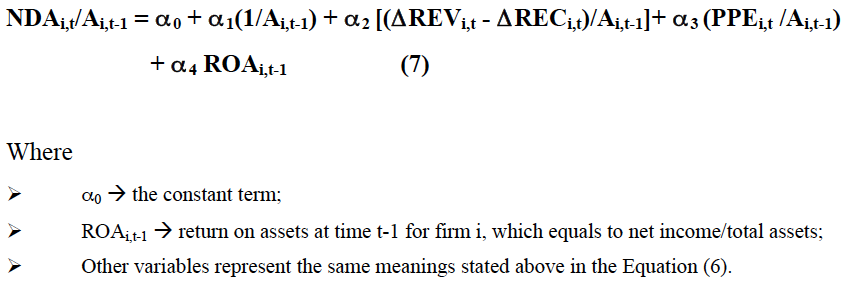
Empirical evidences show that accruals which is proxy for the behavior of earnings management is associated with firm performance since the incentives of managing earnings, such as manager compensation, initial public offerings as well as seasoned equity offerings, related to the performance of corporations. (Dechow et al., 1995; McNichols and Maureen, 2000; Kothari et al., 2005)

In their major research, Kothari et al. (2005) improve the Jones and the Modified Jones Model through the way by taking the firm performance into consideration. To control for extreme economic performance, they create a Performance Matching Discretionary Accruals Model which is applied for the research in this thesis to measure the accrual-based earnings management.

Firstly, they add one control variable ROAi,t-1 or ROAi,t (additional control for the lagged rate of return on assets) to represent the influences of firm performance on discretionary accruals. As they stated “*prior research analyzing long-run abnormal stock return performance and abnormal operating performance finds matching on ROA results in better specified and more powerful test compared to other matching variables (Ikenberry et al., 1995; Barber and Lyon, 1996, 1997; Lyon et al., 1999)*”, including ROA in the model can yield stronger results. In this thesis, we will adopt ROAi,t-1 since later studies used only the lagged ROA (Ronen and Yaari, 2008).

Secondly, another remarkable feature of their study is that they include an intercept (a constant term in the regression) to mitigate heteroskedasticity. By doing so, it can lesson the misspecification of the Jones Model and the Modified Jones Model. They demonstrate that higher symmetry around zero discretionary accruals is obtained when including the intercept and this improves the power of tests for type I error. In addition, evidence of increased rejection rates (more than 20%) of those models which exclude the constant term is found in their comparison tests. (Kothari et al., 2005)

Hence, the Performance Matching Discretionary Accruals Model (Kothari et al., 2005) is proposed as follows:



*Real activities earnings management*

The model from Roychowdhury (2006) will be adopted in this thesis to measure the real activities earnings management. In his major study, Roychowdhury (2006) applies three dependent variables as proxies for real activities earnings management; those are the abnormal levels of cash flow from operations (CFO), the discretionary expenses (DE) and the production costs (PC). In the follow-up researches, the empirical evidence of the construct validity of these proxies is found in both studies directed by Gunny (2006) and Zang (2010). With regard to earnings management methods, Roychowdhury (2006) adopt three main approaches, which are sales manipulation, reduction of discretionary expenditures and overproduction, or increasing production to report lower COGS. Next, these three methods and the related formulas will be explained in detail.

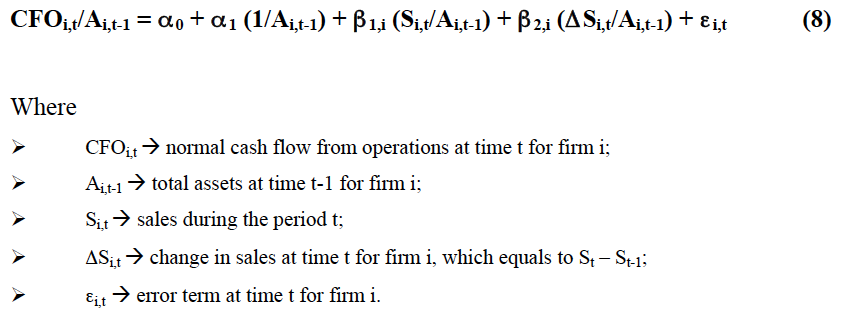
In the first place, in order to boost current earnings, managers have incentives to accelerate the timing of sales or add more additional sales through the way of increasing the price discounts or providing more lenient credit terms. However, these behaviors can only exert temporal positive effects on the amount of current sales to improve earnings (assuming the margins are positive). Once the level of price discounts or credit terms turn back to the original one or a new figure, the increased sales volumes will be likely to fade away. Another significant characteristic resulting from this action is that the cash flow from operations will be lower in the current period.

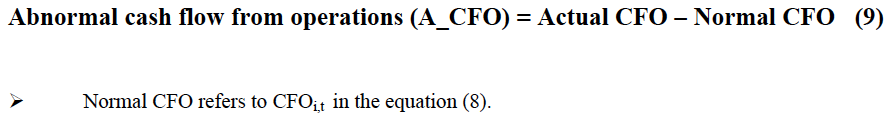
Secondly, another way to increase current earnings is to decrease the discretionary expenditures including the Research and Development Expenses (R&D), Advertising Expenses and Selling, General and Administrative Expenses (SG&A). Compared to the first method, it can lead to higher cash flow from operations under the situation that the firms generally use cash to pay for these expenses which presents the cash outflow in the current period.

Thirdly, the last method to manage earnings is through the way of making the surplus of production, especially applicable to manufacturing corporations. Managers have the ability to increase the volume of products more than necessary aiming to improve current-period earnings. Based on the results that the more the units of products being made, the less the fixed overhead costs per unit since the fixed overhead costs can be shared by a larger number of units in the case of overproduction. So long as the decreasing of fixed costs per unit is not offset by any increasing of marginal cost per unit, the total cost per unit is cut down. As a result, the decreased COGS can lead to the higher reported operating margins. However, the overstock of production will bring companies holding cost as these surplus products cannot be sold in the current period, and hence leading to the decline of cash flow from operations, the same as the situation happens in the sale manipulations method.

Next, we are going to focus on the formulas for each variable in order to get the final dependent variable (REM) indicating real activities earnings management, of which is created by Dechow et al. (1998) as implemented in Roychowdhury’s study (2006).

First of all, in terms of sales manipulations, we try to figure out the normal levels of cash flow from operations (CFO). The normal CFO is expressed as the linear function of sales and change in sales during the current period. To estimate this model, the cross-sectional regression for each industry and year is executed as follows:

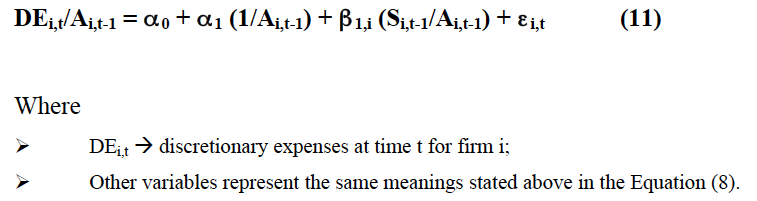
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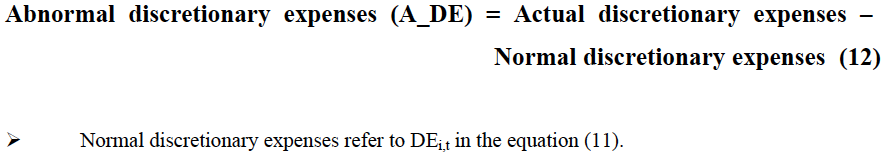


In the second place, with regard to the discretionary expenditure, it is expressed as the linear function of contemporaneous sales. The actual discretionary expenses are the sum of advertising expenses, research and development expenses and selling, general and administrative expenses. The regression model derived from the study of Dechow et al. (1998) for discretionary expenses is presented as:



Roychowdhury (2006) points out one problem with this model. If managers carry out sales-increasing management to improve reported earnings in any period, they can lead to unusually low residuals from Equation (10) in that year, even when they do not reduce the discretionary expenditures. In order to avoid this bias, discretionary expenses are modeled as the function of lagged sales instead of contemporaneous sales. Consequently, the following regression model is ran for discretionary expenses:





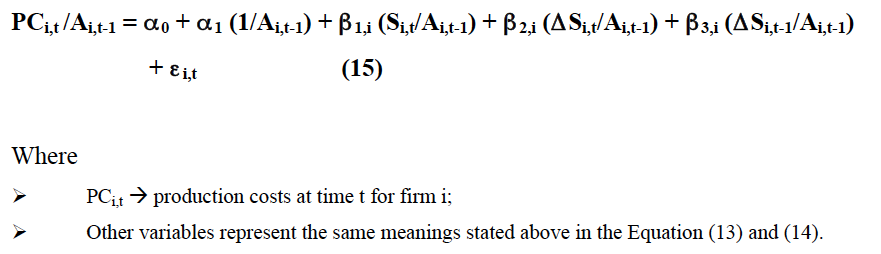
Lastly, it comes to overproduction; the production costs are the sum of costs of goods sold (COGS) and changes in inventory. Roychowdhury (2006) expresses expenses as the linear function of contemporaneous sales. The model for normal COGS is stated below:

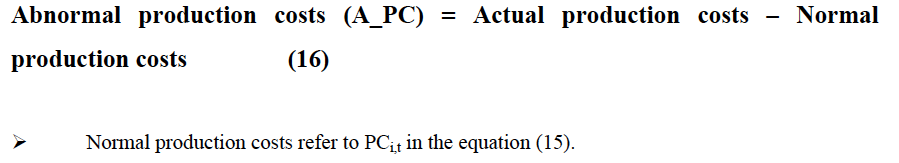


Similarly, the regression model for normal inventory growth is:



In order to get the amount for production costs, we add Equation (13) and Equation (14). The regression model of normal production costs is presented as follows:





In the final step, we calculate the real activities earnings management dependent variable by combining the three individual variables mentioned above in order to capture the total influences of real activities earnings management through these three approaches in a comprehensive measure. In particular, consistent with the study of Zang (2006), we multiple variable A\_CFO and A\_DE by negative one so that the higher amount of these two variables represent the more frequent behaviors of managers to increase earnings through price discounts or decreasing discretionary expenses. Since the higher production costs is an indication of overproduction to cut down COGS, we don’t need to multiple variable A\_PC by negative one. Hence, the combined regression model for real activities earning management is as follows (Cohen and Zarowin, 2010):



Besides, the data from estimation period are used to predict the value of the coefficients in the equation (8), (11) and (15) which is used to calculate normal cash flow from operations, normal discretionary expenses and normal production costs.

### 2.2.2 Audit Quality

#### 2.2.2.1 Meaning of Audit and Audit Quality

An audit is an investigation or a search for evidence to enable reasonable assurance to be given on the truth and fairness of financial and other information by a person or persons independent of the preparer and persons likely to gain directly from the use of the information, and the issue of a report on that information with the intention of increasing its credibility and therefore its usefulness.

In the recent published book “the audit process” written by Gray and Manson (2011), the definition of audit is as above. Consistent with this statement, the joint international quality and environmental auditing standard expresses that “*audit is the systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled*”. (Arter, 2003) From these definitions, we can see that audit is the process that aims to check the credibility of financial statements in order to provide interested parties a true and fair view of firm financial positions and status.

With regard to audit quality, it is difficult to define it in a precise way and to decide which specific factors could provide an in-depth understanding of how well firms are dealing with this issue. (Gray and Manson, 2011) In her major study, DeAngelo (1981) points out that it is the joint probability of the behavior of auditors to detect and report the breach in the client’s financial statement. According to this explanation, the quality of audit, specifically, means their ability to discover the misstatement of financial reports before their disclosure, in other words, the capability to detect earnings management that is out of the boundaries of rules or regulations.

#### 2.2.2.2 Role of Audit

In the contemporary financial market, audit serves a vital economic purpose and plays an important role as it provides a degree of insurance to affiliated stakeholders who rest upon the information subjected to audit. (Audit Quality Forum, 2005; Gray and Manson, 2011) A main role of auditing is to detect earnings management outside GAAP behaviors before the disclosure of financial statements and to try to ensure the true and fair representation of firm performance to outsiders. Since auditors are regarded as relatively unbiased and hence the stakeholders can, to some extent, trust audit reports and take them as reference when making investment decisions. (Arter, 2003) Auditors act as the independent third party agent to offer the credible verification of the corporation’s financial affairs in terms of accuracy, integrity and fairness. Specifically, they focus on the issues covering whether the company’s accounts or transactions have been recorded in accordance with the Generally Accepted Accounting Principals (GAAP). The high quality assurance function implemented by an external auditor of a company is crucial in building trust on the information provided by company and retaining stakeholders’ confidence in the management of a company. (Corporate Law Reform Committee, 2007)

#### 2.2.2.3 Measurements (Proxies) of Audit Quality

A considerable amount of studies have been committed into the area with regard to the different kinds of measurements to represent for the quality of audit, due to the reason that the audit quality is multidimensional and inherently unobservable, and hence may be influenced by various factors. (DeAngelo, 1981; Becker et al., 1998; Balsam et al., 2003; Lin and Hwang, 2010) In the research of this thesis, we will adopt four proxies for audit quality; those are Audit firm Size (Big-4), Audit Tenure and Industry Specialist Auditors as well as Audit Independence which are described in detail as follows.

