Earnings Management and Corporate Governance Mechanisms prior to Leveraged Buyouts in the UK

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Abstract

This research examines the use of accruals (AEM) and real earnings management (REM), and how they are affected by corporate governance mechanisms preceding leveraged buyouts in the UK. The sample includes all UK leveraged buyouts of listed firms between 1997 and 2011, which covers the second wave of leverage buyouts in the UK. The research considers management buyouts (MBOs) and institutional buyouts (IBOs) separately, because managerial incentives regarding earnings management are expected to differ in these two settings.

The first empirical study investigates the existence of AEM, and how audit committee characteristics and external auditing quality affect AEM, prior to MBOs and IBOs. The findings suggest that managers engage in negative AEM prior to MBOs, possibly to reduce the perception of firm value, and thus depress the purchasing price of MBOs. The research finds no evidence that firms subsequently targeted in IBOs engage in AEM to a greater degree than non-buyout firms. This finding might be related to the fact that managers are unable to predict IBOs. Moreover, the research suggests that quality of audit committees and external auditing has a greater impact on AEM in IBO than in MBO firms.

The second empirical study explores the use of REM preceding MBOs and IBOs, and how block ownership and board characteristics affect it. Surprisingly, the findings suggest that managers pursue positive REM prior to both IBOs and MBOs. As firms targeted by IBOs tend to be undervalued compared to non-buyout firms, managers might engage in positive REM to improve the firm's share price to reduce the risk of IBO bids. Positive REM prior to MBOs may serve to enhance prospective external financiers' perceptions of the firm's value to secure financing for MBOs, even though it is likely to increase the purchasing price of MBOs. The research also indicates a positive relationship between insider and outsider block ownership and REM.

While the findings for firms targeted by IBOs in first two empirical projects are consistent with the expectation that managers try to improve the perception of the performance and value of their firms, the findings for MBOs appear inconsistent and rather baffling. The third empirical study thus explores the puzzle of how decisions about AEM and REM are related in firms prior to IBOs and MBOs. The research reveals that, while AEM and REM have a complementary relationship preceding IBOs, prior to MBOs, AEM and REM have a substitutive relationship.

This thesis contributes to our understanding of earnings management prior to IBOs and MBOs. Moreover, the findings highlight that the impact of firms' corporate governance characteristics on earnings management differs depending on the setting. This might be related not only to different managerial incentives but also to a lack of context awareness by directors or auditors.

Key Words: Accruals earnings management, Real earnings management, Corporate governance mechanisms, Management buyouts and Institutional buyouts

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List of Glossary and Abbreviations

AEM	Accruals-based earnings management
REM	Real activities earnings management
GAAP	Generally Accepted Accounting Principles
MBOs	Management buyouts
IBOs	Institutional buyouts
CFO	Cash flow from operations
OLS	Ordinary least square
3SLS	Three-stage least squares
2SLS	Two-stage least squares
ICB	Industry Classification Benchmark
CEO	Chief Executive Officer
VIFs	Variance inflation factors
R&D	Research and development
SG&A	Selling, general and administrative
COGS	Costs of goods sold
SSAP	Statements of Standard Accounting Practice
ROA	Return on assets
SOX	Sarbanes–Oxley Act
GLS	Generalised least squares
GMM	Generalised method of moments
UK	The United Kingdom
US/USA	The United States of America

Declaration

I hereby declare that this thesis is solely based on my own research. For the best of my knowledge and belief, no material contained in the thesis has previously been submitted for a degree in this or any other institution.

Statement of Copyright

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Dedication

I dedicate this thesis to my beloved mom and dad who share this dream with me.

1. Chapter 1: Introduction

1.1 Research background and motivation

Leveraged buyouts have become a distinct and increasingly important type of acquisition in global financial markets, which have also attracted increasing academic interest. A leveraged buyout is the purchase and delisting of a publicly listed corporation, in which the buyers are typically funded by substantial amounts of debt and backed by private equity firms (Weir and Wright, 2006). Within the UK market, since the 1990s, there has been a significant increase in the number and value of leveraged buyouts. The value of leveraged buyout deals has increased from £458.62 million in 1997 to £3802.91 million in 2010. In the peak year of 2006, there were 17 leveraged buyouts with the average value being £1267.12 million per deal (Thomson ONE database, Table 1.1 in the appendix). In leveraged buyouts, whether the company is purchased in a direct transaction by incumbent management or by outside institutional investors, the price paid for the firm directly affects the cash flow accruing to both sides of the transaction. In either case, purchasers always seek the lowest possible purchase price, and selling shareholders are concerned whether they get the highest possible sales price.

However, information asymmetries generally exist between better-informed managers and less well informed outsiders (Jensen and Meckling, 1976). In leveraged buyout firms, the shareholders are principals, and managers act as agents. Information asymmetries arise when principals cannot reliably observe and interpret information about the competencies, intentions, expertise and actions of agents (Saam, 2007; Sepe, 2010). Information asymmetries might lead to moral hazard problems, which occur when an agent believes that their opportunistic behaviours will not be detected (Saam, 2007). In this case, a divergence of interests between principals and agents might lead to the exploitation of principals.

Information asymmetries create a demand for internally generated measures of a firm's performance to be reported on a periodic basis. Accounting earnings information thus plays a crucial role in reducing information asymmetry. For instance, prior to leveraged buyouts, potential bidders make extensive use of publicly available accounting information[1], such as earnings figures, to help them to model the valuation of firms. Earnings information therefore has great value relevance to investors and other financiers, and their demand for such information increases when they are making decisions (Aharony and Barniv, 2004). A detailed analysis of earnings information can also help shareholders to assess whether they have been offered a fair price in leveraged buyouts (Bull, 1989). For instance, DeAngelo (1990) found that investment bankers make extensive use of accounting earnings for firm valuation in leveraged buyouts. Perry and Williams (1994) also report that accounting earnings are used by the courts to assess the fairness of a buyout price when selling shareholders claim that their compensation is inadequate in management buyouts (MBOs). As financial statements should provide value-relevant information to the external stakeholders of a firm, the heavy reliance on accounting numbers creates powerful incentives for managers to manipulate earnings. Therefore, earnings management is a potential issue prior to leveraged buyouts.

There are two types of earnings management, accruals-based earnings management (AEM) and real activities earnings management (REM). AEM 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

[1] Potential bidders might also need access to private information in confidentiality agreements.

contractual outcomes that depend on reported accounting numbers" (Healy and Wahlen, 1999: 368). AEM involves changing discretionary accrual choices within the boundary of Generally Accepted Accounting Principles (GAAP), it therefore directly influences the amount of accounting accruals, and has no direct effect on cash flows (Kim and Sohn, 2013).

In contrast, REM refers to "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (Roychowdhury, 2006: 337). REM involves changing the normal operating decisions of the business. REM can have direct consequences on current and future cash flows as well as on accounting earnings (Kim and Sohn, 2013). Although both types of earnings management aim to conceal the actual performance of the firm, AEM and REM have distinct characteristics and effects on firm performance. Hence both types of earnings management are significant concerns prior to leveraged buyouts.

A relatively small number of empirical studies have previously investigated AEM prior to MBOs in the US market. MBOs are leveraged buyouts in which managers are involved as buyers. Although the evidence is somewhat mixed, most of these studies (e.g. Perry and Williams, 1994; DeAngelo, 1986; Wu, 1997) suggest that managers engaged in negative AEM prior to MBOs, possibly in an attempt to depress valuation by concealing the real value of the firm so that shareholders might accept a lower buyout price. In contrast, Fischer and Louis (2008) report that managers engaged in positive AEM prior to MBOs, possibly to enhance prospective external financiers' perceptions of a firm's value in order to secure finance for buyouts. The contradictory results of prior studies encourage more research to be done in this field in an attempt to find further evidence. Moreover, prior studies have not investigated REM behaviours preceding leveraged buyouts when both AEM and REM are at the managers' discretion. By investigating both AEM and REM, this research might be able to explain further the reasons behind the contradictory results in previous studies.

There are several types of REM behaviours, such as sales manipulation or overproduction, and managers might choose different strategies in their use of specific types of REM due to the potential long- or short-term effects. Aggregate REM is less likely to reveal specific strategies in REM. Hence investigating differentiated REM behaviours, rather than total REM behaviours, might provide a better understanding of managerial incentives and behaviours. In addition, given the portfolio of earnings management strategies, managers might use AEM and REM as complements or as substitutes for each other in order to increase the probability of beating earnings targets and to lower the risks of detection. Examining the relationships between AEM and REM might give a clearer understanding of the strategies that managers use in overall earnings management.

In addition, prior studies have focused on AEM prior to MBOs, but the earnings management behaviours preceding another important type of leveraged buyout, institutional buyouts (IBOs), is under explored. IBOs are exclusively buyouts that are initiated and executed solely by outside institutional investors and private equity houses without including target firm's management in the transaction. This research has found that IBO firms have undervalued shares in the market, as measured by the industry-adjusted price-earnings ratio. Firm undervaluation attracts IBO buyers (Hafzalla, 2009), and IBOs threaten managers' long-term job security (Denis and Denis, 1995). It appears that, as managers become aware that their firm has been undervalued, which might become a potential IBO target, they are more likely to engage in earnings management in an attempt to increase their firm's value. Hence managers might have different incentives in MBOs and IBOs, and their earnings management behaviours might be different prior to buyouts. Investigating and comparing earnings management behaviours prior to these two types of buyouts might provide a better understanding of managerial incentives and earnings management behaviours in leveraged buyout settings.

Furthermore, corporate governance mechanisms play an important part in mitigating earnings management behaviours, but prior studies have not explored this issue in leveraged buyout settings. Specifically, different types of leveraged buyout might provide different incentives for different stakeholders, and the effects of corporate governance mechanisms on earnings management behaviours might be different in MBOs and IBOs. Hence it is worth investigating the effects of corporate governance mechanisms on earnings management preceding MBOs and IBOs.

Most of what is currently known about leveraged buyouts comes from studies that analysed US samples from the 1980s and 1990s (e.g. DeAngelo, 1986; Perry and Williams, 1994). It is questionable whether the US evidence is generalisable to the UK, due to the distinct characteristics of the markets. In the UK, leveraged buyouts have relatively fewer hostile takeovers, lower debt levels, focus more on growth opportunities and are commonly financed by privately placed mezzanine funds rather than junk bonds (Toms and Wright, 2005). Moreover, the most recent wave of leveraged buyouts in the UK, starting from 1997, is different from the first wave in the 1980s. In the latest wave, increasing numbers of private equity and debt financiers were willing to provide financial backup to support the buyout transactions. Furthermore, target shareholders were more likely to accept condition of irrevocable undertakings, a binding agreement on target shareholders to accept a buyout offer, which increases the chances of success in buyout transactions (Renneboog et al., 2007). Hence it is important to investigate earnings management behaviours prior to leveraged buyouts in the UK.

Leveraged buyouts are a distinct and significant type of acquisition in financial markets, and the self-interested behaviours of managers prior to buyouts may significantly affect buyout transactions. Prior literature (e.g. DeAngelo, 1986; Perry and Williams, 1994; Wu, 1997; Fischer and Louis, 2008) mainly focuses on AEM behaviours prior to MBOs, and the findings are inconclusive, suggesting either positive or negative AEM. Earnings management behaviours prior to IBOs are under explored. Hence there is a research gap relating to all types of earnings management behaviours prior to both MBOs and IBOs. This research investigates this research gap by taking account of managerial incentives in order to provide a better understanding of management behaviours preceding leveraged buyouts. There is also a call for future research to explore the effects of corporate governance mechanisms on earnings management in special situations (e.g. Shan, 2015; Renneboog et al., 2007). This research therefore explores this research gap to investigate the effectiveness of corporate governance mechanisms on earnings management practices prior to leveraged buyouts. The findings of this thesis may have implications for existing shareholders, potential investors and corporate boards. They might have a better understanding of managers' incentives and behaviours so that to be more active in protecting or maximising the long-term interests of shareholders. Moreover, the findings may have implications for governance regulators who seek to enhance the monitoring and control mechanisms for potential earnings management practices.

1.2 Aims and objectives

This study aims to carry out an investigation on the use of AEM and REM, and to determine how they are affected by corporate governance mechanisms preceding leveraged buyouts in the UK. This research differs from prior studies as it provides a new angle on the earnings management literature by examining managerial AEM behaviours preceding leveraged buyouts in the UK. Weak corporate governance enables greater managerial discretions to manipulate earnings, but good corporate governance limits managers' ability and thus potentially restricts earnings management behaviours. Hence, corporate governance is important for mitigating earnings management behaviours. This study provides a new angle on corporate governance literature by examining the relationship between corporate governance mechanisms and AEM prior to leveraged buyouts in the UK. Specifically, AEM is achieved by changing the accounting methods or estimates used, which carries a high risk of drawing the scrutiny of auditors (Cohen and Zarowin, 2010a). Hence this aspect of the research focuses on audit committee characteristics and the quality of external audits.

Since REM is at managers' discretion, this study extends the earnings management literature by examining managerial REM behaviours preceding leveraged buyouts in the UK. As managers might use different strategies in different types of REM, due to the potential long- or short-term effects of each type, this study investigates specific types of REM in addition to aggregate REM.

This study also examines the relationships between corporate governance mechanisms and REM prior to leveraged buyouts in the UK. As REM uses managerial discretions over business operational decisions, it is more likely to be constrained by effective monitoring and control from significant shareholders and boards rather than from auditors. Thus the investigation focuses on the shareholding by outsiders and board characteristics instead of on auditors. Shareholders might have diverse concerns regarding the negative impact of different elements of REM, for instance, institutions with long-term investment horizons might greatly concern about research and development expense cuts. Accordingly, this research investigates disaggregated components of REM.

Furthermore, examining only one earnings management technique at a time may not explain the overall effect of earnings management activities if managers use AEM and REM as complements or as substitutes for each other (Fields et al., 2001). Hence this study provides a new angle on earnings management literature by investigating the relationship between AEM and REM preceding leveraged buyouts. This relationship might also be constrained by the relative costs of engaging in AEM and REM and by managers' abilities to use the two earnings management methods. For instance, if their ability to use REM is constrained or the costs attached are high, managers may have a tendency to use more AEM. Similarly, if their ability to use AEM are constrained or the costs attached are high, managers may have a tendency to use more REM. Thus controlling for a set of constraints of the two types of earnings management might contribute to the investigation of the relationship between AEM and REM.

Prior literature usually assumes that AEM and REM might be related sequentially as REM needs to be engaged in reasonably far ahead of the publication of the financial reports, whereas AEM is likely to be more flexibly arranged in the short run after fiscal year end (e.g. Lara et al., 2012; Zang, 2012). However, this sequential relationship that REM is engaged prior to AEM is merely based the expectations on theoretical and/or practical considerations. Moreover, if AEM and REM have a sequential relationship, which sequence the relationship is likely to be in. Prior studies do not actually test whether they get the sequence right.

Hence, this raises the question that whether AEM and REM might really have a relationship given their distinct differences. Specifically, AEM changes discretionary accrual choices within the boundary of GAAP to distorting the impression of a firm’s financial position (Kim and Sohn, 2013). REM changes normal operations to influence both accounting accruals and cash flows in the current period (Kim and Sohn, 2013). This suggests that AEM and REM might not actually be related, as they are very different types of activities.

In contrast, this study suggests that managers might consider both AEM and REM jointly rather than consecutively. Managers might consider their ability and the most degree that could engage in each type of earnings management jointly, because the limited flexibility to exercise AEM constrains managers (Gunny, 2010), and balance the use of AEM and REM could reduce associated risks and costs.

Prior literature tends to simply use aggregate measure of REM in investigation might have increased the noise in the measure due to managerial different strategies in terms of the different types of REM, which might lead to spurious results (e.g. Lara et al., 2012; Zang, 2012). In contrast to argue the sequence of AEM and aggregated REM, this study examines whether AEM and REM might be related by disaggregating different types of REM, which might provide a relatively more reliable result. This is because managers might adopt different strategies in terms of the different types of REM, and the potential relationship between AEM and disaggregate types of REM might be different.

However, a potential relationship between AEM and REM is not a foregone conclusion. As AEM and REM have distinct differences, investigating these two different types of earnings management separately is still valid. Moving from independent AEM and REM to interdependent AEM and REM, this chapter makes a further method based development to investigate the potential relationship between AEM and REM.

Depending on whether they participate in leveraged buyouts or not, managers might have different incentives for engaging in earnings management, and their choice of earnings-management strategies might be different. Thus I subdivide leveraged buyouts into MBOs and IBOs[2] for the purposes of this investigation.

In MBOs, managers are buyers and are part of the team instigating the takeover and they therefore remain with the firm. They usually have high levels of personal investment in a firm after the buyout. In the context of MBOs, managers' direct involvement in the transaction generates conflicts of interests. Managers wish to pay the lowest possible purchase price, whereas their shareholders wish to sell their shares for the highest possible price. The managers’ personal economic stake may motivate them to depress pre-buyout accounting earnings in order to portray the firm as underperforming, increasing the possibility that shareholders will accept a lower buyout price (Perry and Williams, 1994). Hence managers might have strong incentives to engage in negative earnings management in an attempt to depress the buyout price in MBOs.

Furthermore, in most cases, internal financing by managers is insufficient to raise the cash required to implement a buyout. Management need to seek additional finance from external sources by leveraging their company’s assets through secured bank loans. Further external debt financing may also be obtained through private placements of subordinated claims from institutional investors. Managers therefore tend to depend on external funds to execute their buyouts, and they will be concerned about their ability to obtain finance from external sources. This might motivate them to manipulate earnings upward in order to enhance prospective external financiers’ perceptions of the firm’s value and thereby secure external financing. Hence managers who rely on external sources of finance might engage in positive earnings management prior to MBOs (Fischer and Louis, 2008). Therefore, earnings management prior to

[2] Throughout the paper, I use the term ‘MBOs’ to refer to leveraged buyouts where management is involved, and ‘IBOs’ to refer exclusively to leveraged buyouts where management is not involved.

MBOs could be either negative, in an attempt to depress the buyout price, or positive, to secure external financing. ''

By contrast, IBO targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986). Firm undervaluation is likely to attract IBO buyers, and third-party buyers wish to take control and engage in active monitoring or make changes to a firm's existing management team after a buyout (Hafzalla, 2009). Even if managers are not dismissed initially, the uncertainty regarding whether the business will be re-sold again within several years threatens managers' job security (Denis and Denis, 1995). As firm undervaluation attracts IBO buyers, a reduction in firm undervaluation is likely to reduce the possibility of becoming an IBO target. Therefore, prior to IBOs, managers might engage in positive earnings management to reduce firm undervaluation and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding.

Before comparing the MBO and IBO samples, it is worth first considering whether the investigation of earnings management behaviours prior to MBOs and IBOs is appropriate. In the run up to buyouts, managers' incentives may change if they participate in an MBO. Before choosing to participate in an MBO, earnings management behaviours are driven by incentives that are unrelated to the buyout. However, once managers decide to take part in an MBO, the buyout-related incentives might become more important, driving earnings management behaviour from then on. In contrast, there is less likely to have such a change in incentives if managers encounter an IBO, as they are not part of the buying group. Hence earnings management behaviours in IBO firms are expected to be different from those in MBO firms once managers decide to take part in an MBO.

Moreover, this research uses earnings management of non-leveraged buyout industrial peers as benchmark to calculate the abnormal AEM and REM of buyout firms. Any abnormal AEM or REM detected in this process is taken to be earnings management relating to leveraged buyouts. Due to this control, exploring earnings management behaviours prior to MBOs and IBOs is appropriate.

1.3 Theoretical background

Agency theory defines a contractual relationship in public corporations under which one or more persons, referred to as the principal(s), engage another person, serving as the agent, to perform some service on their behalf (Jensen and Meckling, 1976). In this relationship, the principal delegates some decision making authority to the agent, but the agents do not bear the full wealth effects of their decisions (Jensen and Meckling, 1976). This formal structure is applicable to an even wider context where no formal delegation relationship is explicitly involved (Rees, 1985; Saam, 2007). Therefore, agency theory proposes a consensual relationship between two parties, where one participant (the agent) agrees to act on the behalf of the other (the principal) (Eisenhardt, 1989; Schroeder et al., 2010). In modern companies, the shareholders or owners of the firm, who do not directly manage the firm themselves, are referred as the principals, whereas the managers or employees, who are entrusted to act in the interest of shareholders, are serving as the agents (Solomon, 2010; Berle and Means, 1932). The separation of ownership and control between principal and agent in modern corporations (Berle and Means, 1932) is associated with some inherent problems.

There are two major problems in an agency relationship, which are interests conflict and information asymmetry. First, interests conflict between the shareholders and the managers is the primary assumption of agency theory. Shareholders usually desire to maximise their long-term wealth, whereas managers might prefer to pursue the short-term objectives to maximise their own utilities, such as higher salaries, bonuses and as many perquisites as possible (Solomon, 2010; Schroeder et al., 2010). As agency theory suggested, if both parties to the relationship are self-utility maximisers, there is a good reason to believe that the agent will not always act in the best interests of the principal (Jensen and Meckling, 1976). Therefore, managers may not always act in the best interests of shareholders. Apparently, they will pursue self-interests by maximising short-term investments and extract private benefits rather than long-term shareholder wealth maximisation, which might lead to a reduction of shareholder wealth in the long-term (Jensen and Meckling, 1976; Saam, 2007).

Moreover, the risk preferences between shareholders and managers is another reason for aberrant activities of the agent (Saam, 2007). Generally, the principal and the agent vary widely in their risk attitudes, which are related to different compensation schemes. Besides, the principal can diversify their risks through investments diversification, while the agent cannot. It is reasonable to assume that the manager is more risk averse, whereas the shareholder is risk neutral. Therefore, the inherent preference of risk or expectation divergence may lead to shareholders and managers favouring different action plans (Eisenhardt, 1989; Saam, 2007; Roche, 2009).

The interest and risk diverges between shareholder and manager may cause managerial abnormal behaviours (Dalton et al., 2007). The feasible solution to this agency problem is to develop incentive plans thus aligning the interests of owner and agent through offering equity ownership to agents (Fama and Jensen, 1983a; Jensen and Meckling, 1976). Such incentive alignment generally involves financial alignment, whereby the manager’s economic rewards co-vary with those of shareholders through offering equity ownership (Jensen and Meckling, 1976). However, such financial alignment may additional affect agents' risk preferences, causing them to take either riskier or less risky decisions than optimal from the shareholders' perspective (Nyberg et al., 2010). Excessive incentive can also divert managers' attention away from performing a task instead of focusing on how to get the incentives (Sprinkle, 2000).

Second, informational asymmetry between the shareholder and the manager is another major problem in an agency relationship, which is reflected in agency theoretical considerations. It is rational for both principal and agent to enter an agency relationship, either a potential agent has competences to fulfil a task which the principal does not have, or both of them have the competences, but the potential agent can fulfil the task at lower cost (Pratt and Zeckhauser, 1985; Saam, 2007). Informational asymmetries arise because the competences, intentions, knowledge, and actions of the agent cannot be monitor or can only be monitor at high costs, however the principal needs this information to compensate the agent depending on his effort. Therefore, asymmetrical information in favour of the agent is assumed in agency theory (Saam, 2007; Sepe, 2010).

Informational asymmetry can result in moral hazard problems. Moral hazard problems are associated with hidden actions when agents have the incentive to pursue self-interested behaviour. After contracting the manager can perform aberrant activities, or work less but pretend to work hard, which cannot easily be evaluated by the principal (Saam, 2007; Voigt, 2011; Fama and Jensen, 1983b). Further, manager may has private knowledge on facts which are relevant to evaluate his work's effort, and such knowledge is part of his expertise which he may use opportunistically (Arrow, 1985). Shareholders may pay a high price to obtain the same information as managers, or it may be impossible for them to eliminate informational asymmetry. Hence, information asymmetry put the principal in a disadvantageous position (Voigt, 2011;

Schillhofer, 2003).

While corporate reporting is in general supposed to be a corporate governance mechanism to alleviate information asymmetry, unless properly supervised, managers might use corporate reporting to increase information asymmetry, by issuing information to distort investors' and other stakeholders' perception of the firm.

Earnings management is a moral hazard problem, and managers could use it to manipulate the degree of information asymmetry hence to affect shareholders' perceptions of a firm's value. Agency theory assumes that managers are self-motivated, thus they are likely to use earnings management to enlarge information asymmetry hence manipulating others' perceptions to meet their own objectives. This implies that managers seek to mislead investors to pursue the managerial private interests (Beneish, 2001). The empirical literature initiated by Healy (1985) found that managers use AEM to strategically manipulate bonus income hence to increase their compensation. Later researches by Sloan (1996) and Collins and Hribar (2000) provides evidence that managers may be able to use AEM to affect the markets' valuation of their firms. These authors found an apparent accruals anomaly in financial markets, and the market appears to consistently overestimate the persistence of the accruals components of earnings, hence to overprice them (Bergstresser and Philippon, 2006). This means that investors are overoptimistic, and they are unlikely to spot on accruals earnings manipulation. Moreover, Teoh, Welch, and Wong (1998a; 1998b) suggest that investors naively extrapolating pre-issue earnings without fully adjusting for the potential manipulation of reported earnings. Their research reveals that firms appear to have engaged in AEM to report higher net income prior to the initial and the seasoned equity public offering have lower post-issue long-run abnormal share returns and net income. Therefore, managers may potentially be able to use AEM to affect shareholders' perceptions of a firm's value.

In the leveraged buyouts context, managers are also likely to use earnings management to affect shareholders' perceptions of their firm's value. DeAngelo (1986) suggests that managers could effectively manage shareholders' perception of a firm's value by engaging in negative AEM prior to MBOs. The empirical research by Perry and Williams (1994) found that managers engaged in negative AEM prior to MBOs in an attempt to depress valuation by concealing the real value of the firm. Further, Fischer and Louis (2008) report that managers engaged in positive AEM prior to MBOs in an attempt to enhance prospective external financiers' perceptions of a firm's.

Earnings management is an opportunistic behaviour from agency theory perceptive, which managers used to enlarge information asymmetry. However, signalling theory might view earnings management behaviour as a way that managers used to reduce information asymmetry between them and outside shareholders and potential investors.

Signalling theory describes the behaviour of two parties (individuals or organizations) when they have access to different information. This theory indicates that, typically, the sender party choose whether and how to communicate (or signal) the information, and the other party, the receiver, choose how to interpret the signal (Connelly et al., 2011). Signalling theory is fundamentally concerned with the reduction of information asymmetry between two parties (Spence, 2002). Spence (1973) formulates this theory in labour markets by demonstrating how a job applicant might engage in behaviours to reduce information asymmetry that interferes the selection ability of prospective employers. Spence (1973) illustrates that the potential high-quality employees distinguish themselves from low-quality prospects via the costly signal of rigorous higher education.

Financial economists extended signalling theory to illustrate that firm debt (Ross, 1973; Levine (1996) cited in Arya et al., 1998) and dividends (Bhattacharya, 1979) could represent signals of firm quality. These researches suggest that only high-quality firms have the ability to make interest and dividend payments over the long term, while low quality firms will not be able to sustain such payments. Hence such signals influence outside lenders' or investors' perspective of a firm's quality (Riley, 2001). With regards to earnings management, Holthausen and Leftwich (1983) enunciated that informative earnings management could be a useful signal, under which managerial discretion was a means to reveal managerial private expectations for investors about the firm's future cash flows (Beneish, 2001).

Signalling theory is a potential alternative theory that could adopt in this research. However, as it suggests that earnings management is a way to reduce information asymmetry, which is not support the hypotheses in this research that managers use earnings management to pursue their private interests.

Stewardship theory is an alternative to agency theory and offers opposing prediction that managers are stewards rather than the entirely self-interested rational economic (Muth and Donaldson, 1998). Stewardship theory suggests that managers have a range of non-financial motives for their behaviours, such as the need for achievement and recognition, the intrinsic satisfaction of successful business, respect for authority and the work ethic (Argyris, 1964; Herzberg, 1968; McClelland, 1961). Stewardship theory views managers as essentially good stewards and are loyal to the company. When confronted with a course of action seen as personally unrewarding, managers may act based on a sense of duty and identification with the organisation (Etzioni, 1974). They act to achieve high performance and capable of using a high level of discretion to act for the benefit of shareholders (Donaldson and Davis, 1991). Stewardship theory provides a theoretical basis in this research to assume that managers are essential to the success of the business and corporate governance functions, as they are good stewards and loyal to the company rather than entirely self-interested.

Resource dependence theory is one additional theory used in corporate governance research (Pfeffer and Salancik, 1978). In contrast to agency theory emphasising board independence, resource dependence theory suggests that board provides various resources that is vital for the survival of a firm (Muth and Donaldson, 1998; Hillman and Dalziel, 2003). Boards are important boundary spanners that can be used as a mechanism to link the external environment with a firm. The inter-organisational linkages, such as the appointment of outside directors and board interlocks, is important because they can be used to manage environmental contingencies. For instance, prestigious directors, in their professions and communities, can be a source to access timely information for executives. These directors become involved in helping the organisation by influencing their other constituencies on behalf of this one (Price, 1963; Zald, 1967). Hence, adding more directors to serve the board may ensure a minimum required knowledge base (Vafeas, 2005), and the ability of the board to monitor may increase (Andres et al., 2005; Guest, 2009). Resource dependence theory is a theoretical base of this research to assume that boards or board sub-committees are essential functions of corporate governance mechanisms, which is helpful to mitigate earnings management behaviours.

This study takes positivist approach to conduct an accounting research. Positivism refers to “an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond” (Bryman and Bell, 2011:16). The positivistic approach seeks the facts or causes of social phenomena that is independent to the subjective state of the individual.

Thus logical reasoning is applied to the research, which implies precision, objectivity and rigour on research investigation. Positivism takes the basic assumption that social reality is independent of us and exists regardless of whether we are aware of it, when studying human behaviour. Hence, the act of reality investigating has no effect on the reality. This might indicate the ontological position of positivism (Collis and Hussey, 2013). Positivist researchers are likely to use a highly structured methodology in order to facilitate replication (Gill and Johnson, 2002). They also emphasise on quantifiable observations and the use of statistical analysis, although they might also use qualitative methods (Saunders et al., 2009).

Positivism is generally taken to entail five principles: (1) only observable phenomena can genuinely lead to the production of credible data; (2) existing theory is used to generate hypotheses that can be tested and thereby lead to the further development of theory, which then may be tested by further research; (3) the hypotheses development lead to the gathering of facts that is the basis for subsequent hypothesis testing; (4) research is undertaken in a way that is value free; (5) scientific statements, rather than normative statements, are the true domain of the scientist, because the truth of scientific statements can be confirmed by the senses (Saunders et al., 2009; Bryman and Bell, 2011).

Positive accounting research start flourishing since the introduction of empirical finance methods to financial accounting research (e.g. Ball and Brown, 1968; Beaver, 1968). The paper by Watts and Zimmerman (1978) helped advocate the positive accounting research, and introduced a brand of positive accounting theory that especially well grounded in economic theory (Watts and Zimmerman, 1990; Watts and Zimmerman, 1986). Watts and Zimmerman (1990) indicate that the term ‘positive’ is used to distinguish their and other people's positive research from traditional normative theories by emphasising the importance of prediction and explanation.

This stream of positive accounting researches aims to predict and explain managerial accounting choice and the preference for accounting policies (Watts and Zimmerman, 1990). Positive studies of market reaction to earnings (e.g. Ball and Brown, 1968) revealed that the numbers were important to markets (positive share price changes associated with positive unexpected earnings) but could neither explain or predict the accounting choices been made (Watts and Zimmerman, 1990). By introducing information perspective (accounting data providing information) and/or transactions costs (e.g. agency costs), positive accounting researches could test hypothesis for the relationship between accounting choices and other motivations, such as political cost, bonus plan, debt/equity (Watts and Zimmerman, 1990).

This study takes positivist accounting approach to investigate earnings management behaviours and the effects of corporate governance mechanisms on them prior to leveraged buyouts in the UK. In this study, agency theory is mainly used to develop hypotheses. As this study focuses on the UK market, the sampling frame is all UK firms involved in leveraged buyouts. This ensures the implications for the UK generalisability. In order to collect data to test hypotheses, this study choose to use secondary data from multiple sources, as no one database could provide all the data required in this study. Secondary data saves enormous resources for research, such as time and efforts to collect data, and could regarded as high quality data (Saunders et al., 2009). However, secondary data might be collected for a different purpose which is not match the specific research needs, hence the data downloaded from database needs refining before applying. Secondary data might also include mistakes so that the data sources must be evaluated carefully (Saunders et al., 2009). This study could also use interview or survey as additional data collection methods. Nevertheless, these two methods are time consuming and the author might have difficulty to access interviewees (Saunders et al., 2009). Following positivist approach, the refined data is put into empirical models of this study to test for hypotheses, and thereby the results aim to lead to the further development of theory.

1.4 Research questions

In order to achieve the aims of this study, the following research questions are addressed:

(1) Is there evidence of managers practising AEM preceding MBOs and IBOs in the UK?

(2) What are the effects of the corporate governance mechanisms of audit committee characteristics and external audit quality on AEM behaviours preceding MBOs and IBOs in the UK?

(3) Is there evidence of managers engaging in REM behaviour preceding MBOs and IBOs in the UK?

(4) What are the effects of the corporate governance mechanisms of shareholding by outsiders and board characteristics on REM activities preceding MBOs and IBOs in the UK?

(5) Is there any relationship between AEM and REM preceding MBOs and IBOs?

(6) Do the constraints of earnings management methods have asymmetric effects on the relationship between AEM and REM preceding MBOs and IBOs?

1.5 Methodology

This study investigates all UK leveraged buyout cases in the London Stock

Exchange between 1997 and 2011. It adopts abnormal discretionary accruals from the cross-sectional model of Kothari et al. (2005) to proxy for AEM. The Dechow et al.'s (1995) cross-sectional model or Jones's (1991) cross-sectional model is also used to provide alternative measures of AEM. Moreover, this study uses cross-sectional models developed by Roychowdhury (2006) to detect REM proxies in signed values. Specifically, abnormal cash flow from operations (CFO) proxies for sales manipulations, abnormal production costs proxies for overproduction and abnormal discretionary expenses proxies for manipulations of discretionary expenses. Furthermore, alternative REM proxies in signed values generated by the models of Gunny (2010) and Lara et al. (2012) are used to increase robustness of this study. The adoption of alternative measures of AEM and REM aims to provide consistent results and confirm that my findings are not sensitive to the particular measures used for AEM or REM.

Univariate tests adopt two-sided T-tests to examine whether earnings management behaviours (both AEM and REM) exist prior to MBOs and IBOs. Further, multivariate tests adopt ordinary least square (OLS) models to investigate the effects of corporate governance mechanisms on earnings management behaviours (both AEM and REM) preceding both MBOs and IBOs.

Finally, in the third empirical chapter, this study constructs a simultaneous equations system to capture the relationship between AEM and REM. The AEM and REM variables are subject to a potential endogeneity bias, as the levels of AEM and REM might be determined simultaneously. Similar to prior studies (e.g. Beatty et al., 1995; Barton, 2001; Pincus and Shivaram, 2002; Badertscher, 2011), this research uses the simultaneous equations system to address the potential simultaneity. This study uses both three-stage least squares (3SLS) and two-stage least squares (2SLS) to explore the impact of simultaneous equations system to address the sequence of earnings management decisions. The findings support the suggestion of prior literature (e.g. Greene, 2011;

Hussain, 2000) that 3SLS, by estimating the whole system of structural equations jointly, better address the simultaneous relationships.

1.6 Contributions

This thesis represents a comprehensive study on earnings management (AEM and REM) and the effects of corporate governance mechanisms on earnings management in the UK leveraged-buyout market. The first empirical study (Chapter 2) explores the existence of AEM and the effects of audit committee characteristics and external audit quality on AEM prior to MBOs and IBOs. The second empirical study (Chapter 3) investigates the existence of REM, and the effects of the shareholding by outsiders and board characteristics on REM activities preceding MBOs and IBOs. Based on the results of these two studies, the third empirical study (Chapter 4) examines the potential relationships between AEM and REM preceding MBOs and IBOs by controlling for a set of factors that may constrain the ability and degree to which managers can engage in earnings management.

This thesis contributes to the earnings management and corporate governance researches, and the main contributions are set out in line:

First, the first empirical chapter of this thesis investigates AEM behaviours in leveraged buyout settings, which extends earnings management research to both MBOs and IBOs fields. Managers might have different incentives when they engage in earnings management prior to MBOs and IBOs. Depending on whether they participate in leveraged buyouts or not, their choice of earnings-management strategies might be different. Hence this study subdivides the sample into MBOs and IBOs for investigation. It sheds light on the importance of earnings management prior to IBOs. The findings suggest that managers have different earnings management patterns prior to MBOs and IBOs.

Second, this study investigates REM behaviours in leveraged buyout settings. As AEM and REM have distinct characteristics and effects on firm performance, managers might have different AEM and REM behaviours preceding leveraged buyouts. Several prior studies have examined AEM behaviours prior to MBOs (e.g. Perry and Williams, 1994; DeAngelo, 1986; Wu, 1997; Fischer and Louis, 2008). However, little attention has been paid to REM behaviours prior to leveraged buyouts. Hence the second empirical chapter explores REM behaviours in leveraged buyout settings. This research sheds light on the importance of REM in fields of research that cover leveraged buyouts. It seeks to improve the understanding of the effect of managerial incentives on all earnings management behaviours prior to leveraged buyouts. The findings reveal that managers engage in negative AEM and positive REM preceding MBOs. This study also finds that managers engage in positive REM but there is no evidence of systematic AEM compared to non-buyout firms preceding IBOs. These findings suggest that managers have different AEM and REM behaviours preceding leveraged buyouts. Thus it is worth investigating REM behaviours in addition to AEM behaviours in leveraged buyout settings.

Third, this study extends corporate governance research in the leveraged buyout fields by investigating the effects of corporate governance mechanisms on earnings management prior to MBOs and IBOs. MBOs and IBOs are different buyout types with distinct features. Managers and investors might have similar or different incentives, such as interest alignments or interest conflicts, depending on the type of buyout, and the effects of corporate governance mechanisms in MBOs and IBOs might also differ. This study seeks to improve the understanding of how corporate governance mechanisms affect managerial behaviours prior to different types of leveraged buyout. The findings suggest that corporate governance mechanisms have different effects on earnings management (both AEM and REM) prior to MBOs and IBOs. This might be because different buyout settings provide managers and shareholders with different incentives to engage in governance mechanisms.

Fourth, this study investigates the relationship between AEM and REM in both MBO and IBO settings. Given the portfolio of earnings management strategies, examining only one earnings management tool may not explain the overall effect of earnings management activities (Fields et al., 2001). While managers intend to enhance prospective external financiers' perceptions of a firm's value to secure financing for MBOs, managers in firms targeted by IBOs tend to improve their firm's share price in order to reduce the risk of IBOs. Hence management decisions on earnings-management strategies prior to MBOs and IBOs might lead to a different relationship between AEM and REM.

This study seeks to improve our understanding of managerial earnings-management strategies prior to different types of leveraged buyouts, that managers might use AEM and REM as complements or as substitutes for each other. The findings suggest that REM and AEM have a negative impact on each other prior to MBOs, but they have a positive impact on each other preceding IBOs. The findings reveal that managers adopt different strategies on the relationship between AEM and REM preceding MBOs and IBOs.

Fifth, this research uses simultaneous equation systems to explore the interdependencies of AEM and REM. Prior literature (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a; Zang, 2012) has made a primary assumption about the sequence of decision making without testing it. Unlike them, this research adopts a simultaneous equations system to examine the relationship between AEM and REM, thus to mitigate the potential endogeneity bias. This study draws on 3SLS, 2SLS and OLS methods to explore the impact of simultaneous equations system on the findings, as suggested by prior literature (e.g. Greene, 2011; Hussain, 2000). The findings reveal that AEM and REM sequentially effect each other. Moreover, the findings support the suggestion of prior literature (e.g. Greene, 2011; Hussain, 2000), that 3SLS better address the simultaneous relationships by estimating the whole system of structural equations jointly.

Moreover, this study adopts a new approach to interpret the multivariate regression test results. Unlike much of the prior literature (e.g. Klein, 2002; Peasnell et al., 2005), this research has considered the sign of the dependent variables in the regressions. The signed value of some dependent variables (AEM and REM proxies) has been indicated as significantly negative in the univariate tests. If the dependent variable of an earnings management proxy in univariate tests is significantly negative, a positive relationship between the earnings management proxy and corporate governance mechanisms means the governance mechanisms mitigate earnings management, and a negative relationship between them means the governance mechanisms facilitate earnings management. For robustness purpose, this study transforms all dependent variables into absolute values and re-runs all multivariate tests as a sensitivity analysis. The results of the sensitivity analysis largely support the new approach of findings interpretation.

