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**THE IMPACT OF EQUITY-BASED COMPENSATION ON
A RELATIONSHIP BETWEEN EARNINGS MANAGEMENT AND
RESEARCH AND DEVELOPMENT EXPENDITURE**

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Abstract <p>This study examines the influence of equity-based remuneration on an association between earnings management and research and development (R&D) expenditures. Prior academic researchers argue that earnings manipulation is significant positive correlated with managers' decisions related to R&D spending. Besides, the higher amount spending on R&D activities has two sides. On one hand, it is a good signal to indicate the successful market expansion or growth of a firm in the future. On the other hand, it causes by financial constraints. Thus, it is raised a concern that whether the high level of R&D investment, that related to a high stage of earnings management, is optimal or not. Also, a high extent of earnings manipulation is a red warning of boards of directors of a firm. Based on agency theory, incentive related to equity instruments is one of useful tools for aligning the interests between shareholders and managers. Thus, we hypothesize that equity compensation will mitigate the degree of earnings management which is correlated to R&D expenditures.</p> <p>In the research design, Jones (1991) model is used to estimate the discretionary accruals, as the proxy for earnings management. We also build up the empirical models which includes the R&D expenditure, equity-based compensation and other financial control variables. As the results, by using a sample data of listed firms of The United State from 2006 to 2013, we do not find the significant effect of equity-based incentives on the correlation between R&D spending and earnings management. However, in the sensitive analysis, for sample firms with high level of R&D and firms belongs to a business equipment industry such as computer, software and electronic, we find the evidence that managers are less likely to manage earnings through R&D activities when they have granted a greater percentage of equity-based awards.</p>			
Keywords Earnings Management, Research and Development Expenditure, Equity-based Compensation			
Additional information			

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1 INTRODUCTION

1.1 Background

Financial statements are basic tools for transferring the company's business activities to the outside interested users. Activities of a company can be divided into three parts which are operating, financing and investing activity. The benefits of supplying accounting information to outside not only increase the ability of a company to access a labor, input and output market, but also enhance the efficiency of capital markets to the investors. Based on financial reports, investors pay more attention to past performance, current resources available to a firm and the claims on those resources in order to give their predictions about the company's future performance. For example, among all business activities of a firm, investors are tent to focus to not only capital expenditure on property, plants and equipment but also research and development (R&D) expense. Perhaps, in the last few decades of twenty century, there is a significant increasing tendency in the investment to R&D projects within all industries. It is a signal to point out for investors about the firm-level innovation and firm value in the future. The study of (Pandit et al. 2011) finds that the higher R&D expenditure a company spends, the higher and less volatile its future operating performance is.

In another hand, financial statements disclose the accounting policies which a firm has used. The freedom of choosing accounting methods will increase the flexibility of standard sets as well as help each firm to apply the suitable accounting methodology based on its specific business activities. For instance, the treatment of R&D expense to disclose on the financial statements is still debate between Generally Accepted Accounting Principles (GAAP) and International Financial Accounting Standards (IFAS). While GAAP requires that all R&D expenditures are immediate charged as expense, the IFAS indicates that in some certain cases, R&D can be capitalized. Additionally, R&D investments are considered as the discretionary decisions. Thus, the difference in choosing accounting measures also means the dissimilar reported accounting result number which is closely related to evaluate the performance of managers.

Additionally, from the view of standard setters, earnings management happens when managers use their own judgments in financial reporting and restructuring business transactions not only to mislead some stake holders about the economic performance of a firm, but also impact on contractual outcomes (Healy & Wahlen 1999). For examples, managers can make subjective assumptions about the expected live of long term assets, impairment assets, higher or lower bad debt allowance, chose to make or defer expenditures, adopt the different methods of inventory valuation and so on. There are three reasons to motivate the managers to manipulate reported earnings. Firstly, the investors and financial analysts rely on published financial statements to make their predictions about the firm's performance and conduct to trade their stock in the market. As the result, the price of firm's stock will be affected. Realized this fact, in the short time, the managers can manipulate the earnings either upward to meet the expectation of the investors and increase shareholders' wealth, or downward to influence buyout firms' stock price in order to maximized their own benefits. Furthermore, it can be the contracting motivation. There are two key contracts between firms and stakeholders, which are management compensation contracts and lending contracts. Management compensation contracts include bonus, earnings-based compensation as well as the equity-based compensation. In order to increase their award, the study of (Healy 1985) shows that if a firm has use the upper and lower bound to calculate the bonus award, its managers prefer to choose an income-decreasing accruals policy. On the other hand, they are likely to make the income-increasing accruals. In addition, lending contracts are tools for limiting managers' activities which can increase the benefits of stockholders and be considered as the expense of firm's creditors such as dividend constraint, an interest coverage ratio and so on. Some research point out the upwards - managed earnings tendency to prevent from violating these constraints. The third reason for earnings management comes from regulatory motivation such as industry-specific regulation as well as anti-trust regulation. For example, (Moyer 1990) finds that if commercial bank faces to face on the downward of a capital adequacy ratio which is below the minimum regulatory requirement, managers have tried to manipulate some financial indicators such as the loan loss provision, loan charge-offs, and securities gains and losses.

Furthermore, there are three techniques that managers use to adjust the real earnings. They are affecting on accruals, changing in accounting policy and modifying real business activities of a firm. Some prior researches show that the managers are likely to choose ways to affect the accruals to distort the earnings number. For example, (Fields et al. 2001) conduct the study related to accounting choices and find that regarded as the earnings management practice, managers are less preferable to manipulate the real business activities. Modifying the real transaction influences the financial results of both current period cash flows and for future growth prospects. On the other hand, accruals management is more flexible to exercise by managers. However, perhaps, the impact of current accruals on the financial statements will be inverse in the next accounting period, this method just helps managers influence accounting results in a short time. Also, the more aggressive accruals manipulations are used, the higher probability of a qualified audit from auditors, financial penalties from regulatory professionals the firm faces. It is caused through earnings restatements and lawsuits, the outside financial information users can detect accrual manipulation (Skinner 1997).

Based on previous discussion about earnings management and R&D expenditure, we argue that the higher level of R&D spending a firm has, the higher tendency of manipulating earnings managers have. However, it raises a concern that, whether a high level of investment to R&D activities, that related to a high stage of earnings management, is an optimal level of investment of a firm or not. Besides, perhaps, a high level of earnings management is a red warning of boards of directors of a firm. In this study, we investigate the moderating effect of equity based compensation on the positive correlation between earnings management as well as R&D expenditure. Our focus on the moderating impact of equity-based compensation is motivated by several existing studies. Because of the significant increasing proportion of the equity-based compensation from twenty years ago, there are many researchers who pay attentions to discover the influence of this policy on a firm (Bryan et al. 2000a, Q. Cheng &Warfield 2005a). It is argued that this policy is one of corporate governance tools which help to reduce the larger different interests between managers and shareholders (Baber et al. 1996, Kang et al. 2006, Murphy 1999). Also, there are some papers indicated that equity based compensation is an efficient

policy to encourage managers to make the optimal investment decision in long-term rather than boost short-term earnings (S. Cheng 2004, Datta et al. 2001, Kang et al. 2006). As the result, we predict that if a company uses the equity incentive, the extent of earnings management can be lower, because of interests of manager changed to maximize the long term profitability of investment projects. Moreover, we can answer the question that is whether the equity based compensation is a suitable solution for firms with the large amount of R&D projects or not. Besides, we will confirm a positive relationship between earnings management practice as well as R&D spending under the impact of equity incentives. In our thesis' scope, we would like to use sample data of listed firms of The United State from 2006 to 2013 to answer our research question.

1.2 Prior related research

Earnings management is one of strategies that managers would like to use to intervene in the process of preparing financial statements to meet various incentives. In order to do that, they can either adjust earnings figure through accounting accruals manipulation or change to the real business transaction or combine both of them. Prior various researches focus on the relationship between R&D expenditure and earnings management. For example, because in the mind of managers, R&D expenditure, can be seen as the discretionary expense, the decreasing of R&D expense can make the earnings figure of a firm become positive and ensure an earnings growth tendency (Baber et al. 1991). (Dechow & Sloan 1991) examine a problem related to a trend about R&D investment decision of chief executive officers (CEOs) in some years before they leave. The evidence points out clearly that during this period, if managers do not have a great percentage of stock ownership in the firm, spending on R&D is more likely cut in order to help managers meet the short-term reward. Moreover, (Perry & Grinaker 1994) investigate the correlation between earnings surprise and expenditure for R&D. They conclude that it exists the linearly negative form between earnings surprise and unexpected R&D. This study also suggests that due to satisfying the analyst expectation in a short time, expenditure for R&D will be cut down. Furthermore, another study of (Wang & Souza 2006) proves a positive correlation between earnings management and R&D expenditure.

In this study, authors clearly indicate a group of organizations that have a tendency to achieve reporting goals, only in the case compared with last year, current R&D expenditure is lower. Besides, the calculation about pre-R&D, pre-accounting manipulation figures helps the author to test the impact of ex-ante accounting flexibility on the R&D choices of firms with strong reporting incentives to involve in either real or accounting manipulation. Apart from a main conclusion related to positive a relationship between R&D and earnings management, authors find that managers are likely the use of accruals than real earnings management.

Making R&D investment decisions is based on the expectation of the future benefits and growth. If a firm has a high level of long term investment, it does not indicate an optimal level of investment. In this case it is related to over investment (M. F. McNichols & Stubben 2008). The concern of these authors is that whether decision makers based on distorted information, which is a result of earnings manipulation, to give excessive investments. They predict that there are two explanations for this phenomenon. First, the managers of a firm are either overoptimistic or not aware of misstatement and they strongly believe to use an untrue growth tendency to give the investment level consistently. In addition, it cannot deny a probability that the managers obtain the misreport situation, however, they still make the high level of investment in a high risk approach to turn around performance.

It is clear that a high degree of capital investment has both side effects. Firstly, a large budget spending on R&D causes by financial constraints. Different to the efficient market hypothesis, which strongly assumes that publicly information related to individual stocks in particular as well as the whole stock market is presented correctly and truly in a securities market, many researchers provide the evidence about the slow reaction of investors to publicly financial information (Lakonishok et al. 1994). Furthermore, the study conducted by (Daniel & Titman 2006) is aimed to investigate the unsimilar reaction of investors when they gather and analyse both tangible as well as intangible information. This paper shows that, compared with tangible information, investors are more likely to react incorrectly to intangible related announcements. Thus, the R&D expenditure is classified in intangible information group, so that in a firm with larger spending on R&D activities, its

abnormal earning is positive for several following periods. In this case, it is understood that outside shareholders do not react accurately to the benefit of R&D increases; as a result, this firm could cope with a problem related to building up its capitals in financial markets.

On the other hand, a high level of long term investment expenditure is a good signal to point out the successful market expansion or growth of a firm in the following years. In order to understand managerial investment behavior rightly, the nature of earnings management should be examined. (Cohen & Zarowin 2010) report an evidence that high level of earnings management is consistent with a tendency to make suboptimal investment decision. In this study, the authors investigate the earnings manipulation practice of corporations around seasoned equity offerings. Especially, they pay attention to examine not only accruals-based manipulation but also real earnings management. They found that corporation used both techniques of earnings management around seasoned equity offerings. Also, if a firm less engages to distort reported earnings, it means that managers have judged as well as evaluated a large spending of investment activities correctly. In this situation, based on a high level of long term investment, which is as long as not excessive, investors can be confident to predict the sustainability of the development of a company. On the contrary, if it is clear to obtain the trend of earnings manipulation within a firm, a high level of investment expenditure shows a sub-optimal decision.

Perhaps, the root of a problem, which is a positive correlation between earnings management and R&D expenditure, comes from different benefits between managers and the owner, called an agency problem (Jensen & Meckling 1976). They identify the principal-agent problem that “an agency relationship 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” (Jensen & Meckling 1976). Because corporation size becomes larger and larger, shareholders are hard to obtain as well as monitor the abilities and skills of managers directly to control daily business activities. Then, in some certain situations, managers may use firms’ assets for their personal purposes and try to maximize their own benefits. To solve an agency problem, one of efficient

methodologies is executive compensation packages. Corporations built up suitable award policies for managers to align executive incentives with shareholder desires. For example, based on the management performance, a firm offers executives suitable salaries and bonus, stock, restricted stocks or stock options and so on. Especially, the academic researchers now pay more strongly attention to the grants of stock options as well as restricted stocks because of their broaden application in reality. There are some researchers conducted to investigate the actual situation of using equity- based compensation policies in firms with high growth opportunities and high- tech companies (Baber et al. 1996, Gaver &Gaver 1993, Kwon &Yin 2006, Smith Jr &Watts 1992). For instances, some unique features of these firms are different strategies, a high confidential degree of core technology, non-comparable with their peers and so on. These characteristics result in an information disparity problem. Shareholders as well as outside members of board of directors, who do not have managers' specific knowledge, face various difficulties in order to monitor and gather enough information to support for all investment decisions of executives. Thus, the correlation between compensation policy and investment opportunities has also evolved as part of agency problems (Smith Jr &Watts 1992). Furthermore, these studies document the evidence that the more high growth companies are, the more increasing percentage of grants of equity based incentive to total awards for managers are (Baber et al. 1996, Gaver &Gaver 1993, Kwon &Yin 2006, Smith Jr &Watts 1992).