*Audit firm Size (Big-4 auditors)*

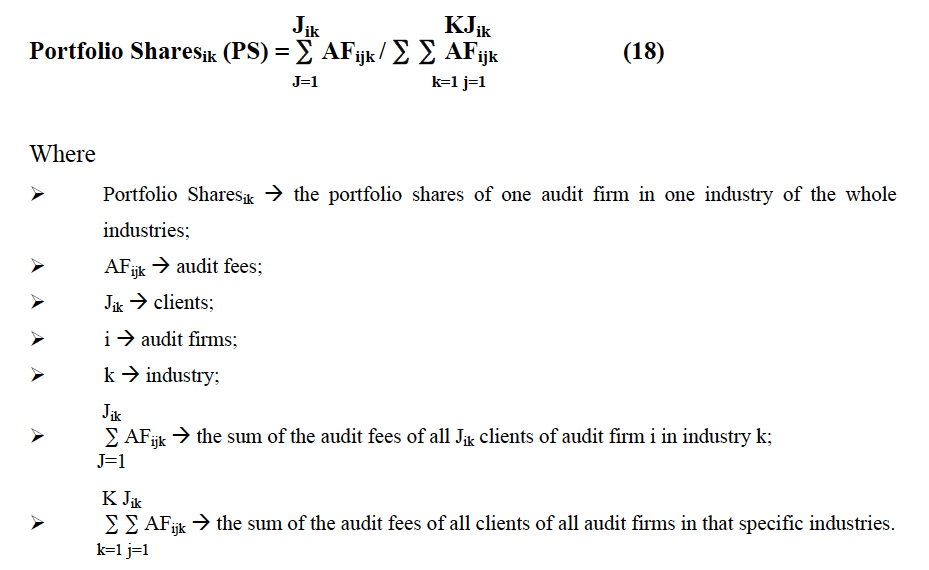
One of the most common proxy for audit quality is the audit firm size, of which is described as a dummy variable for Big-N and non-Big-N. A considerable amount of literature has been set foot in this area. (Becker et al., 1998; Francis et al. 1999; Krishnan, 2003) Firstly, Big-N audit firms are much larger than non-Big-N audit firms in terms of company scale, the number of clients and the size of clients. Compared to their competitors, Big-N auditors have greater in-house experiences in auditing large-scale public corporations, and thus can detect behaviors of earnings management more thoroughly and administer clients more effectively. (Francis and Yu, 2009) Similarly, since Big-N auditors have more resources (large client bases) by dealing with large companies, they obtain abundant and excellent human capital, of which more capable and professional auditors can devote themselves in auditing and gain experiences that allow them to ensure the reliability of financial statements. (Becker, 1993) On the other hand, in order to maintain their good reputation and avoid large loss in the case of audit failure (litigation), Big-N audit firms tend to be more independent and hence provide high quality audit. (Becker et al., 1998; Kim et al., 2003) In the context of American stock exchange, we will adopt PwC, Ernst&Young, Deloitte&Touche and KPMG as Big-4 audit firms for the research in this paper.

*Audit Tenure*

The second proxy adopted in the paper is audit tenure which is widely discussed in the previous studies. On the one hand, some researchers argue that longer audit tenure may impair audit independence since they have intention to make decisions in accord with managers in order to maintain large client and hence may allow more earnings management and decrease audit quality. (Beck et al., 1988; Lys and Watts, 1994) On the other hand, some studies provide evidence on the increased audit quality along with the longer audit tenure. Since the tenure of audit becomes longer, the auditors can be more familiar with the operation conditions of their clients and gain more knowledge in that specific industry, and therefore can provide higher audit quality. (Arens et al., 2005) In their study, Myers et al. (2003) give their definition on audit tenure that is the number of years the firm has retained the given auditor. In this paper, we will adopt this definition by include audit tenure as the number of consecutive years the client has retained a certain audit firm.

*Industry Specialist Auditors*

The third proxy for audit quality is the industry specialist auditors. Compared to non-specialist, the industry specialist auditors possess relatively comprehensive knowledge in that particular industry. Therefore, they can make high quality assurance for financial statements by detecting earnings management more thoroughly and hence improve the quality of audit. (Balsam et al., 2003) In their major study, Jiang et al. (2012) generalize two main definitions of industry specialist auditors. One is based on the market shares, which defines the industry specialist auditors as the firms which occupy a large portion of market value in that specific industry. The other perspective considers the audit firms individually and classifies audit firms as industry specialists in those industries that hold the largest portfolio shares for that particular audit firm. With regard to the measurement of industry specialist auditors, we will adopt the model developed by Yardley et al. (1992) using auditor portfolio shares as proxy for industry specialist auditors. In their model, they estimate industry specialization as the proportion of an auditor’s audit fees in one particular industry of all the audit fees earned from that specific industry. The calculation formula is stated as follows:



According to prior literatures (Chen and Elder, 2001; Mayhew and Wilkins, 2003; Casterella et al., 2004; Chen et al., 2005) we adopt a threshold of 20% of market share to distinguish the industry specialist auditors. If the portfolio shares of one audit firm are larger than 20%, we classify it as industry specialist auditors.

*Audit Independence*

The last proxy for audit quality is audit independence which is regarded as an important characteristics of auditors. Auditor independence from the management is of great significance to the outsiders, including shareholders, investors and regulators. However, since there is economic bond between the audit firms and the clients through non-audit services, the auditor independence is likely to be impaired, and hence reduce the quality of audit. (Frankel et al., 2002; Gul et al., 2007) In the year 2000, SEC revised the regulations concerning the disclosure of audit fees and non-audit fees based on the assumption that non-audit fees may lead to the impairment of audit independence. In accordance with the previous literatures (Krishnamurthy et al., 2006), the ratio of non-audit fees to total fees of the same client is adopted as the proxy for audit quality.

## 2.3 Summary

In this chapter, I give a comprehensive introduction about the basic elements of this research, from underlying theories to the main subjects.

Firstly, the theoretical background for earnings management is the Positive Accounting Theory (PAT) and the Agency Theory. The PAT is used to investigate the accounting choices made by firm management which relates to the behavior of earnings management. Due to the principal-agent relationship resulted from the agent theory, external auditors appear in order to enhance the reliability of financial statements provided to the affiliated parties.

Secondly, the major elements regarding earnings management are described in detail, consisting of definition, incentives, patterns and measurements. The first sub-question “*What is earnings management and how is it measured?*” and the third sub-question “*Which model is most appropriate for measuring earnings management?*” formulated in the introduction part of the thesis are answered. One of the main focuses in this chapter is the approach in terms of earnings management measurement. We point out that the Performance Matching Discretionary Accruals Model (Kothari et al., 2005) is adopted to calculate discretionary accruals as proxy for accrual-based earnings management and the Roychowdhury Model (2006) is used to measure real activities earnings management.

Thirdly, the content of audit quality containing the meaning, the role of audit and three proxies for audit quality are elaborated. In addition, the second sub-question “*What is audit quality and how is it measured?*” is answered in this part. We mainly place emphasis on the proxies for audit quality, which include audit firm size (Big-4 auditors), audit tenure and industry specialist auditors as well as audit independence. We give a comprehensive description with regard to the definition and measurement of these three variables based on the previous literatures.

Lastly, based on these fundamental concepts and models, in the next chapter, prior researches will be reviewed.

# 3 Literature Review

The main purpose of this part is to present relative evidence as provided by prior literature and basic theories concerning the subjects examined in this paper. By this way, a more broaden view of the association examined between audit quality and earnings management is achieved. Besides, the assumptions, primary models and main results as well as contributions and weaknesses of previous researches will be discussed. An overview of the findings of prior researches is presented in Appendix A and B.

## 3.1 Earnings Management

Earnings management has been regarded as one important research question in the academic area during the last few decades. Especially, the frequent occurrences of accounting scandals, along with the global financial crisis in 2008 lead more and more attention from both the academic area and social public to focus on the topic of earnings management.

### 3.1.1 Incentives of Earnings Management

Previous reviews on literatures mainly focus on the definition of earnings management; following, a question covering what are the main incentives for managers to carry out earnings management has been aroused. A considerable amount of literatures has been focused on this issue in an attempt to give an answer to this question. There are several researches that examine earnings management in relation to management incentives.

In an early paper, Burgstahler and Dichev (1997) mainly demonstrated that the reason of companies trying to manage reported earnings is to avoid the decreases and losses of earnings. In addition, they point out two main components to be managed, which are cash flow from operations and changes in working capital. By identifying the empirical evidence on the unusually low frequencies of small earnings decreases along with the unusually high frequencies of small earnings increases, they demonstrate that management discretion aims to prevent earnings declining. In addition, for the sake of making their finding more convincing, they apply two theories that can explain the results; the one is that managers avoid reporting decline and losses of earnings aiming to decrease the costs associated with the contracts between firms and stakeholders; the other one is arisen from prospect theory, in which it presumes the losses aversion attitude.

In his review of relation between earnings management and pay-for-performance incentives, Kedia (2003) identifies that both the level of stock-based and stock options-based pay-for-performance incentives exert a tremendous influences on the possibility of misrepresenting the financial information in order to gain managements’ personal benefits. In addition, the effects these two forms affect the earnings management is different due to control benefits associated with large equity stakes. His study is based on a sample consisting of 224 unique firms that make 257 announcements of restatements. Specifically, in order to examine the association between pay-for-performance incentives and behavior of earnings management more accurately, they control for several other incentives that would bias the result, such as debt covenants, beat analyst forecasts, etc.

Similarly, Bryan et al. (2000) in their studies introduce CEO restricted stock awards which is one unique style of stock-based compensation. By examining the theories of optimal CEO stock option awards and restricted stock grants based on one primary sample and two subsamples, they get the conclusion that there is strong evidence showing increased Incentive-Intensity and Mix for CEOs of firms with either ample investment opportunities or volatile earnings in terms of stock returns, while the opposite result shown on the restricted stock awards, of which Incentive-Intensity and Mix of restricted stock awards declined in firms with ample investment opportunities. This phenomenon indicates that stock option awards exert greater impact on earnings management than restricted stock awards which cannot provide sufficient stimulus for risk-averse managers to carry out more earnings management.

Another recent study by Bergstresser and Philippon (2006) involved the association between manipulations of reported earnings and managers’ compensation based on the stock and option holdings. In their major study, they illustrated that the possibility for those more “incentivized” CEOs (whose compensation is more sensitive to the share prices of their companies) to manipulate reporting of financial information is higher under the situation of the dramatic increase in the stock-based and option-based managers’ compensation.

From another perspective, Press et al. (2012) propose another form of earnings management incentives, insider trading incentives that is consistent with the debt covenant hypothesis. Based on the sample of 462 firms which have financial problem during the period from 1983 to 1997, they find that debt contract and insider trading incentives drive the occurrence of income increasing earnings management. Consistent with their contributions, Beneish (1993) also mentions debt covenants is one source of earnings management incentives which can impel managers to manage reported earnings to reduce the costs related to the covenant violations and to lesson the restrictions of accounting terms in debt agreements.

### 3.1.2 Patterns of Earnings Management

Extant empirical accounting literatures have attempted to figure out the existed methods of earnings management. In their analysis regarding the style of earnings management, Ziv (1998) point out two main patterns that managers use to manage earnings; those are accounting earnings management which take advantage of the flexibility of accounting regulations without changing cash flow and economic earnings management that would change cash flow by altering operation decisions. Similarly, Gunny (2010) also identifies these two methods, accruals management and real activities earnings management which “*occurs when managers undertake actions that change the timing or structuring of an operation, investment, and/ or financing transaction in an effort to influence the output of the accounting system*”.

On the one hand, accruals based earnings management deals with accounting choices that within generally accepted accounting principles (GAAP) which try to ‘obscure’ or ‘mask’ true economic performance of firms. (Dechow and Skinner 2000). Consistent with this argument, Gunny (2010) point out that accruals management is achieved by choosing various accounting methods to depict the operating activities; by contrast, real activities earnings management touch upon firm’s underlying operations in order to report current earnings on their own will. In their major study, Li et al. (2009) argue that managers tend to carry out earnings management within the bound of GAAP by using its accounting flexibility which is well known as accrual based earnings management.

However, more and more researches pay more attention on the real activities earnings management. (Baber, Fairfield, and Haggard 1991; Bartov 1993; Bens, Nagar, and Wong 2002; Roychowdhury, 2006; Zang, 2012). Especially, recent studies emphasize the important of real activity manipulations. In their paper, Graham et al. (2005) provides evidence arguing that managers prefer real earnings management to accrual-based earnings management due to the characteristics that real earnings management is less likely to be detected and scrutinized by auditors and regulators. Following, Cohen et al. (2008) find out indication of diversion from accrual-based to real earnings management in the post Sarbanes-Oxley Act (SOX) period. Subsequently, Zang (2012) identify the phenomenon that increased appreciation for the significance of understanding how firms manage earnings through operation activities other than accrual-based earnings management is reflected in recent research. Specifically, Roychowdhury (2006) suggests several measures to represent for real activity earnings management, in particular, managers tend to offer price discounts to temporarily increase sales, overproduce to report lower costs of goods sold and reduce discretionary expenses in order to prevent the decline in annual earnings reported in the financial statements.