Finally, this study extends the research of pre-buyout earnings management and corporate governance into the UK context. Leveraged buyouts are a distinct and increasingly important type of acquisition in the UK financial market. Previous studies that addressed pre-buyout earnings management issues have been conducted in the US market (e.g. Perry and Williams, 1994; DeAngelo, 1986; Wu, 1997; Fischer and Louis, 2008). It is questionable whether the US evidences is generalisable to the UK, because the UK market has distinct characteristics. Consequently, further work is required to introduce evidence from the UK regarding pre-buyout earnings management and corporate governance mechanisms.

1.7 Structure of the thesis

This thesis is structured into five chapters. This chapter has discussed the background and motivations for this study, outlined the objectives, specified the research question and overviewed the research methodology. The contributions made by this thesis have also been highlighted. The remainder of this thesis is organised as follows:

Chapter 2 examines AEM practices preceding leveraged buyouts in the UK. It investigates the existence of AEM, and whether managers have different AEM behaviours preceding MBOs and IBOs. It also examines the effects of the corporate governance mechanisms of audit committee characteristics and external audit quality on AEM behaviours prior to MBOs and IBOs.

Chapter 3 investigates REM behaviours prior to leveraged buyouts in the UK. It starts with an investigation on the existence of REM, and how do managers behave differently on REM preceding MBOs and IBOs. Then, it examines whether corporate governance mechanisms, especially outsiders' shareholding and board characteristics, can mitigate REM activities preceding MBOs and IBOs.

Chapter 4 investigates the relationship between AEM and REM preceding MBOs and IBOs in the UK. This chapter first compares these two types of earnings management tools, and then discusses how managerial incentives might affect their decisions on the relationship between AEM and REM. The investigation includes a set of factors that may constrain the ability and degree to engage in earnings management.

Chapter 5 presents a summary of this thesis and draws conclusions and implications. This chapter also discusses the potential limitations, and provides suggestions for future research.

2. Chapter 2: Earnings Management, Audit Committee Characteristics and External Audit Quality prior to Leveraged Buyout in the UK

2.1 Introduction

Agency theory provides a framework for linking earnings management behaviour to corporate governance by considering both as mechanisms that are used to protect investors and help them to reduce agency conflicts (Jensen and Meckling, 1976). However, the few articles that address these issues (e.g. Klein, 2002; Xie et al., 2003) focus more on the magnitude than on the direction of AEM. This study builds on the current literature by examining a specific setting: leveraged buyouts. This setting provides a clear incentive for managers to engage in a specific form of discretionary AEM, which is different from much of the previous literature. While managers are expected to lower the market value of a firm prior to MBOs, they are expected to increase its value prior to IBOs. This makes leveraged buyouts an ideal setting in which to examine the effects of corporate governance on specific forms of AEM practices. Therefore, this study investigates how the corporate governance mechanisms of audit committee characteristics and external audit quality affect AEM behaviour preceding MBOs and IBOs in the UK.

AEM involves changing discretionary accrual choices within the boundary of GAAP to “either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers” (Healy and Wahlen, 1999: 368). AEM directly influences the amount of accounting accruals and has no direct effect on cash flows. AEM is managerial discretion which focuses on distorting the impression of a firm's financial position (Kim and Sohn, 2013).

In addition, prior literature (e.g. Dechow and Skinner, 2000; Healy and Wahlen, 1999) suggests that managerial incentives are a key determinant of earnings management behaviours. Because managers have a variety of incentives, the earnings management literature often focuses on specific settings where the incentives are clear, such as meeting dividend thresholds (Atieh and Hussain, 2012), meeting capital market expectations (Teoh et al., 1998b), pursuing managerial compensation contracts (Healy, 1985) and reducing the possibility of an unfavourable ruling from antitrust regulations (Cahan, 1992). Although the leveraged buyouts setting provides clear incentives for managers to engage in specific forms of AEM, prior literature only examines AEM preceding MBOs (e.g. DeAngelo, 1986; Perry and Williams, 1994). Hence this study will investigate whether managers have different AEM practices preceding MBOs and IBOs in the UK.

In MBOs, managers' direct involvement in the transaction generates an agency conflict of interest. A firm's managers wish to pay the lowest possible purchase price, whereas their shareholders wish to sell their shares for the highest possible price. This creates an incentive for managers to manipulate earnings figures to reduce the perceived value of their firm (Perry and Williams, 1994). In IBOs, the bidding group consists solely of outside institutional investors and private equity houses. The non-participation of management in the transaction generates another conflict of interest: a firm's managers wish to protect their jobs and/or personal wealth in any circumstance, whereas the third-party buyers often wish to make changes to a firm's existing management team after the buyout (Hafzalla, 2009). This creates an incentive for managers to manipulate earnings figures to increase the perceived value of their firm and, thereby, prevent the buyout.

In this study, we perform empirical tests using abnormal AEM estimated by the cross-sectional version of Kothari et al.'s (2005) model, for all UK listed firms that made leveraged buyouts announcements between 1997 and 2011 and were subsequently delisted from the London Stock Exchange. We also perform robustness tests using abnormal AEM estimated by the cross-sectional version of Dechow et al.'s (1995) model.

I find that discretionary AEM behaviours are significantly negative in the year preceding MBOs, whereas there is no evidence of systematic AEM preceding IBOs compared to non-buyout firms. In other words, this means that managers manipulate earnings downward prior to MBOs, and there is no evidence of systematic AEM compared to non-buyout firms preceding IBOs. This research differs from those carried out in prior research, as it extends AEM research in the context both of MBOs and of IBOs. My study also contributes to empirical accounting research by taking account of managerial incentives when exploring the choices of managers to engage in AEM.

Moreover, my findings contribute to the institutional debate on the quality of financial reporting, in relation to the characteristics of audit committees and the quality of audits in the UK. First, audit committees control the quality of financial reporting, and thus they are expected to constrain the aggressive forms of AEM. I find that the financial expertise of the audit committee has no impact on negative AEM prior to MBOs. Prior to IBOs, the financial expertise of the audit committee is found to be negatively associated with AEM, which is consistent with the findings of Xie et al. (2003), Bédard et al. (2004), and Abbott et al. (2004). However, contrary to the findings of Klein (2002) and Bédard et al. (2004), from the US, the independence of audit committees is not an effective corporate governance mechanism in mitigating AEM prior to either MBOs or IBOs. This could be because outside directors perform little or no real monitoring role as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). Furthermore, I find that equity ownership by members of audit committee and the presence of non-executive blockholders on audit committee have no impact on negative AEM prior to MBOs. Prior to IBOs, equity ownership by members of audit committee and the presence of non-executive blockholders on audit committee are positively correlated with AEM. High share ownership might jeopardise the independence of audit committee members, thus leading to more AEM prior to IBOs. Hence audit committee characteristics have a greater impact on AEM prior to IBOs than they have prior to MBOs. Preceding MBOs, audit committees might be ineffective because they do not take sufficient care of the MBO context, and focus on traditional positive AEM.

Second, as auditors attest to financial reports, they are the most important controller of pernicious AEM practices. I find that Big 5 auditors have no impact on negative AEM prior to MBOs. In terms of IBOs, Big 5 auditors are negatively associated with abnormal AEM. This is consistent with the findings of prior studies (e.g. Palmrose, 1986a), which found that larger auditor firms provide higher quality auditing. Moreover, I find that audit fees are positively associated with AEM prior to MBOs and IBOs. This might be because, prior to MBOs and IBOs, economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect auditors' independence, leading them to permit AEM (Frankel et al., 2002). In addition, the level of non-audit fees is negatively associated with negative AEM prior to MBOs. It might be related to the greater knowledge of client business. By undertaking auditing as well as providing consulting services, auditors learn more about a client's business, which may improve the quality of all their services (Wallman, 1996). Prior to IBOs, the level of non-audit fees has no impact on AEM. Overall, this study contributes to the corporate governance literature by providing empirical evidence that audit committee characteristics and external audit quality have dissimilar effects on AEM preceding MBOs and IBOs.

The remainder of the paper is structured as follows. Section 2 discusses AEM prior to MBOs and IBOs. Section 3 reviews the literature on the relationships between corporate governance mechanisms and AEM, and then specifies the hypotheses. Section 4 outlines the design of the proposed research. Section 5 reports the empirical results and findings. Section 6 provides a conclusion.

2.2 Accruals Earnings Management prior to Leveraged Buyouts

2.2.1 The role of accounting earnings in leveraged buyouts

Leveraged buyouts are a very specific form of takeover, in which listed firms become private and the deal is funded with high amounts of debt. Over the years, leveraged buyouts have become increasingly popular in the UK as measured by the number and size of the transactions (Renneboog et al., 2007). Whether a company is purchased in a direct transaction by the incumbent management or by outsiders, the price paid for the firm directly affects the cash flow accruing to both sides of the transaction. In either case, purchasers always seek the lowest possible purchase price, while selling shareholders seek the highest possible selling price.

Agency theory suggests that information asymmetries generally exist between managers, who are better informed, and outsiders, who are less well informed. Information asymmetries create a demand for internally generated measures of firm performance to be reported on a periodic basis. Accounting information thus plays a crucial role in overcoming problems that arise when markets do not perfectly aggregate individually held information (Fields et al., 2001). During periods surrounding leveraged buyouts, new potential financiers, such as the new investors and acquiring firms, scrutinise publicly available accounting information extensively in order to prepare their bidding. Accounting information therefore provides great value relevance for investors and other financiers of the firm, who increase their demand for such information when making decisions (Aharony and Barniv, 2004). A detailed analysis of accounting earnings can help shareholders to assess whether they have been offered a fair price in leveraged buyouts (Bull, 1989). DeAngelo (1990) found that investment bankers make extensive use of accounting earnings to value firms in leveraged buyouts. Additionally, Perry and Williams (1994) report that accounting earnings were used by the courts to assess the fairness of buyout prices when selling shareholders claimed that their compensation was inadequate in MBOs.

AEM 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 numbers" (Healy and Wahlen, 1999: 368). Managers possess private information about their firms and have a great deal of discretion over accounting earnings. Information asymmetry could have an impact on the outsiders' perceptions of a firm's prospects and on the value placed on its stock price (Lehn and Poulsen, 1989). The manipulation of accounting accruals helps managers to keep their informational advantage over their shareholders and any competing bidders from outside of the firm. Accruals manipulation is not a costly tool, because it only involves exercising accounting choices to alter accounting earnings and has no actual effects on a firm's real operations. Therefore, since managers could use AEM to cheat shareholders or external financiers, it might be a potential issue prior to leveraged buyouts.

2.2.2 Hypotheses for AEM preceding MBOs and IBOs

An MBO consists of the purchase and privatisation of a public company by incumbent managers who seek institutional support from private equity firms, typically relying on a preponderance of debt. In MBOs, managers purchase their own firm and are likely to remain with the firm. Their direct involvement in the transaction generates a conflict of interest. They wish to pay the lowest possible purchase price, whereas their shareholders wish to sell their shares for the highest possible price. This creates an incentive for managers to manipulate earnings figures before MBOs (DeAngelo, 1986).

Previous literature (e.g. Perry and Williams, 1994; DeAngelo, 1986; Wu, 1997) reports that managers systematically manipulate reported earnings downwards prior to MBOs. Perry and Williams (1994) indicate that, in their fiduciary role representing shareholders, managers have a legal duty to seek the highest possible price when trading a firm. However, agency theory suggests that incumbent managers' personal economic stake in buyouts may motivate them to act in their own interests and seek the lowest possible buyout price for themselves. By deliberately depressing earnings, not meeting the expectations of security analysts, reporting decreases in earnings, or even losses, managers can take advantage of the undervaluation of share prices in MBOs. Moreover, managers are likely to engage independent investment bankers and the courts to evaluate the terms of an MBO offer. Because the independent third parties employ earnings-based valuation methods to assess the fair value of a firm, managers have incentives to understate reported earnings in order to reduce the MBO transaction price (DeAngelo, 1986). Perry and Williams (1994) and Wu (1997) report that unexpected accruals were negative in the year prior to MBO transactions for the US firms they studied, indicating managers engaged in negative AEM. Wu (1997) further suggests that a downward movement of pre-MBO share prices is systematically associated with changes to pre-MBO earnings, based on the observation that the change in earnings of sampled MBO firms was significantly lower than the industry median. Nevertheless, DeAngelo (1988) found that competitive bidding also motivates managers to manipulate earnings upwards in order to avoid the risk of being replaced after MBOs. Fischer and Louis (2008) report that the need for external financing causes managers to adopt income-increasing earnings management practices in order to secure their external funding. Despite this, I expect the earlier discussion to be more relevant in the investigation of this study. Accordingly, I hypothesise as follows:

$H_{1\text{-}1a}$: Managers engage in negative AEM prior to MBOs

In IBOs, the buyouts are initiated and executed solely by outside institutional investors and private equity houses, which purchase the firms without including its management in the transaction. Managers can be excluded from a transaction when outside buyers either do not wish to relinquish their control power to a firm's existing management team, or wish to make changes to the team after a buyout (Hafzalla, 2009). Even if managers are not dismissed initially, the uncertainty associated with that the firm will be re-sold again within several years threatens managers' job security (Denis and Denis, 1995). Hence, managers and third-party buyers have a conflict of interests in IBOs. Managers are likely to lose their jobs after the transaction, and this creates an incentive for them to manipulate earnings figures upwards in order to prevent a buyout.

IBO targets are characterised by having undervalued shares in the market, relative to firms that remain public (Weir and Wright, 2006). Undervaluation may reflect a perceived undervaluation by management, or it may be objective. Managers have some private information that can lead them to value a firm differently from the shareholders in the market. If the shareholders do not appreciate this information, incumbent managers may have a perception of share undervaluation. However, managers may also concentrate too closely on the performance of share prices as a measure of a firm's value, ignoring more objective measures, such as the price-earnings ratio. Objective measures provide a broader indication of firm growth perspectives in addition to market capitalisation (Weir et al., 2005b).

IBO targets usually have low growth perspectives in the market (Jensen, 1986; Jensen, 1989), which reflects objective undervaluation. Some researchers have argued that objective undervaluation results from the poor decisions of prior managers, and a leveraged buyout is often used as a means to turn a failing company around (Renneboog et al., 2007). Jensen (1986; 1989) indicates that IBO targets have another key characteristic: substantial free cash flows. Incumbent managers hold the discretions of free cash flows, which gives them increased control and power. As the third-party buyers usually wish to make changes to incumbent management teams, managers are likely to lose control and power over their firms after IBOs, which also endangers their perquisites, remuneration and/or share-related personal wealth (Baron, 1983; Weir et al., 2005a; Weir et al., 2005b). Moreover, when the hostile bidders take control in IBOs, managers usually face a high risk of losing their jobs (Renneboog et al., 2007). Even if managers are not dismissed initially, the uncertainty associated with the business will be re-sold again within several years threatens managers' long-term job security (Denis and Denis, 1995). Therefore, in the periods preceding IBOs, managers are expected to act in such a way as to prevent any potential IBOs.

It is argued that managers are likely to manipulate accounting earnings upwards preceding IBOs. As they have private information, they become aware of their firm's undervaluation before any one else in the market does (Weir and Wright, 2006). Undervaluation attracts IBO specialists, who expect to create additional shareholder value once a firm has been privatised (Renneboog et al., 2007). In order to protect their jobs and personal interests, managers are likely to use discretionary tools to get their firms overvalued and thereby prevent any potential IBOs. Accounting earnings contains information about a firm's growth potential (Holthausen and Leftwich, 1983), and thus earnings management is an ideal tool for managers who wish to alter the perceived value of their firms. Accordingly, if an undervaluation is realised, managers who expect an increase in the share price of their firm are likely to engage in income-increasing AEM. Once the increased accounting earnings are announced, the market will adjust this information in the firm's share price (Abarbanell and Bernard, 1992; Chambers and Penman, 1984). Consequently, IBO specialists are less likely to be aware of the undervaluation, or may find the adjusted share price less attractive. Therefore, I predict that managers will manipulate accounting earnings upwards in order to protect their jobs and/or their personal interests prior to IBOs. Accordingly, I hypothesise as follows:

$H_{1\text{-}1b}$: Managers engage in positive AEM prior to IBOs

2.3 Literature Review and Hypothesis Development

2.3.1 The role of the audit committee

Audit committees play a key role in providing active scrutiny of financial reporting processes and in monitoring the relationship between a firm's management and its external auditor. An effective audit committee adds to the quality of the corporate reporting process on two levels: First, the audit committee should supervise major accounting choices in order to mitigate earnings management practices. Second, the committee should coordinate internal and external audits and protect external auditors' independence in order to increase the likelihood that any irregularities they discover will be reported at a sufficiently high level (Piot and Janin, 2007). Prior studies highlight that certain audit committee characteristics are likely to affect an audit committee's ability to perform its role, namely independence, financial experience, equity ownership by committee members and size.

2.3.2 Audit committee independence

Agency theory suggests that non-executive directors are more independent than executive directors are, and thus they can monitor more effectively (Fama and Jensen, 1983a; Elshandidy and Hassanein, 2014). Independent audit committee members, as non-executive directors, may view their service as directors as a means of enhancing their reputations as experts in decision control (Fama and Jensen, 1983a). Serving on an audit committee may improve a director's reputation, but it may also carry the potential for their reputation to be damaged if a financial misstatement occurs (Abbott et al., 2000). Consequently, the preservation of reputational capital serves as a motivation for outside directors to monitor managers more closely.

Furthermore, apart from being directors of a firm, non-executive directors have no economic or psychological affiliation that may interfere with their ability to question management (Fama, 1980). In contrast, as part of the management team, executive directors often have incentives to underperform their monitoring role (Vafeas, 2005). In line with this, prior evidence suggests that the presence of executive directors on an audit committee is likely lead to poorer financial reporting choices (Bédard et al., 2004; Klein, 2002). Therefore, non-executive directors on audit committees are more likely to provide unbiased assessments and judgements hence being able to monitor management effectively.

However, non-executive directors are also criticised for performing little or no real monitoring role, as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and

Baker, 1987; Gilson and Kraakman, 1991). The inclusion of insiders on an audit committee is also advantageous. They facilitate the communication of relevant information to outside directors during committee meetings and provide a forum for evaluating the performance and senior management potential of junior executives. In addition, executive directors provide expertise that a firms' decision makers may draw on when formulating and implementing high-level strategies (Baysinger and Butler, 1985).

Prior studies tend to establish a negative relationship between the independence of an audit committee and the magnitude of abnormal accruals, although there is a lack of consensus due to the diversity of the approaches used in the studies. Bédard et al. (2004), Xie et al. (2003), and Davidson et al. (2005) found that more independent audit committees are associated with lower earnings management. Klein (2002) reports that it is the presence of a majority of outside directors on an audit committee, rather than 100 percent of the members being outsiders, that seems to have a significant effect on the level of abnormal accruals. Therefore, these expectations lead to the following hypothesis:

$H_{1\text{-}2a}$: There is a negative relationship between audit committee independence and AEM preceding both MBOs and IBOs

2.3.3 Financial expertise of the audit committee

Directors of audit committees are often from a range of different backgrounds and some may not have acquired enough experience or technical knowledge to enable effective accounting and auditing oversight. An audit committee's monitoring role may be perceived as ineffective by an external auditor if the auditor believes it does not possess the necessary financial knowledge to understand technical auditing and accounting reporting matters (Abbott et al., 2004). An external auditor's consideration of corporate governance factors along with its knowledge of the client's overall business risk could affect the levels of inherent and control risks that are assessed, thereby affecting the nature, timing, and extent of audit work (Cohen et al., 2002).

In contrast, where there is financial expertise within audit committees, it makes their internal control judgments more like those of experts, effectively facilitating the reporting process (DeZoort and Salterio, 2001). Audit committees that have financial expertise are better equipped to understand auditing issues and risks, as well as any procedures that are proposed to address and/or detect them (DeZoort and Salterio, 2001). In addition, knowledgeable audit committees are more likely to understand the internal audit programs and their results, and, in turn, they ensure that internal controls are more effective for preventing or detecting earnings management (Abbott et al., 2004). Therefore, the financial expertise of the audit committee may be associated with greater monitoring effectiveness.

Empirical evidence from Xie et al. (2003), Bédard et al. (2004), and Abbott et al. (2004) is consistent with the notion that the presence of at least one member with financial expertise on an audit committee is negatively related to the level of AEM. Accordingly, I hypothesise as follows:

$H_{1\text{-}2b}$: There is a negative relationship between the presence of members with financial expertise on audit committee and AEM preceding both MBOs and IBOs

2.3.4 Equity ownership by members of the audit committee

According to agency theory, directors who own more equity in the firm are expected to protect shareholder interests more effectively. As equity ownership aligns the interests of directors with those of external shareholders, more equity ownership by the directors creates a personal incentive to actively monitor managers (Bhagat et al., 1999). Accordingly, when audit committee members hold high levels of equity, this is likely to mitigate the risk of these directors colluding with management to manipulate earnings. Such collusion would ultimately harm their own interests (Vafeas, 2005). As discussed previously, prior to MBOs, managers are likely to adopt income-decreasing AEM in order to depress offering prices. As lower MBO offer prices generate lower premiums for selling shareholders, this harms their interests. Thus members of an audit committee who have higher levels of equity ownership are inclined to monitor more actively, resulting in less AEM.

Prior to IBOs, high levels of equity might impair the independence of members in an audit committee and leads to a lower level of monitoring. Hence members of audit committees with high levels of equity ownership might compromise to upwards AEM prior to IBOs. The findings of existing literature are inconclusive on the relationship between audit committee members' equity ownership and AEM (Klein, 2002; Lin et al., 2006; Xie et al., 2003). Accordingly, I hypothesise as follows:

$H_{1\text{-}2c}$: There is a negative relationship between audit committee members' equity ownership and AEM preceding MBOs

$H_{1\text{-}2d}$: There is a positive relationship between audit committee members' equity ownership and AEM preceding IBOs

Large shareholders have the opportunity, resources, and ability to monitor, discipline, and influence managers (Cornett et al., 2008). Non-executive directors, as large shareholders, have a powerful personal incentive to exercise effective monitoring, because their high equity ownership makes them an effective agency of external shareholders. Substantial equity ownership by outside directors reunites ownership and control, and leads to better monitoring of management (Bhagat et al., 1999). Hence outside directors with substantial shareholdings and a position on the audit committee can force managers to focus more on maximising the wealth of shareholders rather than on opportunistic or self-serving earnings management. In the UK, The Corporate Governance Code suggests that directors who have 3% or more shareholdings of a firm are classified as 'substantial shareholders' (FRC, 2010). As previously discussed, members of an audit committee who have higher levels of equity ownership are inclined to monitor management actively prior to MBOs and to monitor inactively prior to IBOs. Accordingly, I hypothesise as follows:

$H_{1\text{-}2e}$: There is a negative relationship between AEM and the incidence of at least one outside blockholder (with at least 3% shareholdings) sitting on a board's audit committee preceding MBOs

$H_{1\text{-}2f}$: There is a positive relationship between AEM and the incidence of at least one outside blockholder (with at least 3% shareholdings) sitting on a board's audit committee preceding IBOs

2.3.5 Audit committee size

Resource dependence theory suggests that a firm's board provides various resources, and more directors will expand the available resources of the board (Hillman and Dalziel, 2003). Initially, adding more directors to serve the audit committee may ensure that it has a minimum required knowledge base (Vafeas, 2005). In addition, the effectiveness of an audit committee is significantly related to the power of this committee (Kalbers and Fogarty, 1993). Larger audit committees are beneficial because they have an elevated status in an organisation, and are thus more likely to be acknowledged as an authoritative body by external and internal audit functions (Louis Braiotta et al., 2010). The increased organisational status and power of a large audit committee may enhance its performance of internal audit functions, and subsequently prevent or detect earnings manipulations (Abbott et al., 2004; Vafeas, 2005).

However, large size of an audit committee might be detrimental to its effectiveness and cohesiveness, and resulting in it having a weak monitoring role. Problems with coordination and communication may arise in larger committees as it is more difficult for them to arrange meetings and reach a consensus, and thus leading to slower and less-efficient decision-making, and directors becoming less likely to criticise the behaviour of top managers (Jensen, 1993; Yermack, 1996). Moreover, directors' free-riding problem may increase as committee grow, because monitoring cost to any individual director falls in proportion to committee size (Lipton and Lorsch, 1992).

The results of prior studies on the relationship between audit committee size and AEM are mixed (Lin et al., 2006; Xie et al., 2003; Vafeas, 2005; Bédard et al., 2004). In consideration of the arguments presented in this section, I hypothesise as follows:

H_{1g}: There is a negative relationship between audit committee size and AEM preceding both MBOs and IBOs

2.3.6 Audit Quality

Watts and Zimmerman (1986) define external audit quality as the ability of an external auditor to detect accounting misstatements and then to express them in appropriate audit opinions. In other words, audit quality is determined by an auditor's independence, competence and the effort it devotes to detect errors and misstatements during an audit (Ronen and Yaari, 2007). Previous literature suggests that larger audit firms tend to deliver a higher audit quality than smaller, less well-known firms do, because they are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (e.g. Becker et al., 1998). The relevant studies have investigated the notion of 'Big 5' auditors and 'non-Big 5' auditors and they quality of their audit work. DeAngelo (1981) suggests that larger audit firms have more resources to invest in improving the quality of their work. Hence larger audit firms have greater incentives to detect and reveal management misstatements resulting in a difference between the audit quality of larger and smaller firms.

Since Big 5 audit firms are larger than their peers, it follows from DeAngelo's analysis that their audits are of higher quality (Becker et al., 1998). Moreover, Palmrose (1986a) and Palmrose (1988) report that Big 5 audit firms have lower litigation rate and charge higher fees or monopoly price for the higher quality audits they provide. The empirical studies of Craswell et al. (1995), Palmrose (1986a), and Simunic (1980) also suggest that Big 5 auditors are associated with higher audit quality. Accordingly, I hypothesise as follows:

H_{3a}: The presence of 'Big 5' auditors is negatively associated with AEM preceding both MBOs and IBOs

Another measure of the quality of external audits could be audit fees in relation to the size of a firm. Several studies suggest that higher audit fees are likely to reflect a higher quality of external audit, as they compensate for the increased audit effort and the high-price of reputation capital (e.g. Craswell et al., 1995; Ferguson and Stokes, 2002; Palmrose, 1986a; Simunic, 1980). Increased audit effort is more likely to detect and report irregularities and errors in the estimation of accruals (Srinidhi and Gul, 2007). Due to the risk of litigation, auditors are less willing to accept questionable accounting reports. Auditors will require management to correct errors and modify accounting methods to improve financial reporting quality (Abbott et al., 2006). Hence higher audit fees reflect a higher audit quality, which, in turn reduces AEM practices.

Nevertheless, economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect auditors' independence and lead them to permit AEM (Frankel et al., 2002). In addition, higher AEM is likely to be associated with higher inherent risk, as assessed by auditors. The higher the level of inherent risk, the more audit effort will be required to reduce the risk of detection in order to achieve an accepted level of audit risk (Gul et al., 2003). Hence higher audit fees could also have a positive relationship with AEM. Empirical findings on the relationship between audit fees and AEM are mixed (e.g. Frankel et al., 2002; Gul et al., 2003; Abbott et al., 2006). According to the arguments and counter arguments, I hypothesise the following:

$H_{1\text{-}3b}$: The level of audit fees is negatively associated with AEM preceding both MBOs and IBOs

2.3.7 Rent seeking by auditors

The effectiveness of external monitoring also largely depends on an auditor's willingness to challenge its client's management when errors or opportunistic accounting practices are encountered. The joint provision of audit and non-audit services may compromise the independence of auditors, which in turn affects their willingness to express an audit opinion appropriately (Frankel et al., 2002; Simunic, 1984; Beck et al., 1988). Large fees paid to auditors, particularly those related to non-audit services, make them more economically dependent on their clients. This causes auditors to become reluctant about making appropriate inquiries during audits for fear of losing highly profitable clients (Hoitash et al., 2007). Furthermore, when auditors are no longer perceived to be independent, managers are unlikely to be deterred from opportunistic behaviours (Srinidhi and Gul, 2007). Consequently, even if auditors are competent in detecting errors, an economic bond with a client reduces their independence, in turn reducing audit quality. The provision of non-audit services causes auditors to lose objectivity, and thus affects their role in preventing earnings management. In addition, the joint provision of audit and non-audit services may mean that an auditor ends up auditing its own work (Beattie and Fearnley, 2002).

Nevertheless, by undertaking audits in addition to providing consultancy services, auditors learn more about a client's business, which may improve the quality of their services (Wallman, 1996). Empirical evidence regarding the relationship between non-audit fees and AEM is inconclusive (Frankel et al., 2002; Ashbaugh et al., 2003). In line with the argument that non-audit fees reduce audit quality, I hypothesise as follows:

$H_{1\text{-}3c}$: Non-audit fees are positively associated with AEM preceding both MBOs and IBOs

2.4 Methodology

2.4.1 Sample

This study investigates all UK listed firms that made leveraged buyouts announcements during the period from 1997 to 2011 and were finally delisted from the London Stock Exchange. The setting of the study has significant advantages as follows: First, most of the research on leveraged buyouts is based on the analysis of US samples from the 1980s and1990s (e.g. DeAngelo, 1986; Perry and Williams, 1994). Yet, it is questionable whether evidence from the US can be generalised to the UK. In the UK, leveraged buyouts are more rarely related to hostile takeovers than they are in the US. They also have lower debt levels, focus more on growth opportunities and are commonly financed by privately placed mezzanine funds rather than by junk bonds (Toms and Wright, 2005).

Second, the period studied covers the second wave of leveraged buyouts in the UK, which is different from the first wave in the 1980s. In the second wave, private equity and debt providers had increased confidence regarding important issues, such as access to key information, the support of target shareholders, and the expectation of acquiring all shares through squeeze-out provisions (Renneboog et al., 2007). Moreover, the increased use of innovative techniques, such as inducement fees and strict exclusivity agreements, facilitated the reduction of risks in leveraged buyouts (Davis and Day, 1998).

The data for leveraged buyout samples are collected from Thomson ONE Banker. 39 firms from the financial industry (Industry Classification Benchmark (ICB) code between 8000 and 8999) are excluded because they are subject to the external scrutiny of bodies like the Financial Services Authority (Weir et al., 2005a), which may affect their corporate governance. Datastream provides the earnings, total assets, and other financial data required to calculate abnormal AEM. 17 of the firms are eliminated due to there being insufficient financial data available from Datastream. This study uses the cross-sectional regression models developed by Kothari et al. (2005) and Dechow et al. (1995) to estimate the unadjusted abnormal accruals for each sample firm. The model parameters are estimated by industry and I require each firm-year to have at least six observations with the same ICB code. The industry-matched firms are collected from a sample of firms that were not involved in leveraged buyouts. Four-digit ICB codes are used for matching to the extent possible, and if no appropriate match is found, three-digit or two-digit codes are chosen. This approach is similar to the research design of Perry and Williams (1994). Data about audit committee characteristics and audit quality are hand collected from annual reports. I exclude 4 observations due to missing information about their audit committees. In total, these requirements yield 192 observations for leveraged buyouts[3], including 113 MBOs and 79 IBOs. The sampling process is listed in Table 2.1

Table 2.1 Sample

	MBOs	IBOs
Initial sample	149	102
Deleting	Financial firms	
	25	14
Non-financial firms	124	88
Deleting	Observations with missing financial data	
	9	8
Firms with Complete financial data	115	80
Deleting	Observations with missing corporate governance data	
	2	1
Final sample	113	79

2.4.2 Measuring AEM

This study adopts discretionary accruals from the cross-sectional model of Kothari, et al. (2005) to proxy for AEM[4]. Dechow et al. (1995), Guay et al. (1996) and Kasznik (1999) show that any proxy for abnormal accruals yields biased metrics if measurement error in the proxy is correlated with omitted variables. Significantly, well-specified tests must include an adjustment for any omitted variables if the omitted variables are associated with an independent variable or within a non-random sample (Klein, 2002). Following Kothari et al. (2005), this paper uses a matched-firm or portfolio technique to adjust the abnormal

[3] For studies on Leveraged buyouts in the UK, this sample size is large enough in comparison to Weir, et al. (2005a), who examined 96 Leveraged buyouts, and Renneboog, et al., (2007), who investigated 177 leveraged buyouts.

[4] This research adopts the same approach of prior studies on detecting earnings management by breaking the total accruals into two components: the discretionary accruals (abnormal accrual) and nondiscretionary accruals (normal accruals) (e.g. Healy, 1985; Jones, 1991; Dechow, et al., 1995; Subramanyam, 1996; Sok-Hyon & Sivaramakrishnan, 1995).

accruals. Furthermore, in an attempt to capture revenue manipulation, change in revenue is subtracted by changes in receivables. In addition, return on assets is added to the model in order to control for extreme operating performance, which can also bias the estimation of discretionary accruals (Kothari et al., 2005).

Normal accruals are estimated using the following model:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 + \alpha_i\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}\left(\frac{\Delta REV_{it} - \Delta AR_{it}}{A_{it-1}}\right) + \beta_{2i}\left(\frac{PPE_{it}}{A_{it-1}}\right) + \beta_{3i}(ROA_{it}) + \varepsilon_{it}$$

Where:

TA_{it}: is the current total accruals, calculated as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization

A_{it-1}: is the lagged total assets

ΔREV_{it}: is the sales growth

ΔAR_{it}: is the change in receivables

PPE_{it}: is the property, plant, and equipment

ROA_{it-1}: is the lagged return on assets

Total accruals are first regressed on equation (1) using data of peer firms in year t to estimate the parameters that are used to calculate the expected normal accruals for each leveraged buyout firm in year t. The parameter estimates a_0, a_i, b_{1i}, b_{2i}, and b_{3i} of α_0, α_i, β_{1i}, β_{2i}, and β_{3i} from the previous step are then combined with data on each leveraged buyout firm in event year t to generate estimated discretionary accruals ($AccruKo_{it}$), as follows:

$$AccruKo_{it} = \frac{TA_{it}}{A_{it-1}} - [\alpha_0 + \alpha_i\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}\left(\frac{\Delta REV_{it} - \Delta AR_{it}}{A_{it-1}}\right) + \beta_{2i}\left(\frac{PPE_{it}}{A_{it-1}}\right) + \beta_{3i}(ROA_{it})] \qquad (2$$

Where:

- $AccruKo_{it}$: is abnormal accrual or discretionary accruals

The estimated discretionary accruals (AccruKo) represent the magnitude of AEM, which is the difference between current accruals and expected normal accruals. Specifically, zero discretionary accruals indicate that a firm's current accruals are the same as expected, which means that AEM is not detected. Positive discretionary accruals indicate income-increasing AEM, while negative discretionary accruals indicate the opposite.

Moreover, in order to increase the robustness of the results, this study also used a cross-sectional adaptation of the modified Jones (1991) model, as developed by Dechow et al. (1995), as an alternative to measure discretionary accruals (AccruDe), as follows:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_i\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}\left(\frac{\Delta REV_{it} - \Delta AR_{it}}{A_{it-1}}\right) + \beta_{2i}\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it} \qquad (3)$$

Kothari, et al.'s (2005) model and Dechow et al.'s (1995) are developed by the US scholar to detect AEM behaviours in US firms. The differences of accounting systems between the US and other countries might reduce the effectiveness of the models. For instance, Yoon and Miller (2002) and Yoon et al. (2006) report that the modified Jones model does not fit for Korean firms. Hence, this study uses the models developed by Kothari, et al. (2005) and Dechow et al. (1995) to increase the robustness of my results.

2.4.3 Governance variables

Audit committee independence is measured by the percentage of non-executive directors on the audit committee (Ned%AudCom), and I expect a negative coefficient of this variable.

The financial expertise of audit committees is measured using a dummy variable with a value of 1 if at least one audit committee member has accounting or financial expertise, and 0 otherwise (FinancialExp).

Equity ownership by members of the audit committee is identified as the percentage of common share cumulatively owned by audit committee members (AudShare). In addition, this study identifies the presence of large shareholders on audit committees by a dummy variable with a value of 1 if at least one of the non-executive directors on audit committee has at least a 3% shareholding, and 0 otherwise (3%holdAudCom).

Audit committee size is measured by the number of audit committee members (AudComSz). Moreover, Defond et al. (2005) suggests that audit committee size also represents the amount of board resources devotes to the audit committee's function. Accordingly, this study uses another size proxy: the size of the audit committee divided by the size of the full board (AuditSz2BoardSz).

Audit quality has two proxies in this study: Big 5 auditors and audit fees. Big 5 auditors is coded 1 if a firm is audited by Big 5 auditors (Big5). Moreover, the measurement of audit fees is identified by a natural logarithm of audit fees (LNAudFees). Furthermore, size deflation ensures that the findings are not driven by size. Simunic (1980) and Kinney et al. (2004) suggest that the square root function best captures the relationship between audit fees and assets. On examining various scatter plots of residuals, the residual variance was found to be homogeneous when a square-root transformation was used. To control the size effect of the fees, audit fees is scaled by the square root of the 'total assets value' of each firm (AudFees/AssetsSqrt).

Rent seeking by auditors is identified by the natural logarithm of non-audit fees (LNNonAudFees). In addition, to control the size effect of the non-audit fees, this paper also scales non-audit fees by the square root of the total assets value of each firm (NonAudFees/AssetsSqrt). This study also captures rent seeking by auditors by the fee ratio of non-audit fees to total auditor fees (NonAudFees/TotalFees).

In Table 2.2 at section 2.4.6, Panels A and B show the summary statistics of all the variables for MBOs and IBOs respectively. For MBOs, on average, 85% of the audit committee members and 45% of the board members are outsiders. Audit fees and non-audit fees are, on average, 37.2% and 43.5% of the square root of total assets respectively. 28.3% of the firms include a financial expert in their audit committees, and 69.9% of the firms are audited by Big 5 auditors. For IBOs, on average, 95.7% of the audit committee members and 52.5% of the board members are outsiders. Audit fees and non-audit fees are 59.7% and 63.8% of the square root of total assets respectively. 63.3% of the firms include a financial expert in their audit committee, and 86.1% of the firms are audited by Big 5 auditors. Hence audit committees and boards in IBOs are more independent than they are in MBOs. IBO firms incur more audit fees and non-audit fees than are incurred in MBOs. More IBO firms include financial experts in their audit committees and choose Big 5 auditors to do their external auditing.

2.4.4 Control variables

This study controls for three other governance mechanisms, namely, board independence, board size, and Chief Executive Officer (CEO) duality.

As discussed before, outside directors are expected to have greater incentives to monitor management behaviour than inside directors have, and thus greater board independence is expected to lead to less discretionary accruals. Prior studies found that the proportion of non-executive directors on a board is negatively associated with discretionary accruals (Klein, 2002; Xie et al., 2003; Davidson et al., 2005). In UK studies, Peasnell et al. (2000a) and Peasnell et al. (2005) report that a higher proportion of non-executive directors is more likely to constrain income-increasing accruals than income-decreasing accruals. However, Rahman and Ali (2006) and Siregar and Utama (2008) found an insignificant relationship between board independence and earnings management. Similar to prior studies, this study identifies board independence by the percentage of non-executive directors on a board (NED%).

This study controls for board size. As discussed above, larger boards are associated with more resources and greater ability in respect to monitor management. Thus larger boards are expected to be associated with less discretionary accruals. Xie et al. (2003) and Peasnell et al. (2005) found a negative association between board size and AEM, whereas Rahman and Ali (2006) reported a positive association between them. This study measures board size by the number of board members (BoardSz).

This study controls for CEO duality. Duality occurs when the same individual holds the posts of CEO and chairman. CEO duality enables a CEO to effectively control the information that is available to other board members and thus it may impair effective monitoring (Jensen, 1993). Furthermore, CEO duality concentrates power in the CEO’s position without effective controls and balances. When CEO duality does impede effective monitoring, it might also be associated with greater use of discretionary accruals (Cornett et al., 2008). Therefore, CEO duality is likely to be positively associated with discretionary accruals. Klein (2002) reports that the absolute value of discretionary accruals is positively related to a powerful CEO who holds a position on a board's nominating and compensation committee. As in prior studies, in this study, CEO duality is identified by a dummy variable with a value of 1 if a board has CEO duality, and 0 otherwise (Duality).

The inclusion of firm size as a control variable is motivated by the size hypothesis. Larger firms are more likely to draw the attention of antitrust legislation due to their high reported profits or monopoly rents. Antitrust legislation has the power to redistribute wealth from these large firms. In order to reduce this political attention, managers of large firms are inclined to manage accounting discretion in order to reduce earnings (Watts and Zimmerman, 1978). However, larger firms are also likely to be under closer scrutiny by outsiders, such as financial/investment analysts, than small firms are (Hussain, 2000; Hussain, 1996). This can potentially reduce managers' opportunities to exercise earnings management (Koh, 2003). Furthermore, information asymmetry is often smaller in large firms because they produce more public information, which in turn reduces the needs for earnings management practices (LaFond and Watts, 2008). Peasnell et al. (2000a), Xie et al. (2003) and Klein (2002) found that firm size is negatively associated with abnormal accruals. In line with previous research, this study uses the natural logarithm of a firm's market value to proxy for its size (LNMarketVal).