1.3 Research problem and structure of thesis

According to a discussion in previous literature review, the tendency of managers to engage in manipulating public earnings figures is more likely stronger when a firm has a high spending on R&D activities. Besides, some researchers have conducted to investigate two–side consequences of a high level of R&D expenditure. In one hand, investors believe that a firm with large R&D spending will has more opportunities to develop and expand its business in the future. On the other hand, it can lead to financial constraint when a firm needs to raise more capital. Thus, in order to get a right view of this phenomenon, a question, what is the nature of earnings management practice, should be addressed. Some prior papers emphasize a

connection between a high ability to engaging in managing earnings figures and a trend to make suboptimal investment decisions (Cohen & Zarowin 2010). Thus, a keystone reason for this phenomenon comes from an agency problem, which indicates the benefit differences between top executives and shareholders, the owners of a corporation. To address this conflict, it is argued that a firm should build up its suitable policies related to not only monitoring the behavior of managers but also aligning executives' awards with shareholders desires. In the scope of our thesis, we would like pay attentions to the effect of incentives for executives in general, especially, equity-based compensation in particular. Supported by a positive influence of equity-based awards in real applications, we argue that stock options and restricted stock, two kinds of equity-based compensation, can mitigate the earnings management behavior and improve the process of making investment decisions. Because equity based incentives adjust the managers' action to focus on long term performance of a firm, we forecast that the extent of managing earnings will reduce in firm with high degree investment. Our above predications are supported by the results of (Xian et al. 2011)'s study. These researchers select the merged data between Compustat and Center for Research in Security Prices in the period from 1992 to 2010; however, in the scope of our thesis, we would like to pay more attention to listed US firms from 2006 to 2013.

The remainder of our thesis is constructed as follows: in the next part, we will discuss earnings management and R&D expenditure deeply. Earnings management is specified as detail such as definition, some incentives for earnings management and so on. Furthermore, in part two, the correlation between earnings manipulation and R&D spending is discussed based on previous litterature researchs. Then, in the third section, we continue to examine equity-based compensation and set up our hypothesis. Based on that, we will build up a research design in order to address our research question. Subsequently, the fifth section shows the empirical results for regressions. Lastly, we provide some conclusions.

2 EARNINGS MANAGEMENT AND RESEARCH AND DEVELOPMENT EXPENDITURE

2.1 Definition

Following the idea of (Beneish 2001), among the academic researchers, there are different views of the nature of earnings management. There alternative definitions are presented in the following

- (a) “By “earnings management” I really mean “disclosure management” in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain (as opposed to, say, merely facilitating the neutral operation of the process)” (Schipper 1989a, page 92)
- (b) “Earnings management occurs when managers exercise their discretion over the accounting numbers with or without restrictions. Such discretion can be either firm value maximizing or opportunistic” (Fields et al. 2001, page 260, citing, Watts & Zimmerman 1990)
- (c) “..under(the information perspective of earnings management),... managerial discretion is a means for managers to revel to investors about their private expectations about the firm’s future cash flows”(Beneish 2001, page 5)

These definitions discuss about three separated understanding of researchers based on the effect of earnings management which are beneficial, pernicious and neutral. The statement of (Schipper 1989a) indicates the pernicious earnings management which has an association with misrepresentation as well as frauds, while a view of (Beneish 2001) emphasizes the significant of managing earnings practices on increasing the transparency of financial reports. In the neutral zone, come from their own benefits or economical efficient such as maximizing firm value, managers who are complying with bright-line standards to prepare reports, make accounting choices distort the earnings figure.

Furthermore, (Healy &Wahlen 1999) inspire from a perspective of standard setters and their full definition of earnings management can be described as follow:

" Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting number"(Healy &Wahlen 1999, page 368)

First, (Healy &Wahlen 1999) pay more attentions to identify various situations lead to earnings manipulation practice. In the processing to prepare financial statements, it is necessary for manager to use their own judgements to estimate future economic events such as expected useful life and salvage value of non-current assets, the extent of allowances for bad debt, higher or lower assets impairments, pension accounting and so on. Also, the managers are free to choose a suitable type of acceptable accounting methods for the similar transactions, for instance adopting the straight line or accelerated depreciation method, specific one of four methods to calculate the value of inventories. Besides, managers make decisions related to controlling working capital resources of a firm, such as the extent of inventories, the timing of purchasing or shipping merchandises and applicable credit policies for customers. These actions can influence the cost allocations and a result of net revenue. In addition, the reported earnings can be affected by the managerial decision related to the timing of recognition of revenues and expenses, such as R&D expenses, advertising and brand name costs. Moreover, in some cases, it is required the managers to decide how to structure the business transactions, for example, by which way lease contracts can be classified as finance lease or operating leases.

The second point referred to the definition of (Healy &Wahlen 1999) is an objective of managers when they practice earnings management. They can either impede the stakeholders about the underlying economic performance of a corporate or affect contractual outcomes. There are two reasons to explain why these consequences have happened. Firstly, managers believe that at least some stakeholders are not aware of earnings manipulation and do not wash up this phenomenon when they begin to

analysis financial data. In addition, because of information asymmetry between managers and outside stakeholders, the stakeholders cannot observe earnings manipulation. Thus, the result of (Stein 1989) indicates that in this case, the outside stakeholders have a tendency to tolerate and anticipate a certain extent of manipulated earnings figures.

Furthermore, positive accounting theory can be useful to analyze the nature of earnings management. According to (Scott cop. 2003), positive accounting theory can be understood as “ it is concerned with predicting such actions as the choices of accounting policies by firm managers and how managers will respond to proposed new accounting standard” (Scott cop. 2003). Positive accounting theory assumes that both securities markets and managerial labor markets are efficient, however, information related to the abilities and efforts of inside managers are not transparent. These assumptions indicate the existence of the interest conflict between managers and shareholders. Also, positive accounting theory is divided into two versions, which are an efficient contracting as well as an opportunistic version. According to an efficient contracting perspective, managers use their own evaluation to choose the particular accounting policies in order to achieve their firm’s corporate governance targets and enhance the informative characteristic of financial reports. For example, if it exists the good impact of auditing, the net account receivable, which is estimated by managers, will be a credible signal for investors to predict the future cash flow of a firm. Other example supports for this idea is that some firms with greater investment chances will practice earnings management as the tool for pointing out the potential growth in the future (Gul et al. 2000). Furthermore, the managers can mitigate the limitations of current applicable accounting standards as well as improve of the informative feature of financial statements by using their reporting judgment. For instance, the managers of the successful firm, which has the high percentage of R&D spending, decide to build R&D limited partnerships in order to capitalize their R&D expenditure rather than immediately expense. Thus, earnings management is beneficial because it can help manager transfer the private information about which support investors predict the future business performance of a firm.

On the other hand, earnings manipulation can be costly and it can be explained by opportunistic perspective. As there is a separation between managers and shareholders, managers have power to distort earnings figures, which are the keystone to calculate their bonus awards, to maximize their interests. Thus, the reported financial figures do not reflect the precise business performance of the firm and impact on the decision making of outside investors. Moreover, the managers are motivated to control earnings figures, which have a close relationship with stock prices. For instance, when the firm need to increase its capital by issuing new shares, the earnings figures are more likely to adjust upwards. This situation can be beneficial with the current shareholders; however, it can be harmful for the new shareholders. In conclusion, practicing earnings management has two sides, either benefit or harm, this depends on the way managers use it.

2.2 Incentives for earnings managment

In the line of academic knowledge about earnings management practice, researchers pay attention to identify the incentives to motivate each manager engage to distort the reported earnings figures. According to (Healy &Wahlen 1999), these incentives can be grouped into three main ones, which are capital market motivation, contracting motivation and regulatory one. This section will not only discuss deeply necessary conditions in which managers engage in manipulating earnings, but also the frequent level of this behavior and the reaction of stakeholders.

2.2.1 Capital market motivation

Firstly, it starts at information perspective on the decision usefulness of financial reporting, that is one of key financial accounting theories and practices. Information perspective emphasizes the need of investors to make their own predictions of the future firm performance based on the useful accounting information, including reported earnings. In addition, it assumes that when the markets are efficient, the movement of securities market prices will be predictable and correlated with the new public accounting information announcements. Thus, understanding this

phenomenon, the managers are motivated to manipulate reported accounting numbers in an attempt to impact on stock prices in the short period.

Previous conducted researches on capital market motivations to manipulate earnings have paid more attentions to the unexpected accrual behaviors during some specific duration when the executives of a firm have more tendencies to manage earnings for stock market reasons. Overall, these academic researchers focus on the seasons surrounding capital market transactions and when it exits a divergence between performance of a firm and expectations of either analysts or investors.

The first presented period is before management buyouts. In terms of management buyouts, they are transactions when a group of investors, encompassing inside managers of a firm, buy all of outstanding common shares of this firm. This transaction is attractive with managers because of the more potential benefits from being owners rather than employees. Also, the more important inside information the managers possess, the more motivations managers run management buyouts proposals. (L. E. DeAngelo 1988) conducts a research to examine the trend of earnings management prior management buyouts and documents that information related to earnings figures have a significant role to valuate in management buyouts. Thus, she sets up a hypothesis that managers are more tend to understate earnings before management buyouts transactions happen. However, there is little evidence to support for her hypothesis. Another recent study conducted by (Perry & Williams 1994) investigates a similar topic in a different calculation of unexpected accrual, as the sum of changes in revenues and depreciable capital. They find negative unexpected accruals, which are similar to the decreasing of income, in firms before management buyouts transactions occur.

Another duration which can motivate the managers to adjust earnings figures is before equity offers included initial public offers, seasoned equity offers and stock-financed acquisitions. At first, initial public offer (IPO) happens when the first shares of the firm are sold in securities markets. Under the view of a corporate business circle, there are two different views of IPO. On one hand, IPO is a tool for initial investors to “cash in” their shares (Elitzur & Gaviious 2003). On the other hand, IPO

can be considered as a first stage for a firm to raise its capital externally and a firm has an expectation that it will raise more capital in the future (Chaney & Lewis 1998, Ritter & Welch 2002). Researchers agree that managers practice different earnings management strategy based on different perspectives of IPO. Many studies included (Marquardt & Wiedman 2004, Teoh, Welch et al. 1998, Teoh, Wong et al. 1998) find an evidence to support for the idea that firms present positive unexpected accruals, referred to income-increasing, before IPOs period in order to inflate its share price. Moreover, according to (Teoh et al. 1998), if IPO is just the first step of building up capital for a firm, after IPO period, the managers have to be more conservative and careful to manage earnings in order to ensure the future expectations such as maintaining the goodwill of investors or firm's reputation and so on.

Similar to the period before IPOs, when an already publicly traded firm needs to issue more its stocks, namely seasoned equity offered, before this period, the CEOs have more propensities to manage income-increasing accruals (Teoh et al. 1998). This is simply to explain because the owners of a firm always favor as high a share price as possible.

Moreover, another transaction related to equity offers is the shares of the acquiring company that is used to buy the target firm (Erickson & Wang 1999). Perhaps, in this transaction, the managers of acquiring firm pay more attention to the value of its stocks, which is a foundation to calculate the quantity of acquiring firm shares exchanged for one share of target firm. Thus, the correlation between of the price and the exchanged number of acquiring firm shares is negative on the agreement date. According to (Erickson & Wang 1999), before a merger transaction has happened, managers in an acquiring firm have more tendencies to manage earnings upward. There are some reasons to explain this action. Firstly, in order to mitigate the state of earnings dilution, current shareholders of an acquiring firm like the higher value of their stock. Also, because of the number of new issued shares, the current shareholders, especially managers who are shareholders of an acquiring company, are afraid of the reducing of their voting power and control. Last reason is that a firm can reduce the cost of acquiring the target cost as the higher value of acquiring shares.

In addition, various researches related to earnings manipulation for capital market incentives point out that the expectation of analysts as well as investors is one of stimulations for managers to distort reported financial numbers. For instance, (Kasznik 1999) investigates and discovers that earnings figures are more likely to be managed upward by adjusting unexpected accruals, when managers realize that the prediction of analysis of the tendency of company performance is falling. An additional research conducted by (Abarbanell &Lehavy 2003) focus on the association between the stock recommendations of financial analysts and the tendency of earnings managements. They document evidence that analysts often offer a “buy” recommendation for the firms with manage earnings in order to meet the analyst earnings prediction. On the other hand, the “sell” recommendations are made for firms with negative unexpected accruals. Also, the finding of (Burgstahler &Eames 2006) not only confirms the upward management of reported earnings to meet the expectations of investors but also provide the evidence related to descending ‘management’ of analysts’ prediction in order to gain zero and small positive earnings surprise.

Next, one concern of researchers is that the rate at which share-based earnings management occurs. (Teoh et al. 1998) examine on 1,682 IPOs companies from 1980 to 1990 and present that in a year when a firm do an IPO transaction, median abnormal accruals are significantly 5 percent of total assets. Furthermore, they state that relative to a matched sample of control companies, nearly 62 percent of IPO firms have higher abnormal accruals (Healy &Wahlen 1999, Teoh et al. 1998). Because these researchers have just collected the sample of similar IPO firm to increase the power of their experiment, thus, it is hard to generalize the overall rate of earnings management for capital market motivations. Perhaps, until now, there is relatively little evidence on the frequency of stock-based earnings management and this question is still open.

2.2.2 Contracting motivation

The financial accounting statements are not only useful for the investors to predict the future performance of a firm but also basic tools to monitor and regulate the

contracts between the firm and many different stakeholders such as managers, investors, board of directors, debtholders, financial institutions and so on. Also, in spite of some any motivations, decisions related to managing earnings have possible probabilities to deceive financial reports as well as influence the process of a firm to allocate its resources. Thus, it is necessary for academic research to examine the nature of earnings management for contracting incentives. In addition, there are two kinds of contracts, namely lending contracts and management compensation ones, which researchers have focused on examining whether motivations created by these contracts can interpret earnings controlling. The next part, we will discuss the research evidence on the correlation between contracting motivations and voluntary changes in accounting methodologies, estimates or accruals.

2.2.2.1 Lending contracts

A relationship between lenders and the owners of a firm always has a conflict of interests. In the view of the lenders, they favor that a firm will disburse dividends to its shareholders after they have collected all principal, while the shareholders have a strong emphasis on dividends at the end of fiscal years. In order to protect the right of lenders, the debt contract contains various agreements, one of which indicates that the company can pay dividends to its shareholders as long as its earnings are higher than a particular threshold number. Previous papers such as (H. DeAngelo et al. 1994, Healy & Palepu 1990) analyze the ability that providing a firm faced to their dividend constraints; it changed used accounting methodologies, accounting estimates or accruals to prevent from cutting dividends or making costly restructuring decision. (Holthausen & Leftwich 1983) try to find evidence about whether a company closes to its dividend constraint; it will change to adopt straight-line depreciation method. All of three studies document a little evidence about the extent of engaging earnings manipulation among these companies. Furthermore, in place of managing earnings, these firms attempt to manage their cash flow by decreasing dividend payments as well as rearranging their business operations and contractual relationships.