## 3.2 Audit quality and Earnings Management

The first serious discussions and analyses concerning the association between earnings management and audit quality emerged in 1998. In their paper, Becker et al. (1998) mainly examine the influence of audit quality on earnings management through discretionary accruals and in particular, emphasizing on the income-increasing earnings management. Based on a large sample which consists of 10,397 firm year observations audited by Big Six auditors and 2,179 firm year observations audited by non-Big Six auditors, Becker et al. point out that the higher-quality audit represented by Big Six auditors is bound up with lower discretionary accruals indicating less earnings management. Specifically, through the empirical evidence that clients of non-Big Six auditors report discretionary accruals (mean and median of absolute value) that increase income significantly more than the discretionary accruals reported by Big Six auditors, which indicated that the lower audit quality connects with more “accounting flexibility”.

Additionally, according to their study, Chen et al. (2005) also set foot in the field regarding the relationship between audit quality and earnings management, especially for the IPO firms in Taiwan. They demonstrate that high quality auditors represented by big five auditors constrain earnings management; therefore, improve the quality of financial statements.

Following, in a recent study, Francis and Yu (2009) investigate the association between Big 4 office size and audit quality by examining the relation concerning the office size and going-concern audit reports. They predicted that larger offices of Big4 auditors are related with higher audit quality since they have superiority in the greater in-house experience in dealing with more large enterprises auditees that is regarded as one important dimension of human capital, of which enables its clients get more opportunities and enhance their ability to detect and report material problems in the financial statements. By examining a large sample including 6568 firm-year observations under U.S. set, they found that larger offices are more likely to issue going-concern reports, along with that auditees by Big4 auditors who present high audit quality tend to make less aggressively earnings management as evidenced by lower absolute discretionary accruals and a lower likelihood of meeting benchmark earnings targets.

However, in their major study, Kim et al. (2003) find that Big 6 auditors are less effective than non-Big 6 auditors in detecting income-decreasing earnings management. Based on a large sample with the total number of 33163 firm-year observations which is composed of 4810 non-Big 6 observations and 28353 Big 6 observations with sufficient data during the period from 1984 to 1998, they conduct the empirical analysis on the differences reactions between Big 6 and non-Big 6 auditors with regard to two types of earnings management carried out by managers, which are income-increasing and income-decreasing earnings management. Unexpectedly, two completely opposite results are obtained. On the one hand, Big 6 auditors are more effective in constraining earnings management than non-Big 6 auditors when firms tend to manage earnings upward. On the other hand, Big 6 auditors is less effective than non-Big 6 auditors while firms carry out income-decreasing earnings management.

In terms of the alternative proxies for audit quality, Davis et al. (2001) adopt audit tenure as proxy for audit quality. In their study regarding the relationship between audit tenure and earnings management, they find out that the absolute value of discretionary accruals increase along with the longer audit tenure, which indicates the more earnings management being carried out by firms. Besides, they point out that the incentive for firms to manage earnings is to meet earnings forecast. From another perspective, they also find evidence on the incremental income-decreasing earnings management when auditor tenure increases, due to the reason that firms tend to save earnings for future use.

Another important proxy for audit quality illustrated in the previous literatures is the industry specialist auditors. Through two measurements of audit specialization, of which the one is the auditor market share in an industry and the other one is an industry’s share in the auditor’s portfolio of client industries, Krishnan (2003) find that clients of industry specialist auditors have relatively lower levels of discretionary accruals compared to the auditees of nonspecialist auditors, and hence industry specialist auditors can to some extent constrain the behavior of earnings management more effectively. In addition, they highlight that if the auditor both belongs to a Big 6 auditor and an industry specialist, it can further mitigate accrual-based earnings management.

A considerable literature also set foot in the relationship between audit independence and earnings management. Based on a sample of 3074 firms, Frankel et al. (2002) find that non-audit fees positively relates to absolute discretionary accruals as proxy for earnings management. It implies that audit independence is impaired due to the non-audit services to the clients. Consistent with their research, Gul et al. (2007) also point out the positive association between earnings quality which is represented by discretionary accruals and audit independence proxied by non-audit fees.

To sum up, in their meta-analysis of earnings management and twelve great-related objects, Lin and Hwang (2010) argue that auditor tenure, auditor size, auditor independence and specialization negatively associate with earnings management. What makes this research unique is that they conducted a comprehensive study on the earnings management adopting 48 prior researches through meta-analysis method. They measured audit quality from various aspects and get the overall conclusion. First of all, the empirical evidence shows that along with the increasing auditors tenure, auditor can benefit from gained experience and more in-depth knowledge of their clients’ business which make them be better at assessing material misstatement. Consequently, auditor tenure has a significant negative relationship with earnings management. Secondly, in terms of auditor size, the adoption of Big 6/5/4 auditors lead to less earnings management since they have superior knowledge and higher reputation risk. In the third place, they find that industry specialist auditor can detect earnings management more effectively and consequently improve the quality of audit and earnings. Lastly, regarding auditor independence, mixed results is identified, in which a significant positive association is presented when adopting the unweighted Stouffer test but a non-significant relationship is shown when using the weighted test.

## 3.3 Summary

In conclusion, this section comprehensively reviews the previous literatures from two important aspects, fundamental concepts of earnings management and its relationship with audit quality respectively. Some key points are worth mentioning which will be helpful to formulate the hypotheses for this research.

Firstly, Becker et al. (1998) point out that the Big Six Auditors representing high audit quality negatively correlate with discretionary accruals as proxy for earnings management. Similarly, Chen et al. (2005) also indicate that the Big 5 audit firms as surrogate for higher quality of audit constrain earnings management behavior. However, Kim et al. (2003) find that Big 6 auditors are less effective than non-Big 6 auditors in detecting income-decreasing earnings management, which is inconsistent with other studies. (Becker et al., 1998; Chen et al., 2005)

Secondly, in their study, Davis et al. (2001) point out that the longer audit tenure is, the more earnings management behavior appears. In the meantime, they also indicate that the underlying reasons of making earning management is either to meet earnings forecast or to save profit for future use. By contrast, Lin and Hwang (2010) find the opposite results concerning the association between earnings management and audit tenure. Their study shows that auditors can constrain earnings management more effectively due to the increased experience and more in-depth knowledge of their clients’ business along with the longer audit tenure.

Thirdly, in terms of the other two proxies for audit quality, Krishnan (2003) finds that industry specialist auditors are better than non-industry specialist auditors in constraining earnings management. In their study, Frankel et al. (2002) point out that non-audit fees positively relates to the absolute value of discretionary accruals which represents earnings management. This implies that the audit independence negatively associates with earnings management, which is consistent with the study conducted by Lin and Hwang (2010). Under the meta-analysis method, they show that there is a negative relationship between earnings management and audit independence as well as industry specialization auditors.

An overview of the findings of prior researches is presented in Appendix A and B. Besides, the sixth sub-question “*What are the results of prior research on earnings management and audit quality?*” is answered. Based on these studies, the hypotheses will be formulated in the next chapter.

# 

# 4 Hypotheses Development

In the first chapter, the main question of this study has been stated as following:

*Main question: “Are there any changes in earnings management before and after financial crisis as an indication for variations in audit quality?”*

Based on the previous literature reviews covering the relation between audit quality and earnings management, I am seeking to find the answers for these questions by establishing the hypotheses.

On the one hand, the influence of financial crisis may lead to the decrease in the corporate earnings. Under this situation, a question covering the reaction of managers towards the downward earnings is aroused, in other words, whether they would carry out more earnings management to meet financial analyst estimation or let the earnings as it originally is. According to the previous study, as is expected, the behavior of earnings management would increase after economic crisis since it becomes more difficult for companies to meet economic targets, either the earnings goal or the financial analyst estimation. (Zalk, 2010) In particular, Jungeun et al. (2012) point out that companies tend to increase real activities earnings management after financial crisis due to the reason that real activities earnings management is hard to be detected by regulators. As a consequence, I predict that the behavior of earnings management may increase dramatically after the global financial crisis.

***H1: Earnings management will increase after the financial crisis***

On the other hand, the attitudes of auditors towards the increasing earnings management behavior of corporates is drew attention with regard to whether they will detect all the earnings management or the audit quality will decline as they may neglect some earnings management behavior. (Mitton, 2002) In their major study, Johl et al., 2003 find that the Asian crisis exert influences on the level of audit quality with respect to constrain the behavior of earnings management. Hence, it is expected that the auditors may not detect all the earnings management effectively, in other words, the audit quality will decrease. Therefore, I propose the following hypotheses to be tested in the study:

***H2: The relationship between audit quality and earnings management will not change before and after economic crisis.***

As stated in the Chapter 2, this research applies four proxies (audit firm size, audit tenure, industry specialist auditors and audit independence) to represent the quality of audit. First of all, a considerable amount of studies has been conducted on the relationship between audit firm size and earnings management. (Becker et al., 1998; Kim et al., 2003; Chen et al., 2005; Francis and Yu, 2009;) According to Becker et al. (1998), high quality audit which is represented by Big 6 audit firms is associated with lower discretionary accruals as proxy for earnings management. Consistent with their argument, Chen et al. (2005) also provide evidence on the negative relationship between audit firm size (Big-N) and the level of earnings management. In their major study, Francis and Yu (2009) point out that Big 4 audit firms have superiority in the greater in-house experience in dealing with more large enterprises auditees that lead to their higher quality of audit. However, Kim et al. (2003) find an opposite result that Big 6 auditors are less effective than non-Big 6 auditors in detecting income-decreasing earnings management. Secondly, there are several literatures concerning audit tenure as proxy for audit quality. Davis et al. (2001) indicate that the longer that audit tenure is, the higher level of discretionary accruals which represent earnings management. Thirdly, a relationship exists between industry specialist auditors and earnings management. In line with Krishnan (2003), clients of industry specialist auditors have relatively lower levels of discretionary accruals compared to the auditees of nonspecialist auditors, and hence constrain earnings management more effectively. Lastly, in terms of audit independence, the previous researchers point out those non-audit fees as surrogate for audit independence positively relate to the behavior of earnings management which is represented by the absolute value of discretionary accruals. (Frankel et al., 2002; Gul et al., 2007) In this research, we expect the relationship between earnings management and audit firm size, audit tenure, industry specialist auditors as well as audit independence respectively still exists and the financial crisis will exert influences on these four associations. The following four hypotheses are developed as the sub-hypotheses for the H2.

***H2a: The relationship between audit firm size (Big4 or Non-Big4 auditors) and earnings management will not change before and after financial crisis.***

***H2b: The relationship between audit tenure and earning management will not change before and after financial crisis.***

***H2c: The relationship between industry specialist auditors and earning management will not change before and after financial crisis.***

***H2d: The relationship between audit independence and earning management will not change before and after financial crisis.***

In addition, earnings management includes two aspects, accrual based earnings management and real activities earnings management. The auditors may react differently at these two behaviors. Graham et al. (2005) point out that managers prefer earnings management to accrual-based earnings management due to that real activities earnings management is less likely to be detected and scrutinized by auditors. In their main research, Inaam et al. (2012) provide empirical evidences on Big4 and industry specialist auditors are negatively associated with levels of accruals as proxy for earnings management, which implies that higher audit quality along with the lower level of earnings management. They also indicate that Big4 auditors enhance the extent of real earnings management. Hence, it is expected that there are differences concerning the relationship between audit quality and accrual-based earnings management as well as real activities earnings management respectively. Similarly, financial crisis may exert influences on this association. It arouse the following hypothesis which is stated as:

***H3: There are differences on the change of the association between audit quality and earnings management with regard to the accrual-based earnings management and real activities earnings management before and after financial crisis.***

In terms of earnings management, whether managers would increase earnings to meet earnings benchmark in that year or decrease annual earnings as the decline can contribute to the financial crisis and save the earnings to the next years, consequently, leading the increase of income in the following years. This choice arouses another question; that is whether the attitude of auditors would be different towards the income-increasing accruals and income-decreasing accruals. In their major study, Kim et al. (2003) argue that the effectiveness of Big4 and non-Big4 audit firms with regard to detect income-increasing and income-decreasing earnings management is different. Big4 audit firms is more effective in constraining income-increasing earnings management while non-Big4 audit firms are better at detecting the behavior of income-decreasing earnings management. In addition, whether the financial crisis will change the association between audit quality and the level of earnings management concerning these two directions is unknown. Hence, the fourth hypothesis is stated as following:

***H4: There are differences on the change of the association between audit quality and earnings management with regard to the income-increasing accruals and income-decreasing accruals before and after financial crisis.***

In conclusion, this chapter formulates the main hypotheses and sub-hypotheses and answers the sub-question seven “What are the hypotheses for the research of this thesis?”. Following, in the next chapter, the main research models will be established in order to test these hypotheses.