This study uses institutional ownership as a control variable because institutional investors are expected to act as an alternative governance mechanism. Initially, agency theory suggests that large shareholdings may act as a disciplining mechanism (Jensen and Meckling, 1976). Since institutional investors have large shareholdings, they are induced to undertake monitoring activities, as their voting power allows them to significantly influence management (Shleifer and Vishny, 1986). Moreover, the presence of large institutional owners facilitates the exercise of shareholder's rights (Cremers and Nair, 2005), enabling the shareholders to remove top executives in firms that are performing poorly (Denis et al., 1997). Chtourou et al. (2001) indicate that firms which have a larger percentage of institutional ownership usually have a lower level of abnormal accruals. However, institutions with high levels of ownership may also influence managers and secure private benefits at the expense of other shareholders (Ahmed and Duellman, 2007). In line with prior literature, the percentage of shares owned by institutional investors is used to measure institutional ownership (InsShare).

More profitable firms are likely to have fewer agency conflicts, as managers are inclined to protect shareholder wealth rather than extract private interests. Thus pernicious earnings management is exercised less in these firms (Jensen and Meckling, 1976). Furthermore, managers are less likely to engage in income-increasing earnings management, in order to produce better accounting results, if their firm already performs well (Becker et al., 1998; Bédard et al., 2004). Bédard et al. (2004) report that firm performance, measured as the lagged return on assets, is negatively associated with earnings management. Accordingly, firm performance is measured by the previous year's return on assets (LagROA).

Sales growth is likely to affect earnings management, as growth in sales will affect accruals, such as inventory and receivables. Furthermore, large growth in sales often inflates the market's expectations of future cash flows, which can affect earnings management (Ahmed and Duellman, 2007). In times of rapid growth, a company may also be under pressure to maintain or exceed anticipated growth rates, driving managers to engage in earnings management to achieve a targeted growth rate, or to mask downturns (Carcello and Nagy, 2004). As in prior studies, sales growth is measured by the annual percentage growth in total sales (SalesGrow).

Leverage picks up debt contracting motivations for earnings management. Higher leverage is associated with a higher risk of a firm violating its debt covenants (Press and Weintrop, 1990), and the violation of debt covenants is related to the decision to use discretionary accruals to manage earnings (DeFond and Jiambalvo, 1994). Managers of highly leveraged firms have incentives to exercise income-increasing discretionary accruals to avoid violating debt covenants. Moreover, higher leverage ratio is associated with higher cost of debt financing (Piot and Janin, 2007). As debt increases, companies may use income-increasing earnings management practices in order to present a more favourable financial position when negotiating with lenders. Thus, leverage ratio is likely to have a positive relationship with abnormal accruals (Watts and Zimmerman, 1986). Similar to prior studies, leverage is measured by the ratio of total debt to total assets (Leverage).

Jensen (1986) suggests that the leveraged buyout targets generally have large free cash flows, which are more likely to raise agency conflicts. However, steady free cash flow could be used to pay off the debt raised in leveraged buyout transactions, and thus attract potential buyers (Jensen, 1986). Jensen and Meckling (1976) suggest that managers always act in their best interests. Therefore, free cash flow is likely to motivate managers to adopt income-decreasing earnings management in order to depress shareholder premiums prior to MBOs, and income-increasing earnings management to secure their jobs and interests prior to IBOs. Free cash flow is measured by deducting capital expenditure and cash dividend from funds from operations, and then scaling it by a firm's total assets (FreeCashFlow).

2.4.5 Model

This study uses OLS models to investigate how the corporate governance mechanisms of audit committee characteristics and external audit quality affects AEM. In order to avoid multicollinearity problems, audit committee variables and main board variables are separated into different models. Model 1 investigates the effects of audit committee variables on AEM, and Model 2 investigates the effects of board characteristics on AEM.

Audit Committee Characteristics Model:

$$\begin{aligned} AccruKo_{it} = {} & \beta_0 + \beta_1 \mathrm{Ned\%AudCom} + \beta_2\ \mathrm{FinancialExp} + \beta_3 \mathrm{AudShare} \\ & + \beta_4 \mathrm{3\%holdAudCom} + \beta_5 \mathrm{AudComSz} + \beta_6 \mathrm{AuditSz2BoardSz} \\ & + \beta_7 \mathrm{LNMarketVal} + \beta_8 \mathrm{InsShare} + \beta_9 \mathrm{LagROA} + \beta_{10} \mathrm{SalesGrow} \\ & + \beta_{11} \mathrm{Leverage} + \beta_{12} \mathrm{FreeCashFlow} + \varepsilon \qquad (1) \end{aligned}$$

Audit Quality Model:

$$\begin{aligned} AccruKo_{it} = {} & \beta_0 + \beta_1 \mathrm{Big5} + \beta_2\ \mathrm{LNAudFees} + \beta_3 \mathrm{AudFees/AssetsSqrt} \\ & + \beta_4 \mathrm{LNNonAudFees} + \beta_5 \mathrm{NonAudFees/AssetsSqrt} \\ & + \beta_6 \mathrm{NonAudFees/TotalFees} + \beta_7 \mathrm{NED\%} + \beta_8 \mathrm{BoardSz} + \beta_9 \mathrm{Duality} \\ & + \beta_{10} \mathrm{LNMarketVal} + \beta_{11} \mathrm{InsShare} + \beta_{12} \mathrm{LagROA} + \beta_{13} \mathrm{SalesGrow} \\ & + \beta_{14} \mathrm{Leverage} + \beta_{15} \mathrm{Free\ \ Cash\ \ Flow} \\ & + \varepsilon \qquad (2) \end{aligned}$$

Where:

AccruKo: is abnormal accruals, detected using the cross-sectional model of Kothari et al. (2005)

Ned%AudCom: is the percentage of non-executive directors on the audit committee

AudComSz: is the number of members on the audit committee size

AuditSz2BoardSz: is the ratio of audit committee size to board size

FinancialExp: is a dummy variable coded 1 if the audit committee has financial expertise;

AudShare: is the percentage of common stock cumulatively owned by audit committee members

3%holdAudCom: is a dummy variable coded 1 if at least one non-executive director on the audit committee has at least a 3% shareholding

Big5: is a dummy variable coded 1 if the firm uses a Big 5 Auditor

LNAudFees: is the natural logarithm of audit fees

AudFees/AssetsSqrt: is the fee ratio of audit fees to the square root of total assets

LNNonAudFees: is the natural logarithm of non-audit fees

NonAudit Fees/Assets SQroot: is the fee ratio of non-audit fees to the square root of total assets

NonAudFees/AssetsSqrt: is the fee ratio of non-audit fees to the total auditor fees

NED%: is the percentage of non-executive directors on the main board

BoardSz: is the number of directors on the board

Duality: is a dummy variable coded 1 if the board has CEO duality

LNMarketVal: is the natural logarithm of the market value

InsShare: is the percentage of cumulative institutional Shareholding

LagROA: is the lagged return on assets

Leverage: is the ratio of total debt to total assets

SalesGrow: is the percentage of sales growth

FreeCashFlow: is defined as funds from operations - capital expenditure - cash dividend, scaled by total assets.

If the errors in OLS models are heteroscedastic, OLS estimators are still unbiased coefficient estimates, but they are no longer best linear unbiased estimators. This is because they no longer have the minimum variance among the class of unbiased estimators (Brooks, 2014). White (1980) general test is used in this research to detect any potential heteroscedasticity. The results of this diagnostic tests suggest that there is no heteroscedastic problem in the OLS model.

Moreover, multicollinearity, omission of an important variable and inclusion of an irrelevant variable might also result in OLS model to generate biased results (Brooks, 2014). The board characteristics data and audit committee characteristics data have a relatively high correlation, which might cause multicollinearity. In order to avoid multicollinearity problems, these variables are separated into different models. However, due to data limitation, the selection of variable in my model is constrained. Hence, the OLS model applied in this study might omit another corporate governance variable that is relevant to this study. Moreover, the OLS model might include irrelevant control variable, and thus the estimation might be less efficient. Therefore, I've replaced the dependent variable in robustness test section to check whether my results are consistent and not sensitive to the selection of variables.

Furthermore, corporate governance variables might suffer from endogeneity problem (Coles et al., 2008). If there is no endogeneity in a model, the coefficient estimates will be consistent for both OLS and 2SLS, but OLS is more efficient. However, if there is an endogeneity problem, only 2SLS estimator is consistent (Brooks, 2014). In order to ensure my model do not suffer from endogeneity problem, I use Hausman tests to detect the potential endogeneity. The Hausman test results suggest that there is no endogeneity in my models, which will be explained in section 2.5.4.

2.4.6 Summary statistics and correlation matrix

Table 2.2 shows the summary statistics of all variables. Panel A shows the summary statistics for MBOs. Panel B shows the summary statistics of IBOs.

Table 2.2 Panel A Summary Statistics for MBOs

Panel A: Summary Statistics for MBOs								
Variable	Obs	Mean	Median	Std.Dev.	p25	p75	Min	Max
AccruKo	113	-0.010	-0.002	0.068	-0.039	0.013	-0.208	0.194
AccruDe	113	-0.013	-0.010	0.091	-0.052	0.008	-0.316	0.431
Ned%AudCom	113	0.850	1.000	0.246	0.667	1.000	0.000	1.000
FinancialExp	113	0.283	0.000	0.453	0.000	1.000	0	1
AudShare	113	0.073	0.005	0.148	0.001	0.067	0.000	0.771
3%holdAudCom	113	0.168	0.000	0.376	0.000	0.000	0	1
AudComSz	113	3.053	3.000	1.209	2.000	4.000	1	8
AuditSz2BoardSz	113	0.521	0.500	0.219	0.400	0.571	0.125	1.000
Big5	113	0.699	1.000	0.461	0.000	1.000	0	1
LNAudFees	113	4.343	4.357	0.835	3.807	4.890	2.303	6.551
AudFees/AssetsSqrt	113	0.372	0.327	0.197	0.243	0.476	0.019	1.133
LNNonAudFees	113	3.860	4.094	1.629	3.047	5.037	0.000	7.187
NonAudFees/AssetsSqrt	113	0.435	0.266	0.581	0.105	0.553	0.000	4.242
NonAudFees/TotalFees	113	0.429	0.421	0.234	0.275	0.588	0.000	0.912
NED%	113	0.450	0.429	0.132	0.400	0.500	0.143	0.750
BoardSz	113	6.062	6.000	1.571	5.000	7.000	3	11
Duality	113	0.283	0.000	0.453	0.000	1.000	0	1
LNMarketVal	113	10.321	10.205	1.476	9.325	11.108	5.635	15.067
InsShare	113	0.357	0.321	0.218	0.197	0.502	0.000	0.890
LagROA	113	-0.017	0.102	1.132	0.051	0.149	-11.864	0.429
SalesGrow	113	0.358	0.036	2.212	-0.060	0.136	-0.554	21.687
Leverage	113	0.168	0.144	0.150	0.032	0.256	0.000	0.740
FreeCashFlow	113	-0.008	0.015	0.140	-0.046	0.046	-0.980	0.369

Table 2.2 Panel B Summary Statistics for IBOs

Panel B: Summary Statistics for IBOs								
Variable	Obs	Mean	Median	Std.Dev.	p25	p75	Min	Max
AccruKo	79	-0.002	0.002	0.080	-0.020	0.041	-0.457	0.159
AccruDe	79	-0.001	-0.003	0.083	-0.037	0.044	-0.449	0.245
Ned%AudCom	79	0.957	1.000	0.115	1.000	1.000	0.500	1.000
FinancialExp	79	0.633	1.000	0.485	0.000	1.000	0	1
AudShare	79	0.030	0.001	0.075	0.000	0.010	0.000	0.393
3%holdAudCom	79	0.152	0.000	0.361	0.000	0.000	0	1
AudComSz	79	3.076	3.000	0.931	3.000	3.000	1	8
AuditSz2BoardSz	79	0.473	0.500	0.138	0.375	0.556	0.222	1.000
Big5	79	0.861	1.000	0.348	1.000	1.000	0	1
LNAudFees	79	4.982	4.875	1.147	4.205	5.704	2.890	8.038
AudFees/AssetsSqrt	79	0.597	0.400	0.735	0.234	0.659	0.081	5.683
LNNonAudFees	79	4.659	4.605	1.607	3.829	5.704	0.000	8.366
NonAudFees/AssetsSqrt	79	0.638	0.375	0.926	0.178	0.693	0.000	5.683
NonAudFees/TotalFees	79	0.450	0.444	0.222	0.300	0.578	0.000	0.880
NED%	79	0.525	0.500	0.129	0.429	0.625	0.125	0.750
BoardSz	79	6.772	7.000	1.633	5.000	8.000	4	10
Duality	79	0.114	0.000	0.320	0.000	0.000	0	1
LNMarketVal	79	11.424	11.480	1.767	9.983	12.764	8.111	15.653
InsShare	79	0.379	0.377	0.186	0.288	0.504	0.000	0.905
LagROA	79	0.073	0.074	0.140	0.044	0.129	-0.429	0.604
SalesGrow	79	0.187	0.075	0.668	-0.010	0.189	-0.895	5.169
Leverage	79	0.253	0.230	0.211	0.092	0.366	0.000	1.130
FreeCashFlow	79	-0.270	0.009	2.313	-0.047	0.050	-20.550	0.201

In Table 2.3, Panels A and B show the results of the Pearson correlation matrix for MBOs and IBOs respectively. Multicollinearity in regression analysis is regarded as harmful only when correlations exceed 0.7. When the highly correlated variables are separated into different models, all independent variables included in each regression analysis in this research are below 0.65. The variance inflation factors (VIFs) are also computed and examined in order to examine whether multicollinearity is a problem. The VIFs of all regression models are below 3, which is far lower than the critical value of 10 (Tabachnick and Fidell, 2012). Therefore, multicollinearity is not a problem in this study.

Table 2.3 Panel A Pearson Pairwise Correlation Matrix for MBOs

Panel A: Pearson pairwise Correlation matrix for MBOs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Ned%AudCom (1)	1																				
FinancialExp (2)	-0.17	1																			
AudShare (3)	-0.453	0.289	1																		
3%holdAudCom (4)	0.072	0.085	0.416	1																	
AudComSz (5)	-0.362	0.103	0.368	0.138	1																
AuditSz2BoardSz (6)	-0.594	0.021	0.5	0.138	0.717	1															
Big5 (7)	0.269	-0.016	-0.164	-0.118	-0.083	-0.162	1														
LNAudFees (8)	0.369	-0.196	-0.288	-0.182	0.04	-0.275	0.314	1													
AudFees/AssetsSqrt (9)	0.2	-0.222	-0.197	-0.196	-0.043	-0.079	0.123	0.57	1												
LNNonAudFees (10)	0.311	-0.21	-0.132	-0.02	0.106	-0.134	0.311	0.474	0.198	1											
NonAudFees/AssetsSqrt (11)	0.223	-0.121	-0.135	0.003	-0.05	-0.095	0.199	0.137	0.176	0.633	1										
NonAudFees/TotalFees (12)	0.194	-0.079	-0.027	0.05	0.072	-0.084	0.207	0.04	-0.126	0.831	0.703	1									
NED% (13)	0.365	-0.066	-0.058	0.183	0.258	0.232	0.015	0.201	0.08	0.058	0.046	-0.022	1								
BoardSz (14)	0.303	0.05	-0.166	0.012	0.332	-0.362	0.137	0.382	-0.009	0.322	0.037	0.215	0.026	1							
Duality (15)	-0.269	-0.09	-0.024	0.085	-0.093	0.123	-0.016	-0.302	-0.23	-0.106	-0.137	-0.019	-0.27	-0.288	1						
LNMarketVal (16)	0.223	-0.124	-0.163	0.021	0.11	-0.179	0.254	0.59	-0.053	0.507	0.071	0.222	0.049	0.366	-0.087	1					
InsShare (17)	0.26	-0.117	-0.362	-0.266	0.025	-0.023	-0.017	0.258	0.294	0.186	0.163	0.046	0.236	0.034	-0.188	0.059	1				
LagROA (18)	0.034	0.06	0.049	0.05	-0.068	-0.208	0.154	0.163	-0.085	0.199	0.07	0.145	-0.222	0.134	-0.138	0.346	-0.183	1			
SalesGrow (19)	0.014	-0.073	-0.06	-0.049	0.008	-0.081	-0.012	0.012	-0.006	0.12	0.096	0.149	0.016	0.13	0.176	-0.01	-0.066	0.008	1		
Leverage (20)	0.105	0.159	-0.177	-0.127	0.004	-0.133	0.006	0.204	0.098	-0.078	0	-0.138	0.175	0.129	-0.311	-0.041	0.193	0.085	-0.068	1	
FreeCashFlow (21)	-0.039	0.055	0.147	0.132	-0.067	-0.071	-0.005	-0.063	-0.197	-0.029	-0.194	-0.024	-0.175	-0.04	-0.023	0.184	-0.201	0.647	-0.074	-0.126	1

Table 2.3 Panel B Pearson Pairwise Correlation Matrix for IBOs

Panel B: Pearson pairwise Correlation matrix for IBOs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Ned%AudCom (1)	1																				
FinancialExp (2)	0.069	1																			
AudShare (3)	-0.26	0.066	1																		
3%holdAudCom (4)	-0.022	0.176	0.654	1																	
AudComSz (5)	-0.313	-0.108	0	0.042	1																
AuditSz2BoardSz (6)	-0.498	-0.186	0.262	0.165	0.609	1															
Big5 (7)	0.142	0.149	-0.085	0.068	0.152	0.069	1														
LNAudFees (8)	0.325	-0.041	-0.219	-0.157	0.222	-0.145	0.362	1													
AudFees/AssetsSqrt (9)	0.094	0.021	-0.074	-0.071	-0.118	-0.058	-0.143	0.29	1												
LNNonAudFees (10)	0.174	-0.045	-0.003	0.004	-0.048	-0.136	0.113	0.437	0.289	1											
NonAudFees/AssetsSqrt (11)	0.068	0.058	-0.007	-0.061	-0.2	-0.128	-0.12	0.08	0.638	0.558	1										
NonAudFees/TotalFees (12)	-0.075	0.014	0.208	0.141	-0.142	-0.04	-0.047	-0.245	-0.257	0.62	0.387	1									
NED% (13)	0.219	0.039	-0.021	0.09	0.317	0.315	0.189	0.156	-0.233	0.014	-0.226	0.013	1								
BoardSz (14)	0.143	0.103	-0.265	-0.136	0.349	-0.462	0.056	0.421	0.128	0.168	0.085	-0.125	-0.102	1							
Duality (15)	0.018	-0.058	0.123	-0.041	-0.116	-0.093	-0.086	-0.146	-0.129	0.033	-0.021	0.186	-0.022	-0.048	1						
LNMarketVal (16)	0.329	0.104	-0.285	-0.255	0.15	-0.247	0.263	0.686	0.189	0.246	0.045	-0.27	0.007	0.522	-0.093	1					
InsShare (17)	-0.141	-0.169	-0.206	-0.27	0.079	0.183	-0.033	-0.099	0.136	0.052	0.138	0.047	0.011	-0.129	0.053	-0.103	1				
LagROA (18)	0.108	0.119	0.089	0.012	-0.114	-0.263	-0.001	0.039	-0.057	-0.091	-0.09	-0.12	-0.288	0.123	-0.041	0.203	-0.168	1			
SalesGrow (19)	0.006	-0.087	0.023	-0.021	-0.06	0.022	0.032	0.017	0.046	0.145	0.069	0.109	0.015	-0.086	-0.053	0.06	0.019	0.014	1		
Leverage (20)	0.283	0.04	-0.216	-0.089	-0.173	-0.248	0.095	0.162	0.174	0.222	0.185	0.017	0.249	0.116	0.134	0.24	0.254	-0.033	0.083	1	
FreeCashFlow (21)	-0.043	-0.087	0.053	0.044	0.246	0.119	0.283	0.159	-0.788	-0.115	-0.623	0.126	0.345	-0.1	0.043	-0.132	-0.158	0.04	-0.071	-0.227	1

2.5 Empirical Results

2.5.1 Univariate tests

In Table 2.4, Panels A and B shows the results of univariate tests on abnormal accruals after the sample was partitioned into MBOs and IBOs. In Panel A, the means of the detected abnormal accruals (AccruKo) are negative for MBOs, based on the model from Kothari et al. (2005). The results are statistically significant (at the 10% level of confidence) in the one-sided t-test. Panel B shows the average direction of abnormal accruals prior to MBOs, as measured by the model from Kothari, *et al.* (2005). It can be seen that the minority of MBO firms have engaged in positive AEM practices (39.8%). In addition, the test for robustness, using abnormal accruals as measured by the model from Dechow et al. (1995) reports the same results for MBOs. These results indicate that managers engage in income-decreasing AEM behaviour preceding MBOs in the UK. The finding is consistent with those of DeAngelo (1986), Perry and Williams (1994), and Wu (1997): managers engage in negative AEM practices prior to MBOs, possibly in attempt to depress the premium for selling shareholders. This is consistent with hypothesis $H_{1\text{-}1a}$.

In Panel C of Table 2.4, the means of the detected abnormal accruals are shown to be negative for IBOs, but this figure is very small and has no significant difference from 0 in the t-test. In order to further investigate AEM behaviour preceding IBOs, this study summarises the direction of AEM practices in Panel D. It can be seen that, 53.2% of the detected abnormal accruals are positive, according to the model from Kothari et al. (2005). This indicates that the majority of managers exercised income-increasing AEM prior to IBOs in the UK. Nevertheless, the results from the Dechow et al. (1995) model shows that 48.1% of the detected abnormal accruals have a positive sign. These findings are inconclusive; hence we cannot determine the direction of AEM practices preceding IBOs. This is inconsistent with hypothesis $H_{1\text{-}1b}$.

In summary, the results show that abnormal accruals is significantly negative in the year preceding MBOs, which suggests that managers engage in negative AEM. In contrast, the results show that managers engage in no greater AEM behaviour compared to non-buyout firms preceding IBOs. Managers' ability to predict IBOs is much less accurate than it is with MBOs, as they are not part of the bidding group. Hence their behaviour is likely to be driven by the perception of undervaluation. Managers do not usually have a long time to prepare before IBO biddings. Since AEM can only be used in the end of the accounting period, when managers perceive their firm to be undervalued, they might have no time to engage in AEM before the bid are announced. Therefore, managers are less likely to have systematic AEM prior to IBOs.

Table 2.4 Univariate Tests Results

Panel A. T-test for Abnormal Accruals in Signed Value (MBOs)							
Group	Variable	Obs	Mean	Std.Dev.	H_1[Note1]	t-Stat	p-Value
MBO	AccruKo	113	-0.011	0.072	AccruKo<0	-1.626	0.053
MBO	AccruKo	113	-0.011	0.072	AccruKo>0	-1.626	0.947
MBO	AccruDe	113	-0.013	0.091	AccruDe<0	-1.568	0.060
MBO	AccruDe	113	-0.013	0.091	AccruDe>0	-1.568	0.940

Panel B. The direction of Abnormal Accruals (1=positive, 0= negative) (MBOs)				
Group	Variable	Obs	Mean	Std.Dev.
MBO	AbnAcc	113	0.398	0.492
MBO	AccruDe	113	0.363	0.483

Panel C. T-test for Abnormal Accruals in Signed Value (IBOs)							
Group	Variable	Obs	Mean	Std.Dev.	H_1	t-Stat	p-Value
IBO	AccruKo	79	-0.006	0.073	AccruKo<0	-0.701	0.243
IBO	AccruKo	79	-0.006	0.073	AccruKo>0	-0.701	0.757
IBO	AccruDe	79	-0.001	0.083	AccruDe<0	-0.127	0.450
IBO	AccruDe	79	-0.001	0.083	AccruDe>0	-0.127	0.550

Panel D. The direction of Abnormal Accruals (1=positive, 0= negative) (IBOs)				
Group	Variable	Obs	Mean	Std.Dev.
IBO	AccruKo	79	0.532	0.502
IBO	AccruDe	79	0.481	0.503

Note1:The null hypothesis is "AccruKo=0", H_1 is alternative hypothesis

Variable Definition: AccruKo: detected abnormal accruals using Kothari, *et al.* (2005) model; AccruDe: detected abnormal accruals using Dechow *et al.* (1995) model.

2.5.2 Multivariate tests

Table 2.5 shows the results from the OLS regressions. Panel A shows multiple regression results for the audit committee variables. Panel B shows multiple regression results for the audit quality variables. In this section, the dependent variable is AEM, which is proxied by the detected abnormal accruals (AccruKo) from the model of Kothari et al. (2005).

In this section, the interpretation of regression results will be different from that found in prior literature, as this study includes a dependent variable, AEM, that has been shown to have a significantly negative value in univariate tests. If the AEM proxy in univariate tests is significantly negative, a positive correlation between the AEM proxy and corporate governance mechanisms indicates that the governance mechanisms mitigate AEM, and a negative correlation between the AEM proxy and corporate governance mechanisms indicates that the governance mechanisms facilitate AEM.

Table 2.5 Panel A Multivariate Test Results

Panel A. Audit Committee Characteristics Model								
	MBO 1	MBO 2	MBO 3	MBO 4	IBO 1	IBO 2	IBO 3	IBO 4
VARIABLES	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo
Ned%AudCom	0.017	0.001	0.006	-0.009	0.083	0.026	0.062	0.016
	(0.414)	(0.037)	(0.130)	(-0.220)	(1.250)	(0.318)	(0.929)	(0.199)
FinancialExp	-0.010	-0.006	-0.010	-0.004	-0.024*	-0.028*	-0.025*	-0.029*
	(-0.749)	(-0.428)	(-0.704)	(-0.246)	(-1.853)	(-1.783)	(-1.907)	(-1.800)
AudShare	0.080		0.103		0.309**		0.321**	
	(1.111)		(1.278)		(2.285)		(2.309)	
3%holdAudCom		0.015		0.019		0.054*		0.056*
		(1.064)		(1.300)		(1.799)		(1.793)
AudComSz	0.008	0.010			0.003	-0.001		
	(1.092)	(1.139)			(0.310)	(-0.114)		
AuditSz2BoardSz			0.001	0.020			-0.029	-0.027
			(0.017)	(0.463)			(-0.441)	(-0.369)
LNMarketVal	0.010**	0.009**	0.011**	0.011**	0.012**	0.013**	0.013**	0.013**
	(2.120)	(2.005)	(2.276)	(2.215)	(2.171)	(2.054)	(2.590)	(2.396)
InsShare	-0.024	-0.029	-0.016	-0.024	0.084	0.088	0.090	0.091
	(-0.857)	(-0.986)	(-0.584)	(-0.796)	(0.966)	(0.953)	(1.005)	(0.973)
LagROA	-0.011	-0.010	-0.012*	-0.010	-0.073**	-0.058	-0.082**	-0.062
	(-1.581)	(-1.474)	(-1.732)	(-1.558)	(-2.097)	(-1.412)	(-2.184)	(-1.434)
SalesGrow	0.007***	0.007***	0.007***	0.007***	-0.002	-0.001	-0.002	-0.001
	(3.884)	(3.742)	(3.293)	(3.253)	(-0.197)	(-0.103)	(-0.205)	(-0.077)
Leverage	0.043	0.035	0.048	0.041	-0.097	-0.108*	-0.101	-0.110*
	(0.804)	(0.699)	(0.865)	(0.761)	(-1.614)	(-1.730)	(-1.629)	(-1.713)
FreeCashFlow	0.060	0.062	0.055	0.056	-0.003**	-0.003**	-0.003***	-0.003***
	(0.856)	(0.866)	(0.837)	(0.832)	(-2.282)	(-2.115)	(-2.884)	(-3.194)
Constant	-0.152*	-0.128*	-0.142	-0.126	-0.227**	-0.167	-0.194*	-0.148
	(-1.862)	(-1.823)	(-1.538)	(-1.443)	(-2.311)	(-1.496)	(-1.855)	(-1.270)
Observations	113	113	113	113	79	79	79	79
R-squared	0.131	0.120	0.119	0.102	0.213	0.189	0.214	0.190
F-test	2.337	2.285	1.663	1.652	7.103	5.670	7.092	5.685
Prob > F	0.016	0.018	0.0997	0.103	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.5 Panel B Multivariate Test Results

Panel B. Audit Quality Model						
	MBO 1	MBO 2	MBO 3	IBO 1	IBO 2	IBO 3
VARIABLES	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo
Big5	-0.019	-0.023	-0.020	-0.043**	-0.040*	-0.034*
	(-1.165)	(-1.409)	(-1.254)	(-2.147)	(-1.877)	(-1.758)
LNAudFees	-0.001			0.026***		
	(-0.065)			(2.822)		
AudFees/AssetsSqrt			-0.065*			0.010
			(-1.966)			(0.915)
LNNonAudFees		0.009*			0.008	
		(1.856)			(1.430)	
NonAudFees/AssetsSqrt			0.024**			0.004
			(2.419)			(0.568)
NonAudFees/TotalFees	0.071**			0.046		
	(2.336)			(1.084)		
NED%	0.101	0.087	0.086	0.020	0.021	0.033
	(1.396)	(1.248)	(1.183)	(0.266)	(0.261)	(0.454)
BoardSz	0.008	0.005	0.006	-0.001	-0.001	-0.000
	(1.589)	(1.272)	(1.362)	(-0.341)	(-0.193)	(-0.094)
Duality	0.017	0.016	0.013	0.008	0.003	0.008
	(1.155)	(1.093)	(0.808)	(0.400)	(0.128)	(0.342)
LNMarketVal		0.004	0.007		0.010*	0.011*
		(0.867)	(1.543)		(1.859)	(1.937)
InsShare	-0.039	-0.051	-0.036	0.065	0.065	0.062
	(-1.257)	(-1.658)	(-1.092)	(0.840)	(0.817)	(0.782)
LagROA	-0.007	-0.010	-0.004	-0.027	-0.049	-0.053
	(-1.216)	(-1.532)	(-1.131)	(-0.605)	(-1.097)	(-1.155)
SalesGrow	0.004**	0.004**	0.004**	-0.000	-0.001	0.001
	(2.115)	(2.022)	(2.403)	(-0.013)	(-0.102)	(0.096)
Leverage	0.031	0.035	0.015	-0.109**	-0.109**	-0.108*
	(0.581)	(0.644)	(0.287)	(-2.058)	(-2.042)	(-1.848)
FreeCashFlow	0.079	0.080		-0.005***	-0.001	
	(1.211)	(1.175)		(-2.750)	(-0.380)	
Constant	-0.114**	-0.139**	-0.128**	-0.119*	-0.127*	-0.119*
	(-2.085)	(-2.195)	(-2.004)	(-1.845)	(-1.935)	(-1.838)
Observations	113	113	113	79	79	79
R-squared	0.156	0.157	0.176	0.200	0.166	0.152
F-test	2.536	1.812	3.732	8.669	6.771	1.397
Prob > F	0.007	0.062	0.000	0.000	0.000	0.195

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

2.5.2.1 Results for management buyouts

In Panel A of Table 2.5 in the Appendix, Models MBO 1 to MBO 4 report the results of the OLS regressions on audit committee characteristics for MBOs. This study does not include all the audit committee variables in the same regressions, in order to avoid high correlation between them.

The percentage of non-executive directors on an audit committee

The percentage of non-executive directors on an audit committee (Ned%AudCom) has no significant relationship with AEM (AccruKo). The sign direction of AEM is significantly negative in univariate tests, which indicates negative AEM. This suggests that the percentage of non-executive directors on an audit committee has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2a}$.

Non-executive directors might perform little or no real monitoring role as they lack the independence, time, expertise and information they would need in order to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). Hence a high percentage of non-executive directors on the audit committee might have no impact on AEM.

Financial expertise on audit committee

The financial expertise of audit committees (FinancialExp) has no significant relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, which indicates negative AEM. This suggests that the financial expertise of audit committees has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2b}$.

Equity ownership by members of audit committees

Audit committee members' equity ownership (AudShare) has no significant relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, which indicates negative AEM. This suggests that equity ownership by audit committee members has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2c}$.

Moreover, as an alternative measure of equity ownership, the presence in an audit committee of an outside blockholder with more than a 3% shareholding (3%holdAudCom) has no significant relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, which indicates negative AEM. This suggests that having a blockholder with a 3% shareholding on the audit committee has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2e}$.

Audit committee size

Audit committee size (AudComSz and AuditSz2BoardSz) has on significant relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, indicating negative AEM. This suggests that audit committee size has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2g}$.

Audit committees might not take sufficient care that an MBO is about to happen, and thus they might focus on mitigating traditional positive AEM, in which managers boost earnings, rather than noticing negative AEM. Hence, audit committee members are unable to spot negative AEM behaviours prior to MBOs.

In Panel B of Table 2.5 in the Appendix, Models MBO 1 to MBO 3 report the results of the OLS regressions on audit quality for MBOs.

Big 5 auditors

The presence of a Big 5 auditor (Big5) has an insignificant relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, which indicates negative AEM. This suggests that the presence of a Big 5 auditor has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3a}$.

External auditors might have no awareness that an MBO is about to happen, and thus they might focus on limiting traditional positive AEM, in order to mitigate managers' attempts to boost earnings, rather than on spotting negative AEM.

Audit fees

Audit fees (AudFees/AssetsSqrt) have a significant negative relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, which indicates negative AEM. This suggests that higher audit fees are associated with more AEM, which is inconsistent with hypothesis $H_{1\text{-}3b}$.

Economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect auditors' independence and lead them to permit AEM (Frankel et al., 2002). In addition, higher levels of AEM are likely to be associated with higher inherent risks, as assessed by auditors. The higher the level of inherent risk, the more audit effort will be required to reduce the risk of detection in order to achieve a given level of audit risk (Gul et al., 2003). Hence higher audit fees might be associated with higher levels of AEM.

Non-audit fees

Non-audit fees (LNNonAudFees, NonAudFees/AssetsSqrt and NonAudFees/TotalFees) have a significant positive relationship with AEM. The sign direction of AEM is significantly negative in univariate tests, indicating negative AEM. This suggests that higher non-audit fees are associated with less AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$.

By undertaking audits and providing consultancy services, auditors learn more about a client's business, which may improve the quality of all their services (Wallman, 1996). Hence higher non-audit fees might lead to less AEM.

Summary of findings for management buyouts

In summary, audit committee characteristics have no impact on AEM, which is inconsistent with hypotheses $H_{1\text{-}2a}$, $H_{1\text{-}2b}$, $H_{1\text{-}2c}$, $H_{1\text{-}2e}$ and $H_{1\text{-}2g}$. With regards to the quality of external audits, the presence of a Big 5 auditor has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3a}$. Higher audit fees are associated with more AEM, which is inconsistent with hypothesis $H_{1\text{-}3b}$. Higher non-audit fees are associated with less AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$.

2.5.2.3 Results for institutional buyouts

In Panel A of Table 2.5 in the Appendix, Models IBO 1 to IBO 4 reports the results of the OLS regressions on audit committee characteristics for IBOs. This study does not include all audit committee variables in the same regressions in order to avoid high correlation between them.

The percentage of non-executive directors on the audit committee

The percentage of non-executive directors on the audit committee (*Ned%AudCom*) has no significant relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that the percentage of non-executive directors on the audit committee has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2a}$.

Non-executive directors might perform little or no real monitoring role as they lack the necessary independence, time, expertise, and information in order to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). Hence a high percentage of non-executive directors on an audit committee might have no impact on AEM.

Financial expertise on audit committees

The financial expertise of audit committees (FinancialExp) has a significant negative relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that financial expertise in an audit committees is associated with less AEM, which is consistent with hypothesis $H_{1\text{-}2b}$.

The financial expertise of an audit committee makes internal control judgements more like those of experts, effectively facilitating the reporting process (DeZoort and Salterio, 2001). Audit committees that have financial expertise are better equipped to understand auditing issues and risks, as well as any procedures that are proposed to address and/or detect them (DeZoort and Salterio, 2001). In addition, knowledgeable audit committees are more likely to understand internal audit programs and their results, which, in turn, they ensure internal controls are more effective for preventing or detecting AEM (Abbott et al., 2004).

Equity ownership by members of audit committees

Audit committee members' equity ownership (AudShare) has a significant positive relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that higher levels of equity ownership by members of an audit committee is associated with more AEM, which is consistent with hypothesis $H_{1\text{-}2d}$.

Moreover, as an alternative measure of equity ownership, the presence in an audit committee of an outside blockholder with more than a 3% shareholding (3%holdAudCom) has a significant positive relationship with AEM. The sign direction of AEM is insignificantly in univariate tests, which means no systematic AEM behaviour. This suggests that having a blockholder with a 3% shareholding on the audit committee is associated with more AEM, which is consistent with hypothesis $H_{1\text{-}2f}$.

The share ownership might impair the independence of audit committee members. Members of audit committees with high equity ownership might therefore underperforming their monitoring role. Hence members of audit committees who have higher equity ownership might compromise to income-increasing AEM, leading to higher levels of AEM preceding IBOs.

Audit committee size

Audit committee size (AudComSz and AuditSz2BoardSz) has an insignificant relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that the size of an audit committee has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2g}$.

As the responsibility of audit committee might be appropriately assigned, the size of an audit committee might have no impact on its function in detecting AEM.

In Panel B of Table 2.5 in the Appendix, Models IBO 1 to IBO 3 report the results of the OLS regressions on audit quality for IBOs.

Big 5 auditors

The presence of a Big 5 auditor (Big5) has a significant negative relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that the presence of a Big 5 auditor is associated with less AEM, which is consistent with hypothesis

$H_{1\text{-}3a}$.

Larger audit firms tend to deliver high quality audits, because they are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (e.g. Becker et al., 1998). These firms also have more resources to invest in improving the quality of their work (DeAngelo, 1981). Hence larger audit firms have greater incentives to detect and reveal misstatement, and this makes a difference to the quality of their audits. Moreover, Big 5 auditors have lower litigation rates than their peers have (Palmrose, 1986a; Palmrose, 1988), which suggests that they provide higher quality audits.

Audit fees

Audit fees (*LNAudFees*) has a significant positive relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that higher audit fees are associated with more AEM, which is inconsistent with hypothesis $H_{1\text{-}3b}$.

The economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect auditors' independence, leading them to permit AEM (Frankel et al., 2002). In addition, higher AEM is likely to be associated with a higher inherent risk, as assessed by auditors. The higher the level of inherent risk, the more audit effort will be required to reduce the risk of detection in order to achieve an acceptable level of audit risk (Gul et al., 2003). For these reasons, higher audit fees might be associated with higher AEM.

Non-audit fees

Non-audit fees (LNNonAudFees, NonAudFees/AssetsSqrt and NonAudFees/TotalFees) have an insignificant relationship with AEM. The sign direction of AEM is insignificant in univariate tests, which indicates no systematic AEM behaviour. This suggests that non-audit fees have no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$. This might be because the variable of non-audit fees picks up different things in different circumstances.

Summary of findings for institutional buyouts

In summary, the percentage of non-executive directors on an audit committee has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2a}$. The financial expertise of audit committees is associated with less AEM, which is consistent with hypothesis $H_{1\text{-}2b}$. Higher levels of equity ownership by audit committee members are associated with more AEM, which is consistent with hypothesis $H_{1\text{-}2d}$. Furthermore, having on an audit committee a blockholder with at least of a 3% shareholding is associated with more AEM, which is consistent with hypothesis $H_{1\text{-}2f}$. Audit committee size has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2g}$.

With regards to the quality of external audits, the presence of a Big 5 auditor is associated with less AEM, which is consistent with hypothesis $H_{1\text{-}3a}$. Higher audit fees are associated with more AEM, which is inconsistent with hypothesis $H_{1\text{-}3b}$. Non-audit fees have no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$.

2.5.2.3 Comparison of results between the two types of buyout

Audit committee characteristics have different impacts on AEM prior to MBOs when compared with IBOs.

The percentage of non-executive directors on an audit committee (Ned%AudCom) has no impact on AEM prior to either MBOs or IBOs, which is inconsistent with hypothesis $H_{1\text{-}2a}$. This might be because these directors perform little or no real monitoring role as they lack the independence, time, expertise, and information they would need in order to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991).

Prior to MBOs, the financial expertise of an audit committee (FinancialExp) has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2b}$. This might be because even financially literate directors are usually particularly focused on avoiding positive AEM. They may perceive negative AEM as accounting conservatism, which is good news even in the case of an MBO, and therefore they do not intervene. Prior to IBOs, the financial expertise of an audit committee is associated with less AEM, which is consistent with hypothesis $H_{1\text{-}2b}$. Financial expertise makes an audit committee's internal control judgements more like those of experts, effectively facilitating the reporting process (DeZoort and Salterio, 2001). Audit committees with financial expertise are better equipped to understand auditing issues and risks, as well as the procedures that are proposed to address and/or detect them (DeZoort and Salterio, 2001). In addition, knowledgeable audit committees are more likely to comprehend an internal audit program and its results, which in turn, increase the effectiveness of internal controls in preventing or detecting AEM (Abbott et al., 2004).