Another stream of contracting-based earnings management research is that examining the sample of the companies which actually make a lending covenant violated (DeFond & Jiambalvo 1994a, Sweeney 1994). There are different results between two papers. By using the time series and cross-sectional models, (DeFond & Jiambalvo 1994a) discover that a year before of the lending covenant violation, firms among their sample adjust their earnings go upward. Also, in a year of covenant violation happened, the abnormal working capital accruals of sample firms are significant positive. Thus, these results can be interpreted as the proof of earnings manipulation of companies which are close to their lending agreements. On the other hand, (Sweeney 1994) carries out the examination whether sample firms that make affirmative covenant violations change their accounting policies. Affirmative covenants require a firm to preserve a particular extent of some accounting ratios such as minimum net worth and working capital restriction and so on. This paper concludes that the managers of firms with debt covenant infringements change accounting policies that transfer reported earnings from future periods to the current period, however, this action occurs after default. Thus, this evidence points out clearly that sample firms continue to use remained accounting procedures although they will face to violate lending covenants. Following (Sweeney 1994), there are two explanations for this phenomenon. First, the managers allow debt covenant violation happened because they believe no default costs, and when ex post creditors are enforced default costs, and then managers are motivated to use various new different accounting procedures to reduce the default ex post. Another explanation is that before a default period although the managers obtain the flexible ability to choose applicable accounting procedures for a firm, they find the suitable solutions to postpone default. After violating debt contracts, either providing that the available accounting flexibility enhanced or because there is an improvement of firms' performance, available accounting flexibility becomes effectively to resolve default costs. (Sweeney 1994)

To answer the question related to the significance as well as the frequency of earnings manipulation for lending contract incentives, there is only study of (Sweeney 1994) to address. She documents that the accounting changes, influenced to reported earnings, of 5 firms over 22 sample firms are effective to postpone the

debt-covenants failure by one or more accounting durations. Perhaps, this frequent ratio is quite small and it maybe not the correct rate of lending contracts-based earnings management because Sweeney (1994) does not collect data of another firms that are well controlled earnings to preclude technical default.

2.2.2.2 Management compensation contracts

Besides the existence of conflicts between owners and lenders, there exists the similar conflicts about interest between managers and shareholders. Management compensation contracts are used to inspire the managers on performance of the firm in both short term and long term.

In general, some previous papers provide the evidence to support the tendency of managers using their accounting judgments to accelerate their earnings-based bonus compensation. Initially, in a study of (Healy 1985), accruals are differences between reported earnings and operation cash flow and an author compares the actual sign of accruals of each firm with the predicted number, a base to determine the bonus award for managers. According to Healy (1985), each company has the different way to set up bonus scheme. In particular, it is determined as the percentage of the variance between reported earnings and earnings target or lower bound. If actual earnings are below than the target, there is no bonus for managers. Another companies also include the upper limit on the excess of reported earnings over target ones. As the result, he finds the significant evidence that if a company has used both the upper and lower bound to calculate the bonus award, its managers are more likely choose an income-decreasing accruals policy. On the other hand, they like to manage earnings to increase on order to maximize their bonus.

Furthermore, (Holthausen et al. 1995) collect confidential data of managers-specific bonus plans in short term and analyze the extent to which executives manipulate earnings to maximize their bonus payments. Similar to (Healy 1985), they find evidence supported for a hypothesis which is that managers manipulate earnings downwards when their bonuses are at their maximum. In addition, the finding of (Guidry et al. 1999) indicates that among multinational companies, divisional

managers tend to use accounting judgments to increase their short-term bonus plans when the reported earnings are not reach to the earnings target.

Another stream of doing earnings management research is the influence of implicit award contracts for executives. In particular, the researchers are interested in the frequency of earnings manipulation whether is higher in the time when executives face a danger of their job security or their expected occupancy duration with the firm is short. (L. E. DeAngelo 1988) present that during the voting period, executives try to adapt suitable accounting discretion to satisfy the requirements of shareholders about the good performance result of a firm. Furthermore, in the final years at the CEOs position, managers are more likely to reduce R&D expense, which makes reported earnings inflate, to increase their short-term bonus awards (Dechow & Sloan 1991a).

To sum up this section, previous literature papers specify the certain impact of lending contracts as well as management compensation contracts on reporting higher earnings so as to maximize managers' compensation, enhance job security as well as reduce ability to violate debt covenants. Besides, there has been a little document about the frequency of contracting-based earnings manipulation.

2.2.3 Regulatory motivation

From above discussion, it is suggested that the wealth of managers depends on the change of stock price as well as cash bonus, thus they are more likely engage on controlling reported earnings. Nevertheless, there are other elements such as taxes, regulatory procedures if a firm is regulated as well as political costs influenced the change of share price and cash awards either directly or indirectly (Watts & Zimmerman 1978). Perhaps, managers have to balance the impact of such imposed costs on their firm's profits.

At first, before business results of a firm are determined, it is necessary to calculate the tax expense that a firm has to pay for tax authority. At this time, the managers have already known whether they can achieve to the target profits or not. Hence, it is

argued that in some extents, managers are motivated to distort tax expense to reach preferable earnings goals. In particular, deferred tax allowances, which can help a company obtain the future tax advantages, are under the control of managers to achieve the target earnings (Bauman et al. 2001, Dhaliwal et al. 2004, Visvanathan 1998).

The second line research of incentives for managing earnings is industry regulations. Perhaps, each industry has its unique features and is regulated differently, especially, for both banking and insurance. It is required that almost banks have to maintain the adequate capital level, presented by accounting figures to operate smoothly. Similarly, insurance firms will face a number of obstacles if their financial results are below the minimum requirements. In hence, as satisfying specific industry regulations, the managers strongly tend to adjust documented earnings numbers. For example, the study conducted by (Moyer 1990) presents that loan loss provision, loan charge-offs as well as securities gains and loss are accounts that executives of banks control if the banks cope with the drop of a capital adequacy ratio which is smaller than the minimum obligated scale. This evidence is supported by the finding of (Beatty et al. 1995, Scholes et al. 1990). In addition, (Adiel 1996) are interested in the extent of earnings manipulation in insurance firms. This researcher points out that during ten years from 1980, 1.5 percent of 1,294 insurance companies take part in doing reinsurance contracts to avoid the failing regulatory examinations.

The academic literature argues that earnings management causes by political reason. Political costs occur when a firm is profitable and attracts the larger interests of both public media and regulators. As the consequences, in some cases, politician will launch new special tax policies or more strict laws which cause the higher profitable firms will appear less attractive. Thus, the political cost hypothesis refers that managers of the firm with imposed political costs are motivated to report lower current income by switch different accounting procedures or methodologies. Furthermore, there is a correlation between political cost hypothesis and firm size. Some larger firms operated in monopolistic sections such as oil, gas or powers have more responsibilities related to environment if their performances are profitable. For example, (Key 1997) examine the impact of political costs on earnings control in

sample firms belonged to the cable television industry and discover the earnings-decreasing tendency when these companies cope with government scrutiny. Moreover, a study of (Jones 1991) states that “managers make income-decreasing during import relief investigations” (Jones 1991). Similarly, carried out an examination about companies under the anti-trust investigation duration, (Cahan 1992) discover a large trend of managers to disclosure income-decreasing unexpected accruals.

Next question is that whether regulatory incentives for earnings manipulation are more accepted among many firms. Perhaps, the sample of previous studies is quite small, for instance, 48 companies with anti-trust investigation in (Cahan 1992) research or (Key 1997) collects the data of 22 firms in cable television industry and there are 23 sample companies analyzed in (Jones 1991). Nevertheless, the frequent proportion that these sample firms engage in earnings manipulation is relative high, such as 70 percent and 90 percent for firms belonged to cable section and seeking import relief respectively. Since these papers have just examine in some particular circumstances, it is quite hard to generalize the answer about the frequency of regulatory-based earnings manipulation to the whole segment of the economy.

Based on the above discussion, almost researchers agree regulatory motivations accounted for earnings management of managers. Also, until now, it is not clear about the frequent extent of this behavior in practice.

2.3 Techniques for earnings management

A prior section has discussed about some incentives for earnings manipulation, academic literatures also concern about the types of techniques the managers can do to distort the earnings figures. In general, there are three unique techniques that executives have usually practiced, namely controlling discretion through accruals, changing accounting procedures as well as real activities manipulation.

The first technique, which is common for managers used, is accruals. Accruals occur when the timing of between cash flows and accounting recognition of business

transaction is discrepant. Accruals are the aggregate of both non-discretionary accruals (expected or normal accruals) and discretionary accruals (unexpected or abnormal accruals). Non-discretionary accruals are related to normal business transactions of a company, so it is suitable and reasonable. On the other hand, discretionary accruals present the accounting mediation preferred by executives (Healy 1985). Healy (1985) documents that accounting standard setters offer the manager some flexible accepted accounting methodologies to exercise their abnormal accruals. Most of the researchers use discretionary accruals as the proxy to detect earnings manipulation. The overall influence of discretionary accruals on reported earnings is not either revealed or easily estimable for outside users (Balsam 1998). However, the drawback of using accruals techniques is “iron law” of earnings manipulation, which can be understood that current accruals will be inversed in some following accounting period. Accruals-based earnings management will be discuss more clearly in the part 2.4.

The second choice of managers to control long-term performance results of firms is changing accounting procedures. There are some circumstances that motivate executives to switch to different accounting policies. At first, changing accounting policies happen when there are two or more generally accepted accounting principles that apply for a specific item. In this case, it has the direct influence on the reported income. For instance, the managers can switch from first in first out method to weighted average method to evaluate the value of inventories or change revenue recognition policy and so on. The study of (Bowen et al. 2002) investigates on the Internet corporations, whose reported revenue is often so high, and documents a result that since the burden of searching for external capital fund and satisfying the expectation of investors, the managers of these firms are more likely to engage to barter as well as gross –up revenue reporting. In this paper, barter revenue indicates “revenue recorded based on transactions in which Internet firms exchange advertising on each other’s website”, while gross-up revenue implies “ that the substance of the transaction suggests that revenue should be reported on a net basis and thus the use of grossed-up reporting is considered a discretionary mechanism to boost revenue” (Bowen et al. 2002). Secondly, firms need to change their accounting implementation procedures when the former policies are no longer

generally accepted. In this case, the managers can manipulate earnings through deciding the timing of implementing a new standard (Ali & Kumar 1994) or a choice to either record the transition influence of a new standard on the profit and loss report or as a retrospective adjustment to stockholders' equity on the balance sheet (Balsam et al. 1995). Perhaps, these circumstances create more opportunities for executives to manipulate earnings number in order to satisfy their personal interests. For example, (Healy 1985) provides that there exist more accounting method changes within sample companies which adjust the bonus plans. However, (Healy 1985) suggests that managing earnings through accounting procedure changings is not as flexible and efficient as through accruals. Furthermore, it is not proper to use this technique to manipulate reported results in the short-term period.

The last techniques that managers prefer to use is real activities manipulation. According to (Roychowdhury 2006), real activities manipulation terminology illustrates various managers' decisions that depart from a company's regular practices, to help managers achieve desired earnings magnitude. If managers engage in real activities manipulation, reported cash flow as well as in some situations, accruals will be affected. Previous studies have discovered three ways belong to real activities manipulation on managing earnings, which are decreasing R&D spending, accelerating sales in the short term by launching a price discounts policy or more lenient credit terms and overproduction. The relationship between earnings management and R&D expenditure will be discussed more detail in part 2.5. Also, the finding of (Bartov 1993) shows that if a company is not profitable, its managers will boost more assets sales transactions to achieve higher earnings. Besides, (Thomas & Zhang 2002) present their results about the choice of executive to affect the changed level of firm's inventory, such as overproduction, on a cost of goods sold account, for their earnings manipulation purposes. Nevertheless, according to (Hribar 2002), it is stated that (Thomas & Zhang 2002) are not successful to dismiss another interpretation to explain their results. Overproduction also can arise from the overestimation of managers about the future demand and intensive investment in inventory. Furthermore, (Roychowdhury 2006) discovers the significant evidence to point out that managers of companies in an attempt to prevent from the losses have taken part in to all three procedures of real activities manipulations.

Following (Bruns Jr & Merchant 2006, Graham et al. 2005) researches, relative to accrual management, managers are more favorable to engage real activities manipulation. Firstly, both auditor as well as regulator often pay more attentions on the accrual-based earnings management rather than real decisions about assets pricing and level of production. Also, discovering accruals management cause not only income restatements but also lawsuits (Skinner 1997), hence, the likelihood of lawsuits with real activities manipulation is smaller than accruals management. A second reason is that it is risky to depend on accruals only. (Roychowdhury 2006)

On the other hand, the disadvantage of controlling earnings through real activities is the decreasing of firm value since a specific transaction made earnings upward in a current period will have a negative impact on cash flow in following durations. For example, if a company uses the high rate to discount its products' price in order to increase its sales volumes, there will be the expectation of customers about this discount in the next periods. Perhaps, it indicates the lower margins on future sales (Roychowdhury 2006). Hence, (Healy 1985) emphasizes that accruals as well as changing accounting procedures are two favorite techniques that managers use to manipulate accounting numbers.

2.4 Accruals-based earnings management

The previous part is a discussion about three techniques that executives have used to engage earnings management. According to the discussion of (Healy 1985), among these techniques, switching new accounting procedures indicates as an opportunistic incentive on earnings manipulation than accruals, while accruals are considered as the common and effective means of among executives. Besides, there are great numbers of academic articles examining the adopted accrual manipulation in practice. Thus, in the scope of this thesis, we will put more emphasizes on accrual techniques on earnings management.