# 5 Research Design and Sample Selection

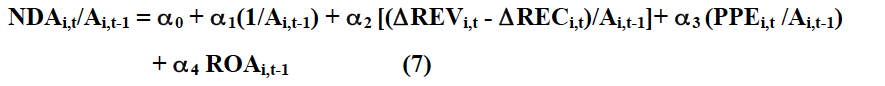
In the previous chapters, the theoretical background and literature review have been elaborated comprehensively, which have ultimately led to the formulation of several hypotheses. Following, we will illustrate the empirical section of this research. Firstly, the main research models will be introduced in detail, including formulas, dependent variables, independent variables and control variables, part of which have already been presented in Chapter 2. Next, the data part and the procedure of sample selection will be discussed. Following, the process of statistical analysis will be elaborated. Lastly, this chapter will end with a brief summary.

## 5.1 Main Research Models

### 5.1.1 Research Models

First of all, the Performance Matching Discretionary Accruals Model (Kothari et al., 2005) is adopted to calculate the value of accrual-based earnings management in order to test the first hypothesis, of which whether there is any changes before and after financial crisis with regard to the behavior of earnings management. Similarly, the Roychowdhury Model (2006) is used to examine the variance in the value of real activities earnings management. The two models have been already elaborated in the Chapter 2, so only the final formulas are presented here as follows:

*Accrual-based earnings management*



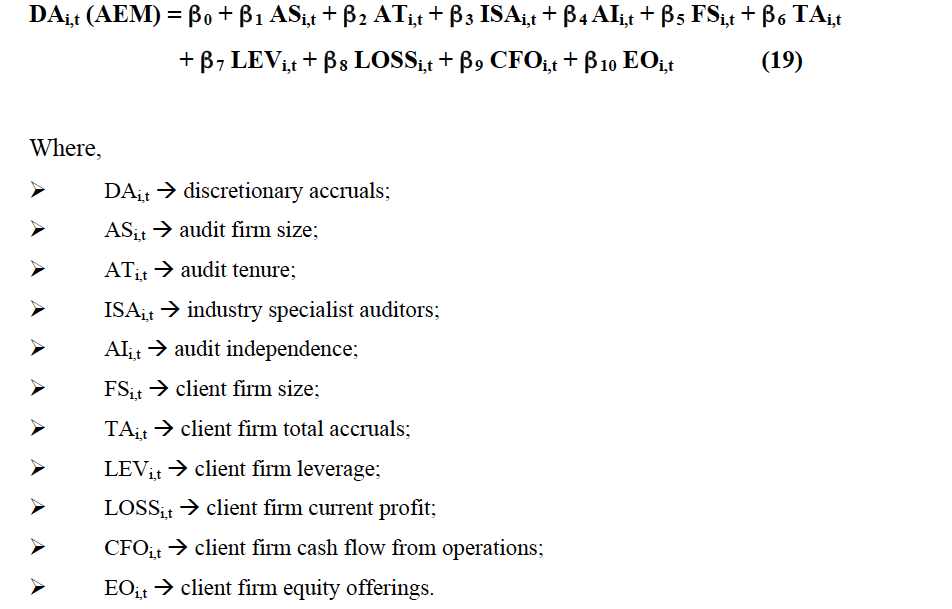
****

*Real activities earnings management*

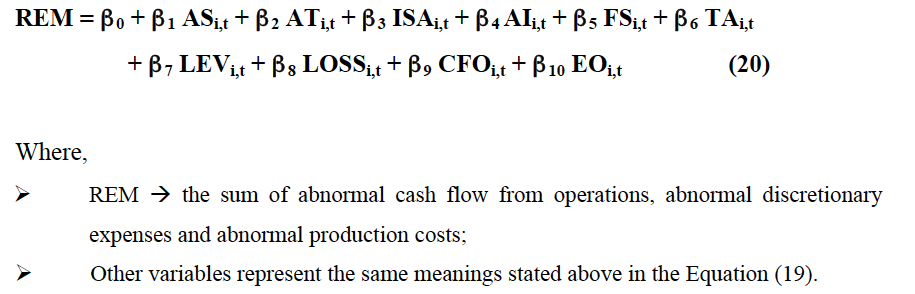


Next, in order to examine the relationship between earnings management and audit quality, we establish two regression models based on the formulas developed by Becker et al. (1998), Rusmin (2010) as well as Inaam et al. (2012) respectively.

The first multivariate regression model is used to test the association between accrual-based earnings management and audit quality which is presented as follows:



The second multivariate regression model is used to test the association between real activities earnings management and audit quality which is stated below:



### 5.1.2 Dependent Variables

In the first regression model, the dependent variable is the discretionary accruals as proxy for accrual-based earnings management. In terms of the second model, we adopt REM as the dependent variable to represent the real activities earnings management, of which is calculated as the compound effects of abnormal cash flow from operations, abnormal discretionary expenses and abnormal production costs.

### 5.1.3 Independent Variables

With regard to the independent variables, we adopt four variables to represent the quality of audit, audit firm size (Big-4), audit tenure, industry specialist auditors and audit independence. The concrete explanations of these four factors have been illustrated in the Chapter 2.

### 5.1.4 Control Variables

In order to control for the compound effects of various disturbing factors, this research incorporates several control variables in the multivariate regression models. In accordance with previous literatures (Becker et al., 1998; Myers et al., 2003; Francis et al., 2005; Lim and Tan, 2009), the control variables are the representations for an extensive set of variables related to the client characteristics, such as firm’s basic situation, financial status, probability and litigation risk, as well as other variables which can assure the relationship between audit quality and earnings management not to be biased by omitted factors. Those control variables are firm size, total accruals, leverage, loss, cash flow from operations and equity offerings which are described in detail as follows.

*Firm size*

In line with Becker et al. (1998) and Francis et al. (2005), the size of firms is included since large clients may attract more attention and hence under more scrutiny from outsiders, ranging from government to financial analysts as well as investors. On the other hand, large firms are supposed to have greater litigation risk and hence firms are more unlikely to manage earnings. In this research, firm size (FS) is defined as the natural logarithm of total assets to control for the potential influences of size on the choices of discretionary accruals. We estimate firm size is negatively associated with discretionary accruals.

*Total accruals*

According to Becker et al. (1998) and Francis et al. (1996), they point out that the clients with more inherent potential to generate accruals tends to have more uncertainty about their earnings since it is difficult for outsiders to distinguish between discretionary accruals and non-discretionary accruals. Consistent with their argument, Krishnan (2003) also provide evidence on that firms with higher values of total accruals are more likely to have more discretionary accruals and thus more earnings management behaviors. Hence, we include the absolute total accruals (ATA) in the regression models and a positive association is expected.

*Leverage*

Previous studies (Healy and Palepu, 1990; Defond and Jiambalvo, 1994) indicate that firms are more inclined to engage in earnings management to increase reported earnings in order to delay or avoid the costs resulting from violating debt agreements.

Meanwhile, higher level of leverage is found to relate to the debt covenants violation. (Press and Weintrop, 1990) As a result, the firms with high leverage intend to carry out income-increasing earnings management. The level of leverage is included in the regression models to control for the potential effects of leverage on earnings management and we expect a positive relationship between discretionary accruals and leverage. The control variable LEV is the ratio of debt to total asset at the beginning of current year.

*Loss*

On the basis of the study conducted by Monroe and Teh (1993), loss can reflect the true financial condition of a firm. The negative profit, to some degree, indicate that the firm is probably in financial distress and hence it may lead to the behavior of income-increasing earnings management. A dummy variable Loss, which equals to 1 if the client experiences a negative profit in the current year, is included in the regression models. We estimate a positive coefficient for this control variable.

*Cash flow from operations*

Based on the study conducted by Becker et al. (1998), it is supposed that companies with higher cash flow from operations which, to some extent, indicates higher profits are more likely to engage in income-decreasing earnings management to smooth earnings. We include the control variable CFO to control for the effect of cash flow from operations on discretionary accruals.

*Equity offerings*

Consistent with prior researches (Becker et al. 1998; Teoh et al. 1998; Rangan, 1998), managers have greater incentives to carry out income-increasing earnings management during the period of equity offerings due to the management’ stock-related compensation. However, on the other hand, managers also tend to decrease earnings in response to share repurchases. Consequently, according to Beneish et al. (1998), we comprise a dummy variable EO which equals to 1 if the outstanding shares have increased or decreased by 10%, otherwise equals to 0.

### 5.1.5 Summary of Variables

**Table 1: Variable Description**

|  |  |  |
| --- | --- | --- |
| Variable Title | Variable Description | Predicted Direction |
| Dependent Variables |  |  |
| **DAi,t** | Discretionary accruals |  |
| **REM** | The value of real activities earnings management |  |
| Independent Variables |  |  |
| **ASi,t** | Audit firm size 🡪 dummy variable which equals to 1 if the client is audited by one of the Big 4 audit firms, otherwise 0 | - |
| **ATi,t** | Audit tenure 🡪 the number of consecutive years the client has retained a certain audit firm | - |
| **ISAi,t** | Industry specialist auditors 🡪 dummy variable which equals to 1 if auditor industry specialist exists in auditee’s industry, otherwise 0 | - |
| **AIi,t** | Audit independence 🡪 the ratio of non-audit fees to total audit fees | + |
| Control Variables |  |  |
| **FSi,t** | Firm size 🡪 natural logarithm of the total assets for firm i in year t | \_ |
| **TAi,t** | Total accruals 🡪 absolute value of total accruals for firm i in year t divided by total assets for firm i in year t-1 | + |
| **LEVi,t** | Leverage 🡪 ratio of book value debt to book value total assets for firm i in year t | + |
| **LOSSi,t** | Losses 🡪 dummy variable which equals to 1 if the client experiences a positive profit in the current year, otherwise 0 | + |
| **CFOi,t** | Cash flow from operations for firm i in year t deflated by total assets in year t-1 | \_ |
| **EOi,t** | Equity offerings 🡪 dummy variable which equals to 1 if the outstanding shares of the firm have increased or decreased by 10%, otherwise 0 | + |

## 5.2 Data and Sample

The initial data set contains all the public listed companies from NYSE stock market of which the total number of the firms is 2488, with 15403 observations from Compustat North America and a corresponding file with 13974 observations from AuditAnalytics. (All the data with regard to the firms’ financial information are obtained from Compustat North America database and the corresponding audit information are from AuditAnalytics.) Besides, the period adopted in this research is during the period from 2004 to 2010. The reason why we also include the observations for the year 2004 is that the calculation of some variables needs the data from the previous year. In terms of the underlying reason to choose this sample, the financial crisis stems from America and consequently, the effect of economic crisis may exert tremendous influences on the companies that are listed on the American stock market. As a result, this sample can reflect the impact of financial crisis on the relationship between earnings management and audit quality more thoroughly and precisely. Besides, with regard to the period adopted in the research, the financial crisis began at the end of the year 2007, so I choose 3 years before (2005, 2006 and 2007) and after (2008, 2009 and 2010) the economic crisis respectively. We also include the information for the year 2004 to calculate the value of some variables mentioned before.

Consistent with previous literatures (Becker et al. 1998; Francis et al. 1999; Krishnan, 2003; Mayhew and Wilkins, 2003), all the firms from the financial institutions, including banks, insurances, finance and unit trusts firms (SIC Code are from 60 to 67 which are Finance, Insurance & Real Estate) are excluded from the research. Since the chart of accounting they adopted is different from other companies, it may bring some bias to the results. In addition, the specific capital structures of these companies differ from other industries, hence it is better to study the finance related companies independently. Apart from financial corporations, the utility firms (SIC Code are from 40 to 49 which are Transportation & Public Utilities) are excluded from the sample since the particular regulation may lead to different incentives to carry out earnings management which is distinct from other industries. Similarly, we also eliminate the firms from the Public Administration section (SIC Code are from 91 to 99). Fourthly, the new listed (IPO) companies in each year are excluded as they may have different levels of earnings management due to the special incentives at the time of going public. Besides, according to Mayhew and Wilkins (2003), they point out that the audit fees in the first year of a firm’s listing may dramatically differ from the following years of a firm’s normal business operations. Fifthly, the firms that change fiscal year-ends during the analysis period are eliminated. Lastly, companies with unavailable or missing data are excluded. After the first round of sample selection procedure, we find that there are much more missing data for calculating the real activities earnings management proxies. Hence, we separate the whole sample into two groups, one is for accrual based earnings management which yields a sample of 619 firms with 4333 observations, and the other one is for real activities earnings management which consists of 214 firms with 1498 observations from Compustat North America database.

According to the result from above, we are going to search audit data for all these firms based on the Audit Analytics database. The firms with insufficient audit data are excluded from the sample. In addition, the companies which are audited under two different audit firms in one year are excluded from sample.