Prior to MBOs, equity ownership by audit committee members (AudShare) has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2c}$. Furthermore, the presence, on an audit committee, of an outside blockholder with over 3% shareholding (3%holdAudCom) has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2e}$. Audit committees might not take sufficient care of the incoming MBO context, and thus they might focus on traditional positive AEM, in order to mitigate managers' attempts to boost earnings, rather than on spotting negative AEM. Hence, audit committee members may be unable to spot AEM behaviours prior to MBOs.

Prior to IBOs, higher levels of equity ownership by audit committee members are associated with more AEM, which is consistent with hypothesis H_{1-2d}. The results also suggest that the presence, on an audit committee, of an outside blockholder with over 3% shareholding is associated with more AEM, which is consistent with hypothesis H_{1-2f}. The independence of audit committee members might be impaired by high share ownership. Members of audit committees with higher equity ownership might be less likely to perform active monitoring. Hence audit committee members with higher equity ownership might compromise to upwards AEM, leading to higher levels of AEM preceding IBOs.

Prior to MBOs, audit committee size (AudComSz and AuditSz2BoardSz) has no impact on AEM, which is inconsistent with hypothesis H_{1-2g}. Prior to IBOs, audit committee size has no impact on AEM, which is inconsistent with hypothesis H_{1-2g}. As the responsibility of audit committee might be appropriate assigned, the size of audit committee might have no impact on functions of AEM detection.

Overall, the results suggest that audit committees perform little or no real monitoring roles prior to MBOs. This might be because that audit committees are not aware of the incoming MBO context, and they traditionally focus on limiting positive AEM to mitigate managers' attempts to boost earnings. Prior to IBOs, the financial expertise of an audit committee and equity ownership by audit committee members is positively correlated with earnings management. These results suggest that audit committees do perform their intended role in governance prior to IBOs. Therefore, including a director with financial expertise in a firm's audit committee and reducing the level of equity ownership by audit committee members can lead to a lower level of AEM prior to IBOs.

Audit quality has different impacts on AEM prior to MBOs and IBOs. Prior to MBOs, the presence of a Big 5 auditor (Big5) has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3a}$. External auditors might not take sufficient care that an MBO is about to happen, and thus they might focus on limiting traditional positive AEM in order to mitigate managers' attempts to boost earnings, rather than to spot negative AEM. Prior to IBOs, the presence of a Big 5 auditor is associated with less AEM, which is consistent with hypothesis $H_{1\text{-}3a}$. Larger audit firms tend to deliver higher quality audits, because they are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (e.g. Becker et al., 1998). Larger audit firms have more resources to invest in improving the quality of their work (DeAngelo, 1981). Hence larger audit firms have greater incentives to detect and reveal management misstatement, leading to audit quality differentiation. Moreover, Big 5 audit firms have lower litigation rates than their peers have (Palmrose, 1986a; Palmrose, 1988), which suggests that they provide audits of a higher quality.

Higher audit fees (LNAudFees and AudFees/AssetsSqrt) are associated with more AEM prior to both MBOs and IBOs, which is inconsistent with hypothesis $H_{1\text{-}3b}$. The economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect the independence of auditors, and lead them to permit AEM (Frankel et al., 2002). In addition, higher level of AEM is likely to be associated with a higher inherent risk, as assessed by auditors. The higher level of inherent risk requires the more audit effort to reduce detection risk in order to achieve an given level of audit risk (Gul et al., 2003).

Prior to MBOs, higher non-audit fees (LNNonAudFees, NonAudFees/AssetsSqrt and NonAudFees/TotalFee*s*) are associated with less AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$. By undertaking audits and providing consultancy services, auditors learn more about a client's business, which may improve the quality of all their services (Wallman, 1996). Hence higher non-audit fees might lead to less AEM. Prior to IBOs, non-audit fees has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$. This might be because the variable of non-audit fees picks up different things in different circumstances.

Overall, the results suggest that the presence of Big 5 auditors mitigates AEM prior to IBOs. Higher audit fees charged by auditors will lead to more AEM prior to MBOs and IBOs. The economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect auditors' independence and lead them to permit AEM (Frankel et al., 2002). High non-audit fees mitigates AEM prior to MBOs. This might be because auditors learn more about a client's business by providing both auditing and consultancy services, which may improve the quality of all their services (Wallman, 1996).

2.5.3 Robustness tests

This study adopts discretionary accruals (AccruDe) from Dechow et al.'s (1995) cross-sectional model as an alternative to proxy for AEM in order to investigate whether the results of multivariate tests are sensitive to a particular measure of AEM. Table 2.6 reports the regression results of the robustness tests in the multivariate models. Panels A and B of Table 2.6 present multiple regression results for the audit committee variables and audit quality variables respectively. In Panel A, the relationships between the financial expertise of an audit committee, equity ownership by audit committee members and AEM prior to IBOs are consistent with those found in the main tests. They therefore support my findings. Although the presence on audit committee of an outside blockholder with over 3% shareholding has no significant relationship with AEM, the direction of the coefficients in these relationships are still the same as in the main test. In Panel B, although the impact of Big 5 auditors and non-audit fees on AEM are less significant respectively, the directions of these relationships are the same as in the main test. Thus, the findings of this research are largely robust for the UK context.

Table 2.6 Panel A Robustness Test Results (Dependent variable: AccruDe - discretionary accruals estimated by Dechow *et al.* (1995) model)

Panel A. Audit Committee Characteristics Model								
	MBO 1	MBO 2	MBO 3	MBO 4	IBO 1	IBO 2	IBO 3	IBO 4
VARIABLES	AccruDe	AccruDe	AccruDe	AccruDe	AccruDe	AccruDe	AccruDe	AccruDe
Ned%AudCom	0.017	-0.002	-0.001	-0.020	0.030	-0.016	-0.004	-0.044
	(0.363)	(-0.044)	(-0.020)	(-0.396)	(0.498)	(-0.221)	(-0.064)	(-0.603)
FinancialExp	-0.008	-0.004	-0.010	-0.003	-0.039**	-0.041**	-0.042**	-0.044**
	(-0.533)	(-0.223)	(-0.603)	(-0.140)	(-2.484)	(-2.347)	(-2.592)	(-2.385)
AudShare	0.094		0.124		0.267**		0.319***	
	(1.238)		(1.506)		(2.377)		(2.708)	
3%holdAudCom		0.019		0.025		0.037		0.042
		(0.886)		(1.189)		(1.164)		(1.286)
AudComSz	0.005	0.008			-0.010	-0.012		
	(0.680)	(0.802)			(-1.052)	(-1.164)		
AuditSz2BoardSz			-0.023	-0.000			-0.142*	-0.130
			(-0.499)	(-0.007)			(-1.934)	(-1.627)
LNMarketVal	0.006	0.005	0.008	0.007	0.005	0.005	0.004	0.003
	(1.136)	(0.991)	(1.274)	(1.157)	(0.729)	(0.631)	(0.582)	(0.420)
InsShare	-0.032	-0.037	-0.022	-0.031	0.095	0.093	0.108	0.102
	(-1.038)	(-1.111)	(-0.708)	(-0.897)	(1.000)	(0.901)	(1.118)	(0.979)
LagROA	-0.005	-0.004	-0.006	-0.005	-0.037	-0.023	-0.058	-0.036
	(-0.701)	(-0.589)	(-0.923)	(-0.720)	(-0.620)	(-0.361)	(-0.905)	(-0.546)
SalesGrow	0.018***	0.018***	0.018***	0.018***	0.011**	0.012**	0.012**	0.014***
	(5.796)	(5.713)	(5.076)	(5.043)	(2.007)	(2.262)	(2.520)	(2.816)
Leverage	0.026	0.017	0.029	0.020	0.024	0.015	0.017	0.009
	(0.391)	(0.274)	(0.426)	(0.309)	(0.274)	(0.168)	(0.199)	(0.106)
FreeCashFlow	-0.016	-0.014	-0.019	-0.018	0.000	0.000	0.000	-0.000
	(-0.244)	(-0.202)	(-0.307)	(-0.282)	(0.141)	(0.186)	(0.010)	(-0.197)
Constant	-0.113	-0.085	-0.088	-0.068	-0.084	-0.026	-0.000	0.049
	(-1.141)	(-0.975)	(-0.790)	(-0.623)	(-0.785)	(-0.219)	(-0.004)	(0.387)
Observations	113	113	113	113	79	79	79	79
R-squared	0.228	0.220	0.226	0.212	0.158	0.132	0.184	0.147
F-test	4.347	4.253	3.285	3.225	5.356	4.741	6.207	4.950
Prob > F	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2.6 Panel B Robustness Test Results (Dependent variable: AccruDe - discretionary accruals estimated by Dechow *et al.* (1995) model)

Panel B. Audit Quality Model						
	MBO 1	MBO 2	MBO 3	IBO 1	IBO 2	IBO 3
VARIABLES	AccruDe	AccruDe	AccruDe	AccruDe	AccruDe	AccruDe
Big5	-0.003	-0.007	-0.003	-0.021	-0.020	-0.016
	(-0.177)	(-0.345)	(-0.156)	(-0.932)	(-0.885)	(-0.763)
LNAudFees	-0.007			0.007		
	(-0.728)			(0.669)		
AudFees/AssetsSqrt			-0.063*			-0.004
			(-1.678)			(-0.372)
LNNonAudFees		0.004			0.005	
		(0.780)			(0.765)	
NonAudFees/AssetsSqrt			0.014			0.003
			(1.467)			(0.426)
NonAudFees/TotalFees	0.049			0.051		
	(1.446)			(1.051)		
NED%	0.068	0.058	0.054	-0.046	-0.049	-0.038
	(0.843)	(0.740)	(0.674)	(-0.580)	(-0.599)	(-0.545)
BoardSz	0.009	0.007	0.008	-0.000	0.000	0.000
	(1.563)	(1.443)	(1.505)	(-0.031)	(0.008)	(0.064)
Duality	0.012	0.013	0.008	0.031	0.033	0.035
	(0.664)	(0.716)	(0.443)	(1.004)	(1.018)	(1.024)
LNMarketVal		0.001	0.002		0.001	0.002
		(0.176)	(0.399)		(0.155)	(0.228)
InsShare	-0.044	-0.053	-0.038	0.078	0.078	0.077
	(-1.302)	(-1.536)	(-1.089)	(0.934)	(0.914)	(0.904)
LagROA	-0.003	-0.004	-0.005	-0.022	-0.030	-0.032
	(-0.554)	(-0.657)	(-1.130)	(-0.323)	(-0.423)	(-0.473)
SalesGrow	0.016***	0.016***	0.016***	0.015**	0.016**	0.017**
	(5.453)	(5.129)	(5.517)	(2.009)	(2.212)	(2.383)
Leverage	0.016	0.010	0.006	0.022	0.023	0.021
	(0.238)	(0.146)	(0.097)	(0.269)	(0.275)	(0.255)
FreeCashFlow	0.006	0.007		-0.000	0.002	
	(0.095)	(0.101)		(-0.003)	(0.658)	
Constant	-0.082	-0.100	-0.083	-0.058	-0.033	-0.030
	(-1.369)	(-1.329)	(-1.152)	(-0.845)	(-0.488)	(-0.461)
Observations	113	113	113	79	79	79
R-squared	0.236	0.224	0.241	0.111	0.101	0.093
F-test	5.317	4.499	5.500	3.784	4.053	1.182
Prob > F	0.000	0.000	0.000	0.000	0.000	0.316

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

2.5.4 Endogeneity Test

Corporate governance is determined exogenously by environmental factors such as legal efficiency and regulations relating to the market for corporate control (Himmelberg, 2002 cited in McKnight and Weir, 2009). In the UK, the essential exogenous environmental factor is the Corporate Governance Code. Hence Coles et al. (2008) suggest that firm-level governance might be treated as endogenous, otherwise, the tested models are problematic.

Most studies of earnings management have used OLS regression models, but a few recent studies suggest that a simultaneous equations approach might be more appropriate, as models that include corporate governance variables suffer from endogeneity (e.g. Coles et al., 2008; McKnight and Weir, 2009; Piot and Janin, 2007; Linck et al., 2008).

I control for the potential endogeneity using a two-stage least squares regression (2SLS) method that follows the approach of Coles et al. (2008) and McKnight and Weir (2009) using the lagged values of the endogenous variables as instruments. In the analysis, all audit committee characteristics, external audit quality and board structure variables are treated as endogenous.

Before testing endogenous bias, this study adopts a two-stage process to investigate whether lagged regressors of corporate governance variables are valid instruments of themselves. First, for a 2SLS estimation to be reliable, there is a rule of thumb that the t-statistic of instruments in first-stage regressions must be greater than about 3.3. In this study, the t-statistic of instruments are greater than 3.3 for both MBOs and IBOs, which passes the rule of thumb. Second, this study checks the F statistic for joint significance of the instruments in first-stage regression. The results show that the F statistic for joint significance of the instrument has greater than 10 for both MBOs and IBOs, indicating strong instruments. The minimum eigenvalue of the F statistic is also greater than critical value tabulated by Stock and Yogo (2005) for both MBOs and IBOs, which reject the null hypothesis that the instruments are weak. Therefore, lagged regressors of corporate governance variables is a valid instrument for both MBOs and IBOs in this study.

Hausman test is used to investigate whether there is any endogeneity bias for the independent variables. The results of Hausman tests are insignificant at a 5% level of significance, which indicates that my models have no endogeneity bias.

The 2SLS regression results are shown in Table 2.7 in the Appendix. Although some variables have either higher or lower levels of significance, the directions of their correlations remain the same. Thus, regarding AEM in signed value, the 2SLS analyses provide regression coefficients that are qualitatively similar to those obtained in the robustness tests, shown in Table 2.5.

2.6. Conclusion

This research investigates the effect of audit committee characteristics and external audit quality on AEM behaviour preceding MBOs and IBOs in the UK. It extends the corporate governance literature to examine, in particular, the setting of leveraged buyouts. It therefore differs from prior literature in at least three ways: (1) it demonstrates that the leveraged buyouts setting provides clear incentives for managers to engage in specific forms of AEM; (2) leveraged buyouts are subdivided into MBOs and IBOs for investigation and (3) it focuses more on the effect of corporate governance mechanisms on the direction rather than the magnitude of AEM.

I hypothesise that managers may engage in negative AEM preceding MBOs in an attempt to pay a lower buyout price to selling shareholders. In MBOs, managers are buyers and are likely to remain with a firm. They usually have high levels of personal investment in a firm after a buyout. In the context of MBOs, managers' direct involvement in the transaction generates conflicts of interest: they wish to pay the lowest possible purchase price, whereas their shareholders wish to sell their shares for the highest possible price. Managers' personal economic stake may motivate them to depress pre-buyout accounting earnings to portray an underperformed picture of the firm, and thereby increase the possibility that shareholders will accept a lower buyout price (Perry and Williams, 1994). Accordingly, I expect that abnormal discretionary accruals will be negative prior to MBOs.

Moreover, I hypothesise that managers will engage in positive AEM preceding IBOs, in order to reduce firm undervaluation and/or to increase the potential costs of a buyout, and thus impede any potential IBO bidding. IBO targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986). Managers are concerned about undervaluation as it may result in an IBO. IBO buyers might argue that the undervaluation of shares results from poor decisions of prior managers, and they see a leveraged buyout as a means of turning a failing company around (Hafzalla, 2009; Renneboog et al., 2007; Weir et al., 2005b). Although managers wish to retain managerial discretions in their firms, third-party buyers often wish to take control and engage in active monitoring or make changes to a firm's existing management team after a buyout (Hafzalla, 2009). Furthermore, the uncertainty associated with that the business will be re-sold again within several years threatens managers' job security (Denis and Denis, 1995). Therefore, managers may be motivated to engage in positive REM to reduce firm undervaluation and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding. Accordingly, I expect that abnormal discretionary accruals will positive prior to IBOs.

In addition, I examine that how audit committee characteristics and external auditing quality affect AEM. I hypothesise that the independence of an audit committee, its financial expertise and equity ownership by committee members mitigates AEM; and that Big 5 auditors and higher audit fees curb AEM, as a whole, but non-audit fees impair the quality of external audits.

Empirical tests in this study address all UK leveraged buyouts between 1997 and 2011 using discretionary accruals derived from the cross-sectional model of Kothari et al. (2005) to proxy for AEM. This study also adopts a cross-sectional model from Dechow et al. (1995) to give an alternative measure of AEM.

The results show that abnormal AEM is significantly negative in the year preceding MBOs, which suggests that managers engage in negative AEM during this period. This is consistent with my prediction that managers engage in negative AEM preceding MBOs in an attempt to pay a lower buyout price to selling shareholders. Preceding IBOs, the results show that there is no evidence of greater AEM behaviour compared to that in non-buyout firms. Managers' ability to predict IBOs is much less accurate than their ability to predict MBOs, as they are not part of the bidding group. Hence they do not usually have long time to prepare before IBO biddings. AEM can only be engaged at the end of the accounting period. Thus when managers perceive their firm to be undervalued, they might not have time to engage in AEM before the bids are announced.

Having a high percentage of non-executive directors on an audit committee appears to have no impact on AEM, as these directors perform little or no real monitoring role. They lack the independence, time, expertise, and information they would need in order to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). Moreover, the inclusion of insiders on an audit committee is also beneficial, as they facilitate the communication of relevant information to outsiders during committee meetings, and they provide a forum for evaluating the performance and senior management potential of junior executives. This might explain why having a high percentage of non-executive directors on an audit committee appears to have no impact on AEM. The results suggest that the percentage of non-executive directors on an audit committee has no impact on AEM prior to MBOs and IBOs, which is inconsistent with hypothesis $H_{1\text{-}2a}$.

The financial expertise of audit committees helps them to make internal control judgements that are more like those of experts, facilitating the reporting process (DeZoort and Salterio, 2001). Audit committees with financial expertise are better equipped to understand auditing issues and risks, as well as the proposed procedures to address and/or detect them (DeZoort and Salterio, 2001). In addition, knowledgeable audit committees are more likely to comprehend an internal audit program and its results, and this increases the effectiveness of internal controls in preventing or detecting AEM (Abbott et al., 2004). The results suggest that, prior to MBOs, the financial expertise of audit committees has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2b}$. This might be because even financially literate directors usually focus on avoiding positive AEM. They may perceive negative AEM as accounting conservatism, which is good news even in the case of an MBO, and thus they do not intervene. However, prior to IBOs, the results suggest that the financial expertise of audit committees is associated with less AEM, which is consistent with hypothesis $H_{1\text{-}2b}$.

High levels of equity ownership by audit committee members are expected to protect shareholder interests more effectively. Since equity ownership aligns the interests of directors with those of external shareholders, more equity ownership by the directors creates a personal incentive to actively monitor managers (Bhagat et al., 1999). Accordingly, higher equity ownership by audit committee members is likely to mitigate the risk of these directors colluding with management to manipulate earnings, because such collusion would also ultimately harm their own interests (Vafeas, 2005).

Prior to MBOs, the results suggest that equity ownership by audit committee members has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2c}$. The results also suggest that the presence of a blockholder with 3% or more shareholding on the audit committee has no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}2e}$. Members of the audit committee might not take sufficient care that an MBO is about to happen, and thus they might focus on traditional positive AEM, in order to mitigate managers' attempts to boost earnings, rather than on mitigating negative AEM. However, prior to IBOs, the results suggest that higher levels of equity ownership by audit committee members are associated with more AEM, which is consistent with hypothesis $H_{1\text{-}2d}$. The results also suggest that the presence on an audit committee of a blockholder with a holding of 3% or more shares is associated with more AEM, which is consistent with hypothesis $H_{1\text{-}2f}$. The share ownership might jeopardise the independence of audit committee members, leading to a lower level of monitoring. Hence higher equity ownership by audit committee members might compromise to income-increasing AEM, leading to higher levels of AEM preceding IBOs.

Having a large audit committee may ensure that a firm has a minimum required knowledge base (Vafeas, 2005). In addition, the effectiveness of an audit committee is significantly related to its power (Kalbers and Fogarty, 1993). Larger audit committees are beneficial because they have an elevated status in an organisation and are thus more likely to be acknowledged as an authoritative body by the external and internal audit functions (Louis Braiotta et al., 2010). The increased organisational status and power of a larger audit committee may enhance its performance of internal audit functions and subsequently prevent or detect earnings manipulations (Abbott et al., 2004; Vafeas, 2005). The results suggest that audit committee size has no impact on AEM prior to either MBOs or IBOs, which is inconsistent with hypothesis $H_{1\text{-}2g}$. As the responsibility of audit committees might be appropriate assigned, the size of an audit committee might have no impact on its function in detecting AEM.

Overall, the results suggest that audit committees perform little or no real monitoring prior to MBOs. This might be because they do not take sufficient care that an MBO is about to happen, and they traditionally focus on limiting positive AEM.

Big 5 audit firms tend to deliver high quality audits, because larger audit firms are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (e.g. Becker et al., 1998). Larger audit firms have more resources to invest in improving the quality of their work (DeAngelo, 1981). Hence, larger audit firms have greater incentives to detect and reveal management misstatement, resulting in differentiation in the quality of auditing between larger and smaller firms. Moreover, Big 5 audit firms have lower litigation rates than their peers do (Palmrose, 1986a; Palmrose, 1988), which suggests that they provide higher quality audits. The results suggest that, prior to MBOs, Big 5 auditors have no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3a}$. External auditors might not be aware of the MBO context, and thus they might traditionally focus on limiting positive AEM, in order to mitigate managers' attempts to boost earnings, rather than on spotting negative AEM. The results suggest that, prior to IBOs, the presence of a Big 5 auditor is associated with less AEM, which is consistent with hypothesis H_{1-3a}.

Higher audit fees are more likely to reflect higher quality of external auditing as they compensate for an increased audit effort and the high price of reputation capital (e.g. Craswell et al., 1995; Ferguson and Stokes, 2002; Palmrose, 1986a; Simunic, 1980). Increased audit efforts make auditors more likely to detect and report accrual estimation errors and irregularities (Srinidhi and Gul, 2007). Due to potential risks of litigation, auditors are less willing to accept questionable accounting reports. Auditors will require management to correct the errors and modify their accounting methods to improve the quality of financial reports (Abbott et al., 2006). The results suggest that higher audit fees are associated with more AEM prior to both MBOs and IBOs, which is inconsistent with hypothesis H_{1-3b}. This might be because the economic rents associated with audit fees create an economic bond between auditors and their clients, which may affect auditors' independence, leading them to permit AEM (Frankel et al., 2002). In addition, higher AEM is likely to be associated with higher inherent risk, as assessed by auditors. The higher the level of inherent risk, the more audit effort will be required to reduce detection risk to achieve an acceptable level of audit risk (Gul et al., 2003).

Non-audit fees may compromise an auditor's independence, which in turn affects the auditor's willingness to express an audit opinion appropriately (Frankel et al., 2002; Simunic, 1984; Beck et al., 1988). Large fees paid to auditors, particularly those related to non-audit services, make auditors more economically dependent on their clients. This may cause the auditor to become reluctant to make appropriate inquiries during an audit for fear of losing a highly profitable client (Hoitash et al., 2007). Furthermore, when auditors are no longer perceived to be independent, managers are unlikely to be deterred from opportunistic behaviours (Srinidhi and Gul, 2007).

The results suggest that, prior to MBOs, higher non-audit fees are associated with less AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$. By providing both auditing and consulting services, auditors learn more about a client's business, which may improve the quality of all their services (Wallman, 1996). Hence higher non-audit fees may lead to less AEM. Prior to IBOs, the results suggest that non-audit fees have no impact on AEM, which is inconsistent with hypothesis $H_{1\text{-}3c}$. This might be because the variable of non-audit fees picks up different things in different circumstances.

To conclude, the results suggest that audit committees perform little or no real monitoring prior to MBOs. They perhaps do not take sufficient care that an MBO is about to happen. They might traditionally focus on limiting positive AEM behaviours, which managers might use to pursue a bonus plan, and hence be unable to spot negative AEM behaviours prior to MBOs. Prior to IBOs, the financial expertise of an audit committee mitigates AEM. This suggests that audit committees should include financial experts. Moreover, equity ownership by audit committee members is positively correlated with AEM. This suggests that directors who have higher equity ownership should not be included in an audit committee in order to preventing high levels of AEM.

Moreover, the results suggest that the presence of Big 5 auditors mitigates AEM prior to IBOs. This indicates that hiring a Big 5 auditor has advantageous. In addition, the higher audit fees charged by these auditors might lead to more AEM prior to MBOs and IBOs. This reveals that shareholders should be cautions if their firm has a very high level of audit fees, as this might reflect a decrease of auditor’s independence due to economic bond between auditors and their clients. Furthermore, high non-audit fees mitigate AEM prior to MBOs. This suggests that incurring non-audit fees could lead auditors to learn more about a client's business hence may improve the quality of all services.

This study focuses on managerial AEM behaviours preceding leveraged buyouts. It hypothesises that managers use positive AEM to reduce firm undervaluation and increase potential buyout costs in an attempt to impede any potential IBO bidding. In other words, the IBO sample in this study consists of the firms that have attempted to increase their firm value by engaging in positive earnings management but failed to conceal their underperformance and ultimately became IBO targets. Ideally, a control group would include firms that could be predicted to engage in positive AEM in an attempt to increase their firm value and could be expected to be successful in impeding IBO bidding. Due to the limitations of the data available, however, this study does not have such a control group. In other words, this study is based on events that have occurred rather than those that are predicted. Future research may overcome this issue by using a control group that includes firms that have not been subject to IBO bids but do have a high likelihood of being taken over. Drawing on prior literature, future research could construct a model to identify firms with a high likelihood of being targeted by takeovers in the market. By adding IBO firm characteristics into the model, it might be able to distinguish firms at high risk of IBOs from firms at risk from other types of takeover.

In addition, this study hypothesises that managers might engage in positive AEM to reduce firm undervaluation preceding IBOs, thereby reducing the risk of becoming an IBO target. However, the findings are inconsistent with this hypothesis. This might be because managers uses other earnings management tools at the same time (REM for example), and this issue will be explored in Chapter 3.

3. Chapter 3: Real Earnings Management, Block Ownership and Board Characteristics prior to Leveraged Buyouts in the UK

3.1 Introduction

There has been a significant increase in the number and value of leveraged buyouts in the UK since the beginning of the 1990s. For instance, the value of deals increased from £458.62 million in 1997 to £3802.91 million in 2010. In the peak year of 2006, there were 17 leveraged buyouts with the average value being £1267.12 million per deal (data from Thomson ONE database, Table 1.1 in the Appendix). A leveraged buyout is the purchase and delisting of a publicly listed corporation, and buyers are typically funded by substantial amounts of debt and backed by private equity firms (Weir and Wright, 2006). As leveraged buyouts are a distinct and increasingly important type of acquisition in the financial market, managerial self-interested behaviours prior to the buyouts may significantly affect the buyout transactions.

Therefore, this study provides a new angle on the real earnings management (REM) literature by examining managerial REM behaviours preceding leveraged buyouts. REM refers to departures from normal operational practices, motivated by managers' desire to manipulate current-period earnings, using methods such as cutting discretionary expenditures to boost earnings (Roychowdhury, 2006). REM uses managerial discretions over operational business decisions, hence it is less likely to be scrutinised by auditors and regulators and potentially has a smaller probability of being detected (Graham et al., 2005).

REM is made during a financial year to distort the current period's normal operations, hence have direct consequences on current and future cash flows as well as accounting accruals (Kim and Sohn, 2013). REM aims to influence short-term reported earnings at the expense of distorting normal operations in the current period, and this impact is less likely to reverse in future (Kim and Sohn, 2013).

As REM changes the normal operations of a firm, and some REM practices may have a long-term impact on its value (Kim and Sohn, 2013), managers might have different incentives to engage in REM, depending on whether they participate in leveraged buyouts or not. Thus, I subdivide leveraged buyouts into MBOs and IBOs. In MBOs, managers are buyers and are likely to remain with and have high levels of personal investment in a firm after the buyouts. In the context of MBOs, management's direct involvement in the transaction generates conflicts of interest. Managers wish to pay the lowest possible purchase price, whereas their shareholders wish to sell their shares for the highest possible price. Managers' personal economic stake may motivate them to depress pre-buyout accounting earnings in order to portray their firm as underperforming, thereby increasing the possibility that shareholders accept a lower buyout price (Perry and Williams, 1994). Therefore, managers have strong incentives to engage in negative REM in an attempt to offer a lower buyout price in MBOs.

However, managers might also engage in positive REM prior to MBOs, with the intention to secure external funding. In MBOs, managers are part of the buying group and, in most cases, the internal financing by managers is insufficient to meet the cash required to implement a buyout. As managers tend to depend on external funding to execute a buyout, they will consider their ability to obtain the external financing, especially when they have fewer fixed assets available to secure loans. Hence managers might engage in positive REM to enhance prospective external financiers' perceptions of a firm's value in order to secure finance (Fischer and Louis, 2008).

In contrast, IBO targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986). Managers worry about undervaluation as its potential consequence is IBO. IBO buyers argue that the undervaluation of shares results from poor decisions made by incumbent managers, and a leveraged buyout could be a means of turning a failing company around (Hafzalla, 2009; Renneboog et al., 2007; Weir et al., 2005b). Thus, undervaluation attracts potential IBO buyers as it signals that there is scope for improvements.

However, in an IBO, managers wish to retain their managerial discretions, while third-party buyers wish to take control and engage in active monitoring or make changes to a firm's existing management team after a buyout (Hafzalla, 2009). Furthermore, the uncertainty associated with that the business will be re-sold again within several years threatens managers' job security (Denis and Denis, 1995). Thus, incumbent managers have strong incentive to prevent their firm becoming a potential target for an IBO in order to retain their discretions and protect their long-term job security. Managers' ability to predict IBOs is much less accurate, as they are not part of the bidding group. However, as firm undervaluation attracts IBO buyers, reducing undervaluation is likely to reduce the possibility of a firm becoming an IBO target. If their firm is perceived to be undervalued, managers may engage in positive REM in order to reduce the undervaluation and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding. Hence, it is argued that managers might have different incentives to engage in REM, lowering its market value prior to MBOs and increasing it prior to IBOs.

As research on real activity-based earnings management has been limited to just a few studies (e.g. Cohen and Zarowin, 2010a; Kim and Sohn, 2013), this study provides additional insight into this field, and investigates whether managers have different REM behaviours preceding MBOs and IBOs in the UK.

In addition to considering, whether managers engage in REM prior to MBOs and IBOs, it is also of interest to explore when this behaviour starts. Prior literature suggests that managers often plan MBOs for as many as two or three years prior to the date of a public offering (e.g. Perry and Williams, 1994). This indicates that, in most cases, managers issue at least one annual report, in which earnings could be manipulated, prior to MBOs (DeAngelo, 1986). Research by Perry and Williams (1994) indicates that, although some firms may manage accounting accruals for several years prior to an MBO offer, the year prior to the MBO offer announcement is the most likely period to be subject to the systematic manipulation of AEM.

In contrast, as previously mentioned, managers' ability to predict IBOs is much less accurate than their ability to predict MBOs. They might suspect that their firm will become subject to an IBO if it is perceived to be undervalued, but they are much more uncertain about the actual event happening. This might indicate that both the degree and timing of REM differs between MBOs and IBOs. This study therefore examines REM behaviours in the 2-year period prior to MBOs and IBOs in order to detect any potential changes in REM activity.

Before comparing the MBO and IBO samples, it is worth first considering whether the investigation of earnings management behaviours prior to MBOs and IBOs is appropriate. Before choosing to participate in an MBO, managers' REM behaviours are driven by incentives that are unrelated to the buyouts. However, once managers decide to take part in an MBO, this choice is endogenous to certain characteristics of the firm and its environment. Such characteristics may include the percentage of pre-buyout ownership that managers hold in a firm, their ability to procure funding and their level of risk aversion (Hafzalla, 2009). This choice also provides managers of MBO firms with new incentives, as stated before. As long as these endogenous characteristics are unrelated to the REM already being made, a comparison of MBO and IBO samples is appropriate for this study and makes it an ideal setting for my investigation. Moreover, this research uses the earnings management of non-leveraged buyout industrial peers as benchmark to calculate the abnormal AEM and REM of buyout firms. Any abnormal AEM and REM detected in this process are earnings management relating to leveraged buyouts. Due to this control, exploring earnings management behaviours prior to MBOs and IBOs is appropriate.

As REM uses managerial discretions over operational business decisions, weak corporate governance enables greater managerial discretions to manipulate earnings, but good corporate governance limits managers' ability and potentially restricts REM behaviours. Hence corporate governance is important for mitigating REM behaviours, and this study provides a new angle on REM by examining the relationship between corporate governance and REM. Boards have an essential function in monitoring management behaviours to ensure that a company operates in the long-term interests of the shareholders (Ronen and Yaari, 2008). Furthermore, outside shareholders, especially institutional investors, have strong incentives to monitor managers in order to remove their incentives for myopic behaviours (Bushee, 1998). Close monitoring by a board and outside shareholders may reduce self-interested managerial discretions, and thus may mitigate REM behaviours. Therefore, this study investigates whether corporate governance mechanisms can mitigate REM activities, especially outside shareholders and board characteristics.

Since no prior research appears to have analysed REM in the UK or in the context of takeovers, this study investigates the REM activities of all UK firms that have made leveraged buyout announcements during the period from 1997 to 2011 and which are subsequently delisted from the London Stock Exchange. This setting has significant advantages: First, most previous studies of leveraged buyouts have examined US samples from the 1980s and 1990s (e.g. DeAngelo, 1986; Perry and Williams, 1994), but it is questionable whether the US evidence can be generalised to the UK. In the UK, leveraged buyouts are more rarely related to hostile takeovers, have lower debt levels, focus more on growth opportunities and are commonly financed by privately placed mezzanine funds rather than by junk bonds (Toms and Wright, 2005). Second, the sample period covers the second wave of leveraged buyouts in the UK, which differs from the first wave of buyouts in the 1980s. In the second wave, private equity and debt providers have increased confidence on important issues, such as the support of target shareholders[5] and an expectation of acquiring all the shares through squeeze-out provisions, which facilitates the success in buyout transactions (Renneboog et al., 2007).

The remainder of this chapter is structured as follows: Section 2 reviews the literature on REM studies, Section 3 discusses managerial incentives to engage in REM prior to MBOs and IBOs and presents the hypotheses, and Section 4 discusses the impact of corporate governance mechanisms on REM. Section 5 then outlines the proposed research design, while Section 6 reports the empirical results and findings, and Section 7 provides a sensitivity analysis. Finally, Section 8 presents conclusions.

3.2 Literature Review

3.2.1 Theoretical background

The separation of ownership and control in listed public corporations can cause principal–agent problems, as the owners of these firms often lack incentives

[5] Target shareholders were more likely to accept irrevocable undertakings, which a binding agreement on target shareholders to accept a buyout offer.

and the ability to monitor and incentivise managers to manage the daily operations of a firm effectively (Jensen and Meckling, 1976). When principals and agents have divergent economic interests, higher degrees of information asymmetry between them will lead to greater risks that the agents will engage in self-serving behaviour. Information asymmetries arise because principals cannot reliably observe and interpret information about the competence, intentions, expertise and actions of the agent (Saam, 2007; Sepe, 2010). Information asymmetries can result in moral hazard problems. Moral hazard problems arise when agents act in opportunistic behaviours, as they believe the principal is unlikely to detect their behaviour (Saam, 2007).

Information asymmetries in firms with better-informed managers and less-well-informed outsiders create a demand for internally generated measures of firm performance to be reported on a periodic basis. Accounting earnings information thus plays a crucial role in reducing information asymmetry. For instance, prior to leveraged buyouts, potential bidders make extensive use of publicly available accounting information, such as earnings figures, when preparing their bids[6]. Earnings information therefore has great value relevance to investors and other financiers, and their demand for such information increases when they are making decisions (Aharony and Barniv, 2004). Moreover, a detailed analysis of earnings information can help shareholders to assess whether they have been offered a fair price in leveraged buyouts or not (Bull, 1989). For instance, DeAngelo (1990) found that investment bankers made extensive use of accounting earnings for firm valuation in leveraged buyouts; Perry and Williams (1994) also report that accounting earnings were used by courts to assess the fairness of buyout prices when selling shareholders claimed that their compensation was inadequate in MBOs. As financial statements provide value-relevant information to a firm's external

[6] Potential bidders might also need access to private information in confidentiality agreements.

stakeholders, the heavy reliance on accounting numbers creates powerful incentives for managers to manipulate earnings. Therefore, REM is a potential issue prior to MBOs and IBOs.

3.2.2 Prior empirical literature on real earnings management studies

Real earnings management refers to the purposeful actions of management that deviate from normal business operational practices with the primary objective of manipulating current period earnings. REM can have direct consequences both for accounting accruals and for cash flows in current and future periods. REM changes the reported earnings by distorting real activities, such as altering the timing and scale of production, sales, investment, and financing activities throughout the accounting period. For instance, reported earnings can be temporarily boosted by cutting discretionary expenditures or by accelerating the timing of production and sales (Roychowdhury, 2006).

REM is subject to managerial discretion on certain operational business decisions, such as whether assets are sold or bought before or after the end of a reporting period (Bartov, 1993). Hence REM activities are more difficult for monitors, such as audit committees, auditors or regulators, to detect and to scrutinise.

The prevalence of real activities manipulation as an earnings management tool was not well understood until Graham et al. (2005) surveyed more than 400 executives and documented the widespread use of real activities manipulation. Their survey suggested that managers attach higher importance to accounting earnings benchmarks (such as targets of zero earnings, previous period earnings and analyst forecasts) than to cash flows. In order to meet these targets, some executives admitted to decreasing expenditure on research and development (R&D), advertising and maintenance, or postponing new projects, even if this delay caused a small loss in firm value.

Roychowdhury (2006) developed empirical models to separate normal from abnormal levels of real operational activities as reflected in CFO, production costs and discretionary expenditures. Consistent with the survey undertaken by Graham, *et al.*'s (2005), Roychowdhury (2006) found that managers avoid reporting annual losses by manipulating sales upward, reducing discretionary expenditures and overproducing inventory to decrease the cost of goods sold, all of which are deviations from optimal operational decisions.

Recent research examines the consequences of real activities manipulation. Kim and Sohn (2013) suggested that, if REM is used to improve a firm's short-term reported earnings at the expense of distorting current period real operations, it is generally value destroying, particularly in the long term. The same applied to the reduction of R&D expenses to increase current period earnings, or offer increased price discounts or more lenient credit terms to generate additional unsustainable sales. Cohen and Zarowin (2010a) found that firms that engage in REM prior to seasoned equity offerings experience a subsequent decline in performance, as measured by the return on assets. Furthermore, Bhojraj et al. (2009) reported that firms that beat analyst forecasts by using REM and accruals-based earnings management had worse operating performance and stock market performance in subsequent years than firms that missed analyst forecasts without earnings management had.

Nevertheless, research by Gunny (2010) found that REM was positively associated with future-period earnings and cash-flow performance for the firms that just met or beat their earnings benchmarks. She explained that REM attains benefits that allow a firm to perform better in the future. For instance, managers may use REM to meet benchmarks in an effort to enhance a firm's credibility and reputation with stakeholders, and thus benefit from better relationships with its customers, suppliers and/or creditors. Alternatively, managers could engage in REM to just meet earnings benchmarks as a way to signal superior future earnings (Gunny, 2010).

3.3 Hypothesis Development for Real Earnings Management

3.3.1 Managerial incentives prior to management buyouts and institutional buyouts

An MBO is the purchase and delisting of a listed company by incumbent managers who seek financial support from private equity firms, typically using a preponderance of debt. Where managers are buyers, they are likely to remain with the firm and to have significant ownership stakes in the buyout. As a result, management's direct involvement in the transaction generates conflict of interests. Managers will wish to pay the lowest possible purchase price, while their shareholders will wish to sell their shares for the highest possible price (Hafzalla, 2009). Managers therefore have a strong incentive to depress pre-buyout accounting earnings to portray a less favourable picture of the firm, and thus increase the possibility that shareholders will accept a lower buyout price. DeAngelo (1986) argued that managers could effectively manage shareholders' perception of a firm's value by engaging in negative earnings management prior to a purchase offer.

Furthermore, negative earnings management facilitates the overall execution of MBOs. First, if earnings management reduces the perceived value of a firm, shareholders may accept a lower buyout price. Second, lower reported earnings in the periods preceding the MBOs can be used to support the fairness of the buyout price if there is a legal challenge to the role of managers in the transaction (Perry and Williams, 1994). Therefore, managers might engage in negative earnings management prior to MBOs in an attempt to depress pre-buyout accounting earnings hence increasing the possibility that shareholders will accept a lower buyout price.

However, managers might also engage in positive earnings management prior to MBOs, possibly to secure external funding and to lower the cost of finance. In MBOs, managers are part of the investment group buying a firm. In most cases, the internal financing by managers is insufficient to meet the cash required to implement a buyout. Additional financing is sought from external sources by leveraging a company's assets through secured bank loans. Moreover, further external debt financing may be obtained through private placements of subordinated claims from institutional investors. As managers depend on external funding to execute a buyout, they will be concerned about their ability to obtain the funding and motivated by their desire to obtain it at a low cost, especially when they have fewer fixed assets available to secure loans. Managers may therefore be likely to manipulate earnings upward to enhance prospective external financiers' perceptions of a firm's value in order to secure finance (Fischer and Louis, 2008).