2.4.1 Accruals and earnings management

Following (Sloan 1996) paper, accruals are one of two elements of the earnings besides operating cash flows. Total accruals are calculated as the aggregate of depreciation and amortization expense and net difference of non-cash working capital accounts such as account receivables, inventories, bad debt allowances, and account payables and so on. Perhaps, the keystone distinction between accruals and cash flows is the larger level of subjective of accruals. Thus, (Sloan 1996) argues that compared with operating cash flows, accruals are less persistent and they lead to the lower persistence of reported earnings.

Furthermore, total accruals are divided into a pair of components, which are non-discretionary accruals as well as discretionary accruals (L. E. DeAngelo 1986, Dechow & Sloan 1991b, Healy 1985, Jones 1991, Xie 2001). Non-discretionary accruals (often termed normal or expected accruals) are generated from the normal business transactions of a company, which are equivalent to its performance degree, developing strategy, industry customs, macro-economic circumstances and other economic aspects. Depreciation and amortization expense can be seen as the classic illustration of normal accruals. On the other hand, discretionary accruals arise from when managers abuse their managerial power and make their subjective discretion influence reported accounting figures. Non-cash working capital accounts such as account receivable, inventories, and allowances for bad debt and so on are typical examples of abnormal accruals.

Perhaps, managers have just impacted on reported incomes through accruals in short term periods. By using managerial discretions, the current reported earnings adjusted upward or downward are dependent on the shift one part of future earnings results or deferred earnings from the present period to the next one respectively. The terminology of earnings-increasing accruals means that accruals will make current accounting results higher than it should be. On the other hand, researchers have discussed the reversal characteristic of accruals. For example, although earnings-increasing accruals components, opposite with earnings-decreasing accruals ones, increase firm's earnings in this current time, it will reduce the income for the next

period by the similar amount. This characteristic is also namely ‘iron law’ of earnings management practice. Hence, if the key executives would like to maintain the upward movement of earnings for some duration, they have to continue to generate more earnings-increasing accruals in the next period. On the other hand, the managers cannot avoid the reverse impact of accruals forever, therefore, accruals-based earnings management is a suitable technique using for a short time.

Previous papers indicate that some stakeholders such as investors, analysts, auditors and regulator face troubles to discover the extent of earnings manipulation, since general accepted accounting principles allow managers use their own judgments to prepare financial practice. (Schipper 1989b) argue that even the board of directors hardly distinguishes the normal accruals and discretionary accruals. For example, the increasing of amount of allowance of doubtful account is associated with higher risk when current customers will not pay back by cash or whether the managers use the great extent of credit policy to attract more customers.

2.4.2 Accruals methods to detect earnings management

Another concern of researchers is that how to detect earnings management on announced financial statements. As (Healy 1985) specifies that the accruals are the more favorable mean that managers choose to adjust income results. Hence, various academic literatures on earnings management emphasize to develop models to measure the degree of discretionary element of earnings. In the simple angle, discretionary accruals are determined as total aggregate accruals, while a number of complex models are tried to separate into discretionary and non-discretionary accruals. We will discuss more clearly about five common models to detect earnings management practice in this section.

In principle, total accruals are divided into non-discretionary accruals and discretionary accruals. All researchers try to calculate total accruals at first and estimate normal accruals and the residual is the discretionary accruals.

Firstly, in the paper of (Healy 1985) about the bonus-based incentives to control reported income, the author makes an assumption that discretionary accruals sum to zero over the executive's employment time with a company. Since accruals change the timing of announced incomes, at the end of an accounting period after determining amount of cash flows as well as nondiscretionary accruals, managers will use their discretionary judgments to adjust real earnings figures. The author conducts a test for earnings manipulation by correlating to the weight of mean total accruals in lagged total assets across the earnings management partitioning variable. The model of (Healy 1985) "estimates normal accruals as the deflated long-run accruals" (Ronen & Yaari 2008 ,page 397) and is presented below

$$NACC_{t+1} = \frac{1}{n} \sum_{i=t-n}^t \frac{TACC_i}{A_{i-1}} \quad (1)$$

Where *NACC* indicates the nondiscretionary accruals, while *TACC* presents total accruals; *t* refers for years in the estimated period, A_{i-1} is total lagged assets.

The second model of examining earnings management is of (L. E. DeAngelo 1986). Be consistent with (Healy 1985) about the definition of total accruals, as the proxy of earnings manipulation, DeAngelo (1986) scales prior total accruals by lagged assets, as the normal accruals.

$$NACC_t = \frac{TACC_{t-1}}{A_{t-1}} \quad (2)$$

Where *NACC* indicates the nondiscretionary accruals, while *TACC* presents total accruals; *t* refers for years in the estimated period, A_{t-1} is total lagged assets. This model assumes random-walk processes of total accruals. Besides, be contrary to (Healy 1985), (L. E. DeAngelo 1986) has modified earnings to reveal the influence of the equity methodology of accounting for intercorporate investments.

The third common model for detecting earnings management is of (Dechow & Sloan 1991b), is namely Industry model. In this paper, the researchers investigate the trend of R&D spending at the last year when executives are on their positions. These

authors rely on the foundation that all firms belonged to an industry have the same variation of nondiscretionary accruals. As (Dechow & Sloan 1991b) stated, based on the median total accruals divided by lagged assets, it is necessary to run regression to estimate the expected accruals. The equation (3) shows the model of (Dechow & Sloan 1991b)

$$NACC_t = \beta_1 + \beta_2 \frac{\text{Median}(TACC_t)}{A_{t-1}} \quad (3)$$

Where *NACC* indicates the nondiscretionary accruals, while *TACC* presents total accruals; *t* refers for years in the estimated period; *A* is total assets; β_1 and β_2 are two estimated parameters; *Median(TACC_t)* means the median value of total accruals for all non-sample companies belonged a specific industry section. Perhaps, the good side of this model is that it is not necessary for the researchers to build up a model of how the investigated factor such as R&D expenditure behaves. On the other hand, this approach exits some disadvantages. Firstly, it is suitable for event research in that not all companies participate in the similar event. Furthermore, in the case, other companies engage to control earnings in the opposite direction, this test might show non-existent earnings manipulation.

In addition, (Jones 1991) contributes the more precise accruals model to the academic literature on earnings management. Be consistent with the study of Healy (1985) and DeAngelo (1986), model of Jones (1991) is also based on the time-series estimation. Furthermore, time-series of a company's earnings can be divided into a couple of periods, an estimation period and the event one. However, Jones (1991) considers that non-discretionary accruals are not constant over the estimation duration and have a relationship to accruals to the changes in sales as well as property, plant and equipment. Since this assumption, the researchers argue that the model of Jones (1991) is more accurate than previous accruals models. Equation (4) shows the measure of normal accruals in the estimation period.

$$TACC_{i,t} / A_{i,t-1} = NACC_{i,t} / A_{i,t-1} = \alpha_i + \beta_{1,i} \Delta Sale / A_{i,t-1} + \beta_{2,i} PPEGT / A_{i,t-1} + \epsilon_{i,t} \quad (4)$$

Where $TACC$ as well as $NACC$ are total accruals and nondiscretionary accruals respectively; A is total assets, $\Delta Sale$ is the change in revenue; $PPEGT$ represents the value of gross property, plant and equipment; ε is error term; i is an index for firm, $i=1,2,\dots,N$; t is index for the period in the estimation period; coefficients α_i , $\beta_{1,i}$ and $\beta_{2,i}$ are respectively firm-specific parameters, which are estimated from a regression model.

After coefficients α_i , $\beta_{1,i}$ and $\beta_{2,i}$ are determined, the discretionary accruals are measured as the residual of total accruals and normal accruals. An equation of abnormal accruals is presented below.

$$DACC_{i,t} / A_{i,t-1} = TACC_{i,t} / A_{i,t} - \alpha_i + \beta_{1,i} \Delta Sale / A_{i,t-1} + \beta_{2,i} PPEGT / A_{i,t-1} \quad (5)$$

Where $DACC$ refers to discretionary accruals.

The last model of (Dechow & Sloan 1995) is called the modified Jones Model, since these authors would like to mitigate the error measurement of Jones (1991) model by changing the estimation of changes in sales ($\Delta Sale$) into the change in cash sales. As (Dechow & Sloan 1995) refer, change in cash sales is measured as change in revenues subtracts to change in account receivables, thus, these authors believe that the different in account receivables is contributed to the extent of earnings manipulation in the event period. Equation (6) below show the measurement of nondiscretionary accruals of (Dechow & Sloan 1995)

$$\begin{aligned} TACC_{i,t} / A_{i,t-1} \\ = NACC_{i,t} / A_{i,t-1} = \alpha_i + \beta_{1,i} (\Delta REV / A_{i,t-1} - \Delta AR / A_{i,t-1}) + \beta_{2,i} PPEGT / A_{i,t-1} + \varepsilon_{i,t}, \end{aligned} \quad (6)$$

Where ΔREV and ΔAR are respectively the changes in revenue and account receivables.

In conclusion, there are several methods of detecting earnings management and each method has its advantages and disadvantages. In the scope of this thesis, we adapt

Jones (1991) model to measure discretionary accruals, as the proxy of earnings manipulation.

2.5 Relationship between earnings management and R&D expenditure

In this section, we would like to discuss more about the association between earnings management and managerial decisions related to R&D activities. Based on the previous section about three widespread techniques for manipulating business results, most of the researchers have more emphasize on the effect and choice of R&D expenditure, as the significant as well as pervasive evidence of real activities manipulation (Perry & Williams 1994). Perhaps, because of the development of new technology industries, such as information and communication technology as well as biotechnology, combined with the significance of innovation to existing industries, it leads to the increasing spending on R&D projects in the last few decades.

In the beginning, under the general perspective in technology as well as innovation, a firm will obtain a good performance by making more investment to R&D activities over time. In particular, according to classic research in the economics of innovation, (Arrow 1962) argue that the whole society and private companies are suffered by the underinvestment. (Rosenberg 1990) also documents some thoughts that at the time that large companies have engaged on R&D actions to protect their monopolies, small ones do similarly to get first mover advantages. The similar target between large and small firms is trying to either preserve or improve firm value. Moreover, at the end of a business cycle, thanks to R&D investments, the capability to apply new knowledge of these firms will be accelerated (W. M. Cohen & Levinthal 1990). Thus, all these papers agree at a point that R&D activities are advantageous for the corporations as well as society.

Furthermore, a number of accounting academic researchers have emphasized R&D treatment in the preparing financial statements progress and R&D's value relevance to outside investors. As (Kothari et al. 2002)'s argument is that an association between R&D as well as the stability of future performance results of a firm is negative, suggesting that it is doubtful about the benefits of R&D investment in the

future. This finding supports for the treatment of R&D as the current expense under General Acceptable Accounting Principles.

Besides, according to (Baber et al. 1991), R&D spending is regarded as a discretionary investment. Baber et al (1991) discuss about three situations that are distinct by how the R&D decision impacts on the capability to report earnings greater than the income targets. The first situation is that whether managers accept or reject R&D projects, current-period earnings are greater than targets. Thus, it predicts that the entire R&D opportunities are acceptable because this decision does not endanger the earnings objectives. Be opposite to the first situation, the second circumstance is that when the expected income before R&D is smaller that target. Perhaps, if managers accept to invest all R&D projects, these costs do not modify the capability to reach the income target. Be similarly to the first case, the managers will agree to invest in all existing R&D chances. Baber et al (1991) also discuss about the third situation indicated that the ability of reported earnings greater than targets depends on R&D choices. In particular, approving available R&D chances generates current reported earnings smaller than the income target, while disapproving all R&D makes income larger than objective. In this case, if the benefit of managers relies on the reported earnings results, Baber et al (1991) supposes lower R&D spending on case 3 than on either case 1 or 2.

In addition, a part of accounting literature paid attention on the changes in R&D expenditure that is evidence of myopic investment decisions. “Myopic investment behavior (or managerial myopia) refers to underinvestment in long term, intangible projects such and R&D, advertising, and employee training for the purposes of meeting short-term goals” (Bushee 1998). Bushee (1998) argues that some short-term goals come from the managerial motivations to achieve income goals or to smooth earnings and so on. In particular, both the study of (Baber et al. 1991, Bushee 1998) document the similar result about the managerial incentives related to the decreasing of R&D spending in order to obtain earnings benchmarks. Moreover, the research conducted by (Dechow & Sloan 1991b) focuses on answering the question related to R&D decisions of CEOs in the period before they leave. If the executives

possess less proportion of stock option of their firm, they are more likely to reduce spending on R&D activities, thus, will get more short-term awards.

Further, the research of (Perry &Williams 1994) contributes to the academic literature on R&D spending associated with earnings surprise. In order to meet the expectation of analysts about short-term reporting earnings, the managers often cut down expenditure for R&D activities, thus earnings surprise is negative in comparison with unexpected R&D. Another study conducted by (Wang &D'Souza 2006), by using sample data in the period between 1980 and 2004, focus on the impact of accounting flexibility on R&D choices. These authors clearly classify that if a firm has the previous R&D spending less than a current period, it is the evidence of adjusting R&D to meet reporting targets of managers. Another different feature of Wang &D'Souza (2006) 's research design is that data included pre-R&D expenditure and pre-accounting management numbers are gathered to check the influence of ex-ante accounting flexibility on the R&D selections of companies with highly reporting motivation to control earnings through accruals or real activities. Finally, Wang &D'Souza (2006) find the evidence to support the positive correlation between earnings management and spending on R&D activities, in particularly, a firm with less accounting flexibility has more trends to decline R&D expenditure to achieve reporting targets.

Moreover, (Ewert &Wagenhofer 2005, Zarowin &Oswald 2005) papers present the issue related to the influence of accounting standards on how a company prefers to control its announced income. These authors examine on the UK firms choice whether capitalization or expensing their R&D spending. To manage earnings, expensing R&D immediately is more preferable than capitalizing; this tendency is in compliance with the belief that decreasing R&D budget helps to increase the expected income.