After merging each firm in the Compustat North America and the Audit Analytics one by one, it yields the final sample consisting of 3584 firm year observations from 512 firms which are audited by 22 audit firms for accrual based earnings management group and 749 firm year observations from 107 firms which are audited by 9 audit firms for real activities earnings management group. The whole selection procedure is shown in Table 2 below:

**Table 2: Sample Selection**

|  |  |  |
| --- | --- | --- |
| Description | Firm Number (AEM) | Firm Number (REM) |
| Firms listed on NYSE at December 31, 2010 | 2488 | 2488 |
| Less: Firms with SIC Code 60-67 (Finance, Insurance & Real Estate) | 931 | 931 |
| Firms with SIC Code 40-49 (Transportation & Public Utilities) | 287 | 287 |
| Firms with SIC Code 91-99 (Public Administration) | 2 | 2 |
| Less: Firms were listed in each year from 2005 to 2010 | 182 | 182 |
| Less: Firms with unavailable or missing data | 467 | 872 |
| First round result | 619 | 214 |
| Merging Compustat North America with AuditAnalytics |  |  |
| Less: Firms with insufficient audit information | 107 | 107 |
| Final sample | 512 | 107 |

## 5.3 Statistical Analysis

In this section, the main steps that are run in the statistical software SPSS will be elaborated in detail. Firstly, the descriptive statistics tests are conducted in order to get the mean and standard deviation of dependent, independent and control variables. Secondly, the normality test is run to see the normal distribution of the value of dependent variables, accrual-based earnings management and real activities earnings management. Thirdly, we perform the Pearson Correlation analysis as the basis of the multiple regression which aims to test the relationship between two variables. Next, the collinearity diagnostics is conducted in order to eliminate the probability of multicollinearity between independent variables and control variables. Lastly, the most important test OLS regression is performed to test the association between dependent variables and independent variables as well as control variables.

## 5.4 Summary

In this section, the main research models are presented in detail, including the definition of dependent, independent and control variables as well as the computational methods concerning the values of the variables. Until now, the fifth sub-question *“what is the research design of this thesis?”* can be answered. In this research, two models are adopted with respect to two different patterns of earnings management, accrual-based and real activities earnings management and their relationship between audit quality are is represented by four proxies, which are audit firm size (Big 4), audit tenure, industry specialist auditors and audit independence.

Next, the process of sample selection is described comprehensively. After several steps of data filter, it yields to two sample groups corresponding to accrual-based earnings management and real activities earnings management, which consist of 3584 firm year observations for accrual-based group and 749 firm year observations for real activities group.

In the following chapter, the empirical analysis of the data will be presented.

# 6 Analysis and Results

In the last chapter, the main models and data for this research is obtained, based on the results of the tests, the empirical analysis will be provided in this section. It comprises descriptive statistics, correlation matrix analysis and the interpretation of OLS regression results.

## 6.1 Empirical Results

### 6.1.1 Descriptive Statistics

This section presents the descriptive statistics of variables in the pattern of a set of tables.

First of all, the descriptive statistics for the dependent variable is provided mainly from the aspect of mean in the context of the value of discretionary accruals as proxy for accrual-based earnings management and the value of real activities earnings management through two periods, pre-economic crisis and post-economic crisis. From the table three, we can see that the level of earnings management in the context of both accrual-based and real activities earnings management as well as the absolute, income-increasing and income-decreasing earnings management decline after the economic crisis except the absolute value of real activities earnings management which increases after financial crisis. The results doesn’t support the hypothesis one which implies that the behavior of earnings management actually decrease during the post-crisis period. It to some extent shows that management of firms tends to behave more conservative after financial crisis.

**Table 3: Descriptive Statistics—Dependent Variable**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable Description | Mean | | |
|  | Pre-economic Crisis | Post-economic Crisis | Increase/Decrease |
| Accrual-based Earnings Management | | | |
| |AEM| | 0.053643 | 0.048657 | -0.004986 |
| AEM  (Income-Increasing) | 0.063001 | 0.044345 | -0.018656 |
| AEM  (Income-Decreasing) | -0.043874  (|AEM|=0.043874) | -0.052257  (|AEM|=0.052257) | -0.008383 |
| Real Activities Earnings Management | | | |
| |REM| | 1.155846 | 1.252321 | 0.096475 |
| REM  (Income-Increasing) | 0.651904 | 0.567967 | -0.083937 |
| REM  (Income-Decreasing) | -1.699314  (|AEM|=1.699314) | -2.033453  (|AEM|=2.033453) | -0.334139 |

Secondly, the primary descriptive statistics for independent variables and control variables are summarized in the Table 4 and 5 in terms of accruals-based earnings management and real activities earnings management. Both the two tables show that most of the firms are audited by Big4 firms since the mean of AS is more than 90%. Besides, more than half of the clients are audited by industry specialist auditors. The audit tenure is around 4 years and the audit independence as the percentage of non-audit fees to total audit fees is between 16% to 17%. A general description of control variables is as follows: the mean of firm size is around 7.7 as the logarithm of total assets, the level of leverage is between 0.5 to 0.7 as average, the mean of EO is around 0.1. Most of the firms experience profit during the test period since the mean of loss variable is more than 0.7 (loss variable is a dummy variable which equals to 1 if the client experiences a positive profit in the current year). In terms of the percent of total accruals to total assets, it is much smaller for accrual-based earnings management which is around 2% to 5%, compared to real activities earnings management which is approximately 60%.

**Descriptive Statistics—Independent Variables and Control Variables**

**Table 4: Accrual-based Earnings Management and Audit Quality Model**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable Description** | Mean | | | SD | | | |
|  | Pre-crisis | Post-crisis | Total | | Pre-crisis | Post-crisis | Total |
| ***Independent Variable*** | | | | | | | |
| AS | .94 | .95 | .94 | | .237 | .222 | .230 |
| AT | 3.38 | 5.24 | 4.31 | | .664 | .985 | 1.253 |
| ISA | .62 | .64 | .63 | | .486 | .481 | .483 |
| AI | .167912 | .154870 | .161391 | | .1350542 | .1251597 | .1303324 |
| ***Control Variable*** | | | | | | | |
| FS | 7.735238 | 7.800575 | 7.767906 | | 1.4981814 | 1.5048311 | 1.5014980 |
| TA | -.024429 | -.053373 | -.038901 | | .2306337 | .1150712 | .1827838 |
| LEV | .561875 | .609038 | .585457 | | .3870237 | .8015421 | .6296753 |
| LOSS | .90 | .74 | .82 | | .296 | .436 | .381 |
| CFO | .122618 | .116814 | .119716 | | .1136101 | .0918193 | .1033064 |
| EO | .16 | .10 | .13 | | .371 | .305 | .341 |

**Table 5: Real Activities Earnings Management and Audit Quality Model**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable Description** | Mean | | | SD | | |
|  | Pre-crisis | Post-crisis | Total | Pre-crisis | Post-crisis | Total |
| ***Independent Variable*** | | | | | | |
| AS | .93 | .95 | .94 | .249 | .213 | .231 |
| AT | 3.38 | 5.15 | 4.26 | .653 | 1.124 | 1.274 |
| ISA | .62 | .63 | .63 | .486 | .483 | .484 |
| AI | .187213 | .168536 | .177875 | .1473606 | .1201757 | .1346230 |
| ***Control Variable*** | | | | | | |
| FS | 7.730555 | 7.734828 | 7.732691 | 1.5817992 | 1.6153156 | 1.5967559 |
| TA | -.538434 | -.728063 | -.633249 | 3.6878386 | 3.8865610 | 3.7852127 |
| LEV | .569078 | .617430 | .593254 | .2632163 | .2874413 | .2763313 |
| LOSS | .90 | .72 | .81 | .306 | .452 | .395 |
| CFO | .112421 | .114850 | .113 | .0891865 | .0806477 | .0849325 |
| EO | .15 | .08 | .12 | .354 | .279 | .320 |

Thirdly, the main characteristics of audit firms are presented in the following three tables. The first table 6 show that Big 4 audit firms accounts for the most market shares in all the industries. (97. 86% for accrual-based group and 96% for real activities group) Next, the following two tables 7 and 8 show that most of the clients are audited by industry specialist auditors, of which 82.79% for accrual-based group and 91.61% for real activities group.

**Table 6: Big 4 and Non-Big 4 Audit Firms**

|  |  |  |
| --- | --- | --- |
|  | Big 4 Audit Firms | Non-Big4 Audit Firms |
| Accrual-based Earnings Management Group | | |
| Percent of Market Shares (%) | 97.86 | 2.14 |
| Real Activities Earnings Management Group | | |
| Percent of Market Shares (%) | 96 | 4 |

**Table 7: Industry Specialist Auditors**

**—Accrual-Based Earnings Management Group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Industry Description | Big 4 Audit Firms | | | | Non-Big4 Audit Firms |
|  | PwC | Ernst&Young | Deloitte&Touche | KPMG | Total |
| Agriculture, Forestry, Fishing |  | **0.367** | **0.633** |  |  |
| Mining | **0.305** | **0.285** | 0.176 | **0.227** | 0.007 |
| Construction | 0.112 | **0.636** | 0.160 |  | 0.092 |
| Manufacturing | **0.362** | **0.234** | **0.239** | 0.154 | 0.011 |
| Wholesale Trade | 0.112 | **0.526** | 0.108 | **0.241** | 0.014 |
| Retail Trade | **0.200** | **0.340** | **0.210** | **0.244** | 0.006 |
| Services | **0.542** | 0.104 | 0.129 | **0.205** | 0.020 |

**Table 8: Industry Specialist Auditors**

**—Real Activities Earnings Management Group**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Industry Description | Big 4 Audit Firms | | | | Non-Big4 Audit Firms |
|  | PwC | Ernst&Young | Deloitte&Touche | KPMG | Total |
| Agriculture, Forestry, Fishing |  |  | **1** |  |  |
| Mining |  | **1** |  |  |  |
| Construction |  |  | **0.365** |  |  |
| Manufacturing | **0.221** | **0.249** |  | 0.150 | 0.012 |
| Wholesale Trade | **0.247** | **0.229** |  | **0.509** | 0.015 |
| Retail Trade | 0.057 | 0.190 | **0.343** | **0.397** | 0.013 |
| Services | 0.150 | **0.318** | **0.287** | **0.246** |  |

Notes:

1.The classification of industries is based on the two-digit SIC code (Standard Industrial Classification Code);

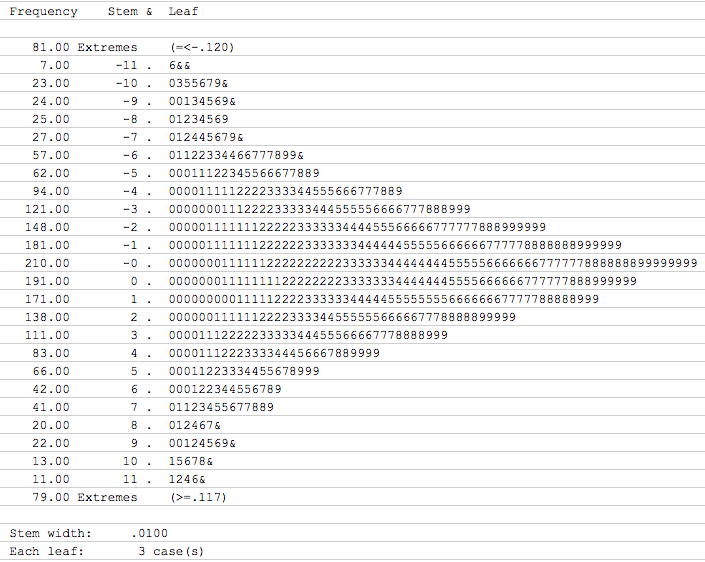
2. The Big4 audit firms are PwC, Ernst&Young, Deloltte & Touche and KPMG;

3. Audit firms are defined as industry specialist auditors when the market share of that audit firm exceeds 20% of all the clients of all audit firms in that specific industry. (Chen and Elder, 2001; Mayhew and Wilkins, 2003; Casterella et al., 2004; Chen et al., 2005);

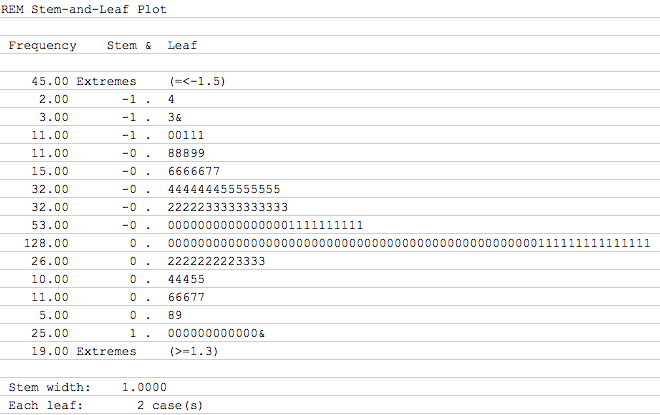
4. The industry specialist auditors in each industry are highlighted in bold text.

Lastly, based on the results of the normality test in SPSS showing in the tables 9 and 10 below, the value of accrual-based earnings management and real activities earnings management are normal distributed.