An IBO is initiated and executed solely by third parties, such as outside institutional investors and private equity houses, who purchase and delist the firm without involving management in the transaction. Prior research suggests that a key characteristic of IBO targets is that their shares are undervalued in the market relative to firms that remain public, as measured by the price-earnings ratio (Weir and Wright, 2006; Jensen, 1986). IBO buyers argue that the undervaluation of shares results from the poor decisions of prior management, and a leveraged buyout could be a means of turning a failing company around by imposing a more efficient system of corporate governance or hiring a different management team (Hafzalla, 2009; Renneboog et al., 2007; Weir et al., 2005b). Thus undervaluation attracts potential IBO buyers as it signals that there is scope for improvement. Moreover, undervalued companies allow investors to acquire assets comparatively cheaply.

Incumbent managers want to prevent their firm from becoming a potential IBO target, as third-party buyers wish take control and engage in active monitoring or make changes to a firm’s existing management team after the buyout. This incentive is particularly strong in the UK, due to the comparatively limited options managers have to defend successfully against takeover offers, once they have been made (Hafzalla, 2009). Many takeover defence strategies that are prevalent in the USA, such as 'poison pills', are illegal under UK company Law and regulations included in The City Code on Takeovers and Mergers (The Panel on Takeovers and Mergers, 2013). Moreover, given that a very high takeover premium is often offered and an adequate time is required to obtain funding, incumbent managers are usually unable to make a rival bid and take the firm over themselves (Hafzalla, 2009).

As firm undervaluation attracts IBO specialists, a reduction in undervaluation is likely to decrease the probability of any potential IBOs. Moreover, an increase of share prices by positive earnings manipulation also increases the costs of IBO transactions (Hafzalla, 2009). This may further impede the initiation of IBO offers, as potential bidders will find it more difficult to raise sufficient funds and generate adequate returns to cover the cost of their finance. While managers cannot precisely anticipate IBO offers, they can use industrial adjusted price-earnings ratio as a measure of undervaluation to trigger REM behaviour in an attempt to reduce the risk of becoming a target. Therefore, managers might engage in positive earnings management to increase the perceived value of their firm once they realise their firm is undervalued.

3.3.2 Real earnings management prior to institutional buyouts

As discussed before, managers have clear incentives to manipulate current period earnings upwards. As managers cannot precisely anticipate IBO offers, they use industrial adjusted price-earnings ratio as a measure of undervaluation benchmark to trigger their REM behaviour. By engaging in positive REM, managers can increase profits, profit margins, profitability or sales at their discretion. Prior literature (e.g. Roychowdhury, 2006; Gunny, 2010) suggests that managers typically engage in five types of REM activities to increase earnings: sales manipulation, overproduction, decreasing discretionary selling, general and administrative (SG&A) expenses, decreasing discretionary R&D expenses and timing the sale of fixed assets. All of these REM practices are value decreasing in the long term, as they interfere with the normal operations of firms by boosting current period profits at the expense of future profits. Hence this study follows the approach of prior literature and focuses on the above five types of REM prior to IBOs.

3.3.2.1 Sales manipulation

Sales manipulation refers to managers' attempts to increase sales during the current year in an effort to increase reported profits. By cutting prices or offering more lenient credit terms toward the end of the year in an effort to accelerate sales from the next fiscal year into the current year, managers can book additional sales to this period. The additional sales will boost profits in the current year, assuming there are positive profit margins in doing so. The potential costs of sales manipulation include losses in future sales and profits once a firm reverts to its old prices (Gunny, 2010).

Both price cuts and more lenient credit terms will result in lower cash flows in the current year, as cash inflow per sale decreases and cash outflow (of total costs) per sales increases. Cash inflow per sale from additional sales is lower as profit margins decline. As long as a firm's suppliers do not offer matching discounts on firm inputs, sales manipulation will lead to lower cash flow over the life of the sales (Roychowdhury, 2006).

3.3.2.2 Overproduction

Overproduction refers to the managers' manipulation of the costs of goods sold (COGS) in an effort to increase reported profits. By producing more units than necessary, the fixed overhead costs can be spread over a larger number of units, thus lowering the fixed costs per unit. As long as the reduction in per-unit cost is not offset by inventory holding costs or any increase in marginal costs in the current period, total costs per unit will decline. As a result, reported COGS will decrease, and the firm can report higher profits in the current year. The incremental costs incurred in producing and holding the additional inventories will nevertheless result in higher annual production costs (Roychowdhury, 2006).

Research by Thomas and Zhang (2002) reported that managers do overproduce in order to decrease reported COGS. Roychowdhury (2006) found that managers use overproduction in an attempt to avoid reporting losses.

3.3.2.3 Decreasing discretionary selling, general and administrative expenses

Discretionary SG&A expenditures are generally expensed in the same period in which they are incurred, such as employee training, maintenance and travel. Some portions of SG&A expenses are subject to managerial discretion. Hence managers can reduce discretionary SG&A expenses in an effort to increase profits in the current year, especially when such expenditures do not generate immediate revenues and income. If discretionary SG&A expenses are reduced to meet earnings targets, a firm should exhibit unusually low discretionary expenses (Roychowdhury, 2006).

If outlays on discretionary expenses are paid in cash, reducing such expenses leads to higher current-period cash flows, possibly at the risk of lower future cash flows (Roychowdhury, 2006). This type of manipulation has drawbacks. If employee-training programs, which are intended to increase human capital and the commitment of employees, are cut back, the economic consequences may not materialise in the short term but in the long term (Gunny, 2010).

3.3.2.4 Hypotheses based on the discussion in Sections 3.3.2.1 to 3.3.2.3

As in Roychowdhury (2006), the discussions in Sections 3.3.2.1 to 3.3.2.3 lead to the following two arguments and hypotheses:

(1) Discretionary expenditure cuts lead to abnormally low discretionary expenses relative to sales. Price discounts and overproduction have a negative effect on abnormal CFO in the current period, while the reduction of discretionary expenditures has a positive effect on it. Thus the net effect on abnormal CFO is ambiguous, leading to the hypotheses below.

After controlling for sales levels, IBO firms exhibit at least one of the following:

$H_{2\text{-}1a}$: The abnormal current-period cash flow from operations is negative prior to IBOs

or

$H_{2\text{-}1b}$: The abnormal selling, general and administrative expenses are negative prior to IBOs

(2) Excessive price reductions and overproduction lead to abnormally high production costs relative to sales. Accordingly, it is hypothesised as follows:

$H_{2\text{-}1c}$: After controlling for sales levels, abnormal annual production costs[7] are

[7] Following the approach of prior research (e.g. Roychowdhury, 2006), I analyse production costs instead of COGS expenses to mitigate the confounding influence of accruals management. For example, if a manager postpones the write-down of obsolete inventory in

positive prior to IBOs.

3.3.2.5 Decreasing discretionary research and development expenses

Under the current accounting rules of 'Statements of Standard Accounting Practice' (SSAP) 13, R&D expenditures must be charged to expenses as incurred[8], because of the uncertainty of future benefits associated with such investments (ASB, 2013). Hence managers who attempt to boost current-period profits could choose to cut investment in R&D, particularly if the realisation of the benefit associated with the abandoned R&D project impacts the firm in a future period rather than in the current period (Gunny, 2010).

Several studies provide evidence that managers cut discretionary R&D spending to achieve earnings targets. For instance, Baber et al. (1991) reported that R&D spending is significantly less when such spending risks the ability to report positive or increasing income in the current period. In addition, Dechow and Sloan (1991) indicated that CEOs cut down R&D expenses in their final years in office. Bens et al. (2002) found that managers cut R&D and capital expenditure when faced with earnings per share dilution due to share option exercises. Gunny (2010) reported that managers cut R&D to meet earnings benchmarks. The evidence suggests that managers myopically cut investment in R&D in order to achieve various income objectives. Accordingly, it is hypothesised as follows:

H_{1d}: Abnormal research and development expenses are negative prior to IBOs.

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an effort to decrease reported COGS, this action would result in abnormally low COGS expenses. Using COGS as a proxy for REM would misclassify accruals management as REM. However, if production costs (COGS + inventories changes) are examined, the accruals management action will not affect production costs because the change in inventories would be correspondingly higher to offset lower COGS (Gunny, 2010).

[8] Unless it is expenditure on fixed assets (Accounting Standards Board, 2013)

3.3.2.6 Timing the sale of fixed assets

Managers have discretions on the timing of assets sales. The gains from the sale of fixed assets are the difference between net book value and current market value. Since gains are reported on the income statement as current-period profits at the time of the sale, the timing of asset sales could be used as a way to increase reported profits (Gunny, 2010). Research by Bartov (1993) reported that managers sell fixed assets to avoid decreases in earnings and debt covenant violations. Accordingly, it is argued that there are abnormally high gains from fixed asset sales prior to IBOs. Although the gains from asset sales can be used to manipulate earnings, it is transparent in the annual report. As REM behaviours are less transparent, and it is difficult to model gains from fixed asset sales, this hypothesis will not be tested.

3.3.3 Real earnings management prior to management buyouts

3.3.3.1 Hypotheses for negative earnings management incentives

As discussed before, prior to MBOs, the conflict of interests between managers and selling shareholders motivates managers manipulate current period earnings downwards in an effort to reduce the perceived value of their firms. By engaging in negative REM, managers can decrease the profits, profit margins, profitability or sales of their firm at their discretion. I expect to find that managers use REM to decrease earnings prior to MBOs, which is a reverse process in comparison to IBOs. Following the approach of prior literature, this study focuses on five types of REM prior to MBOs as discussed in the previous section. Sales manipulation and underproduction may be detrimental to firm value as they interfere in the normal operations of firms. Increasing discretionary SG&A expenses, increasing discretionary R&D expenses, and timing the sale of fixed assets may have positive impact on the firm in the long term. As shown below, the realisation of the benefits associated with these REM practices impacts the firm in a future period rather than in the current period

3.3.3.1.1 Sales manipulation

Managers attempt to decrease sales during the current year in an effort to decrease reported profits. By increasing prices or offering less lenient credit terms toward the end of the year, managers can defer additional sales to the next period at the expense of current profits. The reduction in sales will erode profits in the current year. The sales manipulation will increase future sales and profits once a firm re-establishes its original prices.

Both price increase and less lenient credit terms will result in higher cash flows in the current year. Cash inflows per sale are higher as profit margins increase. As long as suppliers to a firm do not make a matching price adjustment, sales manipulation will lead to higher cash inflows over the life of the sales.

3.3.3.1.2 Underproduction

Managers could manipulate COGS in an effort to decrease reported profits. By producing fewer units, the fixed overhead costs become spread over a smaller number of units, thus increasing the fixed costs per unit. As long as the rise in per-unit cost is not offset by reduced inventory holding costs or any decline in marginal costs in the current period, total costs per unit will increase. This implies that, as reported COGS increases, the firm can report lower profits in the current year. The decline in costs incurred in producing and holding the lower levels of inventory result in lower annual production costs.

3.3.3.1.3 Increasing discretionary selling, general and administrative expenses

As previously discussed, discretionary SG&A expenditures are generally expensed in the same period in which they are incurred. Portions of SG&A expenses are subject to managerial discretion, and managers can therefore increase discretionary SG&A expenses in an effort to decrease profits in the current year, especially when such expenses do not generate immediate revenues and income. If discretionary SG&A expenses are increased to reduce profits, the firm can be expected to exhibit unusually high discretionary expenses.

If outlays on discretionary expenses are paid in cash, increasing them leads to lower cash flows in the current period. This type of manipulation may have benefits. If employee-training programs, which are intended to increase human capital and the commitment of employees, are increased, the economic consequences may materialise in the long term.

3.3.3.1.4 Hypotheses based on the discussion in Sections 3.3.3.1.1 to 3.3.3.1.3

As in Roychowdhury (2006), the discussion in Sections 3.3.3.1.1 to 3.3.3.1.3 leads to the first set of two arguments and hypotheses as follows:

(1) Increases in discretionary expenditures lead to abnormally high discretionary expenses relative to sales. Price increases and underproduction have a positive effect on the abnormal CFO in the current period, while increases in discretionary expenditures have a negative effect on it. Thus the net effect on abnormal CFO is ambiguous, leading to the hypotheses below. After controlling for sales levels, MBO firms exhibit at least one of the following:

$H_{2\text{-}2a}$: Abnormal current-period cash flow from operations is positive prior to MBOs
or

$H_{2\text{-}2b}$: Abnormal selling, general and administrative expenses are positive prior to MBOs.

(2) Excessive price increases and underproduction lead to abnormally low production costs relative to sales. Accordingly, it is hypothesised as follows:

$H_{2\text{-}2c}$: After controlling for sales levels, abnormal annual production costs are negative prior to MBOs.

3.3.3.1.5 Increasing discretionary research and development expenses

Under current accounting rules of SSAP 13, R&D expenditures must be charged to expenses as incurred[9] because of the uncertainty of future benefits associated with such investments (ASB, 2013). Hence managers attempting to reduce current-period profits could choose to increase investment in R&D. If the realisation of the benefits associated with the incremental investment in R&D project impacts the firm in a future period rather than the current period, this type of manipulation will give managers more benefits in the post-MBO period. Accordingly, it is hypothesised as follows:

$H_{2\text{-}2d}$: Abnormal research and development expenses are positive prior to MBOs.

3.3.3.1.6 Timing the sale of fixed assets

Managers have discretions on the timing of asset sales, and gains are reported on the income statement as current-period profits at the time of the sale. The gains from fixed asset sales are the difference between net book value and current market value. Hence, as long as the gains from asset sales are not offset by the costs associated with holding and maintaining fixed assets, the timing of asset sales could be used as a way to decrease reported profits. Moreover, delaying the timing of asset sales may secure additional debt finance to execute MBOs. Accordingly, it is argued that there are abnormally low gains

[9] Unless it is expenditure on fixed assets (Accounting Standards Board, 2013)

from fixed asset sales prior to IBOs. Although the gains from asset sales can be used to manipulate earnings, they are transparent in the annual report. As REM behaviours are less transparent, and it is difficult to model gains from fixed asset sales, this hypothesis will not be tested.

3.3.3.2 Hypotheses for positive earnings management incentives

As discussed before, prior to MBOs, managers might also have incentives to engage in positive REM to manipulate earnings upwards if there is a need for securing external financing. This positive REM practice is similar to that in IBOs. Managers may engage in four types of REM activities to increase earnings: sales manipulation through excessive price discounts or credit sales, overproduction, decreasing discretionary SG&A expenses and decreasing discretionary R&D expenses. Hence this study proposes a second set of hypotheses for MBOs as follows:

(1) Discretionary expenditure cuts lead to abnormally low discretionary expenses relative to sales. Price discounts and overproduction have a negative effect on abnormal CFO in the current period, while the reduction of discretionary expenditures has a positive effect on it. Thus the net effect on abnormal CFO is ambiguous, leading to the hypotheses below.

After controlling for sales levels, MBO firms exhibit at least one of the following:

$H_{2\text{-}2ai}$: Abnormal current-period cash flows from operations (CFO) are negative prior to MBOs
or

$H_{2\text{-}2bi}$: Abnormal selling, general and administrative expenses are negative prior to MBOs.

(2) Excessive price reductions and overproduction lead to abnormally high production costs relative to sales. Accordingly, it is hypothesised as follows:

$H_{2\text{-}2ci}$: After controlling for sales levels, abnormal annual production costs are positive prior to MBOs.

(3) Discretionary R&D expenditure cuts lead to abnormally low discretionary expenses relative to sales. Accordingly, it is hypothesised as follows:

$H_{2\text{-}2di}$: Abnormal research and development expenses are negative prior to MBOs.

3.4 Impact of Corporate Governance on Real Earnings Management

REM are purposeful actions, undertaken by managers, which deviate from normal business operational practices with the primary objective of manipulating earnings in the current period (Roychowdhury, 2006). Hence REM is an agency problem that is more likely to arise in firms with poor corporate governance, characterised by the absence of effective monitoring and control mechanisms. Prior literature has shown that firms can reduce the agency problem by adopting appropriate external and internal governance practices that limit the potential for suboptimal managerial behaviours (e.g. Florackis and Ozkan, 2009). This paper therefore investigates the corporate governance mechanisms of equity ownership and board characteristics.

3.4.1 Equity ownership

3.4.1.1 Aggregate outside ownership concentration

Previous research suggested that large, undiversified outside shareholders in a firm could play a critical role in monitoring (Maug, 1998), as they have the opportunity, resources, and ability to monitor, discipline, and influence managers (Cornett et al., 2008). Substantial equity ownership by outsiders generates greater incentives and capabilities when it comes to monitoring managers. Furthermore, as large equity ownership makes them as effective agents of external shareholders, large outside shareholders have a strong incentive to exercise effective monitoring and to restrict managerial discretion (Bhagat et al., 1999). Hence outside shareholders with substantial shareholdings are expected to force managers to focus more on shareholder wealth maximisation rather than on opportunistic or self-serving REM behaviours.

In the UK, the existing takeover code and the corporate law favours minority shareholders and limits the incentives for investors, especially non-institutional investors, to hold very large percentages of shares (The Panel on Takeovers and Mergers, 2013). Moreover, the UK Corporate Governance Code suggests that shareholders who have 3% or more shares in a firm are classified as substantial shareholders (FRC, 2010). Following the approach taken by Singh and Davidson (2003), in this study, aggregate outside ownership concentration is defined as the aggregate percentage of shareholding by all outsiders (other than board members) with an equity level greater than 3% (Concentr3%). Moreover, although 3% is the majority declaration point, it is still unclear whether outside shareholders with 3% equity ownership have real ability and incentives to monitor and influence the behaviour of managers. As I do not know the level of ownership that could have a real influence on management behaviours, consistent with prior literature (e.g. Florackis and Ozkan, 2009), I also use a 5% ownership threshold (Concentr5%) to capture the effects of concentrated outside ownership.

As discussed before, negative earnings management is harmful to the interests of selling shareholders in MBOs, and positive earnings management works against the wealth maximisation of shareholders in the long term in IBOs. According to the above arguments and counter arguments, it is hypothesised as follows:

$H_{2\text{-}3a}$: Higher concentrations of outside ownership are associated with less REM preceding both MBOs and IBOs

3.4.1.2 Institutional shareholding

Managers find it difficult to manipulate REM when their operations are being monitored closely by institutional investors (Bushee, 1998). Institutional investors provide a high degree of monitoring, removing incentives for managerial myopic behaviour. This monitoring can occur either explicitly, through governance practices, or implicitly, through information gathering and correctly pricing the impact of managerial decisions. Institutions that intend to hold substantial equity ownership in the long term have strong incentives to incur the cost of explicitly monitoring and ensuring that managers do not use REM to meet short-term earnings goals. Moreover, institutional investors can monitor managerial behaviour by gathering information on the quality of operating decisions, thereby reducing the opportunities for REM manipulation (Bushee, 1998).

Institutional investors are also more sophisticated and informed than other investors are. As REM has real economic consequences for the long-term value of a firm, institutional investors are likely to have a better understanding of the long-term impact of a firm's operating decisions, leading them to put more effort into monitoring and controlling REM activities. Prior studies suggest that institutional investors play a monitoring role in reducing REM practice.[10]

[10] However, there is also evidence that ''transient'' institutions, or those with high portfolio turnover and highly diversified portfolio holdings, increase managerial myopic behaviour (e.g.

Bushee (1998) reports that firms with high levels of institutional ownership are less likely to cut R&D expenditure to avoid a decline in earnings. Roychowdhury (2006) found a negative relationship between institutional ownership and REM to avoid reporting negative earnings. Similar to prior literature (e.g. Bushee, 1998), this study measures institutional ownership as the total percentages of shares that are held by institutions (InsShare). Accordingly, it is hypothesised as follows:

$H_{2\text{-}3b}$: Higher levels of institutional ownership are associated with less REM preceding both MBOs and IBOs.

3.4.1.3 Non-managerial large blockholders

The existence of large blockholders may affect REM practices. Large blockholders are shareholders who have the capacity to determine the outcome of particular corporate policy decisions. Among major shareholders, large blockholders are those with the strongest incentives to be active owners, and they may have a significant impact on the levels of managerial discretions (Florackis and Ozkan, 2009). Hence the presence of large blockholders may decrease the extent of managerial discretions and mitigate REM behaviours.

In contrast, some researchers argued that highly concentrated shareholding might create incentives for blockholders to support management rather than monitoring them (McConnell and Servaes, 1990; Morck et al., 1988; Hijazi and Conover, 2011). Instead of imposing efficient monitoring and control on management, large outside shareholders may produce their own agency costs of equity (Roe, 1990). In particular, lack of diversification means that a firm's idiosyncratic risk adversely affects large outside shareholders. As this risk

Bushee 1998; Bushee 2001). In this study, I focus on the average effect of institutional ownership on firms' earnings management activities without looking into the investment horizon of different institutions.

decreases the subjective value of the investment, large outside shareholders may use opportunities to collude with managers and shift wealth from minority shareholders to themselves (Maug, 1998). Moreover, blockholders are likely to side with managers for strategic alignment in proxy contests, or they can be influenced by existing business relationships with managers, and thus act to protect their own interests (Pound, 1988). Furthermore, blockholders are generally passive and are likely to support managers in their quest for growth rather than residual value maximisation, as the role of such shareholders is ambiguous and varies across firms (Gibbs, 1993). Thus the presence of large blockholders may not decrease the extent of managerial discretions and mitigate REM behaviours.

The majority of previous literature classifies large blockholders as those investors whose equity ownership exceeds 20% (e.g. La Porta et al., 1999). Following this approach, I define the presence of large blockholders by a threshold of equity ownership at 20% (Block20%). Moreover, other research shows that investors whose equity ownership exceeds 10% can actually put real pressure on management (e.g. Gugler et al., 2008). Since I do not know the level of ownership that determines a genuinely influential blockholder, a 10% threshold (Block10%) is also used in this study for robustness.

Since, as outlined above, negative earnings management harms the interests of selling shareholders in MBOs, and positive earnings management is detrimental to the long-term wealth maximisation of shareholders in IBOs, I expect that when large blockholders are present, they are inclined to monitor actively, resulting in less REM preceding MBOs and IBOs. Accordingly, it is hypothesised as follows:

$H_{2\text{-}3c}$: The presence of large blockholders is associated with less REM preceding both MBOs and IBOs

3.4.1.4 Management shareholding

The ultimate effect of management ownership on agency problems, such as REM, is determined by a trade-off between the effects of alignment and of entrenchment (Short and Keasey, 1999). Jensen and Meckling (1976) suggested that shareholding by managers helps to align the interests of shareholders and managers. As the equity ownership makes managers co-owners of a firm, they are less inclined to divert resources away from the goal of value maximisation for shareholders. Management ownership works as an incentive mechanism to prevent managers from expropriating wealth from shareholders. Hence higher levels of management ownership may align the interests of managers and shareholders, and lead to lower levels of self-motivated REM behaviour by managers.

However, at certain levels of executive equity ownership, managers' consumption of perquisites may outweigh the loss that they suffer from a reduction of firm value (Fama and Jensen, 1983a). Morck et al. (1988) suggested that high levels of managerial ownership could lead to entrenchment effects, as it is difficult for external shareholders to control the actions of entrenched managers. At certain levels of ownership, managers find that they have sufficient control to follow their own objectives without fear of discipline from other ownership interests (Short and Keasey, 1999). Hence high executive ownership may also entrench managers and lead to higher levels of self-motivated REM discretions.

In line with other literature (e.g. Walters et al., 2008; Klein, 2002), as the chief executive officer (CEO) has the most power in the daily operations of a firm, the effect of management ownership is captured in this study by the percentage of equity ownership held by the CEO (CeoHd). Furthermore, similar to the approach used in prior studies (e.g. Short and Keasey, 1999), this study also tests for a non-linear effect, and CEO ownership is measured as the squared transformation of the percentage of equity ownership held by CEO (CeoHdSq).

The combination of alignment and entrenchment effects suggests that the effects of managerial ownership on agency problems are unclear. According to the above arguments and counter arguments, it is hypothesised as follows:

$H_{2\text{-}3d}$: Higher levels of management ownership are associated with more REM preceding both MBOs and IBOs

3.4.2 The role of board of directors

The board of directors is the most important governance body in a firm, and it has a fiduciary duty to ensure that a company operates in the long-term interests of its shareholders. Boards has two essential functions, which are monitoring management and providing useful connections as well as expert advice. The first role implies that they play a key part in corporate governance, and the second role implies that they bring various skills and expertise in supporting and reviewing the performance of a firm (Ronen and Yaari, 2007). These functions are associated with a board's responsibility to mitigate REM behaviours, because REM could be managerial discretions on making business operational decisions. Prior studies highlight that certain characteristics are likely to affect a board’s ability to fulfil its role, namely, equity ownership by non-executive board members, the percentage of non-executive directors on a board, CEO duality, and board size.

3.4.2.1 Equity ownership by non-executive board members

Agency theory suggests that directors who own more equity in a firm are expected to protect shareholders’ interests more effectively. As equity ownership aligns the interests of directors with those of external shareholders, more equity ownership by directors creates a personal incentive for them to actively monitor managers (Bhagat et al., 1999). Moreover, higher equity ownership by non-executive board members is likely to mitigate the risk of these directors colluding with managers to manipulate earnings, because this would ultimately harm their own interests (Vafeas, 2005).

As discussed before, prior to MBOs, managers are likely to manipulate earnings downwards in order to depress the offering price. As lower MBO offering prices generate lower premiums for selling shareholders, this conflicts with the best interests of selling shareholders. Thus non-executive board members with higher equity ownership may be inclined to monitor managers more actively, leading to less negative REM preceding MBOs. In contrast, prior to IBOs, earlier discussion suggests that managers are likely to manipulate earnings upwards, to increase a firm's value. However, while upward REM increases the short-term value of a firm, it decreases the value in the long term, which is contrary to the principle of shareholder wealth maximisation. Non-executive board members with higher equity ownership are therefore inclined to monitor managers actively, leading to less positive REM practices prior to IBOs. Similar to prior studies (e.g. Peasnell et al., 2005), the percentage of equity ownership held by non-executive directors is used to proxy for non-executive shareholding (NonExecHd). Accordingly, it is hypothesised as follows:

$H_{2\text{-}3e}$: Higher equity ownership by non-executive board members is associated with less REM preceding both MBOs and IBOs

3.4.2.2 The percentage of non-executive directors on board

Resource dependence theory suggests that boards provide various resources, and that having more non-executive directors will expand the available resources of the board (Hillman and Dalziel, 2003). While executive directors have better knowledge about a company and its industry, non-executive directors are boundary spanners who provide various knowledge and resources. Non-executive directors are better advisers, as they provide or facilitate access to external resources that are critical to a firm’s success (Daily et al., 2003). The ability of a board to monitor can increase as more directors are added, and increasing the number of non-executives in particular is expected to have a more positive impact than increasing executive directors would have (Andres et al., 2005; Guest, 2009).

Moreover, agency theory suggests that non-executive directors are more independent than executive directors are, and thus they are expected to have greater monitoring incentives (Fama and Jensen, 1983a; Elshandidy and Hassanein, 2014). Furthermore, apart from being directors, non-executive directors have no economic or psychological affiliation with a firm's managers that may interfere with their ability to question management (Fama, 1980). In contrast, being part of the management team, executive directors often have incentives to underperform their monitoring role (Vafeas, 2005). As non-executive directors can monitor managers more effectively, adding more of them to a board is expected to lead to less REM. Research by Osma (2008) found that the presence of more non-executive directors on a board constrained the manipulation of R&D expenditures in the UK.

However, non-executive directors are also criticised for performing little or no real monitoring role as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). Moreover, the inclusion of executive directors on a board is also preferable because they facilitate the communication of relevant information to non-executive directors during board meetings and provide a forum for evaluating the performance of managers and the senior management potential of junior executives. In addition, executive directors provide a source of expertise that a firms' decision makers may draw on in formulating and implementing high-level strategies (Baysinger and Butler, 1985).

Similar to prior studies (e.g. Klein, 2002), this governance mechanism is proxied by the percentage of non-executive directors on a firm's main board (Ned%). In light of the discussion above, this research hypothesises as follows:

$H_{2\text{-}3f}$: Higher percentages of non-executive directors on boards are associated with less REM preceding both MBOs and IBOs

3.4.2.3 Chief executive officer duality

Duality occurs when the positions of CEO and board chairperson are held simultaneously by one person. CEO duality enables the CEO to effectively control the information that is available to other board members, and thus it may impair effective monitoring (Jensen, 1993). Furthermore, it concentrates power in the CEO’s position without effective controls and balances on his or her activities. If CEO duality does impede the effective monitoring of managers, it might be associated with more REM (Cornett et al., 2008). Similar to prior studies (e.g. Cornett et al., 2008), CEO duality is proxied by a dummy variable coded 1 if a board has CEO duality (Duality). Since CEO duality is likely to be positively associated with REM, it is hypothesised as follows:

$H_{2\text{-}3g}$: CEO duality is associated with more REM preceding both MBOs and IBOs

3.4.2.4 Board size

Resource dependence theory suggests that boards provide various resources, and having more directors will expand the available resources of a board

(Hillman and Dalziel, 2003). Initially, adding more directors to serve the board may ensure a minimum required knowledge base (Vafeas, 2005), and the ability of the board to monitor may increase as more directors are added, especially increasing the number of non-executives (Andres et al., 2005; Guest, 2009).

However, enlarging boards might be detrimental to their effectiveness and cohesiveness, weakening their monitoring role. Problems with coordination and communication may arise in larger boards as it becomes difficult to arrange meetings and reach a consensus, leading to slower and less-efficient decision-making and directors becoming less likely to criticise the behaviour of top managers (Jensen, 1993; Yermack, 1996). Moreover, the director free-riding problem may also increase on larger boards, as the monitoring cost to any individual director falls in proportion to board size (Lipton and Lorsch, 1992). Hence the size of a board might relate to its effectiveness and thus affect managers' ability to engage in REM. Similar to prior studies (e.g. Peasnell et al., 2005), board size is measured by the number of directors on a board (BoardSz). In line with previous research, this study uses the number of board members as a proxy for board size.

In line with argument that larger boards can monitor more effectively, it is hypothesised as follows:

$H_{2\text{-}3h}$: Larger board sizes are associated with less REM preceding both MBOs and IBOs

3.5 Methodology

3.5.1 Data and sample

This study investigates all UK firms who made leveraged buyout announcements during the period from 1997 to 2011 and subsequently delisted from the London Stock Exchange. The data for the leveraged buyouts samples is collected from Thomson ONE Banker. I exclude 39 firms from the financial industry (ICB codes between 8000 and 8999) because they are subject to the external scrutiny of bodies like the Financial Services Authority (Weir et al., 2005a), which may affect their corporate governance. Datastream provides the earnings, total assets and other financial data needed to detect abnormal REM in the sample. This study uses cross-sectional regression models developed by Roychowdhury (2006) to estimate the unadjusted abnormal CFO, production costs and discretionary expenses for each sample firm. Moreover, this study uses alternative measurements of REM from the regression models developed by Gunny (2010) and Lara et al. (2012). The parameters of the models are estimated by industry and I require each firm year to have at least 6 observations with the same two-digit ICB code[11]. The industry-matched firms are collected from firms that are not involved in a leveraged buyout. Following a similar approach to that of Roychowdhury (2006) two-digit ICB codes are used to match the sampled firms wherever possible.

As previously discussed, both the degree and timing of REM can be expected to differ in MBOs and IBOs. This study therefore examines REM behaviours in the period up to 2 years prior to buyouts in order to examine potential changes and mean reversal in REM activity. Hence, I define the year of a leveraged buyout as Year T, the first year preceding a leveraged buyout as Year T-1, and the second year preceding a leveraged buyout as Year T-2. Data about corporate governance is hand-collected from annual reports. The number of initial and final regression samples is listed on table 3.1.2[12].

[11] As suggested by Defond and Jiambalvo (1994), a minimum of 6 firms are needed in each firm-year portfolio to give the minimum degrees of freedom needed to perform statistical tests.

[12] For studies on leveraged buyouts in the UK, this sample size is large enough in comparison to Weir, et al. (2005a), who examined 96 leveraged buyouts and Renneboog, et al., (2007), who investigated 177 leveraged buyouts.

Table 3.1.2 Sample

	Year T-1		Year T-2	
	MBOs	IBOs	MBOs	IBOs
Initial sample	149	102	149	102
Deleting	Financial firms			
Non-financial firms	124	88	124	88
Deleting	observations with missing financial data			
REM sample	118	87	116	82
Deleting	observations with missing corporate governance data			
Regression sample	115	85	115	78

3.5.2 Real earnings management measures – Roychowdhury (2006) models

This study draws on prior studies to develop proxies for REM. Following Roychowdhury (2006), this study considers three measures to detect the level of REM: abnormal levels of CFO, production costs and discretionary expenses. Subsequent studies using the same metrics, such as Zang (2012), Cohen and Zarowin (2010a), and Kim and Sohn (2013) provide evidence that these measures can effectively capture REM behaviours. For instance, the research by Cohen and Zarowin (2010a) found significant positive abnormal production costs, negative abnormal discretionary expenses and negative abnormal CFO in the year of seasoned equity offering, which indicates that managers engaged in REM. Nevertheless, the effect of suggested REM methods on CFO is ambiguous (Roychowdhury, 2006). Specifically, price discounts, channel stuffing and overproduction all decrease CFO, whereas cutting discretionary expenditures increases CFO. For instance, given a particular sales level, both sales manipulation and overproduction lead to abnormally low current-period CFO, whereas reducing discretionary expenditures leads to abnormally high current-period CFO (Zhao et al., 2012).

Following the method employed in other studies, I decompose the actual CFO, production costs and discretionary expenses into the normal (expected) portion and the abnormal (unexpected) portion by estimating the equations shown below for each industry and year. The abnormal levels of CFO, production costs and discretionary expenses, which indicate REM practices, are the difference between their actual level and their normal level respectively. The models are shown as follows:

The normal level of CFO is assumed to be a linear function of sales and changes in sales:

$$\frac{RowCFO_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_t}{A_{t-1}} + \alpha_3 \frac{\Delta Sales_t}{A_{t-1}} + \varepsilon_t$$

The normal level of production costs is estimated from:

$$\frac{RowProdCos_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_t}{A_{t-1}} + \alpha_3 \frac{\Delta Sales_t}{A_{t-1}} + \alpha_4 \frac{\Delta Sales_{t-1}}{A_{t-1}} + \varepsilon_t$$

The normal level of discretionary expenses is estimated from:

$$\frac{RowDiscExp_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_{t-1}}{A_{t-1}} + \varepsilon_t$$

Where:

$RowCFO_t$: is cash flow from operations, as per Roychowdhury’s (2006) model

$RowProdCos_t$: is production costs, as per Roychowdhury's (2006) model, calculated as the sum of the costs of goods sold and changes to the inventory

$RowDiscExp_t$: is discretionary expenses, as per Roychowdhury's (2006) model, calculated as the sum of advertising expenses, research and development (R&D) expenses, and selling, general and administrative (SG&A) expenses. (Advertising expenses data is not available for the UK firms, as it is included in

SG&A expenses)

$Sales_t$: is the sales during period t, and **(Δ)Salest**=$Sale_t$-$Sales_{t-1}$

A_t: is the total assets at the end of period t

In this study, I examine REM practices up to 2 years preceding buyouts in order to investigate whether managers changed their REM behaviours in the run-up to the buyout. This study examines aggregate as well as individual signed levels of REM, as detected using the models described above.

More negative values of CFO and abnormal discretionary expenses are associated with more income-increasing REM. More positive values of abnormal production costs are also associated with more income-increasing REM.

Consistent with Zang (2012) and Cohen and Zarowin (2010a), this study combines the three individual measures to generate two comprehensive metrics of REM activities to capture the total effects of REM. For the first aggregate measure (RowProd+Disc), I first multiply abnormal discretionary expenses by minus one (so that a higher value means the firm is more likely to cut discretionary expenses) and add it to abnormal production costs[13]. The higher amount of the first aggregate measure, the more likely a firm is to be engaged in REM activities. For the second aggregate measure (RowCFO+Disc), I first multiply abnormal CFO and abnormal discretionary expenses by minus one separately, and then aggregate them into one measure. Multiplying by minus one gives a result in which the higher amount of the second aggregate measure indicate a greater likelihood that a firm engages in sales manipulations

[13] Abnormal production costs does not multiply by negative one because higher production costs is indicative of overproduction to reduce COGS. I do not combine abnormal production costs and abnormal CFO. Roychowdhury (2006) suggests that the same activities that lead to abnormally high production costs also lead to abnormally low CFO, thus adding these two amounts leads to double counting (Cohen and Zarowin,2010).

and cutting discretionary expenditure in order to manage reported earnings upwards.

The three individual REM proxies may have different implications for earnings that may dilute any results obtained using two aggregated measures (Cohen and Zarowin, 2010a). Thus, both aggregate and individual signed levels of REM are investigated in this study.

The existing REM detecting models are developed by the US scholar to detect REM behaviours in the US firms (e.g. Gunny, 2010; Lara et al., 2012; Roychowdhury, 2006). The differences of financial market and accounting systems between the US and other countries might reduce the effectiveness of the REM detecting models, thus might compromise the reliability of the models to apply in the UK market. Hence, this study adopts alternative REM detection models, as shown in section 3.5.3 and section 3.5.4, to increase the robustness and reliability of results in this study. If the results are consistent by using different REM detecting models, this might indicate that the country difference is insignificant and my results are reliable.

Moreover, the use of abnormal CFO to detect sales manipulation might include the effects of overproduction and discretionary expenditures cut in addition to sales manipulation (Roychowdhury, 2006). Although sales manipulation is the dominate reason which affects cash flow, the CFO model is not a perfect approach to detect sales manipulation behaviour. For instance, price discounts, channel stuffing and overproduction will reduce CFO, while discretionary expenditures cut increases CFO. Given a particular sales level, both sales manipulation and overproduction results in abnormally low current-period CFO, whereas cutting discretionary expenditures leads to abnormally high current-period CFO (Zhao et al., 2012). Hence, this study adopts more than one REM detection models thus to investigate different types of REM behaviours, which potentially increases the robustness of this study.

3.5.3 Alternative measures – Gunny's (2010) models

Alternative measures of REM are also used in this study for robustness purpose. Gunny's (2010) models have been used to capture the REM activities from abnormal R&D expense, SG&A expenditure, production costs and income from asset sales. Gunny's (2010) models include the natural logarithm of the market value of equity, Tobin's Q, and internal funds to control for additional factors in a firm. The natural logarithm of the market value of equity controls for the size effect. Tobin's Q proxies the marginal benefit to marginal cost of installing an additional unit of a new investment. Internal funds serves as a proxy for reduced funds available for investment.

The prior year's R&D expense is a proxy for a firm's R&D opportunity set for the current year. Normal level of R&D expense is estimated using the following model:

$$\frac{GuyRes\&Dev_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{RD_{t-1}}{A_{t-1}} + \varepsilon_t$$

Where:

$GuyRes\&Dev_t$: is R&D expenses, as per Gunny's (2010) model

MV_t: is the natural logarithm of market value

Q_t: is Tobin's Q ratio (=(the market value of equity + the book value of liabilities) / book values of total assets)

INT_t: is internal funds (=Income before Extraordinary Items + Depreciation and Amortization + Research and Development Expense)

The SG&A estimation model includes a proxy for 'sticky' cost behaviour. Costs are sticky if the magnitude of a cost increase is greater than the magnitude of a cost decrease when associated with an equal level of change in sales. Hence managers trade off the expected costs of maintaining unused resources in weak sales periods with the expected costs of replacing these resources if demand is restored (Anderson et al., 2003). As a result, only negative change in sales between t-1 and t is included in the model to capture the “sticky” cost behaviour. In other words, change in sales multiplies by a dummy variable equal to one when sales revenue decreases between t-1 and t is used in the model to capture the “sticky” cost behaviour. Not including this indicator in the SG&A expectations model may lead to underestimating (overestimating) the response of costs to increases (decreases) in sales (Gunny, 2010). The normal level of SG&A is estimated using the following model:

$$\frac{GuySGA_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{\Delta Sales_t}{A_{t-1}} + \beta_5 \frac{\Delta Sales_t}{A_{t-1}} * DD + \varepsilon_t$$

Where:

$GuySGA_t$: is selling, general and administrative (SG&A) expenses, as per Gunny's (2010) model

DD: is a dummy variable that is equal to one when total sales decrease between t-1 and t, zero otherwise.