Besides, the study of (Bens et al. 2002) describes that in order to prevent earnings per share dilution resulting from employee stock option exercises as well as employee stock option grants, executives of a firm will take part in shares repurchase transactions. In this case, thanks to decreased R&D expenditure, managers can find a

part of fund to afford for these repurchase transactions. In a summary for this section, all previous studies support for the positive correlation between earnings manipulation and R&D expenditure and it comes from the strongly emphasizes of managers on short-term earnings rather than value creation.

3 EQUITY- BASED COMPENSATION

3.1 Agency problems

Previous sections have presented in detail about the nature, the motivations as well as the favorable techniques when managers take part in earnings management practice. Further, based on prior papers, the positive correlation between earnings management and R&D expenditure is proved. Thus, it raises a question is that why the managers can engage in manipulating reported earnings, while they are hired by the owners of a firm. The root of this problem is agency problems. In this part, we discuss about the reasons and the nature of agency problems.

Firstly, the occurrence of the modern corporation leads to segregation between ownership and control of wealth (Berle & Gardiner 1932). Beginning in 1776 and over more than 200 years later, under the perspective of the classical economic theory, private property in the means of the production permit and motivate the entrepreneur, as namely the sole proprietor, to make use of his skills as well as capital in an attempt to maximize his own prosperity. However, from the latter half of the nineteenth century; it is remarkable that ownership of American industries has switched from the sole proprietor to the large publicly traded corporation due to the increasing capital demand (Berle & Gardiner 1932). Providing by Berle & Gardiner (1932), at 1930, nearly 78% of America's business wealth and 38% of them are controlled by corporations and the top 200 largest firms respectively. Also, compared to non-financial companies, these 200 largest firms enjoy more than a double rate of growth (Berle & Gardiner 1932). Thus, a sole owner does not enable to come up with the additional economic obligations of the corporation. Consequently, the modern corporation generally has numerous owners, each purpose on making his investment as great as possible.

Furthermore, (Jensen & Meckling 1976) consider the private corporation as the group of contracting relationships among individuals. In actually, the company looks like a team whose members perform based on their own interests, however, aware that their destinies rely on the subsistence of the team in competitive markets. Within the set of

contracts called a corporation, management as well as risk bearing is considered as typically separated elements of the entrepreneur. Perhaps, the owners become *principals* when they employ managers to operate their company. Also, in the role of an agent of principals, a manager has his responsibility to accelerate the wealth of shareholders, on the other hand, a manager has just accepted as an *agent* position only if he observes the chance to maximize his self- utility. Under the view of the modern corporation, the similar feature between the principals and agents is that both of them are inspired by chances for their own personal wealth. In one hand, principals spend their money in a firm and establish an effective governance system to ensure the maximization of their profits. According to (Berle &Gardiner 1932), there are three main interests of owners. Firstly, principals prefer to gain the maximum wealth congruent with a proper risky level, also to allocate those profits generously and fairly to each shareholder. Last but not least, the owners are motivated to conserve an effective trading market for the investors. On the other hand, the agents are responsible for controlling principals' assets, because they aware the probability of increasing more wealth with this chance than by agreeing other one.

In the case, the utility purposes of both self-interested agents as well as principals are concurrent, agency problem does not exit; thus, not only the owners but also managers are satisfied with their great wealth. However, it is impossible for the shareholders or the managers at zero cost to make sure that the mangers will commit themselves to optimal judgments from the principal's perspective (Jensen &Meckling 1976). When, there is the conflict about the interest between principals and agent, agency cost will be incurred, since the managers are motivated to maximize their own wealth as the cost of the owners. For instance, in despite of the firm value will be increased compatible with extra managerial exertion, executives might want to enjoy more leisure time or dissipations (Jensen &Meckling 1976). Perhaps, the capability that agents and principals have not the similar interests and utility decisions is significant.

According to (Jensen &Meckling 1976), agency costs are measured as the aggregate of the monitoring expenditures by the principals, the bonding expenditures by the

agents and the residual loss. Firstly, monitoring expenditure refers to the cost that the principals are incurred to design a system to restrain the unusual activities of the agents. Moreover, in some circumstances, “it will pay the *agent* to expend resources (bonding costs) to guarantee that he will not take certain actions which would harm the principals or to ensure that the principal will be compensated if he does take such actions” (Jensen & Meckling 1976). Also, the residual loss means the dollar equivalent of the decrease in prosperity of the owners as the result of the deviation between the managers’ decisions and those decisions which would increase the benefits of the principals. Jensen & Meckling (1976) argue that the monitoring as well as bonding cost are positive and inevitable in every agency correlations.

(Jensen & Meckling 1976) have emphasized the key aim in agency theory, which is to mitigate the agency costs by setting up internal controls systems to prevent from the self-serving decisions of the agents. The study of (Walsh & Seward 1990) discuss the advantages and disadvantages of both internal and external corporate control mechanisms. Internal corporate control mechanism is designed by the board of directors to monitor and control the action of all the types of managers in a company, while, an external control circle reveals the market for corporate control such as the merge and acquisition transactions, divestitures and ownership amendments. The performances of a company rely on not only the efficiency of the internal control system but also as the availability or absence of internal entrenchment practices. It is argued that “if a firm’s managers entrench themselves with the sole objective of ensuring their own power, prestige and perquisites, the organization is likely to lose sight of its competitive environmental position and will fail” (Walsh & Seward 1990). In the case, the internal control system is ineffective and expensive, the market-based control mechanisms will proceed to control self-seeking agents (Walsh & Seward 1990). However, Walsh & Seward (1990) suggest that the firm should set up its suitable internal control mechanisms at first because of the expensive cost of the external control process incurred on shareholders.

In order to reduce the influence of agency problems, academic researchers suggest two main solutions, namely monitoring tools and executive compensation packages. To begin with, monitoring mechanism is divided into two elements which are inside

as well as outside monitors. For the internal monitoring channel, the role of board of directors is important. At first, a board of directors has the responsibility to communicate shareholders' targets and interests to managers. They have observed the managerial abilities and checked whether the decisions of managers make the wealth of shareholders reduce. Besides, not only board of directors but also outside auditors, analysts, financial institutions and government have contributed to the monitoring tasks. For instance, auditors will review and examine the accounting systems of a firm and evaluate the quality of its financial reports. Auditors will discover the existing drawbacks within operating accounting systems which can lead to the opportunistic behavior of managers and suggest some efficient solutions. In addition, by using their own special knowledge, analysts examine the financial performances of a company and reveal their opinions to the investment community. A second tool in attempt to congruent the interests between principals and agents is various compensation schemes. If the award of managers is determined by the successful accomplishment of shareholders' targets, executives are motivated to run the business in the viewpoint of shareholders. Thus, compensation policies become especially attractive when managers take advantages of inside financial information related to the business and monitoring tools are not effective.

In conclusion, agency theory is a suitable foundation to explain the correlations where there are the conflicts of interests among parties. In addition, thanks to suitable corporate governance structures and well-designed compensation policies, agency costs will be reduced. In the scope of this thesis, one type of incentive schemes, that is equity-based compensation, is discussed more details in the next section.

3.2 Purpose of equity-based compensation

As discussed in the previous part, no managers are automatically to make decisions consistent with the interests of shareholders. Thus, it is suggested that equity-based compensation belongs to one of the internal control mechanisms to align the interests between principals and agents. Supposedly, if the managers are also the owners of a firm, they are more willing to control the business to maximize the wealth of shareholders. In this section, the nature as well as benefits of equity-based awards in

practical, and the connection between equity-based remuneration and firm performance are discussed deeply.

In the beginning, it is reported that equity-based incentives become more adaptable for all corporation of United States during the 1990. In 1997, the 200 largest American firms have reserved more than 13 percent of their common stocks for compensation awards to executives, while this rate of previous 8 years is smaller than 7 percent (Morgenson 1998). Additionally, each industry has the different proportion of option-based remuneration. The options outstanding of corporations belonged to growth industries such as computer, software and pharmacist are fluctuated between 10 to 14 percent, while this rate in low-growth business sections such as utilities and petroleum is from 2 percent to 3 percent (J. E. Core & Guay 2001). The result of (Ittner et al. 2003) supports for the idea that high technology; “new-economy” companies have more tendencies to use the equity-based incentives than “old-economy” manufacturing ones.

In practically, a couple common types of equity-based compensation are stock options and restricted stocks. Firstly, the managers with their stock options have a right to buy a company’s shares at the fixed price, called the strike price. If the share price in the security market is higher than strike price, the managers will exercise their options to buy the stock at first and sell the stock for the cash after. Hence, the differentiation in this transaction is considered as a profit of the executives. Additionally, stock options help to motivate recipients to act such as accepting contracts, continuing working, committing themselves to tasks and so on, as the results, under the view of managers, the stock option value will be increased in the future. Furthermore, restricted stock is considered as the common shares of a firm, especially, it contains some special conditions such as specific years to pass or a fixed target to be attained prior to the share can be sold outside. Compared to stock option, although the share price of the firm decreases, the value of restricted stock does not go to zero.

According to some previous research papers, there is a relationship between company performance and executive wealth (Hall & Murphy 2002, Kole 1997, Main

et al. 1996). Main et al (1996) conduct the research about the link between total executives remuneration and firm performance in the sample of the top of Britain's largest companies in the period from 1981 to 1989. They discover that because of the existence of stock options, a more performance-sensitive compensation packages is created. In particular, these authors provide the evidence that "in absolute value, an extra £1 million in shareholder value brings the average top executives an extra £239 or so on a typical broadly measured annual pay package of £566,000" (Main et al. 1996). Also, according to (Garen 1994, Haubrich 1994), these amount is large enough to solve the agency problem. Consistent with the study of Main et al (1996), Hall and Murphy (2002) agree with the idea that because using stock options as a factor to set up a direct connection between the extent of firm performance and manager prosperity, the managers are more likely to make decisions that help to increase market share prices. Besides, the paper of Kole (1997) documents the results related to restricted stock and specifies that prior to the period that executives can be able to sale their restricted stock, there exists a straight association between share prices as well as manager wealth. Thus, it has the expectation that the difference about the interests between shareholders and executives is decreased by awarding managers either stock options or restricted stocks.

One point that should be taken into account is the relationship between equity remuneration packages as well as firm performance. Until now, there are two view angles about this issues. The first perspective is that observed equity-based compensation is, on average, "too low". (Morck et al. 1988) argue that if this tendency is precise, the firm will improve its firm value thanks to increasing the equity compensation for CEOs. Thus, in this case, the association between equity ownership of CEOs and firm performance is positive. As the result, Morck et al (1988) present some proofs in line with this argument, apart from among CEOs with large partial equity ownership. The study of (McConnell & Servaes 1990) supports the positive link from increasing ownership of managers to company performances if and only if managerial ownership is smaller than 50 percent. Furthermore, according to (Frye 2004), the firm with more equity-based remuneration to employees will get the better business results in long term periods. On the other hand, rather than considered the low managerial ownerships as the suboptimal remuneration design, (J.

Core & Guay 1999, Demsetz & Lehn 1985, Himmelberg et al. 1999) assume that the extents of managerial ownership are normally at the value-maximizing point. All these researches have the similar assumption that there is not simple ex-ante correlation between managerial ownerships as well as the results about company performance. In particular, it does not any expectation that firms with low percentage of managerial ownership will run their business badly since these firms do not need high-powered equity incentives to align the interests between managers and shareholders. As the results, Himmelberg et al (1999) document the evidence that it cannot expect to obtain a relationship between firm performances as well as the degree of equity incentives in equilibrium. Perhaps, the collected data in these studies examined the relationship between equity compensation packages and firm performance is not well-stated by a simple issue about incentives being “too high” or “too low” for most company (J. E. Core et al. 2003). In the scope of this thesis, we assume that when managers with low equity-based compensation are motivated to increase their ownership and this action will decrease the agency costs, make the interests of both managers and shareholders align and improve the performance of the firm.

In addition, the academic researchers have strongly emphasized to investigate some different reasons which lead to the widespread of the type of managerial compensation contracts based on stock options and restricted stocks. Firstly, although there is an argument is that using risky claims is more expensive compared with cash to remunerate a risk-averse manager for the last achievement, a company with a short of cash is more likely to reward its managers with equity as an alternative of cash dividends (J. Core & Guay 1999, J. E. Core & Guay 2001, Dechow et al. 1996). Perhaps, these arguments are structured on an assumption that relative to selling a same number of shares to the market, the company is less likely to be incurred the cost of capital when it “sells” a small number of stock to a manager instead of cash rewards. Furthermore, various companies with high-growth chances make an argument that stock-based incentive helps them to reinforce cash reward policy as well as increase the competence of excellent employees.

Secondly, tax advantage is one of reasons to explain the widespread of equity-based incentives. For instance, “the grants of options (and grants of restricted stock that are tied to performance-contingent plans) are not subject to the U.S. Internal Revenue Code Section 162(m) \$1 million limit on the tax deductibility of fixed compensation” (J. E. Core et al. 2003). Moreover, if the managers predict the higher corporate tax rate in the future, the future tax reduction from deferred awards can be advantageous compared to the instant tax decrease received from cash remuneration. Thus, corporations with lower marginal tax ratio are more favorable to reward their managers by stock options (Dechow et al. 1996, Matsunaga 1995, Yermack 1995).

The last benefit of stock-based compensation results from the special accounting treatment. In particular, differ than cash award or restricted stock, which is treated as an expense in the income report, the value of stock options is only presented in the footnotes to financial statements. (J. Core &Guay 1999, J. E. Core &Guay 2001, Dechow et al. 1996) provide the evidence that option compensation becomes greater when it is more expensive for companies to have low earnings.

In conclusion, equity-based compensation is regarded as the suitable tool to make the interest between agents and principles consistent in long-term periods. Besides the various advantages of equity remunerations, it contributes to the improvement of firm performance.