**Table 9: Accrual-based Earnings Management**



**Table 10: Real Activities Earnings Management**



### 6.1.2 Correlation Matrix Analysis (Pearson Correlation Matrix)

Table from 11 to 14 depict the results of Pearson correlation matrix concerning the relationship between dependent, independent and control variables. The result of tables 11 and 12 show that accrual-based earnings management is only associated with audit tenure with regard to the total period and post-crisis period. In terms of the correlation between independent and control variables, as expected, Big4 positively relates to industry specialist auditors as well as audit independence since all the industry specialist auditors are Big4 audit firms which represent higher audit independence.

The result of table 13 and 14 don’t show any relationship between real activities earnings management and audit quality proxies. Besides, the positive correlation between audit firm size and industry specialist auditors still exists. All in all, the samples don’t suffer from multicolinearity which can also be observed from OLS regression results following.

**Table 11: Accrual-based Earnings Management and Audit Quality (total period)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |AEM| | AS | AT | ISA | AI | FS | TA | LEV | LOSS | CFO | EO |
| |AEM| |  |  |  |  |  |  |  |  |  |  |  |
| AS | -.043 |  |  |  |  |  |  |  |  |  |  |
| AT | -.046\* | .168\*\* |  |  |  |  |  |  |  |  |  |
| ISA | -.003 | .316\*\* | .019 |  |  |  |  |  |  |  |  |
| AI | -.014 | .082\*\* | -.028 | .029 |  |  |  |  |  |  |  |
| FS | -.077\*\* | .326\*\* | .115\*\* | .116\*\* | .163\*\* |  |  |  |  |  |  |
| TA | .606\*\* | -.017 | -.061\*\* | -.022 | .014 | .020 |  |  |  |  |  |
| LEV | .505\*\* | .074\*\* | .020 | .059\*\* | .025 | .064\*\* | .079\*\* |  |  |  |  |
| LOSS | -.028 | .038 | -.142\*\* | .021 | .075\*\* | .118\*\* | .094\*\* | -.084\*\* |  |  |  |
| CFO | .031 | .017 | .048\* | .057\*\* | .033 | .075\*\* | -.046\* | -.042 | .280\*\* |  |  |
| EO | .025 | -.017 | -.093\*\* | -.016 | .043 | .034 | .004 | -.006 | -.033 | -.050\* |  |

**Table 12: Accrual-based Earnings Management and Audit Quality**

**(Pre-crisis and Post-crisis periods)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pre-crisis | | | | | |
|  | |AEM| | AS | AT | ISA | AI |
| |AEM| |  |  |  |  |  |
| AS | -.039 |  |  |  |  |
| AT | -.017 | .283\*\* |  |  |  |
| ISA | -.002 | .322\*\* | .056 |  |  |
| AI | -.005 | .078\* | -.012 | .004 |  |
| Post-crisis | | | | | |
|  | |AEM| | AS | AT | ISA | AI |
| |AEM| |  |  |  |  |  |
| AS | -.058 |  |  |  |  |
| AT | -.124\*\* | .206\*\* |  |  |  |
| ISA | -.004 | .310\*\* | -.022 |  |  |
| AI | -.041 | .088\*\* | .033 | .058 |  |

**Table 13: Real Activities Earnings Management and Audit Quality (total period)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |REM| | AS | AT | ISA | AI | FS | TA | LEV | LOSS | CFO | EO |
| |REM| |  |  |  |  |  |  |  |  |  |  |  |
| AS | -.023 |  |  |  |  |  |  |  |  |  |  |
| AT | .027 | .083 |  |  |  |  |  |  |  |  |  |
| ISA | .086 | -.104\* | -.005 |  |  |  |  |  |  |  |  |
| AI | .031 | .03 | -.049 | .030 |  |  |  |  |  |  |  |
| FS | .391\*\* | .145\*\* | .037 | .056 | .078 |  |  |  |  |  |  |
| TA | .051 | -.009 | -.018 | -.077 | .053 | .191\*\* |  |  |  |  |  |
| LEV | -.018 | .145\*\* | .048 | -.004 | -.138\*\* | .190\*\* | .032 |  |  |  |  |
| LOSS | .114\* | .007 | -.211\*\* | .044 | -.015 | .124\* | .005 | -.110\* |  |  |  |
| CFO | .052 | -.069 | -.038 | -.162\*\* | -.090 | -.010 | .024 | -.114\* | .350\*\* |  |  |
| EO | -.062 | .025 | -.052 | -.011 | -.018 | -.005 | .031 | .097\* | -.010 | -.001 |  |

**Table 14: Real Activities Earnings Management and Audit Quality**

**(Pre-crisis and Post-crisis periods)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pre-crisis | | | | | |
|  | |REM| | AS | AT | ISA | AI |
| |REM| |  |  |  |  |  |
| AS | -.035 |  |  |  |  |
| AT | -.011 | .127 |  |  |  |
| ISA | .078 | -.126 | -.050 |  |  |
| AI | .083 | .021 | .043 | .000 |  |
| Post-crisis | | | | | |
|  | |REM| | AS | AT | ISA | AI |
| |REM| |  |  |  |  |  |
| AS | -.016 |  |  |  |  |
| AT | .037 | .049 |  |  |  |
| ISA | .093 | -.080 | .017 |  |  |
| AI | -.013 | .073 | -.032 | .067 |  |

Notes:

1. Each panel depicts the result of Pearson Correlation Coefficients;

2. \*🡪 Correlation is significant at the 0.05 level (based on two-tailed test);

\*\*🡪 Correlation is significant at the 0.01 level (based on two-tailed test).

3. The definitions and descriptions for the dependent, independent and control variables are shown in Table 1.

### 6.1.3 Multicollinearity Test

In order to eliminate the probability of multicollinearity between independent variables and control variables, the process of multicollinearity detection is conducted in SPSS. Firstly, we take all the independent and control variables into the independent variable list and then choose one of the independent variables into dependent variable list and run the collinearity diagnostics. We run this test for each independent and control variable. In terms of the result of SPSS, the critical value of VIF is three. If the value of VIF is higher than three, it means that there is multicollinearity. As we can see from the tables 15 to 18 below, the value of all the VIF are all below three which means that there is no multicollinearity in the main models.

**Table 15: Accrual-based Earnings Management—Independent Variables**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| AS | VIF | AT | VIF | ISA | VIF | AI | VIF |
| AT | 1.062 | **ISA** | 1.117 | **AI** | 1.034 | **FS** | 1.150 |
| ISA | 1.021 | **AI** | 1.033 | **FS** | 1.171 | **TA** | 1.025 |
| AI | 1.033 | **FS** | 1.162 | **TA** | 1.025 | **LEV** | 1.027 |
| FS | 1.079 | **TA** | 1.023 | **LEV** | 1.025 | **LOSS** | 1.153 |
| TA | 1.025 | **LEV** | 1.027 | **LOSS** | 1.156 | **CFO** | 1.106 |
| LEV | 1.025 | **LOSS** | 1.121 | **CFO** | 1.103 | **EO** | 1.015 |
| LOSS | 1.154 | **CFO** | 1.098 | **EO** | 1.017 | **AS** | 1.258 |
| CFO | 1.105 | **EO** | 1.007 | **AS** | 1.150 | **AT** | 1.083 |
| EO | 1.017 | **AS** | 1.233 | **AT** | 1.083 | **ISA** | 1.119 |

**Table 16: Accrual-based Earnings Management—Control Variables**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FS | VIF | TA | VIF | LEV | VIF | LOSS | VIF | CFO | VIF | EO | VIF |
| TA | 1.025 | **LEV** | 1.019 | **LOSS** | 1.145 | **CFO** | 1.018 | **EO** | 1.016 | **AS** | 1.260 |
| LEV | 1.024 | **LOSS** | 1.143 | **CFO** | 1.106 | **EO** | 1.015 | **AS** | 1.258 | **AT** | 1.075 |
| LOSS | 1.144 | **CFO** | 1.101 | **EO** | 1.017 | **AS** | 1.259 | **AT** | 1.077 | **ISA** | 1.119 |
| CFO | 1.105 | **EO** | 1.017 | **AS** | 1.258 | **AT** | 1.053 | **ISA** | 1.116 | **AI** | 1.033 |
| EO | 1.014 | **AS** | 1.260 | **AT** | 1.085 | **ISA** | 1.119 | **AI** | 1.034 | **FS** | 1.168 |
| AS | 1.161 | **AT** | 1.083 | **ISA** | 1.117 | **AI** | 1.032 | **FS** | 1.170 | **TA** | 1.025 |
| AT | 1.077 | **ISA** | 1.119 | **AI** | 1.034 | **FS** | 1.160 | **TA** | 1.020 | **LEV** | 1.027 |
| ISA | 1.119 | **AI** | 1.034 | **FS** | 1.168 | **TA** | 1.014 | **LEV** | 1.027 | **LOSS** | 1.154 |
| AI | 1.015 | **FS** | 1.171 | **TA** | 1.017 | **LEV** | 1.018 | **LOSS** | 1.063 | **CFO** | 1.105 |

**Table 17: Real Activities Earnings Management—Independent Variables**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| AS | VIF | AT | VIF | ISA | VIF | AI | VIF |
| AT | 1.058 | **ISA** | 1.067 | **AI** | 1.049 | **FS** | 1.127 |
| ISA | 1.049 | **AI** | 1.046 | **FS** | 1.132 | **TA** | 1.052 |
| AI | 1.047 | **FS** | 1.133 | **TA** | 1.045 | **LEV** | 1.089 |
| FS | 1.121 | **TA** | 1.053 | **LEV** | 1.120 | **LOSS** | 1.233 |
| TA | 1.051 | **LEV** | 1.120 | **LOSS** | 1.223 | **CFO** | 1.200 |
| LEV | 1.104 | **LOSS** | 1.177 | **CFO** | 1.162 | **EO** | 1.015 |
| LOSS | 1.230 | **CFO** | 1.207 | **EO** | 1.015 | **AS** | 1.068 |
| CFO | 1.201 | **EO** | 1.012 | **AS** | 1.052 | **AT** | 1.062 |
| EO | 1.015 | **AS** | 1.063 | **AT** | 1.065 | **ISA** | 1.068 |

**Table 18: Real Activities Earnings Management—Control Variables**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FS | VIF | TA | VIF | LEV | VIF | LOSS | VIF | CFO | VIF | EO | VIF |
| TA | 1.013 | **LEV** | 1.120 | **LOSS** | 1.220 | **CFO** | 1.063 | **EO** | 1.015 | **AS** | 1.070 |
| LEV | 1.078 | **LOSS** | 1.233 | **CFO** | 1.201 | **EO** | 1.015 | **AS** | 1.063 | **AT** | 1.062 |
| LOSS | 1.208 | **CFO** | 1.209 | **EO** | 1.006 | **AS** | 1.067 | **AT** | 1.063 | **ISA** | 1.068 |
| CFO | 1.209 | **EO** | 1.014 | **AS** | 1.056 | **AT** | 1.017 | **ISA** | 1.026 | **AI** | 1.050 |
| EO | 1.014 | **AS** | 1.068 | **AT** | 1.066 | **ISA** | 1.059 | **AI** | 1.042 | **FS** | 1.137 |
| AS | 1.055 | **AT** | 1.065 | **ISA** | 1.068 | **AI** | 1.049 | **FS** | 1.137 | **TA** | 1.052 |
| AT | 1.061 | **ISA** | 1.060 | **AI** | 1.021 | **FS** | 1.113 | **TA** | 1.053 | **LEV** | 1.109 |
| ISA | 1.063 | **AI** | 1.048 | **FS** | 1.095 | **TA** | 1.053 | **LEV** | 1.112 | **LOSS** | 1.234 |
| AI | 1.040 | **FS** | 1.094 | **TA** | 1.053 | **LEV** | 1.107 | **LOSS** | 1.085 | **CFO** | 1.209 |

### 6.1.4 OLS Regression Results

Table 19 shows the results for the OLS regression with regard to the relationship between accruals-based earnings management and audit quality before and after financial crisis. First of all, regarding the absolute value of discretionary accruals, it negatively associated with Big 4 as proxy for audit firm size before financial crisis (p < 0.1), which is consistent with previous studies (Becker et al., 1998; Francis et al. 1999; Krishnan, 2003; Kim et al., 2003). By contrast, audit firm size doesn’t show any difference in constraining earnings management after financial crisis. However, there is significantly negative relationship between discretionary accruals and audit tenure during the post-crisis period (p < 0.01) which doesn’t appear before economic crisis. Secondly, with regard to the income-increasing earnings management, there is no significant association between earnings management and audit quality before crisis, as opposed to the situation after crisis, which finds a significantly positive relation between income-increasing earnings management and audit tenure (p < 0.05) as well as a significantly negative relation between income-increasing earnings management and audit independence (p < 0.05). This indicates that the ability of audit firms to detect earnings management decline along with the longer tenure which to some degree, implies that the audit independence may be impaired due to the longer tenure. This is consistent with previous literatures which show that audit firms tends to make decision in accordance with clients in order to maintain large auditees. (Beck et al., 1988; Lys and Watts, 1994) Lastly, concerning the income-decreasing earnings management behavior, it has a positive association with industry specialist auditors (p < 0.05) and a negative relation with audit independence (p < 0.05), which is inconsistent with previous literatures. It shows that the more non-audit fees, the less discretionary accruals that differs from the prior result, of which along with the increasing non-audit fees, the audit independence may be impaired, hence, decline the quality of audit. (Frankel et al., 2002; Gul et al., 2007) It doesn’t give the evidence that industry specialist auditors can improve the audit quality. By comparison, there is a positive relationship between audit firm size, audit tenure and industry specialist auditors and income-decreasing earnings management. In conclusion, the results reject the hypotheses two to four and its sub-hypotheses which implies that the audit quality and earnings management changes before and after financial crisis both under the context of absolute discretionary accruals, income-increasing and income-decreasing earnings management.