The model for estimating production costs includes sales, changes in sales and lagged changes in sales, which are expected to control for any changes in the demand of a product that might directly influence the level of production. Abnormally high production costs for a given sales level are indicative of either sales boosting or the manipulation of COGS expenses by overproduction (Roychowdhury, 2006). The inclusion of the natural logarithm of the market value of equity and Tobin’s Q in the following model is expected to generate a more precise estimation. The normal level of production costs is therefore estimated using the following model:

$$\frac{GuyProdCos_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{Sales_t}{A_{t-1}} + \beta_4 \frac{\Delta Sales_t}{A_{t-1}} + \beta_5 \frac{\Delta Sales_{t-1}}{A_{t-1}} + \varepsilon_t$$

Where:

$GuyProdCos_t$: is production costs, as per Gunny's (2010) model, calculated as the sum of the cost of goods sold plus changes in the inventory

Funds available for investment and the marginal benefit to marginal cost of installing an additional unit of a new investment may influence the decision to sell fixed assets (Gunny, 2010). These are included in the model used to estimate income from asset sales (Gunny, 2010). Further, separating long-lived asset sales from long-lived investment sales is expected to generate a better estimation of the normal level of income from asset sales. The normal level of income from asset sales is therefore estimated using the following model:

$$\frac{GainA_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{Int_t}{A_{t-1}} + \beta_4 \frac{ASales_t}{A_{t-1}} + \beta_5 \frac{ISales_t}{A_{t-1}} + \varepsilon_t$$

Where:

$GainA_t$: is the income from asset sales (=(-1) * Sale of Property, Plant and Equipment and Investments/Gain (Loss))

Int_t: Internal funds (=Income before Extraordinary Items + Research and Development Expenses + Depreciation and Amortization)

$ASales_t$: is long-lived asset sales

$ISales_t$: is long-lived investment sales

Due to limits on the data available, it is impossible to conduct the estimation of income from asset sales.

3.5.4 Alternative measures – Lara, *et al.*'s (2012) models

The models developed by Lara et al. (2012) are used to capture the REM activities from abnormal production costs and abnormal discretionary expenses. This model controls for the influence of firm performance and growth on the level of production costs and discretionary expenses, following the recommendations of Kothari, Leone and Wasley (2005) and of Collins, Pungaliya and Vijh (2012) (cited in Lara et al., 2012). It includes additional regressors of the lagged return on assets (ROA) (defined as net income scaled by total assets) and current sales growth.

More positive values of abnormal production costs are associated with more income-increasing REM. More negative values of abnormal discretionary expenses are associated with more income-increasing REM. This study reports both aggregate (by adding LaraProdCos_t and -1*LaraDiscExp_t) and individual signed levels of REM estimated from the models described in this section. Higher values of aggregate REM are interpreted as evidence of more income-increasing REM.

The normal level of production costs is estimated using the following model:

$$\frac{\text{LaraProdCos}_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_t}{A_{t-1}} + \alpha_3 \frac{\Delta Sales_t}{A_{t-1}} + \alpha_4 \frac{\Delta Sales_{t-1}}{A_{t-1}} + \alpha_5 LagROA_t + \alpha_6 SalesG_t + \varepsilon_t$$

Where:

LaraProdCos_t: is production costs, as per the model of Lara, *et al*. (2012), calculated as the sum of the costs of goods sold and changes in the inventory

LagROA_t: is the lagged return on assets

SalesG_t: is the current sales growth

The normal level of discretionary expenses is estimated from the following model:

$$\frac{LaraDiscExp_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_{t-1}}{A_{t-1}} + \alpha_3 LagROA_t + \alpha_4 SalesG_t + \varepsilon_t$$

Where:

LaraDiscExp$_t$: is discretionary expenses, as per Lara, *et al*. (2012), calculated as the sum of advertising, research and development (R&D), and selling, general and administrative (SG&A) expenses. (Advertising data is not available for UK firms, as it is included in SG&A)

3.5.5 Control variables

The inclusion of firm size as a control variable is motivated by the size hypothesis. Large firms are more likely to be under close scrutiny by outsiders, such as financial/investment analysts, than small firms are (Hussain, 2000). Such scrutiny potentially reduces managers' opportunities to manage earnings (Koh, 2003). Furthermore, large firms produce more information for public access. This suggests that they have alternative methods of influencing investors' perceptions of their performance, which in turn reduces the need for earnings management practices (LaFond and Watts, 2008). Hence firm size may affect managers' REM practices. In line with previous research, this study uses the natural logarithm of total assets as a proxy for firm size (LN Total Assets).

Actual sales growth is likely to affect REM, as growth in sales will affect accruals, such as inventory and receivables, and CFO, which in turn affects REM. Furthermore, high growth in sales often inflates the market's expectations of future cash flows, leading managers to manipulate sales downwards in order to avoid high expectations for future performance (Ahmed and Duellman, 2007).

Moreover, in times of rapid growth, a company may experience pressure to maintain or exceed anticipated growth rates, resulting in the practices of REM to achieve a growth-rate benchmark, or alternatively to mask a downturn (Carcello and Nagy, 2004). Similar to prior studies, sales growth is measured by the annual percentage growth in total sales (Sales Growth).

This study controls for the potential sales growth prospects of a firm, because firms with higher growth prospects are more likely to engage in REM. Collins and Kothari (1989) found that the market has a greater reaction to earnings announcements from firms with high-growth opportunities. Moreover, Skinner and Sloan (2002) report that the market response to positive vs. negative earnings surprises is asymmetric, and the absolute magnitude of the price response to negative surprises is significantly greater than the price response to positive surprises, particularly for high-growth firms. These findings imply that managers of high-growth firms have greater incentives to avoid negative earnings surprises, such as missing earnings expectations (Matsumoto, 2002). Thus, managers of high growth firms may have strong incentives to engage in REM to avoid negative earnings surprises. As in prior studies, growth prospects are measured as the market value of equity divided by the book value of common equity (Market to Book).

In more profitable firms, managers are less likely to engage in income-increasing earnings management behaviours to produce better accounting results, as their firms already perform well (Becker et al., 1998; Bédard et al., 2004). Consequently, pernicious earnings management is rarely exercised in the more profitable firms. Hence firm performance may have an impact on REM (e.g. Bédard et al., 2004), firm performance is measured by the current year's return on assets (ROA).

Financial leverage captures debt-contracting motivations for REM. High leverage is associated with the closeness of debt covenants violations (Press and Weintrop, 1990), and debt covenant violations are related to the choice of earnings management strategy (DeFond and Jiambalvo, 1994). Managers of highly leveraged firms have incentives to exercise income-increasing REM practices to prevent violation of their debt covenants. Moreover, higher leverage ratio is associated with higher costs of debt financing (Piot and Janin, 2007). As debt increases, companies may use income-increasing REM practices to present a more favourable financial position when negotiating with lenders. Thus leverage ratio is likely to have a relationship with REM practices. Similar to prior studies, leverage in this study is measured by the ratio of total liabilities to total assets (Leverage).

This study uses the asset turnover ratio as a proxy to account for the degree of potential agency problems. The asset turnover ratio is defined as the ratio of total sales to total assets (Assets Turnover Ratio). This ratio is an inverse proxy for agency costs and can be interpreted as asset utilisation ratio that measures how effectively managers deploys a firm’s assets (Ang et al., 2000). A low asset turnover ratio indicates poor corporate governance, such as managers’ inferior investment decisions, insufficient effort, and consumption of perquisites, suggesting that significant agency costs arise from the conflicts between managers and shareholders (Florackis and Ozkan, 2009).

This study also controls for the potential financial constraint of acquirers. If a firm is financially constrained but has potential valuable projects to invest, then this firm can use earnings management to signal its positive prospects and raise its share price in the short term. Hence increased earnings may signal positive prospects to prospective external financiers, enabling a firm to raise capital to make the investments (Linck et al., 2013). Prior studies use the ability to obtain external finance as a proxy for financial constraints, such as financial leverage or free cash flows (e.g. Park and Shin, 2004). However, financial information on acquirers was unavailable for this study. Instead, this study measures financial constrain of acquirers by relative deal values, which reflect how much money is required in a buyout. A deal value demonstrates the ability of an acquirer to obtain external financing, which is an appropriate proxy for financial constraints for the purposes of this study. Specifically, the deal value is the total cash paid to shareholders in buyout transactions. In IBOs, as the acquirer comes from outside the firm, financial constraint is measured by the total deal value. In MBOs, as managers are acquirers and they only need to purchase the shares held by other shareholders, financial constraint is measured by the deal value excluding the portion required to purchase the shares owned by managers. Accordingly, financial constraint of acquirers is measured by deal value (DealVal).

3.5.6 Corporate governance regression model

This study uses the multiple OLS regression model described below to investigate the relationship between REM and corporate governance mechanisms. REM is proxied by the signed value of CFO ($RowCFO_t$), production costs ($RowProdCos_t$), discretionary expenses ($RowDiscExp_t$) obtained from Roychowdhury's (2006) models. The robustness tests use the REM proxies generated from the models of Gunny (2010) and Lara, *et al.* (2010).

$$\begin{aligned}REM_{it} = \beta_0 &+ \beta_1 InsShare + \beta_2 Concentr3\% + \beta_3 Concentr5\% + \beta_4 Block10\% \\ &+ \beta_5 Block20\% + \beta_6 CeoHd + \beta_7 CeoHdSq + \beta_8 Ned\% + \beta_9 Duality \\ &+ \beta_{10} BoardSz + \beta_{11} LnAssets + \beta_{12} SalesGrow + \beta_{13} Mark2Book \\ &+ \beta_{14} ROA + \beta_{15} Leverage + \beta_{16} AssTurn + \beta_{17} DealVal + \varepsilon\end{aligned}$$

Definition of variables:

REM_{it}: represents real earnings management proxies of the following variables, which is dependent variable in the model:

1. Main REM proxies from Roychowdhury's (2006) model:

RowCFO: is the abnormal CFO detected using Roychowdhury's (2006) model

RowProdCos: is abnormal production costs

RowDiscExp: is abnormal discretionary expenses

2. Alternative REM proxies from Gunny's (2010) Model:

GuyRes&Dev: is the abnormal R&D expense detected using Gunny's (2010) model

GuySGA: is abnormal SG&A expenses

GuyProdCos: is abnormal production costs

3. Alternative REM proxies from Lara, et al. (2010)'s Model:

LaraProdCos: is the abnormal production costs detected using Lara (2012) model

LaraDiscExp: is abnormal discretionary expenses

Independent variables:

InsShare: is institutional shareholding (=the cumulative institutional shareholding);

Concentr3% (5%): is ownership concentration (=the sum of the shares of firm's outside shareholders with equity ownership greater than 3% (or 5%))

Block10% (20%): is large blockholders, a dummy variable coded 1 if a firm has a non-managerial large shareholder who own at least 10% (or 20%) equity ownership

CeoHd: is the CEO's shareholding

CeoHdSq: is the squared transformation of the CEO's shareholding

NonExecHd: is the non-executive shareholding (=the percentage of equity ownership held by non-executive directors)

Ned%: is the percentage of non-executive directors on a firm's main board

Duality: means CEO duality, a dummy variable coded 1 if a board has CEO duality

BoardSz: is the number of directors on a firm's board

Control variables:

LnAssets: is the natural logarithm of total assets

SalesGrow: is the percentage of sales growth ratio

Mark2Book: is the market-to-book ratio (= market capitalization divided by the book value of shareholders' equity)

ROA: is the return-on-assets ratio (=earnings before interest and taxes divided by total assets)

Leverage: is the financial leverage ratio (= total liabilities divided by total assets)

AssTurn: is the assets turnover ratio (= total sales to total assets)

DealVal: is the total cash paid to shareholders in buyout transactions. For MBOs, it refers to the value of the deal excluding the portion required to purchase shares owned by managers (=Deal Value * (1- CEO's shareholding); for IBOs, it is the total deal value (unit: £million)

Multicollinearity, omission of an important variable or inclusion of an irrelevant variable, might compromise the reliability of OLS estimations (Brooks, 2014). High correlations between sales growth (Sales Growth) and return on assets (ROA) in year T-2 preceding MBOs cause multicollinearity problem in OLS model. In order to ensure the validity of the results of multivariate OLS model, this study re-runs the same OLS model by omitting each of these highly correlated variables in turn to control for multicollinearity in sensitivity analysis section (section 3.7). The results are consistent in the main test and in the sensitivity analysis, which suggests the results are reliable.

Moreover, due to data limitation, the selection of variable in my model is constrained. For instance, this study controls for the potential financial constraint of acquirers, and the acquirers' financial leverage or free cash flows could be a good proxy (e.g. Park and Shin, 2004). However, it is unable to access the financial information of acquirers, and I have used an alternative measure, the deal value, as a proxy of this variable. Furthermore, I do not control for more factors that might affect the REM behaviours in the OLS model. For instance, this study does not control the motivation to just meet or beat zero earnings. As the sample size is relatively small, controlling for this factor might further reduce observations in this study. In addition, the OLS model might include irrelevant variable, and thus the estimation might be less efficient. In order to consider the robustness of the results, I used different proxies for the dependent variable to check whether my results are consistent and not sensitive to the selection of variables. Hence, this might imply that the results are strongly reliable.

3.5.7 Summary statistics and correlation matrix

Table 3.1.3 contains the summary statistics for the independent and control variables. Panel A shows summary statistics for MBOs in years T-1 and T-2. Panel B compares the summary statistics of MBOs and IBOs in year T-1. Panel C shows summary statistics for IBOs in years T-1 and T-2. Further details of the summary statistics are listed on Table 3.1.4.

Panel A of Table 3.1.3 reports the results for ownership structure, board characteristics and firm characteristics for MBOs in years T-1 and T-2. It can be seen that there are no significant differences between years T-1 and T-2.

Table 3.1.3 Panel A Summary Statistics for MBO Year T-1 VS T-2

	Year T-1			Year T-2			T-test: T-1 ≠ T-2	
Variable	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	t-Stat[1]	p-Value
InsShare	115	0.353	0.218	115	0.334	0.213	0.6501	0.2581
Concentr3%	115	0.389	0.206	115	0.364	0.207	0.9078	0.1825
Concentr5%	115	0.312	0.206	115	0.290	0.204	0.8112	0.2091
Block10%[2]	115	0.748	0.436	115	0.678	0.469		
Block20%[2]	115	0.270	0.446	115	0.226	0.420		
CeoHd	115	0.075	0.131	115	0.076	0.132	-0.0229	0.4909
NonExecHd	115	0.048	0.117	115	0.042	0.104	0.3913	0.3480
Ned%	115	0.440	0.142	115	0.433	0.147	0.3835	0.3509
Duality[2]	115	0.261	0.441	115	0.287	0.454		
BoardSz	115	6.052	1.555	115	6.148	1.613	-0.4579	0.3237
TotalAssets	115	124,718.2	349,671.6	115	121,548.7	352,342	0.0685	0.4727
SalesGrow	115	0.356	2.194	115	0.304	1.319	0.2154	0.4148
Mark2Book	115	1.739	1.787	115	1.339	8.240	0.5092	0.3057
ROA	115	0.062	0.184	115	-0.015	1.122	0.7285	0.2339
Leverage	115	0.509	0.187	115	0.514	0.188	-0.2215	0.4125
AssTurn	115	1.411	0.955	115	1.386	0.999	0.1920	0.4239
PE Ratio	115	-3.834	16.863	115	-3.545	17.298	-0.1283	0.4490

Note 1: T-test significance: *** p<0.01, ** p<0.05, * p<0.1

Note 2: T-test is not used for dummy variables

Panel B of Table 3.1.3 compares ownership structure, board characteristics and firm characteristics between MBOs and IBOs in year T-1. From this table it can be seen that CEOs of MBO firms have 7.5% equity ownership, which is nearly twice that of CEOs of IBO firms. The high rates of managerial shareholding may facilitate the planning and execution of MBOs. Moreover, more MBO firms have outside large blockholders with equity ownership exceeding the 20% threshold than IBO firms do. MBO firms also have more CEO duality than IBOs. In addition, MBO firms have higher asset turnover rates than IBO firms have. The higher asset utilisation ratio indicates that MBO firms have lower agency costs.

In contrast, IBO firms include more non-executive directors on their boards, which may imply that there are greater monitoring incentives for directors. Moreover, IBO firms have larger boards than MBO firms. The firm size and the deal value of IBOs are also larger than that of MBOs. In addition, IBO firms have greater financial leverage than MBO firms have. To conclude, smaller firm sizes and higher managerial shareholdings may indicate a higher possibility that managers can afford a MBO. A lower financial leverage rate may imply that managers are able to leverage a firm's assets to a higher extent, in order to access external finance.

Table 3.1.3 Panel B Summary Statistics for Year T-1 MBO VS IBO

	MBO			IBO			T-test: MBO ≠ IBO	
Variable	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	t-Stat[1]	p-Value
InsShare	115	0.353	0.218	85	0.373	0.187	-0.6948	0.2440
Concentr3%	115	0.389	0.206	85	0.397	0.196	-0.2806	0.3897
Concentr5%	115	0.312	0.206	85	0.295	0.187	0.5974	0.2755
Block10%[2]	115	0.748	0.436	85	0.694	0.464		
Block20%[2]	115	0.270	0.446	85	0.153	0.362		
CeoHd	115	0.075	0.131	85	0.038	0.091	2.3872***	0.0090
NonExecHd	115	0.048	0.117	85	0.033	0.064	1.1719	0.1214
Ned%	115	0.440	0.142	85	0.533	0.119	-5.0268***	0.0000
Duality[2]	115	0.261	0.441	85	0.106	0.310		
BoardSz	115	6.052	1.555	85	6.788	1.612	-3.2407***	0.0007
TotalAssets	115	124,718.2	349,671.6	85	552,946	1461269	-2.6464***	0.0048
SalesGrow	115	0.356	2.194	85	0.224	0.719	0.5996	0.2748
Mark2Book	115	1.739	1.787	85	2.104	15.234	-0.2196	0.4133
ROA	115	0.062	0.184	85	0.033	0.206	1.0433	0.1492
Leverage	115	0.509	0.187	85	0.581	0.233	-2.3381**	0.0103
AssTurn	115	1.411	0.955	85	1.168	0.868	1.8734**	0.0313
DealVal	115	165.154	918.184	85	506.742	1,377.260	-1.9839**	0.0246
PE Ratio	115	-3.834	16.863	85	-2.020	16.432	-0.7629	0.2233

Note 1: T-test significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note 2: T-test is not used for dummy variables

Panel C of Table 3.1.3 reports the results for ownership structure, board characteristics and firm characteristics for IBOs in years T-1 and T-2. There are no significant differences in firm characteristics between years T-1 and T-2 in the case of IBOs. However, the ROA ratio significantly decreases from 0.072 to 0.033 between years T-2 and T-1, which may indicate a decline in firm performance.

Table 3.1.3 Panel C Summary Statistics for IBO Year T-1 VS T-2

	Year T-1			Year T-2			T-test: T-1 ≠ T-2	
Variable	Obs.	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	t-Stat[1]	p-Value
InsShare	85	0.373	0.187	78	0.342	0.192	1.0244	0.1536
Concentr3%	85	0.397	0.196	78	0.369	0.201	0.8895	0.1875
Concentr5%	85	0.295	0.187	78	0.279	0.193	0.5345	0.2969
Block10%[2]	85	0.694	0.464	78	0.731	0.446		
Block20%[2]	85	0.153	0.362	78	0.128	0.336		
CeoHd	85	0.038	0.091	78	0.041	0.094	-0.2580	0.3984
NonExecHd	85	0.033	0.064	78	0.037	0.073	-0.4089	0.3416
Ned%	85	0.533	0.119	78	0.521	0.119	0.6547	0.2568
Duality[2]	85	0.106	0.310	78	0.090	0.288		
BoardSz	85	6.788	1.612	78	6.949	1.772	-0.6031	0.2737
TotalAssets	85	552,946	1461269	78	533,332.5	1383447	0.0880	0.4650
SalesGrow	85	0.224	0.719	78	0.227	0.542	-0.0264	0.4895
Mark2Book	85	2.104	15.234	78	2.554	2.504	-0.2683	0.3946
ROA	85	0.033	0.206	78	0.072	0.140	-1.4397*	0.0760
Leverage	85	0.581	0.233	78	0.564	0.217	0.4678	0.3203
AssTurn	85	1.168	0.868	78	1.101	0.874	0.4878	0.3132
PE Ratio	85	-2.020	16.432	78	-0.062	21.006	-0.6591	0.2554

Note 1: T-test significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note 2: T-test is not used for dummy variables

Table 3.1.4 reports the detailed summary statistics of this study.

Table 3.1.4 Panel A Summary Statistics for MBO Year T-1

Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
InsShare	115	0.353	0.218	0.000	0.196	0.321	0.502	0.890
Concentr3%	115	0.389	0.206	0.000	0.240	0.396	0.527	0.890
Concentr5%	115	0.312	0.206	0.000	0.152	0.294	0.456	0.875
Block10%	115	0.748	0.436	0.000	0.000	1.000	1.000	1.000
Block20%	115	0.270	0.446	0.000	0.000	0.000	1.000	1.000
CeoHd	115	0.075	0.131	0.000	0.001	0.007	0.095	0.681
CeoHdSq	115	0.023	0.066	0.000	0.000	0.000	0.009	0.463
NonExecHd	115	0.048	0.117	0.000	0.000	0.002	0.030	0.664
Ned%	115	0.440	0.142	0.000	0.375	0.429	0.500	0.750
Duality	115	0.261	0.441	0.000	0.000	0.000	1.000	1.000
BoardSz	115	6.052	1.555	3.000	5.000	6.000	7.000	11.000
TotalAssets	115	124,718.2	349,671.6	1,370	21,736	53,357	101,019	3376400
LnAssets	115	10.818	1.268	7.223	9.987	10.885	11.523	15.032
SalesGrow	115	0.356	2.194	-0.554	-0.066	0.036	0.157	21.687
Mark2Book	115	1.739	1.787	-1.676	0.798	1.225	2.116	10.741
ROA	115	0.062	0.184	-1.054	0.024	0.090	0.140	0.521
Leverage	115	0.509	0.187	0.095	0.387	0.492	0.639	1.122
AssTurn	115	1.411	0.955	0.076	0.833	1.335	1.742	8.116
DealVal	115	165.154	918.184	0.110	10.960	31.831	82.601	9,802.953
PE Ratio	115	-3.834	16.863	-58.560	-12.180	-4.090	0.120	88.090

Table 3.1.4 Panel B Summary Statistics for MBO Year T-2

Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
InsShare	115	0.334	0.213	0.000	0.160	0.328	0.495	0.895
Concentr3%	115	0.364	0.207	0.000	0.212	0.350	0.506	0.895
Concentr5%	115	0.290	0.204	0.000	0.125	0.274	0.459	0.860
Block10%	115	0.678	0.469	0.000	0.000	1.000	1.000	1.000
Block20%	115	0.226	0.420	0.000	0.000	0.000	0.000	1.000
CeoHd	115	0.076	0.132	0.000	0.001	0.007	0.097	0.681
CeoHdSq	115	0.023	0.067	0.000	0.000	0.000	0.009	0.463
NonExecHd	115	0.042	0.104	0.000	0.000	0.002	0.033	0.630
Ned%	115	0.433	0.147	0.000	0.333	0.429	0.500	0.750
Duality	115	0.287	0.454	0.000	0.000	0.000	1.000	1.000
BoardSz	115	6.148	1.613	3.000	5.000	6.000	7.000	12.000
TotalAssets	115	121,548.7	352,342	1,925	22,241	49,990	107,682	3448900
LnAssets	115	10.794	1.245	7.563	10.010	10.820	11.587	15.054
SalesGrow	115	0.304	1.319	-0.583	-0.007	0.077	0.210	11.284
Mark2Book	115	1.339	8.240	-67.773	0.888	1.354	2.880	17.164
ROA	115	-0.015	1.122	-11.864	0.051	0.102	0.149	0.429
Leverage	115	0.514	0.188	0.088	0.395	0.511	0.632	1.048
AssTurn	115	1.386	0.999	0.003	0.823	1.298	1.740	8.866
DealVal	115	164.992	918.215	0.110	11.309	32.662	82.556	9,802.953
PE Ratio	115	-3.545	17.298	-78.570	-6.600	-3.000	1.010	93.710

Table 3.1.4 Panel C   Summary Statistics for IBO Year T-1

Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
InsShare	85	0.373	0.187	0.000	0.288	0.374	0.500	0.905
Concentr3%	85	0.397	0.196	0.000	0.296	0.377	0.533	0.905
Concentr5%	85	0.295	0.187	0.000	0.149	0.288	0.422	0.862
Block10%	85	0.694	0.464	0.000	0.000	1.000	1.000	1.000
Block20%	85	0.153	0.362	0.000	0.000	0.000	0.000	1.000
CeoHd	85	0.038	0.091	0.000	0.000	0.002	0.037	0.648
CeoHdSq	85	0.010	0.049	0.000	0.000	0.000	0.001	0.419
NonExecHd	85	0.033	0.064	0.000	0.000	0.002	0.019	0.362
Ned%	85	0.533	0.119	0.222	0.444	0.556	0.625	0.750
Duality	85	0.106	0.310	0.000	0.000	0.000	0.000	1.000
BoardSz	85	6.788	1.612	4.000	5.000	7.000	8.000	10.000
TotalAssets	85	552,946	1461269	3,447	41,021	112,328	533,565	11700000
LnAssets	85	11.758	1.754	8.145	10.622	11.629	13.187	16.278
SalesGrow	85	0.224	0.719	-0.895	0.010	0.083	0.215	5.169
Mark2Book	85	2.104	15.234	-92.143	0.902	1.682	2.409	103.703
ROA	85	0.033	0.206	-0.876	0.028	0.075	0.110	0.413
Leverage	85	0.581	0.233	0.060	0.469	0.550	0.655	1.774
AssTurn	85	1.168	0.868	0.002	0.517	0.978	1.545	5.083
DealVal	85	506.742	1,377.260	1.010	26.030	114.280	508.490	11,730.530
PE Ratio	85	-2.020	16.432	-52.470	-7.400	-3.170	3.550	74.700

Table 3.1.4 Panel D Summary Statistics for IBO Year T-2

Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
InsShare	78	0.342	0.192	0.000	0.202	0.329	0.475	0.905
Concentr3%	78	0.369	0.201	0.000	0.222	0.345	0.497	0.905
Concentr5%	78	0.279	0.193	0.000	0.109	0.253	0.419	0.862
Block10%	78	0.731	0.446	0.000	0.000	1.000	1.000	1.000
Block20%	78	0.128	0.336	0.000	0.000	0.000	0.000	1.000
CeoHd	78	0.041	0.094	0.000	0.000	0.002	0.043	0.648
CeoHdSq	78	0.010	0.050	0.000	0.000	0.000	0.002	0.419
NonExecHd	78	0.037	0.073	0.000	0.000	0.002	0.032	0.377
Ned%	78	0.521	0.119	0.200	0.429	0.500	0.600	0.833
Duality	78	0.090	0.288	0.000	0.000	0.000	0.000	1.000
BoardSz	78	6.949	1.772	4.000	6.000	7.000	8.000	12.000
TotalAssets	78	533,332.5	1383447	5,615	41,200	93,064.5	506,123	10400000
LnAssets	78	11.739	1.723	8.633	10.626	11.441	13.135	16.160
SalesGrow	78	0.227	0.542	-0.702	0.010	0.095	0.286	3.082
Mark2Book	78	2.554	2.504	-2.581	1.259	1.769	3.129	13.274
ROA	78	0.072	0.140	-0.429	0.044	0.073	0.128	0.604
Leverage	78	0.564	0.217	0.075	0.427	0.542	0.664	1.405
AssTurn	78	1.101	0.874	0.012	0.410	0.918	1.456	5.643
DealVal	78	516.082	1,430.584	1.010	26.030	111.470	508.490	11,730.530
PE Ratio	78	-0.062	21.006	-92.810	-6.250	-1.065	7.040	72.750

Table 3.1.5 reports the results of the Pearson correlation matrix. High correlations between right-hand-side variables may lead to the risk of multicollinearity in regression analysis. This study separates highly correlated independent variables into different regression models to mitigate multicollinearity in the multivariate tests section. Moreover, the VIFs are examined in order to ensure that multicollinearity is not problematic in the models. The VIFs are lower than the critical value of 10, indicating that there is no risk of multicollinearity (Tabachnick and Fidell, 2012). If high correlations between control variables in a model lead to multicollinearity problems in this study, then the same regression models are re-run by omitting one of these variables in turn in sensitivity analysis to check the validity of the models and results.

In the multivariate tests section, the high correlation between sales growth

(SalesGrow) and return on assets (ROA) in year T-2 of MBOs leads to multicollinearity problem in regression models that the dependent variables are discretionary expenses (RowDiscExp), SGA expenses (GuySGA) and discretionary expenses (LaraDiscExp) respectively. The same regression models are therefore re-run by omitting these highly correlated variables one at a time in sensitive analysis. The results from the main tests are consistent with those from the sensitivity analysis, thus the results in this study are robust and multicollinearity is not problematic.

Similar to prior studies on ownership (e.g. McKnight and Weir, 2009; Weir et al., 2002; Weir and Laing, 2000), this study includes CEO's shareholding and its squared transformation into one specified model to test the potential non-linear relationship between managerial ownership and REM. The high correlation and the VIFs value between these two variables may indicate a high risk of multicollinearity. However, the powers of a variable, such as X^2 and X^3, are all nonlinear functions of it, and thus including a variable and its powers in one regression model does not violate the assumption of no multicollinearity (Gujarati and Porter, 2009). Moreover, the P-value for powers transformation is not affected by multicollinearity. The high correlations can be greatly reduced by 'centring' the variables (i.e. subtracting their means) before creating the powers. But the P-value for the powers will be exactly the same, regardless of whether or not centring the variable. All the results for the other variables (including the R^2 but not the lower-order terms) will be the same in either case. Hence including a variable and its powers in one specified regression model has no adverse consequences, and multicollinearity is not problematic (Allison, 2012).

Table 3.1.5 Panel A Pearson pairwise Correlation matrix for MBOs Year T-1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
InsShare (1)	1																		
Concentr3% (2)	0.946	1																	
Concentr5% (3)	0.891	0.952	1																
Block10% (4)	0.345	0.387	0.438	1															
Block20% (5)	0.319	0.325	0.382	0.353	1														
CeoHd (6)	-0.394	-0.404	-0.338	-0.254	-0.151	1													
CeoHdSq(7)	-0.314	-0.349	-0.293	-0.292	-0.138	0.924	1												
NonExecHd (8)	-0.181	-0.209	-0.138	0.151	0.377	-0.057	-0.063	1											
Ned% (9)	0.285	0.201	0.177	0.110	0.202	-0.280	-0.244	0.350	1										
Duality (10)	-0.187	-0.206	-0.169	-0.065	0.085	0.340	0.277	-0.075	-0.193	1									
BoardSz (11)	0.042	-0.036	-0.056	-0.058	-0.084	-0.117	-0.103	0.028	-0.007	-0.225	1								
LnAssets (12)	0.169	0.072	0.017	-0.043	-0.072	-0.287	-0.213	0.027	0.214	-0.154	0.429	1							
SalesGrow (13)	-0.059	-0.033	-0.006	0.058	0.026	0.147	0.081	-0.043	0.028	0.186	0.134	0.008	1						
Mark2Book (14)	-0.039	-0.073	-0.138	-0.145	-0.137	0.114	0.166	0.028	-0.003	0.066	0.109	0.069	-0.054	1					
ROA (15)	-0.215	-0.223	-0.247	-0.117	-0.041	0.171	0.215	0.119	-0.168	-0.006	0.102	0.299	-0.208	0.395	1				
Leverage (16)	0.199	0.161	0.113	-0.155	-0.139	-0.115	-0.064	-0.110	0.113	-0.206	0.175	0.135	-0.170	0.296	-0.042	1			
AssTurn (17)	0.077	0.071	0.062	-0.035	-0.203	-0.007	0.018	-0.103	-0.129	-0.029	0.109	0.052	-0.170	0.487	0.142	0.335	1		
DealVal(18)	-0.052	-0.079	-0.100	-0.156	-0.064	-0.084	-0.054	-0.013	0.156	-0.053	0.158	0.404	-0.029	0.059	0.066	0.003	0.041	1	
PE Ratio (19)	-0.186	-0.219	-0.243	-0.216	-0.156	0.168	0.116	-0.003	-0.092	0.029	-0.074	-0.001	-0.092	0.073	0.236	-0.158	0.008	0.017	1

Table 3.1.5 Panel B Pearson pairwise Correlation matrix for MBOs Year T-2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
InsShare (1)	1																		
Concentr3% (2)	0.952	1																	
Concentr5% (3)	0.905	0.953	1																
Block10% (4)	0.394	0.406	0.485	1															
Block20% (5)	0.330	0.344	0.425	0.372	1														
CeoHd (6)	-0.423	-0.423	-0.363	-0.269	-0.153	1													
CeoHdSq(7)	-0.335	-0.357	-0.311	-0.277	-0.144	0.927	1												
NonExecHd (8)	-0.088	-0.089	-0.058	0.187	0.371	-0.024	-0.040	1											
Ned% (9)	0.354	0.324	0.290	0.158	0.172	-0.276	-0.256	0.165	1										
Duality (10)	-0.186	-0.222	-0.162	-0.057	0.025	0.395	0.313	-0.052	-0.186	1									
BoardSz (11)	0.073	0.022	0.008	0.029	0.015	-0.100	-0.077	-0.050	-0.106	-0.214	1								
LnAssets (12)	0.155	0.084	0.035	-0.041	-0.048	-0.269	-0.196	0.003	0.219	-0.164	0.372	1							
SalesGrow (13)	0.235	0.231	0.242	0.069	0.130	-0.068	-0.042	-0.051	0.099	0.113	0.059	-0.105	1						
Mark2Book (14)	0.022	0.034	0.112	0.183	0.051	0.047	0.063	-0.016	-0.002	-0.084	0.032	0.122	0.140	1					
ROA (15)	-0.201	-0.197	-0.238	-0.096	-0.184	0.060	0.047	0.048	-0.119	-0.134	0.058	0.223	-0.784	-0.049	1				
Leverage (16)	0.087	0.045	0.024	0.021	-0.108	0.002	0.035	-0.062	0.059	-0.130	0.037	0.157	0.011	-0.160	0.086	1			
AssTurn (17)	0.068	0.056	0.048	0.016	-0.174	-0.030	-0.018	-0.056	-0.100	-0.029	0.160	0.106	0.281	0.109	0.115	0.364	1		
DealVal(18)	-0.068	-0.089	-0.113	-0.133	-0.044	-0.083	-0.053	-0.006	0.161	-0.060	0.204	0.411	-0.017	0.029	0.025	0.016	0.059	1	
PE Ratio (19)	0.030	0.021	-0.027	0.018	-0.081	-0.095	-0.026	-0.005	-0.073	-0.043	-0.134	0.235	0.037	0.008	0.089	0.045	0.035	0.037	1

Table 3.1.5 Panel C Pearson pairwise Correlation matrix for IBOs Year T-1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
InsShare (1)	1																		
Concentr3% (2)	0.954	1																	
Concentr5% (3)	0.891	0.931	1																
Block10% (4)	0.418	0.412	0.527	1															
Block20% (5)	0.401	0.363	0.422	0.282	1														
CeoHd (6)	-0.114	-0.098	-0.095	-0.013	-0.033	1													
CeoHdSq(7)	-0.098	-0.096	-0.100	-0.103	-0.021	0.915	1												
NonExecHd (8)	-0.262	-0.245	-0.177	0.094	0.071	0.057	-0.029	1											
Ned% (9)	0.076	0.059	0.102	-0.083	0.262	-0.172	-0.137	0.201	1										
Duality (10)	0.062	0.085	0.103	0.145	-0.040	0.276	0.139	-0.067	-0.047	1									
BoardSz (11)	-0.114	-0.140	-0.122	-0.104	0.117	-0.172	-0.156	-0.125	-0.093	-0.050	1								
LnAssets (12)	-0.069	-0.169	-0.193	-0.193	0.098	-0.351	-0.265	-0.279	0.095	-0.072	0.501	1							
SalesGrow (13)	0.009	-0.014	-0.021	-0.084	-0.148	0.016	-0.009	0.088	0.007	-0.065	-0.006	0.007	1						
Mark2Book (14)	0.149	0.140	0.080	0.171	-0.019	0.008	0.014	-0.118	-0.017	-0.004	-0.137	0.078	0.040	1					
ROA (15)	-0.041	-0.073	-0.111	0.009	-0.068	0.229	0.229	-0.012	-0.245	-0.044	0.016	0.150	0.164	0.418	1				
Leverage (16)	0.189	0.189	0.082	0.073	0.023	0.018	-0.032	-0.022	0.159	0.101	0.085	0.161	0.046	0.014	-0.096	1			
AssTurn (17)	-0.164	-0.150	-0.152	-0.054	-0.223	0.482	0.539	0.209	-0.253	0.091	-0.222	-0.461	-0.042	-0.151	0.068	0.081	1		
DealVal(18)	-0.186	-0.217	-0.248	-0.290	-0.076	-0.124	-0.066	-0.149	0.007	-0.072	0.315	0.562	-0.058	0.022	0.060	0.069	-0.214	1	
PE Ratio (19)	-0.180	-0.166	-0.200	0.016	-0.102	-0.017	-0.035	0.003	-0.130	-0.001	-0.037	0.175	-0.190	0.097	0.174	-0.075	-0.139	0.040	1

Table 3.1.5 Panel D Pearson pairwise Correlation matrix for IBOs Year T-2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
InsShare (1)	1																		
Concentr3% (2)	0.945	1																	
Concentr5% (3)	0.879	0.943	1																
Block10% (4)	0.511	0.535	0.567	1															
Block20% (5)	0.319	0.252	0.293	0.233	1														
CeoHd (6)	-0.096	-0.064	-0.081	-0.092	-0.080	1													
CeoHdSq(7)	-0.087	-0.088	-0.107	-0.148	-0.064	0.905	1												
NonExecHd (8)	0.052	0.043	0.082	0.145	0.385	0.073	-0.020	1											
Ned% (9)	0.150	0.129	0.129	0.047	0.206	-0.245	-0.169	0.213	1										
Duality (10)	-0.077	-0.070	-0.121	-0.012	-0.120	0.159	0.096	-0.099	-0.114	1									
BoardSz (11)	-0.199	-0.221	-0.164	-0.083	0.098	-0.240	-0.183	-0.069	-0.076	0.060	1								
LnAssets (12)	-0.198	-0.267	-0.249	-0.157	0.038	-0.414	-0.298	-0.235	0.162	0.073	0.565	1							
SalesGrow (13)	0.253	0.244	0.200	0.146	0.141	0.123	0.073	0.033	-0.006	0.110	-0.014	-0.223	1						
Mark2Book (14)	0.060	0.134	0.156	0.122	-0.056	0.202	0.179	-0.055	-0.148	-0.002	0.010	-0.354	0.372	1					
ROA (15)	-0.294	-0.298	-0.317	-0.112	-0.174	0.321	0.338	-0.019	-0.308	0.147	0.004	0.005	-0.258	0.090	1				
Leverage (16)	0.162	0.230	0.233	0.160	0.009	0.053	-0.033	-0.008	0.054	0.225	0.033	0.094	-0.048	0.099	-0.026	1			
AssTurn (17)	-0.113	-0.082	-0.125	-0.001	-0.039	0.573	0.643	0.164	-0.272	0.070	-0.208	-0.412	-0.043	0.164	0.375	0.149	1		
DealVal(18)	-0.210	-0.235	-0.211	-0.237	-0.052	-0.130	-0.067	-0.146	0.089	0.027	0.479	0.566	-0.092	-0.128	0.021	0.044	-0.188	1	
PE Ratio (19)	-0.158	-0.157	-0.032	-0.017	0.024	0.021	-0.017	0.052	-0.034	0.011	0.210	0.038	0.102	0.321	0.171	0.154	0.028	-0.001	1

3.6 Empirical Results

3.6.1 Univariate tests

This section reports the results of the univariate tests of the signed values of REM after having partitioned the sample into MBOs and IBOs. The main tests analyse the detected abnormal REM proxies from Roychowdhury's (2006) models: abnormal CFO, abnormal production costs, and abnormal discretionary expenses. The results from the models of Gunny's (2010) and Lara, *et al.*'s (2012) are used as alternative measures of REM to increase the robustness of the findings.

3.6.1.1 Univariate test results for management buyouts

Table 3.2.1A summarises the actual results for the REM proxies and the expected results from the hypotheses development for MBOs. In Table 3.2.1A, the results are listed in separate sections for year T-1, year T-2 and the aggregate values of these two years. Further details of the actual results for MBOs are listed in Table 3.2.2.