3.3 Hypothesis development

Based on the discussion on part 2.5, R&D expenditure is significant positive correlated with the extent of earnings manipulation. Furthermore, in fact, to make decisions related to whether a firm should invest in R&D activities and make the budget plan for these projects, managers rely on the expectation of the future benefits and growths which these projects bring back. Perhaps, the expectation of future benefits can be understood as the forecast revenues as well as earnings. Thus, it raises a concern about that if a firm has the higher level of long term R&D spending, this decision is reasonable and optimal not. The study of (M. F. McNichols &Stubben 2008) specifies that it has evolved as part of overinvestment. In this paper,

focused on fixed asset investments, a part of resource allocation within a company, researchers put a question that because of relying on distorted information, a result of earnings manipulation, key managers of a company give the excessive investments. Conducting the sample of public firms from 1978 to 2002, they find evidence that a firm is more tend to over-invest to it fixed assets during the misreporting period. Also, these researchers give two ways to explain to this phenomenon. The first reason is that since managers are either overoptimistic or not aware of misreporting, based on a misleading growth direction, they make the consistent level of investment decisions. Another argument is that although managers are aware of the misreport situation, they still continue to overinvest in a high risk approach to turn around performance.

In addition, there are a number of previous researches which are focused on the consequences of a high degree of capital investment, included R&D. For the one hand, if a firm allocates more its resources for long term R&D activities, this evidence can be understood as the future successful market development or the improvement of not only a firm's size but also its reputation in the near future. This argument is supported by the study of (Pandit et al. 2011). These authors consider future operating performance as both the level as well as volatility of earnings in some following years. The empirical results specify that a firm, with higher R&D spending, has the higher and less volatile its future operating performance.

In spite of a good effect, a large budget spending on R&D causes by financial constraints. Contrasts to the efficient market hypothesis, a large number of researchers find the evidence related to the slow reaction of investors to publicly financial information (Lakonishok et al. 1994). Also, the study of (Daniel & Titman 2006) is conducted to investigate the different reaction of investors to tangible and intangible information. They specify that, compared with tangible information, investors are tending to react incorrectly to intangible related announcements. Perhaps, intangible information includes the R&D expenditure of each firm, so that in a firm with higher spending on R&D activities, its abnormal earning is positive for a long time. In this case, it means that outside investors do not react accurately to the

benefit of R&D increases, thus a firm could face to a problem related to increasing its capitals in financial markets.

From a discussion about the two-side effects of a high R&D spending, it is necessary to examine the nature of earnings management. The study of (Cohen & Zarowin 2010) gives an evidence to support a link between a high level of earnings management and making suboptimal investment decision. Choosing corporations in the seasoned equity offerings, these authors pay an attention to analyze the tendency of these firms to manipulate earnings figure. Furthermore, they investigate two techniques of earnings management, which are accruals-based management and real earnings manipulation. As the result, they find that corporations have practiced two techniques for earnings-manipulated purpose around the seasoned equity offerings period. Moreover, this paper clearly specifies that in the case, a firm is less tend to distort reported financial figures, it can be understood as that its key managers have judged and decided a large expenditure of R&D correctly. Perhaps, in this situation, a decision related to a high level of long term investment is reasonable, and become a strong signal about the sustainable development of a firm in the future. On the other hand, if investors can analyze and attain the trend of earnings manipulation of a firm, a decision related to allocating more resources for investment activities is suboptimal.

Perhaps, it is argued that a positive relationship between earnings management and R&D expenditure can be explained by a conflict about the benefit arisen between executive managers and shareholders. As discussed in part 3.1, this conflict is called by an agency problem. Because of the rapid expansion about the size of modern firms, an agency problem becomes an unavoidable issue and its influence in society is deep and wider. In order to address this trouble, one of effective solutions is an executive compensation package. Numerous studies have documented the tendency of application of equity-based compensation in different kinds of business in reality (Baber et al. 1996, Gaver & Gaver 1993, Kwon & Yin 2006, Smith Jr & Watts 1992). For example, a firm with high growth opportunities and high technology has some unique characteristics, that are different strategies, a high confidential level of core technology, non comparable with its rivals. Since these special features are hard to

obtain by outside investors, information disparity is not avoidable. Thus, not only shareholders but also outside members of a board of directors cope with numerous obstacles to monitor and gather enough information to evaluate and support for R&D investment decision of executives. The study of (Smith Jr & Watts 1992) argues that the conflict between principals and agents becomes larger and wider if it exists a high extent of information asymmetry. The evidence of some paper such as (Baber et al. 1996, Gaver & Gaver 1993, Kwon & Yin 2006, Smith Jr & Watts 1992) indicates that the more high growth firms are, the more increasing proportion of grants of equity-based compensation to total awards for executives are.

As a result, it is suitable for arguing that equity related compensation is a helpful tool to motivating managers deciding an optimal level of spending on R&D activities. Perhaps, an investment decision related to R&D projects has a close correlation with the strategy of a firm in a long run, while equity based awards are effective to motivate managers to focus to the long term targets. We have an expectation that in a firm with a high degree of R&D expenditure, an executives' award policy related to stock options as well as restricted stocks is effective to reduce the extent of manipulating earnings figures. Our main hypothesis is stated as the following.

H: A positive correlation between earnings management and R&D expenditure decreases with the equity based compensation provided to corporate executives.

4 RESEARCH DESIGN

4.1 Measure of earnings management

Based on the previous literatures background of earnings management (García Lara et al. 2005, Pae 2007), we use the value of discretionary accruals as the proxy for the level of earnings manipulation.

Firstly, in order to calculate the total accruals, based on financial data of each firm, following the paper of (Dechow & Sloan 1995), it is computed as the sum of net change in working-capital accounts, and depreciation, scaled by total assets. A formulation of total accruals is illustrated as follow:

$$TACC_{i,t} / TA_{i,t-1} = [(\Delta ACT_{i,t} - \Delta CHE_{i,t}) - (\Delta LCT_{i,t} - \Delta DEBT_{i,t} - \Delta TXP_{i,t}) - DP_{i,t}] / TA_{i,t-1} \quad (7)$$

Where $TACC_{i,t}$ is total accruals of the firm i at the end of fiscal year t ; $TA_{i,t-1}$ represents the total assets of firm i at the beginning of fiscal year t ; ΔACT is the change in current assets; ΔCHE is the change in cash and equivalents; ΔLCT is the change in current liability; $\Delta DEBT$ and ΔTXP are the change in total debt, included current liabilities, as well as income taxes payable respectively; DP is depreciation and amortization expense; i is index to firm, $i=1,2,\dots,N$.

Furthermore, total accruals can be categorized into two elements that are non-discretionary accruals (NACC) and discretionary accruals (DACC). Thus, discretionary accruals, as the proxy of earnings management, are equated to total accruals minus non-discretionary accruals. This relationship can be illustrated as follow:

$$DACC = TACC - NACC. \quad (8)$$

Total accruals are calculated by the formula (7) while non-discretionary accruals are estimated by a model of (Jones 1991). A procedure of Jones' model is separated into two stages. First stage is related to an estimation period, in which (Jones 1991) have

an assumption that discretionary accruals are zero. It also means that total accruals are equal with non-discretionary accruals. Equation (9) has referred to Jones model:

$$TACC_{i,t} / TA_{i,t-1} = NACC_{i,t} / TA_{i,t-1} = \alpha_i + \beta_{1,i} \Delta Sale / TA_{i,t-1} + \beta_{2,i} PPEGT / TA_{i,t-1} + \varepsilon_{i,t}, \quad (9)$$

Where *TACC* and *NACC* are total accruals as well as nondiscretionary accruals respectively; *TA* is total assets, $\Delta Sale$ is the change in revenue; *PPEGT* represents the value of gross property, plant and equipment; ε is error term; *i* is an index for firm, $i=1,2,\dots,N$; *t* is index for the period in the estimation period; coefficients α_i , $\beta_{1,i}$ and $\beta_{2,i}$ are respectively firm-specific parameters, which are estimated from a regression model.

Next stage is the event period, which three coefficients α_i , $\beta_{1,i}$ and $\beta_{2,i}$ are plugged into equation (8) in order to calculate non-discretionary accruals of each firm *i* at the end of fiscal year *t*. Therefore, a discretionary accruals component is the difference between total accruals and a non-discretionary accruals element.

4.2 Measure of independent variables and other control variables

For the primary focus of this study, the moderating effect of equity-based compensation award on the relationship between the level of earnings management as well as R&D expenditure is examined by a following regression equation (10).

$$DACC_{i,t} = \beta_0 + \beta_1 RD_EQUITYMIX_{i,t} + \beta_2 RD_{i,t} + \beta_3 EQUITYMIX_{i,t} + \beta_4 DEBT_{i,t} + \beta_5 ROA_{i,t} + \beta_6 CEODUAL_{i,t} + \beta_7 CEOTENURE_{i,t} + \beta_8 LHISTORY_{i,t} + \beta_9 TA_{i,t} + \varepsilon_{i,t}. \quad (10)$$

The subscript *i* refers to the firms, while subscript *t* indicates the years. Table 1 below describes the definition of a dependent variable as well as various independent variables.

Table 1. The definition of variables

Variable	Definition
DACC	The discretionary accruals, a proxy for the degree of earnings management
RD_EQUITYMIX	The interaction term between RD and EQUITYMIX
RD	The ratio of research and development expenditure to total average assets
EQUITYMIX	The percentage of equity-based compensation to total compensation
DEBT	The sum of both current and long- term debt scaled by total assets
ROA	The proportion of income before extraordinary item to average total assets
CEODUAL	Dummy variable, that is equal one if CEO and the chairman of board of directors is one person; otherwise, zero
CEOTENURE	The log of number of years when CEO is appointed
LHISTORY	The logarithm value of the number of years that a firm has traded on stock market
TA	The log transformation of total assets at the end of a fiscal year

Following (Bryan et al. 2000b), EQUITYMIX can be understood as the percentage of an equity-based award on total compensation for chief executive officers. In particular, we measure it as total fair value of both option awards and stock awards at the grant date. Previous studies have documented different evidences about the correlation between equity incentive and earnings management. On the one hand, (Q. Cheng & Warfield 2005b) find this positive association and explain that since managers not only try to meet the expectations of Wall Street, but also maximize their own benefits through equity-based incentives, they are motivated to manipulate financial figures. However, (O'Connor et al. 2006) find the opposite evidence. The larger CEOs stock options awards mitigate the opportunistic behavior and motivate CEOs pay more attention to long-term profitable targets of a firm. Thus, we do not have any expectation about the coefficient of this dependent variable (β_3).

In addition, value of R&D expense comes from the Compustat data number 46. Regarded as RD, it is calculated by R&D expense scaled by total average assets. Following (Wang & D'Souza 2006)'s study, we expect a positive coefficient (β_2) on RD.

Turning into a main variable in this topic is RD_EQUITYMIX, which is shown the interaction between R&D expense and equity based compensation. This variable is

measured by EQUITYMIX multiplied by RD. In order to be logical with a key hypothesis, we have an expectation that the sign of this parameter (β_1) is negative.

- Other control variables

In the regression model, we put some control variables which might impact on earnings management based on some previous studies. The first control variable is DEBT, which is measured by the weight of short-term and long-term debt in the total assets at the end of a year. This ratio is regarded as the proxy for debt covenants of each firm. Previous studies provide the evidence related to the association between a high leverage and the probability to violate debt covenant (Press & Weintrop 1990). Besides, (DeFond & Jiambalvo 1994b) supports the links from discretionary accruals choices to debt covenant violation among the year preceding and the year of violation. To prevent from debt covenant violation, managers of a firm with a high leverage level are more likely to report income-increasing discretionary accruals. However, there are some studies such as (Cheng & Warfield 2005b) as well as (Richardson et al. 2002) which document an evidence about a negative relationship between earnings manipulation and leverage. Perhaps, if a firm has the high level of leverage, combined with a high tendency to manipulate earnings, it will lead to a risk to be getting caught. Thus, we do not have a clear expectation about a possible direction of coefficient (β_i).

Besides, we calculate ROA, be the return on assets, as the income before extraordinary divided by average total assets. Evidence in (Kasznik 1999), (McNichols 2001) indicates that there exists a correlation between discretionary accruals and earnings performance. A firm with high profit and high growth is more likely to exhibit discretionary accruals positively. On the other hand, the research conducted by (Shrieves & Gao 2002) supports a negative correlation between earnings manipulation and return on assets. They explain that managers in a profitable firm have not any motivation to distort reported earnings. As the result, we have not any clear expectation about the impact of ROA on the level of discretionary accruals.

Besides, we include CEODUAL, a dummy variable, which is 1 if the chairman of the board of directors of a firm is also CEO, otherwise, 0. CEO duality is one of the weak features of corporate governance. Perhaps, CEO is a powerful person to decide corporate-related issues, while a chairman of a board of directors has a key role to set up and negotiate a compensation package of a firm. If there is no separation between two positions, a company will face a high percentage of managing earnings as well as misreporting (Burns & Kedia 2006). However, some prior researches support a negative association between CEO duality and earnings management in the case the member of board of directors has stock options (O'Connor et al. 2006). Thus, with this variable, we do not expect any clear sign.

Next control variable is CEOTENURE, which is calculated as the log of the number of years when CEO of each firm is appointed. There are some different empirical results related to an association between earnings management and tenure horizon of CEOs. On the one hand, the longer time CEO is appointed for, the more familiar and cohesive with managerial corporate group he is. For a long time, if CEOs have not increased their own benefits through stock incentives, they are more likely to manipulate earnings as well as make their wealth status become better (Zhang et al. 2008). On the other hand, since protecting CEOs' good honor, they are less favorable to involve managing earnings (Gray & Cannella 1997). Thus, like CEODUAL, there is not a special expectation about the parameter of CEOTUENURE.