**Table 19: Accrual-based Earnings Management and Audit Quality Model**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period |  | | | Pre-crisis | | | | Post-crisis | | | | Total Periods | | | |
|  | Prediction | | Coefficient | | | t-statistics | | Coefficient | | t-statistics | | Coefficient | | t-statistics | |
| ***Dependent Variable 🡪 |AEM|*** | | | | | | | | | | | | | | | |
| Constant | ? | | .134 | | | 6.946\* | | .131 | | 8.261\* | | .121 | | 7.469\* | |
| ***Independent Variable*** | | | | | | | | | | | | | | | |
| AS | - | | -.022 | | | -1.802\*\*\* | | -.013 | | -1.185 | | -.022 | | -1.923\*\*\* | |
| AT | ? | | -.004 | | | -.962 | | -.010 | | -4.610\* | | -.002 | | -.866 | |
| ISA | - | | .005 | | | .832 | | -.002 | | -.413 | | .000 | | -.021 | |
| AI | + | | .003 | | | .173 | | -.013 | | -.746 | | -.018 | | -.980 | |
| ***Control Variable*** | | | | | | | | | | | | | | | |
| FS | - | | -.012 | | | -6.317\* | | -.008 | | -5.329\* | | -.012 | | -7.053\* | |
| TA | + | | .735 | | | 44.218\* | | -.534 | | -23.668\* | | .546 | | 41.333\* | |
| LEV | + | | .111 | | | 11.052\* | | .033 | | 10.664\* | | .128 | | 33.349\* | |
| LOSS | + | | -.030 | | | -3.266\* | | .024 | | 4.583\* | | -.025 | | -3.686\* | |
| CFO | - | | .169 | | | 7.153\* | | -.163 | | -6.370\* | | .175 | | 7.195\* | |
| EO | + | | .018 | | | 2.681\* | | .019 | | 2.760\* | | .016 | | 2.231\*\* | |
| ***Dependent Variable 🡪 AEM (Income-increasing)*** | | | | | | | | | | | | | | | |
| Constant | ? | | .033 | | | 4.026\* | | .058 | | 5.470\* | | .034 | | 5.415\* | |
| ***Independent Variable*** | | | | | | | | | | | | | | | |
| AS | - | | .007 | | | 1.254 | | .002 | | .312 | | .004 | | .822 | |
| AT | ? | | -.002 | | | -.901 | | .003 | | 2.147\*\* | | .004 | | 5.471\* | |
| ISA | - | | .002 | | | .940 | | .005 | | 1.615 | | .004 | | 1.970\*\* | |
| AI | + | | -.001 | | | -.133 | | -.028 | | -2.279\*\* | | -.012 | | -1.608 | |
| ***Control Variable*** | | | | | | | | | | | | | | | |
| FS | - | | .001 | | | .983 | | -.002 | | -2.299\*\* | | .000 | | | -.583 |
| TA | + | | .960 | | | 145.463\* | | .764 | | 29.679\* | | .948 | | | 151.882\* |
| LEV | + | | .018 | | | 4.490\* | | .022 | | 3.616\* | | .023 | | | 6.436\* |
| LOSS | + | | -.028 | | | -7.134\* | | -.029 | | -8.178\* | | -.036 | | | -13.701\* |
| CFO | - | | .067 | | | 5.723\* | | -.019 | | -1.161 | | .043 | | | 4.364\* |
| EO | + | | .007 | | | 2.402\*\* | | .023 | | 5.544\* | | .015 | | | 5.777\* |
| ***Dependent Variable 🡪 AEM (Income-decreasing)*** | | | | | | | | | | | | | | | |
| Constant | ? | | -.011 | | | -.922 | | .045 | | 5.258\* | | .051 | | | 7.112\* |
| ***Independent Variable*** | | | | | | | | | | | | | | | |
| AS | | - | | | .007 | | 1.052 | | .011 | | 2.065\*\* | | .011 | | 2.379\*\* |
| AT | | ? | | | .003 | | 1.171 | | .002 | | 1.981\*\* | | .000 | | .359 |
| ISA | | - | | | .007 | | 2.283\*\* | | .004 | | 2.008\*\* | | .008 | | 3.593\* |
| AI | | + | | | -.024 | | -2.454\*\* | | -.008 | | -1.029 | | -.017 | | -2.371\*\* |
| ***Control Variable*** | | | | | | | | | | | | | | | |
| FS | | - | | | .003 | | 3.386\* | | -.001 | | -.669 | | .000 | | .344 |
| TA | | + | | | .565 | | 28.172\* | | .954 | | 96.896\* | | .844 | | 77.431\* |
| LEV | | + | | | -.002 | | -.339 | | -.004 | | -3.043\* | | -.012 | | -8.161\* |
| LOSS | | + | | | -.004 | | -.907 | | -.033 | | -12.629\* | | -.021 | | -7.481\* |
| CFO | | - | | | -.160 | | -13.335\* | | -.012 | | -.885 | | -.129 | | -12.663\* |
| EO | | + | | | .005 | | 1.491 | | .002 | | .583 | | .008 | | 2.701\* |

Table 20 reports the results for the association between real activities earnings management and audit quality before and after financial crisis. From the table, we can see that relation between audit quality proxies and real activities earnings management is insignificant (p > 0.1) except that the audit firm size negative associates with earnings management before financial crisis which is consistent with Inaam et al. (2012). Since this is the only paper that examines the relationship between real activities earnings management and audit quality so far, we cannot compare our results to more empirical evidence from previous literature. Altogether, we cannot judge the hypotheses since the results for both the pre-crisis and post-crisis periods are insignificant.

**Table 20: Real Activities Earnings Management and Audit Quality**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period |  | | Pre-crisis | | Post-crisis | | Total Periods | |
|  | Prediction | Coefficient | | t-statistics | Coefficient | t-statistics | Coefficient | t-statistics |
| ***Dependent Variable 🡪 |REM|*** | | | | | | | | |
| Constant | ? | -3.167 | | -2.278\*\* | -4.921 | -2.830\* | -4.342 | -4.341\* |
| ***Independent Variable*** | | | | | | | | |
| AS | - | -.809 | | -1.192 | -.771 | -.745 | -.832 | -1.401 |
| AT | ? | -.110 | | -.439 | .078 | .406 | .064 | .597 |
| ISA | - | .336 | | .975 | .362 | .788 | .378 | 1.335 |
| AI | + | .908 | | .812 | -1.320 | -.717 | -.084 | -.083 |
| ***Control Variable*** | | | | | | | | |
| FS | - | .721 | | 6.700\* | .827 | 5.774\* | .761 | 8.588\* |
| TA | + | -.019 | | -.430 | -.017 | -.295 | -.016 | -.435 |
| LEV | + | -.809 | | -1.219 | -.818 | -1.034 | -.781 | -1.537 |
| LOSS | + | -.075 | | -.132 | .436 | .812 | .366 | .981 |
| CFO | - | .194 | | .098 | 3.271 | 1.081 | 1.384 | .805 |
| EO | + | -.073 | | -.160 | -1.061 | -1.341 | -.443 | -1.060 |
| ***Dependent Variable 🡪 REM (Income-increasing)*** | | | | | | | | |
| Constant | ? | -.673 | | -.707 | -.797 | -.922 | -.518 | -.880 |
| ***Independent Variable*** | | | | | | | | |
| AS | - | -.972 | | -2.052\*\* | -.266 | -.437 | -.693 | -1.906\*\*\* |
| AT | ? | .076 | | .511 | -.006 | -.053 | -.076 | -1.122 |
| ISA | - | .132 | | .559 | -.210 | -.940 | -.027 | -.168 |
| AI | + | 1.129 | | 1.428 | .757 | .847 | .965 | 1.883\*\*\* |
| ***Control Variable*** | | | | | | | | |
| FS | - | .304 | | 3.427\* | .193 | 2.459\*\*\* | .263 | 4.427\* |
| TA | + | -.005 | | -.213 | -.001 | -.049 | -.001 | -.057 |
| LEV | + | -.302 | | -.673 | .180 | .528 | .050 | .248 |
| LOSS | + | -.166 | | -.452 | .327 | 1.448 | .187 | 1.045 |
| CFO | - | -3.292 | | -2.729\* | -.310 | -.212 | -3.007 | -2.862\* |
| EO | + | .046 | | .144 | -.580 | -1.615 | -.177 | -.772 |
| ***Dependent Variable 🡪 REM (Income-decreasing)*** | | | | | | | | |
| Constant | ? | 4.209 | | 1.475 | 8.199 | 2.293\*\* | 6.939 | 3.490\*\* |
| ***Independent Variable*** | | | | | | | | |
| AS | - | .559 | | .428 | .335 | .178 | .506 | .456 |
| AT | ? | .402 | | .706 | -.141 | -.416 | -.112 | -.545 |
| ISA | - | -.561 | | -.797 | -.217 | -.213 | -.513 | -.860 |
| AI | + | -.608 | | -.291 | 5.580 | 1.383 | 1.635 | .821 |
| ***Control Variable*** | | | | | | | | |
| FS | - | -.922 | | -4.768\* | -1.340 | -4.330\* | -1.076 | -6.285\* |
| TA | + | .288 | | .642 | .253 | .808 | .190 | .842 |
| LEV | + | 1.537 | | .946 | 2.226 | 1.063 | 1.738 | 1.348 |
| LOSS | + | -.301 | | -.232 | -.521 | -.382 | -.554 | -.606 |
| CFO | - | -3.825 | | -.694 | -4.662 | -.668 | -4.393 | -1.015 |
| EO | + | .503 | | .565 | .991 | .568 | .722 | .874 |

Notes:

\*🡪 Statistical significance at 0.01 level (based on two-tailed test);

\*\*🡪 Statistical significance at 0.05 level (based on two-tailed test);

\*\*\*🡪 Statistical significance at 0.1 level (based on two-tailed test).

## 6.2 Summary

This chapter provides the empirical result for the research. Firstly, the descriptive statistics are described in detail with respect to dependent, independent and control variables, which includes various aspects in terms of the proxies for earnings management as well as audit quality. In this section, the hypothesis one is rejected since the result of the level of earnings management declines after the financial crisis, which is inconsistent with the prediction of hypothesis one. Secondly, the Pearson Correlation Matrix is created to test the correlation between dependent, independent and control variables. Lastly, the OLS regressions are run concerning the two main models. The results reject the hypothesis two to four. Until now, the sub-questions four *“Are there any differences between accrual-based earnings management and real activities earnings management regarding audit quality?”* and five “*Are there any variances concerning the income-increasing and income-decreasing earnings management?*” as well as nine “*What are the results of this thesis?*” and ten “*What are the analyses of those results?*” are answered in this chapter.

# 7 Conclusions

The last chapter of this study provides a brief summary consisting the research subject, the hypotheses and the empirical results, followed by the limitations and ends with the implications and recommendations for further researchers with respect to earnings management and audit quality.

## 7.1 Summary of the Study

This study mainly examines the changes in the relationship between earnings management and audit quality before and after financial crisis. First of all, the variations on the behavior of earnings management is provided in terms of accrual-based and real activities earnings management. The result shows that earnings management with regard to the absolute value, income-increasing and income-decreasing earnings management all decline after the economic crisis which implies that firm management tend to be more conservative during the post-crisis period. The result rejects the first hypothesis.

Secondly, this study tests the influences of economic crisis on the association between audit quality and accrual-based earnings management. The multivariate regression model reveals that Big 4 audit firms are more effective on constraining the behavior of accrual-based earnings management before financial crisis. However, it doesn’t show any differences between Big 4 and non-Big 4 on detecting earnings management during the post-crisis period. This result support the second hypothesis which indicates that there is changes concerning the relation between earnings management and audit quality during the pre-crisis and post-crisis periods. Here, the second hypotheses including the sub-hypotheses and the third as well as the fourth hypotheses are rejected.

Thirdly, the changes in the relationship between real activities earnings management and audit quality is tested through the second regression model. The results are insignificant possibly mainly due to the sample which is relatively small compared to the accrual-based earnings management group. Since the unavailable data for calculating the proxy for real activities earnings management, the final result is not satisfactory which indicates one obvious limitation of this research.