Table 3.2.1A Summary of real earnings management hypotheses and results for MBOs

Proxies	Hypotheses	Year T-1		Year T-2		Aggregate T-1 + T-2	
		Predicted	Actual	Predicted	Actual	Predicted	Actual
RowCFO	H2a	+	-**	+	-*	+	-**
RowProdCos	H2c	-	+**	-	+*	-	+**
RowDiscExp	H2b	+	-***	+	-	+	-**
RowProd+Disc		-	+***	-	+**	-	+***
RowCFO+Disc		-	+***	-	+*	-	+***
GuyRes&Dev	H2d	+	+	+	-**	+	-
GuySGA	H2b robust	+	-**	+	-	+	-**
GuyProdCos	H2c robust	-	+*	-	+*	-	+*
LaraProdCos	H2c robust	-	+*	-	+	-	+*
LaraDiscExp	H2b robust	+	-**	+	-*	+	-**
LaraProd+Disc		-	+***	-	+**	-	+**

Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1

The first set of hypotheses suggested that, preceding MBOs, managers might use negative REM to depress pre-buyout reported earnings in order to increasing the possibility that shareholders would accept a lower buyout price. The second set of hypotheses suggested that managers might engage in positive REM to manipulate earnings upwards preceding MBOs, in an attempt to secure external funding. The actual results in Table 3.2.1A suggest that managers engage in positive REM prior to MBOs. This supports the second set of hypotheses, which are $H_{2\text{-}2ai}$ $H_{2\text{-}2bi}$ $H_{2\text{-}2ci}$ $H_{2\text{-}2di}$.

In year T-1, the results show that managers use nearly every opportunity to engage in positive REM to increase reported earnings. Further results from year T-1 prior to MBOs are discussed below.

Abnormal cash flows from operations

Abnormal CFO (RowCFO) is significantly negative, which suggests that managers manipulate sales through excessive price discounts or credit sales in order to increase reported earnings.

Abnormal production costs

Abnormal production costs (RowProdCos, GuyProdCos, and LaraProdCos) are significantly positive, which means that managers use overproduction to decrease COGS in an attempt to report higher earnings.

Abnormal discretionary expense cuts

Abnormal discretionary expenses (RowDiscExp and LaraDiscExp) are significantly negative, which shows that managers cut discretionary expenses to increase reported earnings. Furthermore, abnormal SG&A expenses (GuySGA) are also significantly negative but abnormal R&D expenditures (GuyRes&Dev) are insignificant. As reduction of R&D expenditures is easy to spot, managers may choose to cut SG&A expenses to increase earnings preceding MBOs. Alternatively, managers might perceive cutting R&D expenditure as too damaging for a firm's long-term growth potential.

Aggregated values of REM proxies

The aggregated values of REM proxies (RowProd+Disc, RowCFO+Disc, and LaraProd+Disc) are significantly positive, which suggests that managers engage in different types of REM at the same time, and that these manipulations do not cancel each other out.

Investigating any possible mean reversals of REM might reveal systematic manipulation of REM. For instance, managers might engage in negative REM for at least one year to prepare for the extent of positive REM in the following year. This action might cancel the overall effects of REM, and reduce the possibility of the manipulation being detected. In year T-2, the direction of REM manipulation is the same as in year T-1, though some variables are no longer significant in year T-2. This indicates that managers engage in positive REM selectively or to a lesser extent in year T-2. Hence there is no evidence of a mean reversion. The results suggest that some managers might plan more than two years ahead. Further results from year T-2 prior to MBOs are discussed below.

Abnormal cash flows from operations

Abnormal CFO (RowCFO) is significantly negative, which suggests that managers engage in sales manipulation of excessive price discount or credit sales to increase reported earnings.

Abnormal production costs

Abnormal production costs (RowProdCos and GuyProdCos) are significantly positive, which means that managers use overproduction to decrease COGS in an attempt to report higher earnings.

Abnormal discretionary expenses

Abnormal discretionary expenses (RowDiscExp) are negative but insignificant in year T-2, prior to MBOs. This suggests that managers choose not to cut discretionary expenses to increase earnings in year T-2. In comparison to sales manipulation and overproduction, discretionary expenses cut is easy to spot. Further, discretionary expenses cut, such as cancelling employee-training programs, are easy to spot and have long-term negative economic consequences (Gunny, 2010). Hence, managers may take discretionary expenses cut as a final option of REM to minimise the interference of normal operations in year T-2, preceding MBOs.

Abnormal expenditure on research and development

Abnormal R&D expenditures (GuyRes&Dev) are significantly negative only in year T-2, whereas abnormal SG&A expenses (GuySGA) are significantly negative only in year T-1. This might indicate that managers use SG&A expenses cut and R&D expenditures cut as alternatives in order to increase reported earnings preceding MBOs. Moreover, R&D and SG&A expenses are two parts of overall discretionary expenses. Engaging in only one method of discretionary expenses cut at a time may reduce the risk of being detected and minimise interference in normal operations.

As previously stated, the results do not indicate any mean reversion. The results of aggregate REM measures (year T-1 + year T-2) are the same as those for year T-1 preceding MBOs. This suggests that managers do engage in positive REM preceding MBOs. As suggested by the results from years T-1 and T-2, the aggregate effect of REM on reported earnings is positive, and there is no mean reversal of REM in 2 years preceding MBOs. These results indicate that some managers might plan more than two years ahead.

In summary, managers engage in positive REM in year T-1 by manipulating sales through excessive price discounts or credit sales, overproduction to decrease COGS and abnormal cuts to discretionary expenses. Moreover, managers engage in positive REM in year T-2 by manipulating sales manipulation through excessive price discounts or credit sales and overproduction to decrease COGS. The results indicate that, prior to MBOs, managers engage in positive REM, choosing the methods that are easy to control and less likely to be detected, such as sales manipulation and overproduction. As managers are buyers in MBOs, they are likely to remain with the firm after buyouts. Consequently, they select REM methods that cause minimal interference with their firm's long-term performance. For instance, managers might cut either SG&A or R&D expenditures in a given period.

To conclude, the results suggest that managers engage in positive REM to increase reported earnings preceding MBOs. They use more opportunities to engage in REM in year T-1 than they do in year T-2. This result is consistent with the second set of hypotheses, which predict that managers, who rely on external sources of financing, are more likely to engage in positive earnings management prior to MBOs.

The results listed in Table 3.2.1A support hypotheses $H_{2\text{-}2ai}$ $H_{2\text{-}2bi}$ $H_{2\text{-}2ci}$ $H_{2\text{-}2di}$, showing that managers engage in positive REM to manipulate earnings upwards in an attempt to secure their external funding preceding MBOs.

Table 3.2.2 reports all the details of the univariate test results for MBOs.

Table 3.2.2 Summary statistics of REM proxies preceding MBOs

Panel A. MBO Year T-1

Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho[1]: mean=0	t-Stat[2]	p-Value	REM[3]
RowCFO	118	-0.025	0.130	-0.876	0.287	Ha: < 0	-2.106**	0.019	+
RowProdCos	117	0.043	0.242	-0.919	0.991	Ha: > 0	1.909**	0.029	+
RowDiscExp	96	-0.111	0.317	-1.876	1.014	Ha: < 0	-3.436***	0.0004	+
RowProd+Disc	95	0.162	0.438	-1.124	1.982	Ha: > 0	3.618***	0.0002	+
RowCFO+Disc	96	0.136	0.362	-0.902	2.096	Ha: > 0	3.668***	0.0002	+
GuyRes&Dev	117	0.000	0.008	-0.036	0.044	Ha: > 0	0.268	0.395	-
GuySGA	96	-0.038	0.163	-0.724	0.382	Ha: < 0	-2.284**	0.012	+
GuyProdCos	117	0.029	0.209	-0.946	0.805	Ha: > 0	1.473*	0.072	+
LaraProdCos	117	0.027	0.204	-0.976	0.616	Ha: > 0	1.452*	0.075	+
LaraDiscExp	96	-0.047	0.204	-0.545	0.997	Ha: < 0	-2.272**	0.013	+
LaraProd+Disc	95	0.088	0.327	-1.005	1.092	Ha: > 0	2.612***	0.005	+

Panel B. MBO Year T-2

Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho: mean=0	t-Stat	p-Value	REM
RowCFO	116	-0.014	0.111	-0.763	0.259	Ha: < 0	-1.374*	0.086	+
RowProdCos	113	0.034	0.219	-0.733	0.756	Ha: > 0	1.655*	0.050	+
RowDiscExp	96	-0.028	0.274	-0.573	1.578	Ha: < 0	-1.013	0.157	+
RowProd+Disc	93	0.079	0.417	-1.424	1.329	Ha: > 0	1.818**	0.036	+
RowCFO+Disc	96	0.043	0.260	-1.090	0.661	Ha: > 0	1.611*	0.055	+
GuyRes&Dev	115	-0.001	0.006	-0.048	0.009	Ha: < 0	-1.802**	0.037	+
GuySGA	96	-0.017	0.159	-0.569	0.588	Ha: < 0	-1.016	0.156	+
GuyProdCos	113	0.024	0.184	-0.718	0.748	Ha: > 0	1.374*	0.086	+
LaraProdCos	113	0.017	0.175	-0.802	0.597	Ha: > 0	1.024	0.154	+
LaraDiscExp	95	-0.028	0.202	-0.602	0.980	Ha: < 0	-1.351*	0.090	+
LaraProd+Disc	93	0.060	0.317	-0.915	1.199	Ha: > 0	1.823**	0.036	+

Panel C. MBO 2 years aggregate

Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho: mean=0	t-Stat	p-Value	REM
RowCFO	116	-0.039	0.205	-0.951	0.545	Ha: < 0	-2.058**	0.021	+
RowProdCos	113	0.079	0.437	-1.652	1.615	Ha: > 0	1.924**	0.028	+
RowDiscExp	95	-0.140	0.511	-1.760	1.998	Ha: < 0	-2.664**	0.005	+
RowProd+Disc	93	0.242	0.775	-2.273	2.854	Ha: > 0	3.006***	0.002	+
RowCfo+Disc	95	0.177	0.540	-1.993	2.225	Ha: > 0	3.197***	0.001	+
GuyRes&Dev	114	-0.001	0.012	-0.085	0.044	Ha: < 0	-0.667	0.253	+
GuySGA	95	-0.055	0.304	-1.292	0.971	Ha: < 0	-1.759**	0.041	+
GuyProdCos	113	0.054	0.373	-1.636	1.553	Ha: > 0	1.551*	0.062	+
LaraProdCos	113	0.045	0.352	-1.779	1.144	Ha: > 0	1.353*	0.089	+
LaraDiscExp	94	-0.075	0.388	-1.147	1.978	Ha: < 0	-1.870**	0.032	+
LaraProd+Disc	93	0.148	0.609	-1.602	2.291	Ha: > 0	2.343**	0.011	+

Note 1: Ho: is Null Hypothesis; Ha: is Alternative Hypothesis;

Note 2: Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1

Note 3: REM: This column indicates the real earnings management direction. '+' means income increasing earnings management; '-' means income decreasing earnings management. The significance of the positive/negative real earnings management is indicated by the '*' in t-Stat column.

3.6.1.2 Univariate test results for institutional buyouts

Table 3.2.1B summarises the actual results for the REM proxies and the expected results from the hypotheses development for IBOs. In Table 3.2.1B, the results are listed in separate sections for year T-1, year T-2 and the aggregate value of these two years. Further details of actual results for IBOs are listed in Table 3.2.3.

Table 3.2.1B Summary of real earnings management hypotheses and results for IBOs

Proxies	Hypotheses	Year T-1		Year T-2		Aggregate T-1 + T-2	
		Predicted	Actual	Predicted	Actual	Predicted	Actual
RowCFO	H1a	-	-***	-	-***	-	-***
RowProdCos	H1c	+	+***	+	+**	+	+***
RowDiscExp	H1b	-	-**	-	-**	-	-**
RowProd+Disc		+	+**	+	+**	+	+**
RowCFO+Disc		+	+***	+	+***	+	+**
GuyRes&Dev	H1d	-	+	-	-**	-	-
GuySGA	H1b robust	-	-*	-	-	-	-
GuyProdCos	H1c robust	+	+**	+	+**	+	+**
LaraProdCos	H1c robust	+	+**	+	+	+	+*
LaraDiscExp	H1b robust	-	-*	-	-**	-	-**
LaraProd+Disc		+	+	+	+*	+	+

Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1

In year T-1, prior to IBOs, the results suggest that managers engage in positive REM to increase reported earnings. This result is consistent with hypotheses $H_{2\text{-}1a}$, $H_{2\text{-}1b}$, $H_{2\text{-}1c}$, and $H_{2\text{-}1d}$ in respect to IBOs. It indicates that managers use positive REM to increase pre-buyout earnings in an attempt to increase the perceived value of their firms, thus decreasing the possibility of any potential IBOs incidence. Further results from year T-1 prior to IBOs are discussed below.

Abnormal cash flows from operations

Abnormal CFO (RowCFO) is significantly negative, which is consistent with hypothesis $H_{2\text{-}1a}$, suggesting that managers offer price discounts or more lenient credit terms to increase their reported earnings prior to IBOs.

Abnormal production costs

Abnormal production costs (RowProdCos, GuyProdCos, and LaraProdCos) are significantly positive, which is consistent with hypothesis $H_{2\text{-}1c}$. This means that managers engage in overproduction to decrease COGS, in an attempt to report higher earnings.

Abnormal discretionary expense cuts

Abnormal discretionary expenses (RowDiscExp and LaraDiscExp) are significantly negative, which is consistent with hypothesis $H_{2\text{-}1b}$. Furthermore, abnormal SG&A expenses (GuySGA) are significantly negative, suggesting that managers cut discretionary SG&A expenses to increase reported earnings. Abnormal R&D expenditures (GuyRes&Dev) are positive but insignificant, which is inconsistent with hypothesis $H_{2\text{-}1d}$. As a reduction in R&D expenditures is easy to spot, managers may choose not to use this method in year T-1 preceding IBOs. Alternatively, managers might perceive cutting R&D expenditure as too damaging to their firm's long-term growth potential.

Aggregated values of the REM proxies

Aggregated values of REM proxies (RowProd+Disc, RowCFO+Disc) are significantly positive, which suggests that managers engage in different types of REM at the same time, and that these manipulations do not cancel each other out.

Detecting the mean reversals of REM might reveal systematic manipulation of REM for years. For instance, managers might engage in negative REM for at least one year as a preparation for positive REM in the imminent year so that to cancel the overall effects of REM and to reduce the possibility of being detected. In year T-2 preceding IBOs, the direction and the statistical significance of abnormal REM proxies are the same as in year T-1, suggesting that managers persistently engage in positive REM from year T-2 onwards. Furthermore, the results for the aggregate measures of REM (year T-1 + year T-2) are the same as those for year T-1 preceding IBOs. This suggests that there is no mean reversal of REM in the two years preceding IBOs, and that managers do engage in positive REM preceding IBOs. This may be explained by the fact that IBOs are difficult to predict, and thus managers do not tend to plan strategically for the manipulation of REM years in advance.

Moreover, abnormal R&D expenditures (GuyRes&Dev) are significantly negative only in year T-2, whereas abnormal SG&A expenses (GuySGA) are significantly negative only in year T-1. This might suggest that managers cut SG&A and R&D expenditures alternatively in order to achieve discretionary expenses manipulation preceding IBOs. Engaging only one of these methods at a time may reduce the risk of being detected while minimising interference in normal operations.

In summary, managers engage in positive REM in year T-1 by sales manipulation through excessive price discounts or credit sales, overproduction to decrease COGS and cutting abnormal discretionary expenses. Moreover, managers engage in positive REM in year T-2 by the same three methods. The results indicate that, prior to IBOs, managers use most of the available methods of REM to increase their reported earnings, thus increasing their firm's value. Furthermore, managers might cut either SG&A or R&D expenditures in order to reduce the risk of being detected and minimising interference in normal operations.

To conclude, the results suggest that managers persistently engage in positive REM through sales manipulation, overproduction, and discretionary expense cuts in order to increase reported earnings in years T-1 and T-2 preceding IBOs. However, there is no evidence of a mean reversion, which suggests that managers do not systematically plan REM manipulation for years in advance. As IBOs are difficult to predict, once managers realise that their firms are undervalued, they will engage in nearly every REM method available to increase their firm's value. The findings are consistent with predictions of the hypotheses: managers engage in positive REM to reduce firm undervaluation and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding.[14]

Table 3.2.3 reports of the all details of the univariate test results for IBOs.

[14] I have also investigated the difference in REM behaviours between MBOs and IBOs, but the t-test results show that there is no difference between them.

Table 3.2.3 Summary statistics of REM proxies preceding IBOs

Panel A. IBO Year T-1									
Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho: mean=0	t-Stat	p-Value	REM
RowCFO	87	-0.043	0.106	-0.616	0.226	Ha: < 0	-3.762***	0.0002	+
RowProdCos	83	0.073	0.232	-0.462	1.275	Ha: > 0	2.885***	0.003	+
RowDiscExp	67	-0.050	0.204	-0.609	0.524	Ha: < 0	-2.020**	0.024	+
RowProd+Disc	64	0.101	0.367	-0.931	1.137	Ha: > 0	2.205**	0.016	+
RowCFO+Disc	67	0.093	0.208	-0.442	0.622	Ha: > 0	3.655***	0.0003	+
GuyRes&Dev	85	0.000	0.007	-0.028	0.029	Ha: > 0	0.617	0.269	-
GuySGA	67	-0.022	0.118	-0.269	0.326	Ha: < 0	-1.529*	0.066	+
GuyProdCos	82	0.041	0.194	-0.735	0.752	Ha: > 0	1.935**	0.028	+
LaraProdCos	83	0.037	0.177	-0.555	0.561	Ha: > 0	1.879**	0.032	+
LaraDiscExp	67	-0.030	0.167	-0.546	0.425	Ha: < 0	-1.462*	0.074	+
LaraProd+Disc	64	0.049	0.318	-0.980	0.767	Ha: > 0	1.228	0.112	+

Panel B. IBO Year T-2									
Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho: mean=0	t-Stat	p-Value	REM
RowCFO	82	-0.030	0.088	-0.489	0.136	Ha: < 0	-3.135***	0.001	+
RowProdCos	79	0.046	0.209	-0.564	0.676	Ha: > 0	1.948**	0.028	+
RowDiscExp	65	-0.054	0.212	-0.696	0.493	Ha: < 0	-2.054**	0.022	+
RowProd+Disc	63	0.096	0.398	-1.037	1.227	Ha: > 0	1.913**	0.030	+
RowCFO+Disc	65	0.076	0.240	-0.621	0.666	Ha: > 0	2.564***	0.006	+
GuyRes&Dev	80	-0.002	0.007	-0.032	0.016	Ha: < 0	-2.273**	0.013	+
GuySGA	63	-0.021	0.146	-0.419	0.518	Ha: < 0	-1.115	0.135	+
GuyProdCos	77	0.039	0.179	-0.449	0.666	Ha: > 0	1.938**	0.028	+
LaraProdCos	79	0.025	0.178	-0.563	0.512	Ha: > 0	1.254	0.107	+
LaraDiscExp	65	-0.050	0.180	-0.623	0.367	Ha: < 0	-2.248**	0.014	+
LaraProd+Disc	63	0.057	0.336	-0.930	0.922	Ha: > 0	1.353*	0.091	+

Panel C. IBO 2 years cumulative									
Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho: mean=0	t-Stat	p-Value	REM
RowCFO	82	-0.077	0.178	-1.105	0.280	Ha: < 0	-3.926***	0.000	+
RowProdCos	78	0.119	0.404	-0.971	1.583	Ha: > 0	2.609***	0.006	+
RowDiscExp	64	-0.110	0.393	-1.264	0.916	Ha: < 0	-2.241**	0.014	+
RowProd+Disc	62	0.192	0.738	-1.888	2.364	Ha: > 0	2.046**	0.023	+
RowCFO+Disc	64	0.176	0.420	-0.864	1.288	Ha: > 0	3.353**	0.001	+
GuyRes&Dev	79	-0.001	0.012	-0.059	0.038	Ha: < 0	-0.809	0.211	+
GuySGA	62	-0.034	0.246	-0.667	0.844	Ha: < 0	-1.088	0.140	+
GuyProdCos	76	0.076	0.355	-1.146	1.140	Ha: > 0	1.856**	0.034	+
LaraProdCos	78	0.057	0.324	-1.117	0.698	Ha: > 0	1.549*	0.063	+
LaraDiscExp	64	-0.080	0.331	-1.169	0.792	Ha: < 0	-1.938**	0.029	+
LaraProd+Disc	62	0.100	0.622	-1.909	1.689	Ha: > 0	1.261	0.106	+

Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1

The proxies from the models of Gunny (2010) and Lara et al. (2012) are used as alternative measures of REM. As can be seen from Tables 3.2.1A and 3.2.1B, the results of alternative measures are largely consistent with the proxies in the main tests. Hence the findings are robust.

3.6.2 Multivariate tests

This section reports the results of the multiple OLS regression tests on the relationship between REM and corporate governance mechanisms. The main dependent variables are the signed value of REM proxies from Roychowdhury's (2006) models, which are abnormal CFO, abnormal production costs and abnormal discretionary expenses. The robustness tests use the signed values of REM proxies, generated using the models of Gunny (2010) and Lara et al. (2010) as dependent variables. The independent variables are the proxies for corporate governance mechanisms as well as other control variables, such as financial leverage.

In this section, the interpretation of regression results will be different from that in prior literature, as this study includes dependent variables the value of which has been indicated as significantly negative in univariate tests. Hence, if a REM proxy in univariate tests is significantly negative, a positive correlation between this REM proxy and corporate governance mechanisms indicates that the governance mechanisms mitigate REM, and a negative correlation between them indicates that the governance mechanisms facilitate REM.

3.6.2.1 Results for management buyouts

Table 3.3.1A summarises the relationships rather than correlations from multiple OLS regression test results for the MBO samples in year T-1. Further details of the regression tests and correlations are listed in Panel A of Tables

3.3.2 to 3.3.9 at the end of this section.

In Section 3.6.1.1, the results show that managers engage in positive REM to increase reported earnings in year T-1 preceding MBOs, and thus to secure their external funds. They typically engage in sales manipulation by offering excessive price discounts or credit sales, overproduction and cutting discretionary SG&A expenses.

Table 3.3.1A Summary of the relationships (not Correlations) of regressions results for MBOs Year T-1

	Year T-1							
REM proxy	RowCFO	RowProdCos	RowDiscExp	GuyRes&Dev	GuySGA	GuyProdCos	LaraProdCos	LaraDiscExp
Sign[1]	-**	+**	-***	+	-**	+*	+*	-**
InsShare	-	-	+	-	+	+	-	+
Concentr3%	-	+	+	-	+	+	-	+
Concentr5%	-	-	+	+	+	-	-	+
Block10%	+	-	-	+ *	+	-	-	-
Block20%	+	+	+	+	-	+	+	-
CeoHd	-	+	- **	+	- *	+	+	- *
CeoHdSq	+	-	+ **	+	+ *	-	-	+ **
NonExecHd	+	-	+	-	-	-	-	-
Ned%	+	-	-	-	-	-	-	+
Duality	+	+	-	- *	- *	+	+	-
BoardSz	+	+	-	+	- *	+	+	-
LnAssets	-	+	+	+	-	+	-	+
SalesGrow	-**	+	+	+ ***	-	-	- **	+
Mark2Book	+	-	-	-	-	-	+	-
ROA	+ *	-	- *	-	- *	-	-	-
Leverage	-	-	+ *	- **	+	-	-	+
AssTurn	+	-	-	+	-	-	-	-
DealVal	+	- **	+ *	-	+	- ***	- ***	+ ***

1. The sign direction and significant level of REM proxies from univariate tests section
2. Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1
3. Table 3.3.1A summarises the relationships rather than correlations from multiple OLS regression test results for MBO samples for year T-1.

This study uses two variables to measure the effects of significant shareholders on REM: the aggregate outside ownership concentration and the presence of non-managerial large blockholders. The UK Corporate Governance Code suggests that shareholders who hold 3% or more shares in a firm are substantial shareholders (FRC, 2010). Similar to prior studies (e.g. Singh and Davidson, 2003), the aggregate outside ownership concentration is measured by the aggregate shares of a firm's outside shareholders with at least 3% equity (Concentr3%). Although 3% is the majority declaration point, it is still unclear whether outside shareholders with this level of ownership have the genuine ability and incentives to monitor and influence managers' behaviours. Hence I also consider higher thresholds at 5% (Concentr5%). Moreover, as large blockholders have the capacity to determine the outcome of particular corporate policy decisions, this study measures non-managerial large blockholders by a dummy variable, coded 1 if a firm has a non-managerial large shareholder who owns at least 10% (or 20%) of the equity (Block10% or Block20%). Including the proxies of aggregate outside ownership concentration and non-managerial large blockholders in the model might double count the effects of significant shareholders; however, these two proxies are designed to measures different aspects of the shareholders' monitoring functions. Hence these two kinds of variables are separated into different regression models to capture their effects on corporate governance.

Non-managerial large blockholders

The presence of non-managerial large blockholders (Block10%) has a significant positive relationship with abnormal R&D expenses only (GuyRes&Dev). The direction of R&D expenses is insignificant in univariate tests, suggesting that the presence of large blockholders is associated with more REM, which is inconsistent with hypothesis $H_{2\text{-}3c}$.

Gibbs (1993) suggests that, as the role of blockholders is ambiguous and varies across firms, they are generally passive and are likely to support managers rather than monitoring them, such as their quest for growth rather than residual value maximisation. Moreover, as blockholders might invest to fund MBOs, they are likely to side with management for strategic alignment preceding buyouts. Positive REM might facilitate the overall execution of MBOs, which eventually maximises the interests of these blockholders in the long term. Furthermore, as blockholders may perceive R&D expense cuts as too damaging to a firm's long-term growth potential, the findings might indicate that they have greater focus on R&D expenses.

CEO ownership

CEO ownership (CeoHd) has a significant negative relationship with abnormal discretionary expenses (RowDiscExp and LaraDiscExp) and abnormal SGA expenses (GuySGA). Its squared transformation (CeoHdSq) also has a significant positive relationship with these REM proxies. The directions of discretionary expenses (RowDiscExp and LaraDiscExp) and SGA expenses (GuySGA) are significantly negative in univariate tests. The result reveals that CEO ownership has a hump-shaped relationship with REM, which is inconsistent with hypothesis $H_{2\text{-}3d}$.

Given that managers engage in positive REM preceding MBOs, the results suggest that, at low levels, managerial shareholding on increase is associated with more positive REM, but high levels of managerial shareholding on increase is associated with less positive REM. The following paragraphs will explain the mechanism of managerial interests at low levels first, followed by the mechanism of managerial interests at high levels.

In the context of MBOs, low levels of managerial ownership are insufficient to act as an incentive mechanism. As managers will remain in a firm after a buyout, engaging in REM to facilitate an MBO is in their best interests. Holding more shares gives managers more control and power, hence managers find that they can follow their own objectives with less fear of discipline (Morck et al., 1988). Thus, at low levels, managerial shareholding on increase is associated with more REM, as it is intended to facilitate the execution of MBOs.

Moreover, engaging in REM by cutting discretionary expenses affects the long-term operations of a firm. As managers will remain in after a buyout, high levels of ownership force them to consider the long-term success of the business, lead to lower levels of REM. REM by cutting discretionary expenses is also easier to spot than other forms of REM are. If selling shareholders perceive that managers with high ownership have cheated by engaging in REM preceding MBOs, they will demand a higher transaction price or even make a legal challenge against management. Thus, at high levels, managerial shareholding on increase is associated with less REM.

CEO duality

CEO duality (Duality) has a significant negative relationship with abnormal SGA expenses (GuySGA). The direction of SGA expenses (GuySGA) is significantly negative in univariate tests. It suggests that CEO duality is associated with more REM, which is consistent with hypothesis $H_{2\text{-}3g}$.

CEO duality enables the CEO to effectively control the information that is available to other board members, and thus it may impair effective monitoring (Jensen, 1993). Moreover, CEO duality concentrates power in the CEO’s position without effective controls and balances on their activities (Cornett et al., 2008). Hence the practice of CEO duality is associated with more REM.

Moreover, CEO duality (Duality) has a significant negative relationship with abnormal R&D expenses (GuyRes&Dev). The direction of R&D expenses (GuyRes&Dev) is insignificant in univariate tests. It suggests that CEO duality is associated with less REM, which is inconsistent with hypothesis $H_{2\text{-}3g}$.

CEO duality increases the responsibility of CEO, which implies they have a high level of trust from shareholders. R&D expense cuts cause long-term damage to a firm. As managers will be remain in the firm after MBOs, engaging in less REM by cutting discretionary R&D expenses are likely to increase the long-term success of a firm. Thus, CEO duality mitigates REM in the form of R&D expense cuts, preceding MBOs.

Board size

Board size (BoardSz) has a significant negative relationship with abnormal SGA expenses (GuySGA). The direction of SGA expenses (GuySGA) is significantly negative in univariate tests. This means that larger boards are associated with more REM, which is inconsistent with hypothesis $H_{2\text{-}3h}$.

An effective and cohesive board might have a greater ability to monitor managers. However, preceding MBOs, problems associated with coordination and communication might arise in larger boards as it becomes more difficult to arrange board meetings and reach a consensus. This may in turn lead to slower and less-efficient decision-making and to directors becoming less likely to criticise the behaviour of top managers (Jensen, 1993; Yermack, 1996). Moreover, the director free-riding problem also be increased on larger boards as the monitoring cost to any individual director falls in proportion to board size (Lipton and Lorsch, 1992). Hence large board sizes may result in more REM preceding MBOs.

Institutional shareholding

Institutional shareholding (InsShare) has no significant relationship with REM in year T-1 prior to MBOs, which is inconsistent with hypothesis $H_{2\text{-}3b}$. This finding suggests that higher institutional ownership does not mitigate REM behaviours in the years immediately prior to MBOs.

Research by Bushee (2001) indicates that high levels of ownership by institutions with short-term investment horizons may lead corporate managers to make operational and accounting decisions that boost short-term earnings rather than long-term earnings. Hence the short-term investment horizons dominate the focus of transient institutions and lead to weak monitoring of REM. The results from univariate tests suggest that managers engage in positive REM preceding MBOs, which supports the notion that transient institutions quest for short-term growth. Moreover, as a buyout approaches, managers may have stronger motivations to engage in REM, which might make them more determined to resist pressure from institutional investors. Thus institutional ownership has no effect on REM in year T-1, but it mitigates REM in year T-2 preceding MBOs.

Table 3.3.1B summarises the relationships rather than the correlations from the multiple OLS regression test results for MBO samples in year T-2. Further details of regression tests and correlations are listed in Panel B of Table 3.3.2 to Table 3.3.9 at end of this section. It seems that corporate governance mechanisms have different effects on REM in year T-1 compared to year T-2 preceding MBOs. This may be due to different REM strategies being used between year T-1 and year T-2.

In Section 3.6.1.1, the results show that managers engage in positive REM by sales manipulation, overproduction and decreasing discretionary R&D expenses in year T-2 preceding MBOs.

Table 3.3.1B Summary of the relationships (not Correlations) of regressions results for MBOs Year T-2

	Year T-2							
REM proxy	RowCFO	RowProdCos	RowDiscExp	GuyRes&Dev	GuySGA	GuyProdCos	LaraProdCos	LaraDiscExp
Sign[1]	-*	+*	-	-**	-	+*	+	-*
InsShare	-	-	+	-	+	-	+	+ **
Concentr3%	+	- **	-	-	+	- **	-	+
Concentr5%	-	- **	+	+	+	- **	-	+
Block10%	+	-	+	-	-	-	-	+
Block20%	+	+ *	-	+	-	+	+	-
CeoHd	-	- **	+ **	+	-	-	- ***	+
CeoHdSq	+	-	+	-	+	-	-	+
NonExecHd	+	-	-	- *	-	-	-	+
Ned%	-	-	+	+	-	+	-	-
Duality	-	+ **	- *	+	-	+ **	+ **	- *
BoardSz	-	+ *	-	+	- *	+ *	+ *	-
LnAssets	+	-	+	+ *	+	- *	-	+
SalesGrow	-	+	+	- **	+	+	-	-
Mark2Book	- ***	+ ***	- ***	+ ***	- ***	+ ***	+ ***	- ***
ROA	-	+	+	- **	+	+ *	-	-
Leverage	+	+	-	- *	-	+ *	+	-
AssTurn	+	-	-	+	+	- *	-	+
DealVal	+	- ***	+	- **	+ ***	- ***	- ***	+ ***

1. The sign direction and significant level of REM proxies from univariate tests section
2. Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1
3. Table 3.3.1B summarises the relationships rather than correlations from multiple OLS regression test results for MBO samples for year T-2.

Institutional shareholders

Institutional shareholding (InsShare) has a positive relationship with abnormal discretionary expenses (LaraDiscExp). The direction of discretionary expenses (LaraDiscExp) is significantly negative in univariate tests. This suggests that high levels of institutional shareholding are associated with less REM of discretionary expenses cut, which is consistent with hypothesis $H_{2\text{-}3b}$.

Institutional investors provide a high degree of monitoring, removing the incentives for managers to engage in REM to meet short-term earnings goals. Moreover, institutional investors can monitor managerial behaviour by gathering information concerning the quality of operating decisions, thereby reducing the opportunities for REM manipulation (Bushee, 1998). Furthermore, as REM has real economic consequences for a firms' long-term value, institutional investors, who are likely to have a better understanding of the long-term impact of a firms' operating decisions, are likely to make more effort to monitor and control REM activities.

Outside ownership concentrations

Outside ownership concentration, both at the 3% and the 5% shareholding thresholds (Concentr3% and Concentr5%), have significant negative relationships with abnormal production costs (RowProdCos and GuyProdCos). The direction of production costs (RowProdCos and GuyProdCos) is significantly positive in univariate tests. This suggests that high concentrations of outside ownership are associated with less REM, which is consistent with hypothesis $H_{2\text{-}3a}$.

As prior literature has shown, substantial equity ownership by outsiders generates greater incentive and ability to monitor, and leads to better monitoring of management (Cornett et al., 2008). In addition, high equity ownership makes outsiders an effective agency of external shareholders, also resulting in strong incentives to monitor managers (Bhagat et al., 1999). Hence outside ownership concentration mitigates REM. Furthermore, overproduction is difficult to spot and this may explain why outside ownership concentration do not persistently mitigate overproduction in years T-1 and T-2 preceding MBOs.

Non-managerial large blockholders

The presence of non-managerial large blockholders (Block20%), has a significant positive relationship with abnormal production costs (RowProdCos). The direction of production costs (RowProdCos) is significantly positive in univariate tests. This suggests that the presence of large blockholders is associated with more REM, which is inconsistent with hypothesis $H_{2\text{-}3c}$.

Gibbs (1993) suggests that, as the role of blockholders is ambiguous and varies across firms, they are generally passive and are likely to support managers rather than monitoring them. As suggested by the results from the univariate tests, managers engage in positive REM by overproduction to increase earnings preceding MBOs, which might be consistent with the quest for growth of blockholders. Moreover, as blockholders may perceive overproduction as too damaging for a firm's growth potential in the near future, this finding might indicate that they have a greater focus on abnormal changes of production costs.

The presence of non-managerial large blockholders is associated with more REM in both year T-1 and year T-2. This suggests that blockholders may not be a useful corporate governance mechanism prior to MBOs. As blockholders might invest to fund MBOs, they are likely to side with management for strategic alignment preceding buyouts. Moreover, managers' higher levels of self-interest preceding buyouts might curtail the influence of large blockholders, resulting in more REM.

CEO ownership

CEO ownership (CeoHd) has a significant positive relationship with abnormal discretionary expenses (RowDiscExp). Its squared transformation (CeoHdSq) has no significant relationship with the REM proxies. The direction of discretionary expenses (RowDiscExp) is insignificant in univariate tests. This reveals that higher levels of managerial shareholding are associated with more REM of discretionary expense cuts, which is consistent with hypothesis $H_{2\text{-}3d}$.

This is evidence that high levels of managerial ownership could lead to entrenchment effects. High levels of shareholding give managers more control and power, enabling them to follow their own objectives with less fear of discipline (Morck et al., 1988). Hence, prior to MBOs, high levels of managerial ownership entrench managers and lead to high levels of discretionary expense cuts.

Moreover, CEO ownership (CeoHd) has a significant negative relationship with abnormal production costs (RowProdCos and LaraProdCos). The direction of production costs (RowProdCos) is significantly positive in univariate tests, and the direction of alternative production costs (LaraProdCos) is insignificant. These findings suggest that high levels of ownership by management lead to less REM by overproduction, which is inconsistent with hypothesis $H_{2\text{-}3d}$.

As managers might plan MBOs several years ahead, they can systematically plan their REM methods, schedule their manipulation, and gauge the appropriate extent to engage. Cutting discretionary expenses has negative economic consequence for a firm in the long term, but overproduction has immediate short-term negative economic consequences. Interference in short-term operations might lead to abnormal firm performance, which is likely to attract the attention of shareholders and thus affect the overall plan to execute an MBO. Hence in year T-2 preceding MBOs, the optimal plan of management should minimise short-term rather than long-term interference in normal operations in order to ensure the overall success of an MBO execution. Therefore, high managerial ownership leads to low overproduction but high discretionary expense cuts.

CEO duality

CEO duality (Duality) has a significant positive relationship with abnormal production costs (RowProdCos, GuyProdCos, and LaraProdCos). The direction of production costs (RowProdCos and GuyProdCos) is significantly positive in univariate tests, and the direction of alternative production costs (LaraProdCos) is insignificant. This reveals that CEO duality is associated with more REM of overproduction, which is consistent with hypothesis $H_{2\text{-}3g}$.

By effectively controlling the information that is available to other board members (Jensen, 1993) and concentrating power without effective controls and balances (Cornett et al., 2008), CEO duality does impede effective monitoring and facilitate REM. As it is more difficult to spot than the manipulation of discretionary expenses, overproduction is a safer choice for powerful managers. Moreover, as managers will remain in a firm after an MBO, they prefer to increase the success of a firm in the long term and thus choose to engage in REM that only causes short-term interference in normal operations. Thus CEO duality facilitates REM behaviours of overproduction preceding MBOs.

Board size

Board size (BoardSz) has a significant positive relationship with abnormal production costs (RowProdCos, GuyProdCos, and LaraProdCos). The direction of production costs (RowProdCos and GuyProdCos) is significantly positive in univariate tests, and the direction of alternative production costs (LaraProdCos) is insignificant. This suggests that larger boards are associated with higher REM by overproduction, which is inconsistent with hypothesis $H_{2\text{-}3h}$. Larger size might be detrimental to a board's effectiveness and cohesiveness (Jensen, 1993; Yermack, 1996), leading to weak monitoring of REM.

Summary of findings for management buyouts

In summary, high levels of institutional shareholding are associated with less REM in year T-2, but have no significant relationship with REM in year T-1. Institutional investors provide a high degree of monitoring, removing incentives for managers to engage in REM to meet short-term earnings goals (Bushee, 1998). However, as a buyout approaches, managers may have stronger motivations to carry out REM, which might make them more determined to resist pressure from institutional investors. Thus institutional ownership has no effect on REM in T-1, but it mitigates REM in T-2 preceding MBOs.

Moreover, high outside ownership concentration is associated with less REM in year T-2, but have no significant relationship with REM in year T-1. Substantial equity ownership by outsiders generates greater incentive and ability to monitor managers (Cornett et al., 2008), and results in better monitoring of REM behaviours. Overproduction is difficult to spot; this may be the reason that outside ownership concentration do not persistently mitigate overproduction in years T-1 and T-2 preceding MBOs.

Furthermore, the presence of non-managerial large blockholders is associated with more REM in both year T-1 and year T-2. As blockholders might invest to fund MBOs, they are likely to side with management for strategic alignment preceding buyouts. Positive REM might facilitate the overall execution of MBOs, which maximises eventually the interests of non-managerial large blockholders in the long term.

CEO ownership has a hump-shaped relationship with REM in year T-1. In the context of MBOs, low levels of managerial ownership are insufficient to act as an incentive mechanism, but high levels of managerial ownership act as incentive mechanism, aligning the interests of shareholders with those of managers. In contrast, high CEO ownership is associated with more abnormal discretionary expenses, but less abnormal production costs, in year T-2. As managers might plan MBOs several years ahead, by minimising short-term interference in normal operations by overproduction, managers ensure the overall success of MBOs. Therefore, high managerial ownership leads to low overproduction but high discretionary expense cuts.

CEO duality is associated with more SGA expenses cut, but less R&D

expenses cut in year T-1. R&D expense cutting causes more damage to the long-term success of firms than SGA expense cutting does, and if REM by cutting R&D expenses is detected, this will affect a CEO’s reputation. However, CEO duality is associated with more REM of overproduction in year T-2. As managers will remain in a firm after an MBO, they prefer to increase the long-term success of a firm and thus choose to engage in overproduction that only cause short-term interference in normal operations. As managers might systematically plan REM strategies several years ahead of an MBO, the inconsistency of results between years T-1 and T-2 might be because of the systematic arrangement.

Larger boards are associated with more REM both in year T-1 and year T-2. Preceding MBOs, having a larger board might be detrimental to its effectiveness and cohesiveness, hence leading to weaker monitoring of REM.