Moreover, another variable is LHISTORY, which is measured as the log transformation of the number of years of a firm beginning to trading on the stock market. (Biddle et al. 2009, Dechow 1994, Dechow et al. 1998, Dechow & Dichev 2002) provide the evidence that since the different features in a business model, each firm, which is at a different point of the business circle, may not have the same discretionary accruals. We do not expect about the signal of this parameter (β_8). On the one hand, similar to CEOTENURE, the longer time a firm has been traded on the stock market for, the more familiar and easier CEOs know how to control the movement of an earnings figure (Zhang et al. 2008). However, a firm with the short time to trade in the stock exchange market faces to many uncertain issues as well as various errors of estimation, which link to lower earnings quality (Dechow & Dichev

2002). Combined to more frequent investigations from SEC, younger companies become more cautious and less probability to manipulate an earnings figure (Burns & Kedia 2006).

The last control variable is TA, which is measured as the log transformation of total assets at the end of a fiscal year. The result of a study conducted by (Cheng & Warfield 2005a) is no evidence about the association between firm's size and discretionary accruals. However, perhaps the firm's size is related to the extent of an agency problem. Thus we have an expectation that the larger a firm is, the more conflict between agency-principal parties has; thus, it is more likely to manage earnings and the sign of the parameter of TA is positive.

5 EMPIRICAL RESULTS

5.1 Sample selection, Data and Descriptive statistics

To examine our hypothesis question, we use data related to publicly- traded US companies from 2006 to 2013. CEO compensation packages of these firms come from ExecuComp data. We also combine these data with Compustat and CRSP data in order to take the necessary financial information. With an original sample, which has 15,522 observations, firstly, we delete 2,875 firms belonged to a financial industry (SIC 6000-6999) because these firms have special features of finance. After that, observations, which have missing value such as total compensation data or some financial elements, are moved out. Next, in order to ensure a normal distribution, we exclude numerous outliers, which are out 1% and 99% level. Finally, we have 5,870 observations with adequate data to run regressions. In our study, we would like to conduct cross-sectional analysis which one of its advantages is to manage the impact of the changing industry-wide economic circumstances (DeFond & Jiambalvo 1994a).

Table 2 below describes descriptive statistics for all needed variables, which are discretionary accruals, R&D expenditure, equity-based compensation, total compensations and various financial items. First of all, a period between 2006 and 2013, average equity-based compensation is \$3,259,720, which is about 47% total compensation package for CEOs. Also, 67% is the highest percentage of equity-based compensation amount on total awards, which indicates the expanding of using equity incentives. Furthermore, during seven years from 2006, discretionary accruals fluctuate between 0.02 and 0.097. Also, compared with average total assets, the R&D expenditure is average 5%. About various financial characteristics, on average, total assets are \$7,375,860 and the weight of debt in total assets is 23%, with the maximum of 29%. In addition, firms in this sample have the mean return on assets ratio, equals to 3.3%. The median of CEOTENURE is 8.7 years, which presents that in this investigated period, a manager has worked as CEO position for average 8.7

years. Furthermore, the minimum firm's age is 18 years and a maximum value is 42 years.

Table 2. Descriptive Statistics.

Variable	Mean	Std Dev	Lower Quartile	Median	Upper Quartile
DACC	0.085	0.144	0.020	0.047	0.097
RD_EQUITYMIX	0.027	0.045	0	0.009	0.037
RD	0.054	0.078	0.005	0.026	0.077
EQUITYMIX	0.472	0.263	0.316	0.53	0.669
EQUITY(\$Thousands)	3,259.72	4,729.59	559.3	1,863.26	4,284.18
TDC1(\$Thousands)	5,524.25	6,036.23	1,779.80	3,743.16	7,103.30
AT(\$Thousands)	7,375.86	22,814.66	479.336	1,426.94	4,755.40
TA	7.362	1.73	6.172	7.263	8.467
DEBT	0.234	1.924	0.01	0.159	0.289
ROA	0.033	0.397	0.015	0.058	0.098
CEODUAL	0.485	0.499	0	0	1
CEOTENURE (No. years)	10.487	7.087	5.981	8.778	12.997
HISTORY(No. years)	30.239	17.077	18	24	42

Next, table 3 indicates the Pearson correlations among these variables. As can be seen in table 3, the largest negative correlation, which is equals to -0.57 at below the 1% significant level, is between DEBT and ROA. It means that if a firm increases debt to finance their business and the debt burden is costly, return on assets declines. Also, the relationship between EQUITYMIX and DACC is 0.06, consistent with the result of a (Q. Cheng & Warfield 2005a)'s research. Furthermore, if a firm has a long history to be traded in the stock market, it is more likely to manage earnings figures; it is shown by approximately 0.04, which is the coefficient between DACC and LHISTORY with the 1% significant level. Also, there is a positive significant relation (approximately 0.25) between two variables, which are discretionary

accruals and return on assets. This result is consistent with the study of (Kasznik 1999), (M. F. McNichols 2001).

Table 3. Pearson Correlations.

Pearson Correlation Coefficients, N = 5870							
Prob > r under H0: Rho=0							
	RD	EQUITYMIX	DEBT	ROA	CEODUAL	CEOTENURE	LHISTORY
DACC	0.1 <.0001	-0.008 0.542	0.29 <.0001	-0.352 <.0001	-0.047 0.0003	-0.018 0.171	-0.108 <.0001
RD		0.081 <.0001	0.133 <.0001	-0.148 <.0001	-0.126 <.0001	0.072 <.0001	-0.156 <.0001
EQUITYMIX			-0.038 0.004	0.058 <.0001	0.01 0.444	-0.115 <.0001	0.046 0.0005
DEBT				-0.546 <.0001	0.016 0.2327	0.019 0.1268	0.012 0.3496
ROA					0.005 0.692	0.006 0.666	0.013 0.307
CEODUAL						0.276 <.0001	0.167 <.0001
CEOTENURE							-0.023 0.079

5.2 Results analysis

After gather enough necessary data, we run the ordinary least squares regression for model 10. Table below 4 shows a result of a main test about the moderating influence of equity-based compensation on the correlation between earnings management and R&D spending.

Firstly, the coefficient between R&D expense as well as a discretionary accruals component, which is the proxy for the extent of earnings management, is positive and insignificant, with a coefficient of 0.077 and p-value of 5.7%. The insignificant coefficient on R&D expenditure does not support for the evidence of (Wang & D'Souza 2006), which states that one of preferable choices of CEOs related to manipulating an earnings figure, which is through managing R&D expenditure.

Furthermore, the parameter of RD_EQUITYMIX (β_1) is not in line with our expectation, which equals -0.063 and is statically insignificant with p-value of 0.409 . This result rejects our key hypothesis related to the decreased moderating effect of equity-based incentive on a positive correlation among earnings manipulation and spending on R&D activities. Also, we do not find evidence about a significant impact of CEOs' award related to equity on discretionary accruals, which a parameter is approximately 0.009 as well as p-value is 0.287 .

However, as reported in table 4, results for several control variables are significant and similar to those reported in previous studies. There exists the positive association between leverage ratio and earnings management at the 0.01 level (coefficient of 0.0104 and t-statistic of 9.4). This result is consistent with the argument of (Press & Weintrop 1990) that a company with a high debt-to-asset ratio tends to commit to violating financial contracts. Besides, following to (DeFond & Jiambalvo 1994b), because of being afraid of a debt covenant violation, reported earnings is likely managed upward.

Also as expected, the more profitable the firm is, the less extent of earnings management a firm engages. It is shown clearly that a value of the parameter β_5 of ROA variable, which points out the negative correlation between earnings management as well as return on asset element, is estimated equal to -0.1 and statically significant at the 1% level. This result confirms the finding of (Shrieves & Gao 2002) that the profitable firm is not more likely to control their discretionary accruals for an earnings management purpose.

Moreover, as reported in table 4, similar to evidence of (O'Connor et al. 2006), the extent of discretionary accruals is negative significantly correlated with CEO duality (coefficient of -0.008 and p-value of 0.034). Perhaps, CEO duality is a harmful sign for building strong corporate governance, however, in some cases; it makes all member of a board of directors become more careful in giving important business related decisions.

Turning into the effect of firm's age on earnings management level, a result in table 4 is consistent with those of (Burns & Kedia 2006). The parameter of this relationship is -0.027 and has a significance level at 1%. It means that the longer time a firm has traded on stock market, the lower level of discretionary accruals a firm engages. (Burns & Kedia 2006) explain that to avoid the bad consequences of many frequently regular examinations from Securities and Exchange Commission, younger firms are more careful to prepare their financial statements. Thus, it leads to lower level of earnings manipulation.

On the other hand, we do not find the significant evidence about the association between the discretionary accruals component and either total assets or the years the managers are in CEO position.

Table 4. Ordinary Least Squares Regressions Result.

$$\text{Model: } DACC_{i,t} = \beta_0 + \beta_1 RD_EQUITYMIX_{i,t} + \beta_2 RD_{i,t} + \beta_3 EQUITYMIX_{i,t} + \beta_4 DEBT_{i,t} + \beta_5 ROA_{i,t} + \beta_6 CEODUAL_{i,t} + \beta_7 CEOTENURE_{i,t} + \beta_8 LHHISTORY_{i,t} + \beta_9 TA_{i,t} + \varepsilon_{i,t}.$$

Variable	Prediction	Parameter Estimate
Intercept	?	0.165*** (12.47)
RD_EQUITYMIX	-	-0.063 (-0.83)
RD	+	0.077* (1.9)
EQUITYMIX	+/-	0.009 (1.07)
DEBT	+/-	0.0104*** (9.4)
ROA	+/-	-0.1*** (-18.58)
CEODUAL	+/-	-0.008** (-2.12)
CEOTENURE	+/-	-0.003 (-0.99)
LHHISTORY	+/-	-0.027*** (-8.00)
TA	+	0.002 (1.17)
Nobs	5,870	
Adj.R ²	0.15	

Note: ***, **, * indicate statistical significance levels at 1%, 5% and 10% respectively.

5.3 Sensitivity Analyses

Previous part, we have discussed the results of the main hypothesis based on the total sample. In this section, we do some sensitivity analyses to examine our hypothesis in different points of view. We divide our sample data based on the mean of R&D spending and some types of industry and investigate whether there is the stronger moderating effect of equity based remuneration on the positive relationship between earnings manipulation and spending on R&D activities.

5.3.1 Divided by mean of R&D expenditure

In the robustness test, firstly, we divide the sample into two subgroups based on the mean value of R&D spending scaled by average total assets. These sample firms have the proportion of R&D expenditure on the average total asset, which is more than 5.4%, are namely “High RD” group. On the other hand, the “Low RD” group has the weight of R&D expenditures in average total assets, which is smaller than 5.4%. Thus, the “high RD” group contains 1,991 observations, while the “low RD” group includes 3,879 firm-year observations. After dividing into two group, we run the ordinary least squares regression for model (10) and the results are presented in the table 5 below.

Compared with group with “low RD”, the results of “high RD” group support our main hypothesis. In the group of firms has the higher R&D spending, the parameter of RD variable is significant and positive (coefficient of 0.27, p-value is less than 1%). This result indicates that the managers of a firm with the larger R&D expenditures are more likely to engage in controlling discretionary accruals. This result is consistent with the evidence of the paper of Wang & D’Souza (2006). Turning into the coefficient on RD_EQUITYMIX, which refers to the interaction between RD and EQUITYMIX, is negative and statistical significant at 5% level (coefficient of -0.28, t-statistic of -2.46). Hence, this result supports hardly for the effective influence of equity-based incentives in an attempt to mitigate a positive correlation between earnings manipulation and R&D expenditure in the firm with the higher spending for R&D activities. Perhaps, this result suggest that if the company

has invested more its resources to R&D projects, in order to prevent the tendency of manipulating earnings figures through the R&D expense, equity-based compensation will be helpful tool for aligning the interests between managers and shareholders.

Table 5: Ordinary Least Squares Regressions Result- by the mean of RD

$$\text{Model: } DACC_{i,t} = \beta_0 + \beta_1 RD_EQUITYMIX_{i,t} + \beta_2 RD_{i,t} + \beta_3 EQUITYMIX_{i,t} + \beta_4 DEBT_{i,t} + \beta_5 ROA_{i,t} + \beta_6 CEODUAL_{i,t} + \beta_7 CEOTENURE_{i,t} + \beta_8 LHISTORY_{i,t} + \beta_9 TA_{i,t} + \varepsilon_{i,t}.$$

Variable	Prediction	Parameter Estimate	
		Group: high RD	Group: low RD
Intercept	?	0.096*** (3.43)	0.182**** (12.43)
RD_EQUITYMIX	-	-0.28** (-2.46)	0.297 (0.62)
RD	+	0.27*** (4.42)	-0.194 (-0.76)
EQUITYMIX	+/-	0.049** (2.52)	0.005 (0.5)
DEBT	+/-	0.01*** (6.02)	0.145*** (16.59)
ROA	+/-	-0.073*** (-3.78)	0.08*** (6.32)
CEODUAL	+/-	-0.005 (-0.65)	-0.009** (-2.07)
CEOTENURE	+/-	-0.009 (-1.63)	0.0003 (0.1)
LHISTORY	+/-	-0.018** (-2.48)	-0.023*** (-6.44)
TA	+	0.004* (1.93)	-0.008*** (-4.96)
Nobs		1,991	3,879
Adj. R ²		0.1379	0.2115

Note: ***, **, * indicate statistical significance levels at 1%, 5% and 10% respectively

Furthermore, the results on some control variables in the subsample firms with a higher ratio of R&D expenditures are similar to the results of the whole firm-year sample. For instance, the parameter of DEBT variable is always positive and has the statistical significance level at 1% in both groups of observations with the high and low level of R&D spending (coefficient of 0.01 and 0.145 respectively). This result

is consistent with the previous study of (DeFond & Jiambalvo 1994b), which is argued that, a firm with the high level of leverage avoid a debt covenant violation by managing discretionary accruals upwards.

In addition, the more profitable the company with the higher R&D spending is, the less motivations its managers have to engage in manipulating reported earnings. As can be seen on table 5, the coefficient of ROA in “High RD” group is -0.073 and significant as 1% level. This result is consistent with the finding of (Shrieves & Gao 2002).