## 7.2 Research Limitations

As mentioned in the first chapter, there are several limitations to this research. First of all, in terms of earnings management measurement, managers can manage earnings in various patterns and consequently no one can really find the perfect proxy to accurately indicate the behaviors of earnings management. This paper examines the earnings management from two main aspects, accrual-based and real earnings management by using Performance-Matching Discretionary Accruals Model and Roychowdhury Model, respectively, in order to capture earnings management in a precisely way. (Kothari et al., 2005; Roychowdhury, 2006)

Secondly, this research mainly focuses on the American financial market; whether it can be extended to other markets and how to apply it world-widely need further study. One obvious reason is that U.S. American markets is under higher investor protection mechanism which may be different from other accounting environments in other parts of the world. Secondly, the American market is relatively mature; hence, the results cannot be applied to the emerging markets directly.

Thirdly, one obvious limitation concerns the samples. In this research, we adopt two samples which are accrual-based earnings management and real activities earnings management. Although the study tends to investigate all the published companies under the context of American stock market, the data are not all available. In particular, for the real activities earnings management , the sample size is relatively small and may result in some bias due to the unavailable for the information regarding the advertising expenses, research and development expenses as well as selling, general and administrative expenses which are needed to calculate the discretionary expenditures under the Roychowdhury model (2006).

## 7.3 Recommendations for Further Research

In extension to this study, it might be of interest for researchers to examine the changes between earnings management and audit quality before and after financial crisis under the context of other parts of the world, such as European markets which is also relatively mature or the emerging markets, like Chinese market whose structure of audit market is different from other mature markets. Meanwhile, the economic crisis exerts different levels of influences through various countries; hence, it might be necessary to examine it separately across world market. Taking the limitations of this research as a reference, further research can adopt other methods to estimate the behavior of earnings management which might be more accurate under some specific situation regarding the different economic environments for various countries.

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# Appendix: Literature Review

## Appendix A: Earnings Management

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Title | Author (S) | Object of the study | Sample | Research Methodology | Outcome |
| 1. A review of the earnings management literature and its implications for standard setting | Paul M. Healy and James M. Wahlen (1999) | This paper mainly reviews the previous academic studies with regard to earnings management and point out some implications for accounting standard setters and regulators. | n/a | They make reviews on the previous literatures. | 1. The current earnings management literatures provide only moderate insights for standard setters;  2. The underlying reasons for the appearance of earnings management are the stock market perception, management compensation, contracts and avoidance of regulatory intervention. |
| 2. Earnings management to avoid earnings decreases and losses | David Burgstahler and Ilia Dichev (1997) | This paper provides evidence on the phenomenon that firms manage reported earnings in order to avoid earnings decreases and losses. | A sample of 64466 observations in the context of American firms. | They use the cross-sectional distributions of earnings changes and earnings to test the hypotheses. | 1. They find unusually low frequencies of small decreases in earnings and small losses as well as unusually high frequencies of small increases in earnings and small positive income;  2. Two components of earnings, cash flow from operations and changes in working capital are used to achieve increases in earnings. |
| 3. Do executive stock options generate incentives for earnings management? Evidence from accounting restatements | Simi Kedia (2003) | This paper examines the pay-for-performance incentives for earnings management. | A sample of 224 firms with announced financial restatements during the period from January 1997 to June 2002 based on ExecuComp data in America. | 1. They model the endogeneity (firm characteristics) as a non-zero correlation between the endogenous variable and the error term in the restatement equation;  2. They develop a probit model to test the pay-for-performance incentive. | 1. There are differences between stock-based and options-based incentives for earnings management;  2. There is no evidence on the equity holdings earnings management incentive;  3. Large managerial ownership offsets the positive effect of stock options earnings management incentive. |
| 4. Insider trading and earnings management in distressed firms | Messod D. Beneish, Eric Press and Mark E. Vargus (1993) | This paper examines the debt contact and insider trading incentives for income-increasing earnings management. | A sample of 462 firms that experience a first episode of technical default between 1983 and 1997 in America. | They run a regression model to test whether pre-default earnings management connects to both abnormal insider selling and default costs. | 1. Managers’ accounting and trading choices in the period preceding technical default is influenced by the threat of litigation influences;  2. Managers tend to abstain trading and earnings management prior to default. |
| 5. Performance matched discretionary accruals measures | S.P. Kothari, Andrew J. Leone and Charles E. Wasley (2005) | This paper examines the specification and power of tests based on performance-matched discretionary accruals. | A sample of 123000 observations during the period from 1962 to 1999 in America. | They develop the performance-matched discretionary accruals to measure earnings management and compare it with modified Jones model. | The performance-matched discretionary accruals measurement is well specified and powerful. |
| 6. Earnings management through real activities manipulation | Sugata Roychowdhury (2006) | This paper mainly provides the measurement for real activities earnings management. | A sample of 21758 firm year observations during the period form 1987 to 2001 in America. | He adopts three models to calculate abnormal cash flow from operations, abnormal discretionary expenses and abnormal production costs, respectively. | Managers manipulate real activities to avoid reporting annual losses through three ways; those are price discounts to temporarily increase sales, overproduction to report lower cost of goods sold and reduction of discretionary expenditures to improve reported margins. |

## Appendix B: Audit Quality and Earnings Management

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| Title | Author (S) | Object of the study | Sample | Research Methodology | Outcome |
| 1. The effect of audit quality on earnings management | Connie L. Becker, Mark L. Defond, James Jiambalvo, K.R. Subramanyam (1998) | This study examines the association between audit quality and earnings management. | 10379 firm year observations audited by Big Six auditors and 2179 firm year observations audited by non-Big Six auditors from the 1993 Compustat database in America. | 1. They use Big Six auditors as proxy for audit quality and discretionary accruals as proxy for earnings management;  2. They adopt the cross-sectional Jones Model to measure earnings management (DeFond and Jiambalvo, 1994, DeFond and Subramanyam, 1997). | 1. The clients of non-Big Six auditors report more discretionary accruals than those reported by companies of Big Six auditors;  2. The discretionary accruals of firms audited by non-Big Six auditors are 1.5%-2.1% of total assets higher than the discretionary accruals reported by clients of Big Six auditors;  3. Mean and median of the absolute value of discretionary accruals are significantly larger for firms with non-Big Six auditors;  4. Lower audit quality relates to more accounting flexibility;  5. The quality of Big Six auditors is higher than non-Big Six auditors. |
| 2. Big 4 office size and audit quality | Jere R. Francis and Michael D. Yu (2009) | This study tests the relation between Big 4 office size and audit quality. | 6568 U.S. firm year observations and 2,572 unique firms during the period 2003-2005 which are audited by 285 unique Big 4 offices from the Compustat and Audit Analytics databases. | 1. They use aggregate audit fees (total audit fees and ranks of fees) received from SEC registrants to measure Big 4 auditor size;  2. Then, they use abnormal accruals and earnings distributions as proxy for earning quality and earnings management;  3. Lastly, a probit model is adopted to test two common benchmarks; those are reporting small positive profits earnings increase. | 1. Larger audits provide higher quality audits;  2. Clients reported by larger auditors carry out less aggressive earnings management;  3. Larger audits are more likely to issue going-concern audit reports, of which are more accurate with regard to predict next-period client bankruptcy. |
| 3. Auditor conservatism, asymmetric monitoring, and earnings management | Jeong-Bon Kim, Richard Chung and Michael Firth (2003) | This paper examines the differences reactions between Big 6 and non-Big 6 auditors with regard to two types of earnings management carried out by managers, which are income-increasing and income-decreasing earnings management. | A sample of 33163 firm-year observations which is composed of 4810 non-Big 6 observations and 28353 Big 6 observations with sufficient data during the period from 1984 to 1998 in America. | 1. They adopt two proxies for earnings management; those are discretionary accruals and abnormal working capital accruals and calculate them through the extended version of the modified Jones 1991 model;  2. Then they use the two-stage treatment effects model which consist of two stages. Firstly, they estimate a multivariate probit model by defining the dependent variable as the probability of managers’ choice for Big 6 auditor. Next, they run the second regression by including the managers’ accrual choices and the auditor choice as well as other firm-specific variables. | 1. When managers carry out income-increasing earnings management, Big 6 auditors are more effective than non-Big 6 auditors;  2. When managers have incentives to make income-decreasing earnings management, non-Big 6 auditors are effective than Big 6 auditors. |
| 4. Auditor tenure, auditor independence and earnings management | Larry R. Davis, Billy Soo and Greg Trompeter (2001) | This paper examines the relationship between auditor tenure and earnings management. | A sample of 855 firms during the period from 1981 to 1998 in America. | 1. They adopt the original Jones (1991) model to estimate discretionary accruals;  2. They classify the sample into two groups, one concludes the firms employing a single auditor and the other one includes the firms with changing audit;  3. Then they run the regression model to test the relationship between discretionary accruals and auditor tenure. | 1. When auditor tenure increases, the absolute discretionary accruals increases and the absolute forecast errors decline;  2. The longer the auditor tenure is, the more earnings management the mangers carry out aiming to meet earnings forecast;  3. When auditor tenure increases, the discretionary accruals become more negative indicating that clients save earnings for future use. |
| 5. Does Big 6 auditor industry expertise constrain earnings management | Gopal V. Krishnan (2003) | This paper examines the relationship between audit industry expertise and earnings management. | A sample of 24114 firm year observations representing 4422 firms audited by Big 6 auditors during the period from 1989 to 1998 in America. | 1. They use two methods to proxy for auditor industry expertise; one is the auditor market share in an industry and the other one is an industry’s share in the auditor’s portfolio of client industries;  2. In terms of earnings management, they adopt the cross-sectional variation of the Jones (1991) model (DeFond and Jiambalvo) to estimate the client’s absolute discretionary accruals. | 1. Clients of specialist auditors have lower levels of discretionary accruals than clients of nonspecialist auditors;  2. Auditors’ industry expertise can, to some extent, mitigate accruals-based earnings management;  3. If the auditor both belongs to a Big 6 auditor and an industry specialist, it can further improve the reliability of accounting statements by constraining earnings management. |
| 6. Audit partner tenure and audit quality: an empirical analysis | Chijoke Oscar Mgbame, Emmanuel Eragbhe, Nosakhare Peter Osazuwa (2012) | This paper tests the association between auditor tenure and audit quality in the context of Nigeria. | A sample of 50 listed companies in 2010 in the context of Nigeria. | They adopt the Binary Logit Model estimation method to test the association between audit tenure and audit quality which is represented by the likelihood of cooperating with the Big audit firms. | 1. The audit tenure negatively associates with audit quality, though the result is not significant;  2. The other explanatory variables, such as Board Independence, Director Ownership and Board size are negatively related to audit quality;  3. Returns on Assets exerts a positive effect on audit quality. |
| 7. The relation between auditors’ fees for non-audit services and earnings management | Richard M. Frankel, Marilyn F. Johnson and Karen K. Nelson (2002) | This paper tests the association between auditor fees and earnings management as well as the market reaction towards the auditor fees disclosure respectively. | A sample of 3074 firms during the period from February 5, 2001 to June 15, 2001 based on SEC’s EDGAR database and Compustat in America. | 1. In terms of auditor fees, they adopt three specifications, those are the ratio of non-audit fees to total fees, the percentile rank of the amount of non-audit fees and audit fees as well as the percentile rank of the amount of total fees, by auditor, which disclosed by each firm;  2. They run the regression model by defining earnings benchmark (surprises) as the dependent variable to proxy for earnings management;  3. They also adopt another proxy to represent earnings management, discretionary accruals using the cross-sectional modified Jones model. | 1. There is positive relationship between non-audit fees and small earnings surprises;  2. Non-audit fees positively relates to absolute discretionary accruals as well as income-increasing and income-decreasing discretionary accruals;  3. Audit fees negatively relates to discretionary accruals;  4. There is no relationship between total fees and earnings management;  5. There is no association between non-audit fees and the possibilities of reporting a small increase in earnings;  6. The disclosure of non-audit fees negatively associates with share values. |
| 8. Audit quality and earnings management in the Tunisian context | Zgarni Inaam, Hlioui Khmoussi and Zehri Fatma (2012) | This paper examines the effect of audit quality as well as the adoption of the financial security law on restraining the extent of earnings management. | A sample of 319 firm-year observations during the period from 2000 to 2010 in Tunisian. | 1. They adopt discretionary accruals to estimate accrual-based earnings management through the Modified Jones Model;  2. They use the Roychowdhury Model to estimate the level of real activities earnings management;  3. In terms of audit quality, they adopt three independent variables, audit firm size, industry specialist auditors and audit tenure;  4. Several linear-multiple regression analyses are used to test the association between earnings management and audit quality. | 1. Big 4 and industry specialist auditors are negatively associated with levels of accruals as proxy for earnings management;  2. Big 4 auditors enhance the extent of real earnings management;  3. Longer auditor tenure is not associated with more earnings management;  4. The implementation of the financial securities law is not effective on constraining earnings management behavior. |
| 9. Audit quality, corporate governance, and earnings management: A meta-analysis | Jerry W. Lin and Mark I. Hwang (2010) | This paper exams the relationship between corporate governance as well as audit quality and earnings management respectively. | 48 prior studies during the period from 1996 to 2007. | They adopt meta-analysis methodology by using empirical data from previous studies. | As proxy for audit quality, auditor tenure, auditor size, specialization as well as auditor independence as measured by fee ratio and total fee have a negative relationship with earnings management. |