Last but not least, in both groups with either high or low R&D expenditure, the firm’s age is negative related to the extent of the discretionary accruals component. Table 5 presents that the coefficient of LHHISTORY of “High RD” and “Low RD” is -0.018 and -0.023 respectively, and these results are statically significance levels at 5% and 1%. It is suggested that the older a firm has been traded in the security market, the less earnings management is (Burns & Kedia 2006).

5.3.2 Divided by industry

Since each industry has its unique features of business and the mix of discretionary accruals, we would like to examine our main hypothesis under the industry perspective. Firstly, we rely on the Fama-French classifications to divide the sample into 12 specific industries. According to Fama-French classifications, 12 different industries include consumer nondurables, consumer durables, business equipment, chemicals, energy, health, manufacturing, shops, telephone and television transmission, finance and others. Table 6 represents the name and the clear description of each industry and the specific number of firm-year observations belongs to each industry.

Table 6. Fama-French industry classifications.

Industry	Definition	Number of observations
NoDur	Consumer nondurables - Food, Tobacco, Textiles, Apparel, Leather, Toys	262
BusEq	Business Equipment - Computers, Software, and Electronic Equipment	1,880
Chems	Chemistry - Chemicals and Allied Products	314
Durbl	Consumer Durables - Cars, Televisions, Furniture, Household Appliances	231
Energy	Energy - Oil, Gas, and Coal Extraction and Products	85
Hlth	Health - Healthcare, Medical Equipment, and Drugs	884
Manuf	Manufacturing - Machinery, Trucks, Planes, Off Furniture, Paper, Company Printing	1,025
Shops	Shops - Wholesale, Retail, and Some Services (Laundries, Repair Shops)	937
Telcm	Telephone and Television Transmission	42
Other	Others - Mines, Constructions, Trans, Hotels, Bus Service, Entertainment.	210
Finance	Finance	Removing from the sample because of the special features of financial statements.
Utilities	Utilities	No data
	Totals observations	5,870

Since the firms belonged to finance industry has been removed before and there is no data of firms related to utilities industry, we have ten different industries to run the ordinary least squares regression for a model (10). Table 7 represents the results of each industry about not only the moderating influence of equity based remuneration on the relationship between earnings manipulation and R&D expenditures, but also the empirical correlation between discretionary accruals as well as some other control variables.

As can be seen from table 7, the results of business equipment industry, which contains firms related to computers, software and electronic equipment sections, are only strongly supported for our hypothesis. Perhaps, working in the computers, software or electronic equipment areas that require the high level of innovation and

greater technical inventions, it cannot deny the larger resources of these firms allocated for R&D activities. We find the evidence that, in business equipment industry, there is a positive association between R&D spending and discretionary accruals, since the parameter is approximately 0.293 and statistical significance level at 1%. This result is consistent with the argument of previous study which is that the larger spending for R&D activities is, the more tendencies the managers of these firms have to engage in earnings management (Baber et al. 1991, Dechow & Sloan 1991a, Wang & D'Souza 2006, Zarowin & Oswald 2005).

Furthermore, the extent of information asymmetry of firms belonged to a business equipment industry is higher than other industries, since these firms have the different strategies, a high confidential level of core technology and so on. As the consequences, it leads to the increase of agency costs (Smith Jr & Watts 1992). Thus, the finding of various academic research suggests that if the firm has the high development, it is suitable and effective to use more equity compensations for its managers to reduce the conflicts between managers and shareholders (Baber et al. 1996, Gaver & Gaver 1993, Kwon & Yin 2006, Smith Jr & Watts 1992). In our test, we find the significant evidence about the influence of equity-based awards on mitigating the level of earnings management through R&D expenses in the firms belongs to business equipment areas. Table 7 shows that the coefficient of RD_EQUITYMIX, the interaction between R&D expenditure and equity based compensation, of business equipment industry is -0.431 and has a significance level at 1%. Also, we do not receive any supportive proof for the main hypothesis among remaining nine industries, thus it can be understood that the equity-based compensation does not have any significant impact on the correlation between discretionary accruals as well as R&D spending.

In addition, almost of ten industries, except for energy, health, telephone and television transmission have the positive and significant coefficient of DEBT variable. This result supports for the finding of (DeFond & Jiambalvo 1994b), which documents that if the leverage ratio of a firm is high, and by managing income-increasing accruals the firm can prevent from the violating debt covenants.

Table 7. Ordinary Least Squares Regressions Result- by industry.

$$\text{Model: } DACC_{i,t} = \beta_0 + \beta_1 RD_EQUITYMIX_{i,t} + \beta_2 RD_{i,t} + \beta_3 EQUITYMIX_{i,t} + \beta_4 DEBT_{i,t} + \beta_5 ROA_{i,t} + \beta_6 CEODUAL_{i,t} \\ + \beta_7 CEOTENURE_{i,t} + \beta_8 LHISTORY_{i,t} + \beta_9 TA_{i,t} + \varepsilon_{i,t}.$$

Variable	Prediction	Parameter Estimates									
		NoDur	BusEq	Chems	Durbl	Energy	Hlth	Manuf	Shops	Telcm	Other
Intercept	?	0.165** (2.16)	0.142*** (7.54)	0.161*** (2.71)	0.289*** (4.75)	0.016 (0.20)	0.054 (1.06)	0.127*** (4.87)	0.212*** (6.30)	0.634** (2.42)	0.327*** (3.29)
RD_EQUITYMIX	-	-0.362 (-0.12)	-0.431*** (-5.34)	-0.361 (-0.26)	-0.73 (-0.86)	1.215 (0.34)	0.033 (0.12)	-0.141 (-0.37)	-0.743 (-0.60)	-2.489 (-0.74)	2.162* (2.04)
RD	+	0.261 (0.15)	0.293*** (6.80)	-0.124 (-0.18)	0.224 (0.51)	-0.834 (-0.45)	0.083 (0.54)	0.149 (0.76)	0.658** (2.08)	0.271 (0.42)	-1.072 (-1.61)
EQUITYMIX	+/-	0.015 (0.25)	0.041*** (3.48)	-0.02 (-0.38)	0.046 (1.03)	-0.003 (-0.04)	0.089** (2.53)	0.005 (0.26)	-0.008 (-0.45)	-0.023 (-0.24)	-0.028 (-0.62)
DEBT	+/-	0.356*** (6.66)	0.216*** (16.86)	0.122*** (3.05)	0.302*** (6.15)	0.123 (1.32)	0.002 (0.78)	0.207*** (8.83)	0.101*** (5.65)	0.004 (0.03)	0.204*** (7.57)
ROA	+/-	0.148 (1.25)	0.06*** (3.43)	-0.007 (-0.08)	0.099 (1.37)	-0.005 (-0.03)	-0.191*** (-5.19)	0.08** (2.35)	-0.017 (-0.38)	-0.116 (-1.34)	0.181*** (4.58)
CEODUAL	+/-	0.021 (0.91)	0.0006 (0.12)	0.024 (1.39)	-0.003 (-0.18)	-0.01 (-0.49)	-0.037*** (-2.64)	-0.025*** (-3.48)	-0.02** (-2.22)	-0.005 (-0.10)	0.002 (0.08)
CEOTENURE	+/-	0.006 (0.38)	0.002 (0.45)	-0.006 (-0.49)	-0.001 (-0.06)	-0.005 (-0.45)	0.002 (0.26)	0.0006 (0.12)	-0.005 (-0.90)	-0.013 (-0.45)	0.005 (0.25)
LHISTORY	+/-	-0.022 (-1.52)	-0.025*** (-5.30)	-0.023* (-1.82)	-0.025* (-1.84)	0.016 (1.06)	-0.008 (-0.59)	-0.016*** (-2.65)	-0.043*** (-4.25)	-0.157** (-2.05)	-0.021 (-0.82)
TA	+	-0.018** (-2.22)	-0.007*** (-4.02)	-0.003 (-0.52)	-0.027*** (-3.72)	-0.002 (-0.32)	0.006 (1.41)	-0.005 (-1.57)	0.001 (0.32)	-0.003 (-0.26)	-0.028*** (-4.24)
Nobs		262	1,880	314	231	85	884	1,025	937	42	210
Adj. R²		0.153	0.161	0.042	0.191	-0.051	0.185	0.085	0.057	-0.044	0.683

Note: ***, **, * indicate statistical significance levels at 1%, 5% and 10% respectively

6 CONCLUSIONS

Financial statements are the important channel that the outside stakeholders, such as investors, analysts, creditors, the government and so on, rely on in order to obtain the business performance of the firm and make their optimal decisions. Financial reports reveal the business results of some previous periods and current periods, how the resources of a firm are allocated and its liabilities. For example, the investors will pay attention on the R&D expenses of a firm because they believe that it is the good foundation to make the expectation about the firm growth. Pandit et al (2001) provide the supportive evidence that a firm with higher R&D spending will have the higher and more persistent operating performance results in the future. Besides, the accepted accounting procedures that a firm has used are presented in the public financial statements. The current accepted accounting standards allow the managers to give their judgements and choose the suitable accounting methods for the firm's business feature and its circumstances during the progress of preparing accounting numbers. Hence, it is suggested that in some situations, it will lead to the earnings management practice of the managers.

According to the standard setters' perspective, earnings manipulation only occurs in the cases that executives use their individual judgments in not only financial statements but also restructuring business transactions. The aims of earnings management are both misleading some stakeholders about the economic performance and impacting on contractual results. The academic research investigate three main incentives for earnings manipulation practice. They are the capital market incentives, contracting motivations as well as regulatory motivations. The managers will use their own judgments to adjust earnings results upwards in order to either meet the expectations of the investors, maximize their individual awards which rely on the accounting results or prevent from debt covenant violations. The earnings will be managed upward in some situations such that the managers would like to reduce the political cost or when the firm is in import relief investigations.

Furthermore, three key techniques that managers can use to manage earnings are accruals, changing accounting policies and real activities manipulation. Among these techniques, since controlling earnings through the discretionary accruals component

is more flexible for the inside managers and it is hard for the investors or analysts to detect, therefore, accruals are preferable in the practice. For instance, by making some judgements related to discretionary accruals, the managers can shift one part of the future profits to the current earnings or defer a certain amount of current earnings, as the results, the reported earnings will increase or decrease respectively. However, because of the reversal characteristic of accruals, the managers have just used accruals-based earnings manipulation in the short term.

Moreover, in order to adjust the reported earnings to the desirable amount, managers can affect R&D expenditure because it is regarded as a discretionary investment. Previous studies have supported the positive connection between earnings manipulation and R&D spending. For example, before the CEOs leave, they have strong motivations to increase the earnings results, which tie to their short-term awards, by decreasing spending on R&D activities. The reasons for this phenomenon come from not only the segregation between ownership and control but also information asymmetry. These reasons will lead to the different interests between shareholders and managers, namely agency problems.

The purpose of this thesis is to investigate the moderating impact of equity-based remuneration on the positive correlation between R&D expenditure as well as earnings management. On the other words, our aim is to explore the beneficial view into the influence of a managerial equity-based award on R&D investments and earnings manipulation practice. Equity compensation belongs to one of two solutions to address agency problems, which are monitoring tools and executive compensation packages. Perhaps, there is the widespread of managerial awards related to equity instruments over twenty years ago and almost researchers agree about the effective influence of this policy on make the interests of principals and agents align. In addition, equity-based compensation motivates the executives of the firm focus on long term targets rather than short-term results. Therefore, we predict and set up our hypothesis that the positive association between earnings management and R&D expenditures will decline with the existence of equity-based compensation provided for executives.

Next, to examine our main hypothesis, we continue to build up a research model. Following various previous study, we use discretionary accruals as the proxy for earnings manipulation and Jones (1991) model is taken into account to measure discretionary accruals. The variable related to the moderating effect of equity-based compensation is measured as the interaction between the percent of equity-based awards on total awards for executives and R&D expenditures. We also add more some different control variables which might effect on earnings management, such as return on assets, a leverage ratio, total assets and so on. After running ordinary least squares regression for the full sample from 2006 to 2013, we find the insignificant evidence to support our hypothesis. On the other words, the equity-based compensations do not have a significant impact on the correlation between earnings management and R&D investment.

Furthermore, we do some robustness tests. We divided the whole sample based on the mean value of R&D expenditure and Fama -French industry classifications. In particular, we find the significant evidence that within the sample of firms that emphasize to allocate more its resources for R&D activities, compensating managers by equity instruments is effective to reduce the tendency of manipulating earnings numbers through R&D spending. In additional, we discover the significant proof in line with our hypothesis among the sample companies that work in computers, software and electronic equipment section. Thus, these results suggest that two kinds of companies, which equity remuneration policies are helpful in inspiring executives to decide an optimal level of R&D investment by preventing from earnings manipulation, are firms with the higher spending for R&D activities and working in the industries that have the higher level of technological elements and require the larger innovation.

In conclusion, equity based compensation is suitable for using not only in firms with the large amount of R&D projects but also firms belong to technology industry such as computers, software and so on. This policy will help to mitigate the earnings management associated with R&D investment and reduce the conflicts about interests between managers and shareholders. However, it should be cautious when the results of this study are generalized, because there exit some certain limitations. Firstly, in our study, Jones (1991) model is used to estimate the extent of

discretionary accruals, as the proxy for earnings managements, and (Ibrahim 2009) argues that the linear performance-matching Jones model by Kothari et al (2005) is more powerful to measure the discretionary accruals than Jones model. As the results, our results related to discretionary accruals are bias estimated and might influence the outcome main results. Furthermore, since the lack of available data, all variables to measure corporate governance that might correlate with earnings management behavior do not add in the research design. Also, in the scope of this thesis, we assume that equity based compensation is “low” and analyze its impact on earnings management behavior by an incentive-alignment perspective. It is suggested that the further research will release our assumption and analyze deeply equity-based compensation under the risk diversification view on a relationship between earnings management and R&D expenditure.

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