Table 3.3.2 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: RowCFO)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.020			-0.035		0.011			-0.010	
	(-0.387)			(-0.582)		(0.170)			(-0.171)	
Concentr3%		-0.019			-0.042		0.004			-0.014
		(-0.271)			(-0.605)		(0.055)			(-0.213)
Concentr5%			-0.036					-0.016		
			(-0.552)					(-0.264)		
Block10%	0.003	0.003		0.010		0.015	0.016		0.019	
	(0.096)	(0.083)		(0.272)		(0.653)	(0.646)		(0.800)	
Block20%			0.021		0.019			0.030		0.026
			(0.633)		(0.564)			(1.178)		(1.110)
CeoHd	-0.118	-0.119	-0.113	-0.390	-0.367	-0.036	-0.039	-0.048	-0.366	-0.356
	(-0.862)	(-0.919)	(-0.931)	(-0.918)	(-0.898)	(-0.485)	(-0.513)	(-0.568)	(-1.484)	(-1.376)
CeoHdSq				0.564	0.512				0.663	0.624
				(0.812)	(0.765)				(1.633)	(1.549)
NonExecHd	0.049	0.050	0.023	0.045	0.022	0.167	0.165	0.130	0.165	0.140
	(0.755)	(0.746)	(0.297)	(0.673)	(0.262)	(1.337)	(1.339)	(1.116)	(1.319)	(1.115)
Ned%	0.116	0.112	0.110	0.118	0.111	-0.174	-0.172	-0.166	-0.160	-0.158
	(0.946)	(0.961)	(0.938)	(0.962)	(0.956)	(-1.451)	(-1.494)	(-1.540)	(-1.392)	(-1.457)
Duality	0.043	0.043	0.039	0.046	0.041	-0.036	-0.036	-0.038	-0.030	-0.031
	(1.126)	(1.098)	(0.992)	(1.141)	(1.008)	(-1.281)	(-1.314)	(-1.304)	(-1.122)	(-1.142)
BoardSz	0.006	0.006	0.006	0.007	0.006	-0.013	-0.013	-0.013	-0.013	-0.013
	(0.792)	(0.766)	(0.743)	(0.832)	(0.770)	(-1.130)	(-1.161)	(-1.178)	(-1.152)	(-1.211)
LnAssets	-0.012	-0.012	-0.011	-0.013	-0.012	0.007	0.008	0.007	0.006	0.006
	(-1.096)	(-1.151)	(-1.060)	(-1.161)	(-1.123)	(0.860)	(0.864)	(0.876)	(0.744)	(0.684)
SalesGrow	-0.006**	-0.006**	-0.006***	-0.006**	-0.005**	-0.030	-0.030	-0.032	-0.031	-0.033
	(-2.444)	(-2.453)	(-2.701)	(-2.154)	(-2.237)	(-1.436)	(-1.408)	(-1.495)	(-1.501)	(-1.509)
Mark2Book	0.009	0.008	0.008	0.007	0.008	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(1.004)	(0.999)	(1.014)	(0.827)	(0.847)	(-5.032)	(-5.007)	(-4.930)	(-4.956)	(-4.761)
ROA	0.135*	0.137*	0.131	0.130*	0.128	-0.030	-0.030	-0.031	-0.030	-0.031
	(1.694)	(1.679)	(1.571)	(1.668)	(1.591)	(-1.392)	(-1.376)	(-1.429)	(-1.447)	(-1.439)
Leverage	-0.038	-0.038	-0.038	-0.037	-0.040	0.018	0.018	0.021	0.013	0.016
	(-0.471)	(-0.477)	(-0.455)	(-0.454)	(-0.468)	(0.250)	(0.249)	(0.278)	(0.188)	(0.225)
AssTurn	0.003	0.003	0.005	0.004	0.005	0.024	0.024	0.027	0.025	0.028
	(0.250)	(0.253)	(0.375)	(0.294)	(0.393)	(1.321)	(1.322)	(1.416)	(1.410)	(1.489)
DealVal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(1.098)	(1.224)	(1.252)	(1.076)	(1.161)	(1.350)	(1.361)	(1.299)	(1.321)	(1.248)
Constant	0.005	0.012	0.005	0.022	0.031	0.022	0.020	0.029	0.040	0.051
	(0.041)	(0.097)	(0.038)	(0.182)	(0.251)	(0.275)	(0.255)	(0.368)	(0.487)	(0.640)
Observations	115	115	115	115	115	114	114	114	114	114
R-squared	0.113	0.113	0.115	0.124	0.125	0.223	0.223	0.227	0.243	0.245

F-test	4.800	4.681	5.693	4.485	5.342	4.925	4.859	4.455	4.110	3.745
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.3 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: RowProdCos)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.008			0.021		-0.157			-0.133	
	(-0.050)			(0.122)		(-1.288)			(-1.071)	
Concentr3%		0.032			-0.068		-0.161			-0.244**
		(0.170)			(-0.344)		(-1.338)			(-2.155)
Concentr5%			-0.125					-0.268**		
			(-0.694)					(-2.160)		
Block10%	-0.072	-0.079		-0.083		-0.047	-0.046		-0.051	
	(-0.895)	(-0.911)		(-0.994)		(-0.908)	(-0.898)		(-0.997)	
Block20%			0.047		0.038			0.087*		0.076
			(0.678)		(0.551)			(1.695)		(1.610)
CeoHd	0.054	0.068	0.102	0.620	0.616	-0.303**	-0.302**	-0.237*	0.076	0.136
	(0.303)	(0.365)	(0.612)	(1.189)	(1.181)	(-2.185)	(-2.152)	(-1.865)	(0.182)	(0.336)
CeoHdSq				-1.174	-1.048				-0.761	-0.772
				(-1.174)	(-1.122)				(-1.009)	(-1.045)
NonExecHd	-0.121	-0.097	-0.252	-0.117	-0.250	-0.195	-0.196	-0.366	-0.192	-0.376
	(-0.359)	(-0.275)	(-0.774)	(-0.336)	(-0.687)	(-0.738)	(-0.741)	(-1.534)	(-0.714)	(-1.559)
Ned%	-0.027	-0.039	-0.020	-0.030	-0.020	0.007	-0.002	-0.011	-0.010	-0.020
	(-0.163)	(-0.255)	(-0.139)	(-0.187)	(-0.138)	(0.040)	(-0.010)	(-0.075)	(-0.060)	(-0.128)
Duality	0.043	0.045	0.032	0.037	0.029	0.123**	0.118**	0.104**	0.116**	0.091*
	(0.752)	(0.798)	(0.584)	(0.676)	(0.536)	(2.389)	(2.271)	(2.174)	(2.316)	(1.892)
BoardSz	0.007	0.007	0.006	0.005	0.005	0.026*	0.024*	0.021	0.026*	0.021
	(0.316)	(0.349)	(0.292)	(0.242)	(0.253)	(1.920)	(1.837)	(1.579)	(1.889)	(1.550)
LnAssets	-0.001	-0.002	0.002	0.002	0.005	-0.027	-0.028	-0.024	-0.026	-0.021
	(-0.043)	(-0.065)	(0.100)	(0.075)	(0.228)	(-1.431)	(-1.476)	(-1.248)	(-1.353)	(-1.094)
SalesGrow	0.007	0.007	0.006	0.005	0.004	0.012	0.013	0.011	0.013	0.016
	(1.011)	(1.014)	(0.885)	(0.823)	(0.605)	(0.564)	(0.598)	(0.489)	(0.610)	(0.775)
Mark2Book	-0.003	-0.003	-0.001	-0.000	0.003	0.012***	0.012***	0.012***	0.012***	0.011***
	(-0.128)	(-0.136)	(-0.047)	(-0.014)	(0.134)	(5.202)	(5.262)	(5.393)	(5.248)	(5.119)
ROA	-0.108	-0.104	-0.115	-0.094	-0.094	0.018	0.019	0.017	0.018	0.022
	(-0.952)	(-0.886)	(-0.998)	(-0.859)	(-0.821)	(0.789)	(0.842)	(0.772)	(0.798)	(1.046)
Leverage	-0.039	-0.042	-0.016	-0.044	-0.022	0.186	0.179	0.165	0.192	0.168
	(-0.236)	(-0.255)	(-0.099)	(-0.271)	(-0.137)	(1.360)	(1.317)	(1.209)	(1.420)	(1.254)
AssTurn	-0.021	-0.021	-0.020	-0.023	-0.025	-0.041	-0.041	-0.032	-0.043	-0.036
	(-0.649)	(-0.662)	(-0.630)	(-0.685)	(-0.772)	(-1.472)	(-1.460)	(-1.213)	(-1.575)	(-1.428)
DealVal	-0.000**	-0.000**	-0.000***	-0.000**	-0.000**	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-2.398)	(-2.566)	(-2.690)	(-2.369)	(-2.364)	(-4.600)	(-4.701)	(-4.640)	(-4.487)	(-4.668)
Constant	0.139	0.137	0.064	0.103	0.013	0.190	0.225	0.177	0.169	0.161
	(0.660)	(0.636)	(0.340)	(0.484)	(0.060)	(1.177)	(1.411)	(1.091)	(1.029)	(0.978)
Observations	114	114	114	114	114	113	113	113	113	113
R-squared	0.070	0.070	0.063	0.083	0.069	0.229	0.229	0.237	0.236	0.243

F-test	2.989	2.848	3.073	2.768	2.747	17.29	18.26	19.25	15.94	19.25
Prob > F	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.4 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: RowDiscExp)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.339			0.249		0.033			0.038	
	(1.546)			(1.165)		(0.158)			(0.190)	
Concentr3%		0.244			0.138		-0.016			0.070
		(1.296)			(0.855)		(-0.074)			(0.327)
Concentr5%			0.172					0.174		
			(1.049)					(0.919)		
Block10%	-0.090	-0.076		-0.046		0.010	0.017		0.009	
	(-1.006)	(-0.835)		(-0.549)		(0.171)	(0.308)		(0.149)	
Block20%			0.017		0.002			-0.118		-0.097
			(0.229)		(0.032)			(-1.457)		(-1.211)
CeoHd	0.114	0.110	0.143	-1.605*	-1.700**	0.454**	0.438**	0.427**	0.528	0.368
	(0.361)	(0.353)	(0.471)	(-1.904)	(-2.006)	(2.582)	(2.529)	(2.360)	(0.824)	(0.588)
CeoHdSq				3.427**	3.642**				-0.143	0.041
				(2.357)	(2.467)				(-0.137)	(0.041)
NonExecHd	0.437	0.378	0.257	0.407	0.330	-0.078	-0.097	0.121	-0.079	0.089
	(1.032)	(0.906)	(0.664)	(0.957)	(0.796)	(-0.202)	(-0.242)	(0.336)	(-0.203)	(0.214)
Ned%	-0.472	-0.407	-0.406	-0.442	-0.394	0.255	0.264	0.271	0.251	0.282
	(-0.888)	(-0.796)	(-0.794)	(-0.881)	(-0.817)	(0.823)	(0.879)	(0.985)	(0.844)	(1.012)
Duality	-0.028	-0.020	-0.023	-0.002	0.006	-0.122*	-0.124*	-0.104	-0.123*	-0.106*
	(-0.329)	(-0.230)	(-0.268)	(-0.023)	(0.071)	(-1.799)	(-1.892)	(-1.648)	(-1.981)	(-1.849)
BoardSz	-0.010	-0.008	-0.007	-0.007	-0.005	-0.003	-0.003	0.001	-0.003	-0.001
	(-0.594)	(-0.442)	(-0.419)	(-0.392)	(-0.275)	(-0.098)	(-0.128)	(0.034)	(-0.099)	(-0.022)
LnAssets	0.051	0.058	0.064	0.041	0.047	0.025	0.026	0.019	0.025	0.020
	(1.135)	(1.169)	(1.229)	(0.941)	(0.981)	(1.098)	(1.136)	(0.833)	(1.072)	(0.815)
SalesGrow	0.006	0.004	0.002	0.010	0.008	0.130	0.136	0.123	0.130	0.129
	(1.022)	(0.729)	(0.449)	(1.231)	(1.081)	(0.869)	(0.899)	(0.846)	(0.867)	(0.844)
Mark2Book	-0.004	-0.002	0.003	-0.009	-0.007	-0.014***	-0.014***	-0.014***	-0.014***	-0.014***
	(-0.117)	(-0.065)	(0.102)	(-0.271)	(-0.202)	(-3.558)	(-3.556)	(-3.563)	(-3.506)	(-3.424)
ROA	-0.411	-0.451	-0.473	-0.432*	-0.473*	0.111	0.114	0.105	0.110	0.107
	(-1.572)	(-1.605)	(-1.600)	(-1.670)	(-1.690)	(0.783)	(0.799)	(0.761)	(0.784)	(0.756)
Leverage	0.350*	0.369*	0.403*	0.365*	0.395*	-0.237	-0.232	-0.235	-0.236	-0.224
	(1.734)	(1.832)	(1.817)	(1.853)	(1.904)	(-1.422)	(-1.377)	(-1.348)	(-1.424)	(-1.315)
AssTurn	-0.016	-0.010	-0.004	-0.020	-0.014	-0.009	-0.007	-0.022	-0.009	-0.017
	(-0.301)	(-0.175)	(-0.075)	(-0.394)	(-0.250)	(-0.163)	(-0.121)	(-0.416)	(-0.161)	(-0.339)
DealVal	0.000*	0.000	0.000	0.000**	0.000*	0.000	0.000	0.000	0.000	0.000
	(1.835)	(1.461)	(1.638)	(2.045)	(1.841)	(0.903)	(0.843)	(1.273)	(0.933)	(0.961)
Constant	-0.601	-0.723	-0.836	-0.474	-0.596	-0.287	-0.299	-0.257	-0.294	-0.250
	(-1.489)	(-1.581)	(-1.662)	(-1.211)	(-1.328)	(-1.284)	(-1.431)	(-1.200)	(-1.149)	(-0.974)
Observations	95	95	95	95	95	94	94	94	94	94
R-squared	0.203	0.187	0.182	0.275	0.264	0.262	0.261	0.281	0.262	0.274

F-test	6.732	5.776	5.911	6.526	6.130	10.37	10.59	9.938	9.787	9.752
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.5 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: GuyRes&Dev)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.001			-0.002		-0.000			0.000	
	(-0.364)			(-0.453)		(-0.038)			(0.061)	
Concentr3%		-0.001			-0.001		0.001			-0.000
		(-0.347)			(-0.470)		(0.388)			(-0.186)
Concentr5%			0.001					0.000		
			(0.444)					(0.071)		
Block10%	0.002	0.002		0.003*		-0.000	-0.001		-0.000	
	(1.622)	(1.595)		(1.693)		(-0.553)	(-0.706)		(-0.593)	
Block20%			0.002		0.002			0.001		0.001
			(0.753)		(1.165)			(0.898)		(1.105)
CeoHd	0.007	0.007	0.007	0.002	0.005	0.001	0.002	0.002	0.004	0.005
	(0.936)	(0.925)	(1.029)	(0.094)	(0.241)	(0.613)	(0.713)	(1.055)	(0.668)	(0.792)
CeoHdSq				0.010	0.003				-0.005	-0.005
				(0.326)	(0.092)				(-0.546)	(-0.547)
NonExecHd	-0.002	-0.002	-0.002	-0.002	-0.004	-0.003	-0.002	-0.004	-0.003	-0.005*
	(-0.515)	(-0.496)	(-0.355)	(-0.522)	(-0.684)	(-1.045)	(-0.885)	(-1.596)	(-1.013)	(-1.708)
Ned%	-0.004	-0.004	-0.005	-0.004	-0.004	0.001	0.001	0.001	0.001	0.001
	(-0.826)	(-0.918)	(-1.031)	(-0.796)	(-0.888)	(0.356)	(0.268)	(0.211)	(0.304)	(0.242)
Duality	-0.003	-0.003	-0.003	-0.003	-0.003*	0.000	0.000	0.000	0.000	0.000
	(-1.484)	(-1.516)	(-1.589)	(-1.412)	(-1.685)	(0.410)	(0.445)	(0.247)	(0.352)	(0.154)
BoardSz	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(1.034)	(1.013)	(1.021)	(1.072)	(0.967)	(0.247)	(0.276)	(0.157)	(0.241)	(0.129)
LnAssets	0.001	0.001	0.001	0.001	0.001	0.001*	0.001	0.001*	0.001*	0.001*
	(0.882)	(0.841)	(0.885)	(0.866)	(0.959)	(1.680)	(1.646)	(1.734)	(1.703)	(1.783)
SalesGrow	0.002***	0.002***	0.002***	0.002***	0.002***	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(5.321)	(5.429)	(5.179)	(4.981)	(4.856)	(-2.299)	(-2.311)	(-2.453)	(-2.271)	(-2.340)
Mark2Book	-0.000	-0.000	-0.000	-0.000	-0.000	0.000***	0.000***	0.000***	0.000***	0.000***
	(-0.178)	(-0.184)	(-0.180)	(-0.198)	(-0.186)	(3.193)	(3.207)	(3.103)	(3.170)	(3.078)
ROA	-0.006	-0.006	-0.006	-0.006	-0.007	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(-1.104)	(-1.087)	(-1.136)	(-1.128)	(-1.195)	(-2.408)	(-2.410)	(-2.447)	(-2.398)	(-2.413)
Leverage	-0.008**	-0.008**	-0.009**	-0.008**	-0.009**	-0.004	-0.004	-0.005*	-0.004	-0.005*
	(-2.276)	(-2.279)	(-2.385)	(-2.244)	(-2.320)	(-1.633)	(-1.639)	(-1.689)	(-1.616)	(-1.674)
AssTurn	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000
	(0.851)	(0.853)	(0.970)	(0.855)	(1.028)	(0.202)	(0.188)	(0.311)	(0.181)	(0.325)
DealVal	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000**	-0.000*	-0.000*	-0.000**	-0.000*
	(-0.073)	(-0.020)	(-0.421)	(-0.082)	(-0.698)	(-2.126)	(-1.966)	(-1.853)	(-2.034)	(-1.927)
Constant	-0.005	-0.005	-0.004	-0.005	-0.004	-0.007**	-0.007**	-0.007**	-0.007**	-0.007**
	(-0.889)	(-0.808)	(-0.681)	(-0.878)	(-0.666)	(-2.346)	(-2.326)	(-2.307)	(-2.368)	(-2.309)
Observations	114	114	114	114	114	113	113	113	113	113
R-squared	0.298	0.298	0.294	0.299	0.294	0.533	0.533	0.536	0.533	0.536

F-test	7.272	7.215	5.326	6.750	5.199	2.518	2.484	2.563	2.323	2.400
Prob > F	0.000	0.000	0.000	0.000	0.000	0.004	0.005	0.004	0.007	0.005

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.6 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: GuySGA)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.117			0.084		0.184			0.174	
	(1.308)			(0.910)		(1.577)			(1.476)	
Concentr3%		0.083			0.101		0.155			0.179
		(0.869)			(1.101)		(1.253)			(1.448)
Concentr5%			0.121					0.193		
			(1.301)					(1.500)		
Block10%	0.025	0.030		0.041		-0.003	-0.001		-0.002	
	(0.483)	(0.563)		(0.740)		(-0.081)	(-0.031)		(-0.041)	
Block20%			-0.001		-0.004			-0.051		-0.049
			(-0.042)		(-0.108)			(-1.028)		(-1.013)
CeoHd	0.082	0.080	0.057	-0.546	-0.546*	0.024	0.018	-0.001	-0.147	-0.250
	(0.609)	(0.582)	(0.446)	(-1.579)	(-1.675)	(0.187)	(0.136)	(-0.010)	(-0.493)	(-0.837)
CeoHdSq				1.251*	1.197*				0.329	0.481
				(1.823)	(1.960)				(0.695)	(1.027)
NonExecHd	-0.158	-0.179	-0.172	-0.169	-0.143	-0.070	-0.085	-0.024	-0.068	0.002
	(-1.054)	(-1.121)	(-1.095)	(-1.062)	(-0.810)	(-0.313)	(-0.355)	(-0.097)	(-0.300)	(0.009)
Ned%	-0.115	-0.092	-0.087	-0.104	-0.085	-0.123	-0.105	-0.093	-0.113	-0.086
	(-0.932)	(-0.766)	(-0.757)	(-0.849)	(-0.730)	(-0.956)	(-0.839)	(-0.777)	(-0.880)	(-0.708)
Duality	-0.081*	-0.078*	-0.080*	-0.071	-0.071	-0.073	-0.070	-0.068	-0.069	-0.057
	(-1.776)	(-1.697)	(-1.690)	(-1.645)	(-1.498)	(-1.598)	(-1.502)	(-1.510)	(-1.565)	(-1.292)
BoardSz	-0.019*	-0.019*	-0.019	-0.018	-0.018	-0.020*	-0.019*	-0.018*	-0.020*	-0.018*
	(-1.783)	(-1.689)	(-1.656)	(-1.651)	(-1.570)	(-1.943)	(-1.819)	(-1.683)	(-1.909)	(-1.675)
LnAssets	-0.004	-0.002	-0.003	-0.008	-0.009	0.003	0.006	0.006	0.002	0.002
	(-0.273)	(-0.117)	(-0.165)	(-0.495)	(-0.500)	(0.189)	(0.377)	(0.332)	(0.112)	(0.092)
SalesGrow	-0.001	-0.001	-0.001	0.001	0.001	0.007	0.006	0.010	0.007	0.005
	(-0.131)	(-0.292)	(-0.208)	(0.158)	(0.192)	(0.138)	(0.131)	(0.214)	(0.139)	(0.099)
Mark2Book	-0.003	-0.003	-0.002	-0.005	-0.006	-0.008***	-0.008***	-0.008***	-0.008***	-0.008***
	(-0.163)	(-0.134)	(-0.105)	(-0.249)	(-0.300)	(-3.397)	(-3.386)	(-3.678)	(-3.428)	(-3.495)
ROA	-0.207	-0.221*	-0.210	-0.214	-0.212	0.003	0.000	0.004	0.003	-0.000
	(-1.598)	(-1.726)	(-1.584)	(-1.493)	(-1.475)	(0.063)	(0.010)	(0.096)	(0.083)	(-0.010)
Leverage	0.023	0.030	0.017	0.028	0.014	-0.087	-0.077	-0.076	-0.089	-0.078
	(0.224)	(0.291)	(0.163)	(0.282)	(0.140)	(-0.949)	(-0.835)	(-0.837)	(-0.946)	(-0.825)
AssTurn	-0.018	-0.016	-0.018	-0.020	-0.021	0.003	0.004	-0.000	0.003	-0.000
	(-0.565)	(-0.495)	(-0.549)	(-0.604)	(-0.612)	(0.090)	(0.122)	(-0.006)	(0.076)	(-0.013)
DealVal	0.000	0.000	0.000	0.000	0.000	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.387)	(0.214)	(0.097)	(0.460)	(0.173)	(2.959)	(2.846)	(2.875)	(2.942)	(2.919)
Constant	0.172	0.130	0.164	0.218	0.245	0.135	0.085	0.096	0.151	0.129
	(1.075)	(0.833)	(1.001)	(1.317)	(1.332)	(0.679)	(0.450)	(0.507)	(0.718)	(0.627)
Observations	95	95	95	95	95	94	94	94	94	94
R-squared	0.233	0.225	0.225	0.269	0.255	0.303	0.291	0.299	0.305	0.305

F-test	2.605	2.417	2.520	2.515	2.395	6.535	6.244	6.517	6.010	5.628
Prob > F	0.004	0.007	0.005	0.004	0.007	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.7 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: GuyProdCos)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.019			0.048		-0.187			-0.160	
	(0.132)			(0.321)		(-1.658)			(-1.374)	
Concentr3%		0.059			-0.056		-0.164			-0.227**
		(0.375)			(-0.328)		(-1.454)			(-2.154)
Concentr5%			-0.121					-0.254**		
			(-0.795)					(-2.218)		
Block10%	-0.054	-0.061		-0.065		-0.036	-0.039		-0.041	
	(-0.759)	(-0.821)		(-0.889)		(-0.751)	(-0.818)		(-0.858)	
Block20%			0.076		0.065			0.070		0.060
			(1.376)		(1.199)			(1.650)		(1.533)
CeoHd	0.036	0.052	0.080	0.588	0.604	-0.176	-0.167	-0.112	0.249	0.330
	(0.232)	(0.320)	(0.577)	(1.404)	(1.450)	(-1.628)	(-1.517)	(-1.170)	(0.822)	(1.128)
CeoHdSq				-1.144	-1.061				-0.855	-0.908
				(-1.359)	(-1.338)				(-1.416)	(-1.562)
NonExecHd	-0.091	-0.068	-0.263	-0.087	-0.255	-0.250	-0.242	-0.378	-0.247	-0.387
	(-0.342)	(-0.243)	(-1.071)	(-0.317)	(-0.907)	(-0.939)	(-0.866)	(-1.438)	(-0.903)	(-1.455)
Ned%	-0.082	-0.090	-0.071	-0.086	-0.073	0.102	0.085	0.076	0.083	0.064
	(-0.559)	(-0.667)	(-0.545)	(-0.593)	(-0.546)	(0.739)	(0.631)	(0.602)	(0.590)	(0.502)
Duality	0.054	0.056	0.036	0.048	0.034	0.095**	0.091**	0.080*	0.088**	0.067*
	(1.011)	(1.071)	(0.727)	(0.965)	(0.709)	(2.188)	(2.071)	(1.970)	(2.191)	(1.707)
BoardSz	0.007	0.008	0.006	0.006	0.005	0.021*	0.019*	0.017	0.021*	0.017
	(0.379)	(0.429)	(0.344)	(0.299)	(0.307)	(1.803)	(1.677)	(1.430)	(1.753)	(1.403)
LnAssets	-0.002	-0.002	0.003	0.001	0.006	-0.026*	-0.028*	-0.025	-0.025	-0.022
	(-0.079)	(-0.080)	(0.169)	(0.049)	(0.308)	(-1.714)	(-1.781)	(-1.577)	(-1.613)	(-1.378)
SalesGrow	-0.004	-0.004	-0.005	-0.005	-0.006	0.022	0.022	0.020	0.023	0.025
	(-0.791)	(-0.808)	(-0.961)	(-1.047)	(-1.274)	(1.144)	(1.148)	(1.041)	(1.204)	(1.367)
Mark2Book	-0.004	-0.004	-0.002	-0.001	0.002	0.010***	0.010***	0.010***	0.011***	0.010***
	(-0.202)	(-0.208)	(-0.095)	(-0.068)	(0.119)	(6.012)	(6.088)	(6.863)	(6.048)	(6.480)
ROA	-0.002	-0.001	-0.021	0.012	0.001	0.026	0.028	0.025	0.026	0.030*
	(-0.024)	(-0.006)	(-0.250)	(0.147)	(0.017)	(1.373)	(1.452)	(1.372)	(1.379)	(1.683)
Leverage	-0.023	-0.025	-0.004	-0.028	-0.010	0.169*	0.161*	0.150*	0.176**	0.154*
	(-0.181)	(-0.203)	(-0.030)	(-0.226)	(-0.080)	(1.935)	(1.842)	(1.739)	(2.051)	(1.825)
AssTurn	-0.023	-0.023	-0.019	-0.025	-0.024	-0.037	-0.037	-0.030	-0.039*	-0.034*
	(-0.736)	(-0.751)	(-0.634)	(-0.770)	(-0.792)	(-1.656)	(-1.650)	(-1.414)	(-1.788)	(-1.688)
DealVal	-0.000*	-0.000**	-0.000**	-0.000*	-0.000**	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(-1.966)	(-2.095)	(-2.478)	(-1.958)	(-2.118)	(-4.939)	(-4.816)	(-4.835)	(-4.817)	(-4.905)
Constant	0.119	0.108	0.040	0.084	-0.014	0.164	0.205	0.163	0.141	0.142
	(0.643)	(0.565)	(0.239)	(0.445)	(-0.074)	(1.310)	(1.642)	(1.287)	(1.113)	(1.091)
Observations	114	114	114	114	114	113	113	113	113	113
R-squared	0.059	0.060	0.066	0.076	0.074	0.280	0.272	0.279	0.292	0.291

F-test	2.291	2.217	2.809	2.089	2.417	19.88	21.15	21.86	17.92	20.44
Prob > F	0.009	0.012	0.002	0.016	0.005	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.8 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: LaraProdCos)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.022			-0.016		0.005			0.017	
	(-0.145)			(-0.104)		(0.055)			(0.205)	
Concentr3%		-0.048			-0.100		0.013			-0.052
		(-0.306)			(-0.560)		(0.158)			(-0.662)
Concentr5%			-0.110					-0.080		
			(-0.692)					(-0.980)		
Block10%	-0.010	-0.006		-0.013		-0.049	-0.050		-0.052	
	(-0.170)	(-0.096)		(-0.198)		(-1.082)	(-1.124)		(-1.131)	
Block20%			0.048		0.045			0.042		0.036
			(0.876)		(0.833)			(1.069)		(0.969)
CeoHd	-0.106	-0.117	-0.099	0.010	0.013	-0.308***	-0.305***	-0.262***	-0.104	-0.085
	(-0.647)	(-0.685)	(-0.658)	(0.027)	(0.038)	(-2.826)	(-2.805)	(-2.655)	(-0.357)	(-0.302)
CeoHdSq				-0.241	-0.248				-0.411	-0.346
				(-0.343)	(-0.383)				(-0.845)	(-0.735)
NonExecHd	-0.107	-0.121	-0.197	-0.106	-0.211	-0.016	-0.013	-0.134	-0.015	-0.128
	(-0.347)	(-0.400)	(-0.650)	(-0.341)	(-0.643)	(-0.135)	(-0.111)	(-1.439)	(-0.122)	(-1.327)
Ned%	-0.105	-0.101	-0.102	-0.105	-0.098	-0.168	-0.170	-0.171	-0.177	-0.181
	(-0.644)	(-0.678)	(-0.687)	(-0.649)	(-0.629)	(-1.411)	(-1.458)	(-1.505)	(-1.498)	(-1.583)
Duality	0.024	0.022	0.012	0.022	0.011	0.095**	0.095**	0.082**	0.091**	0.078**
	(0.487)	(0.458)	(0.249)	(0.477)	(0.222)	(2.298)	(2.292)	(2.071)	(2.305)	(2.006)
BoardSz	0.015	0.015	0.014	0.015	0.014	0.020*	0.020*	0.017	0.020*	0.017
	(0.873)	(0.888)	(0.865)	(0.849)	(0.852)	(1.768)	(1.802)	(1.478)	(1.736)	(1.468)
LnAssets	-0.004	-0.004	-0.002	-0.003	-0.001	-0.017	-0.017	-0.013	-0.017	-0.012
	(-0.184)	(-0.181)	(-0.086)	(-0.154)	(-0.031)	(-1.167)	(-1.173)	(-0.859)	(-1.116)	(-0.800)
SalesGrow	-0.009**	-0.009**	-0.009**	-0.009**	-0.009**	-0.012	-0.012	-0.010	-0.011	-0.009
	(-2.073)	(-2.054)	(-2.049)	(-2.052)	(-2.039)	(-0.604)	(-0.611)	(-0.518)	(-0.578)	(-0.437)
Mark2Book	0.008	0.008	0.008	0.009	0.010	0.010***	0.010***	0.009***	0.010***	0.009***
	(0.418)	(0.416)	(0.414)	(0.427)	(0.501)	(5.985)	(5.987)	(6.072)	(5.934)	(5.890)
ROA	-0.037	-0.037	-0.053	-0.034	-0.045	-0.004	-0.004	-0.003	-0.004	-0.002
	(-0.360)	(-0.355)	(-0.494)	(-0.333)	(-0.420)	(-0.225)	(-0.228)	(-0.183)	(-0.222)	(-0.086)
Leverage	-0.181	-0.179	-0.174	-0.182	-0.177	0.038	0.038	0.024	0.041	0.025
	(-1.288)	(-1.284)	(-1.214)	(-1.292)	(-1.248)	(0.490)	(0.494)	(0.301)	(0.533)	(0.318)
AssTurn	-0.014	-0.014	-0.009	-0.014	-0.012	-0.011	-0.011	-0.007	-0.012	-0.009
	(-0.503)	(-0.493)	(-0.350)	(-0.509)	(-0.427)	(-0.496)	(-0.502)	(-0.333)	(-0.547)	(-0.427)
DealVal	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000**	-0.000**	-0.000**	-0.000**	-0.000**
	(-3.695)	(-4.100)	(-4.780)	(-3.670)	(-4.493)	(-2.448)	(-2.475)	(-2.444)	(-2.358)	(-2.276)
Constant	0.154	0.165	0.140	0.147	0.132	0.170	0.169	0.132	0.159	0.121
	(0.910)	(0.893)	(0.819)	(0.833)	(0.703)	(1.111)	(1.133)	(0.852)	(1.019)	(0.758)
Observations	114	114	114	114	114	113	113	113	113	113
R-squared	0.071	0.072	0.079	0.072	0.078	0.216	0.216	0.211	0.219	0.211

F-test	13.77	14.69	17.49	12.63	15.10	13.43	13.60	10.58	11.92	9.294
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3.9 Regressions results for MBOs Year T-1 and T-2 (Dependent Variable: LaraDiscExp)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.136			0.085		0.228**			0.204*	
	(0.996)			(0.588)		(2.028)			(1.802)	
Concentr3%		0.143			0.113		0.167			0.165
		(0.975)			(0.818)		(1.329)			(1.265)
Concentr5%			0.104					0.209		
			(0.756)					(1.496)		
Block10%	-0.065	-0.067		-0.040		-0.003	0.004		0.001	
	(-0.994)	(-0.977)		(-0.623)		(-0.059)	(0.091)		(0.028)	
Block20%			-0.044		-0.057			-0.023		-0.020
			(-0.879)		(-1.141)			(-0.367)		(-0.331)
CeoHd	0.172	0.185	0.193	-0.789*	-0.854*	0.198	0.182	0.180	-0.195	-0.298
	(0.912)	(0.978)	(1.008)	(-1.759)	(-1.940)	(1.543)	(1.388)	(1.404)	(-0.535)	(-0.811)
CeoHdSq				1.917**	2.090**				0.757	0.898
				(2.356)	(2.596)				(1.282)	(1.545)
NonExecHd	-0.010	-0.011	-0.018	-0.026	0.044	0.099	0.071	0.093	0.103	0.121
	(-0.033)	(-0.036)	(-0.059)	(-0.084)	(0.136)	(0.426)	(0.273)	(0.356)	(0.435)	(0.437)
Ned%	0.027	0.044	0.051	0.044	0.051	-0.069	-0.044	-0.038	-0.048	-0.017
	(0.183)	(0.315)	(0.374)	(0.297)	(0.367)	(-0.443)	(-0.283)	(-0.261)	(-0.301)	(-0.114)
Duality	-0.064	-0.059	-0.049	-0.049	-0.031	-0.092*	-0.090*	-0.091*	-0.084*	-0.076
	(-1.280)	(-1.189)	(-0.975)	(-1.054)	(-0.634)	(-1.800)	(-1.734)	(-1.792)	(-1.781)	(-1.613)
BoardSz	-0.022	-0.021	-0.021	-0.020	-0.019	-0.020	-0.020	-0.019	-0.020	-0.019
	(-1.520)	(-1.434)	(-1.498)	(-1.389)	(-1.398)	(-1.626)	(-1.552)	(-1.422)	(-1.572)	(-1.408)
LnAssets	0.015	0.017	0.019	0.009	0.009	0.005	0.010	0.010	0.003	0.005
	(0.713)	(0.796)	(0.920)	(0.426)	(0.422)	(0.297)	(0.522)	(0.515)	(0.142)	(0.219)
SalesGrow	0.003	0.002	0.001	0.005	0.004	-0.016	-0.013	-0.012	-0.016	-0.015
	(0.638)	(0.470)	(0.235)	(0.916)	(0.795)	(-0.250)	(-0.201)	(-0.183)	(-0.238)	(-0.225)
Mark2Book	-0.014	-0.014	-0.011	-0.017	-0.017	-0.013***	-0.013***	-0.013***	-0.013***	-0.013***
	(-0.558)	(-0.549)	(-0.441)	(-0.654)	(-0.665)	(-3.059)	(-3.046)	(-3.199)	(-3.124)	(-3.112)
ROA	-0.201	-0.209	-0.222	-0.213	-0.217	-0.016	-0.016	-0.013	-0.014	-0.016
	(-1.094)	(-1.151)	(-1.134)	(-1.147)	(-1.156)	(-0.256)	(-0.263)	(-0.222)	(-0.218)	(-0.248)
Leverage	0.228	0.229	0.262	0.236	0.255	-0.080	-0.065	-0.066	-0.084	-0.068
	(1.252)	(1.289)	(1.319)	(1.310)	(1.364)	(-0.759)	(-0.609)	(-0.627)	(-0.808)	(-0.655)
AssTurn	-0.034	-0.032	-0.033	-0.036	-0.040	0.013	0.015	0.011	0.011	0.011
	(-0.809)	(-0.783)	(-0.754)	(-0.907)	(-0.996)	(0.353)	(0.417)	(0.300)	(0.321)	(0.287)
DealVal	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(2.711)	(2.718)	(3.080)	(2.923)	(3.174)	(3.865)	(3.511)	(3.583)	(3.857)	(3.528)
Constant	-0.123	-0.170	-0.232	-0.051	-0.097	0.040	-0.024	-0.019	0.077	0.042
	(-0.680)	(-0.940)	(-1.217)	(-0.280)	(-0.505)	(0.208)	(-0.126)	(-0.098)	(0.374)	(0.197)
Observations	95	95	95	95	95	94	94	94	94	94
R-squared	0.214	0.214	0.205	0.269	0.274	0.378	0.362	0.367	0.387	0.374

F-test	7.504	8.268	9.681	6.543	7.981	9.018	9.244	9.628	8.361	8.555
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

3.6.2.2 Results for institutional buyouts

Table 3.4.1A summarises the relationships rather than the correlations from the multiple OLS regression test results for IBO samples in year T-1. Further details of regression tests and correlations are listed in Panel A of Tables 3.4.2 to 3.4.9 at the end of this section.

In Section 3.6.1.2, the results show that managers engage in positive REM, including sales manipulation of excessive price discounts or credit sales, overproduction and cutting discretionary SG&A expenses, to increase reported earnings in year T-1 preceding IBOs.

Table 3.4.1A Summary of the relationships (not Correlations) of regressions results for IBOs Year T-1

	Year T-1							
REM proxy	RowCFO	RowProdCos	RowDiscExp	GuyRes&Dev	GuySGA	GuyProdCos	LaraProdCos	LaraDiscExp
Sign[1]	-***	+***	-**	+	-*	+**	+**	-*
InsShare	+	+	-	-	-	+	+	-
Concentr3%	+	+	-	-	-	+	+	-
Concentr5%	+	+	-	-	-	+	+	-
Block10%	-	+	-	+	-	+	-	-
Block20%	-	+ **	-	-	-	+	-	-
CeoHd	+	+	-	+ **	- **	+ *	+	- *
CeoHdSq	-	+	-	-	-	+	+	-
NonExecHd	+	+	- *	+	- *	+	+ **	- **
Ned%	-	+	+	-	-	+	-	+
Duality	- *	+	+	- *	+	-	-	+
BoardSz	- *	+	+	- **	-	+	+	+
LnAssets	+	-	-	+	-	-	+	-
SalesGrow	-	-	+ ***	-	-	-	-	+
Mark2Book	+ **	+	+ **	-	-	-	+ **	+
ROA	-	+	+	- ***	+	+	+	+
Leverage	- *	+	+	- *	-	+	+	+
AssTurn	+ **	-	-	- ***	-	-	-	-
DealVal	+	+	-	-	-	+ *	+	-

1. The sign direction and significant level of REM proxies from univariate tests section
2. Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1
3. Table 3.4.1A summarises the relationships rather than correlations from multiple OLS regression test results for IBO samples for year T-1.

Non-managerial large blockholders

The presence of non-managerial large blockholders (Block20%) has a significant positive relationship with abnormal production costs (RowProdCos). The direction of production costs (RowProdCos) is significantly positive in univariate tests. This suggests that the presence of large blockholders, with at least 20% shareholding, is associated with more REM of overproduction, which is inconsistent hypothesis $H_{2\text{-}3c}$.

As the role of blockholders is ambiguous and varies across firms, they are generally passive and are likely to support managers in their quest for growth rather than maximising the residual value of a firm (Gibbs, 1993). Furthermore, blockholders might be side with management for the purposes of strategic alignment or be influenced by existing business relationships with management, leading them to support management decisions rather than to question them (Pound, 1988). Hence the presence of non-managerial large blockholders leads to more REM. Moreover, IBO targets usually have undervalued shares in the market, and blockholders might therefore put pressure on managers to improve a firm's performance. As managers are unlikely to be able to improve firm performance in the short term, they promote it by engaging in positive REM. This might also help managers to signal their competence and their firms' growth prospects to the market. Furthermore, as blockholders may perceive overproduction as too damaging to a firm’s short-term growth potential, this finding might indicate greater focus on abnormal changes of production costs from the blockholders.

CEO ownership

CEO ownership (CeoHd) has a significant positive relationship with abnormal R&D expenses (GuyRes&Dev) and abnormal production costs (GuyProdCos). Its squared transformation (CeoHdSq) has no significant relationship with these REM proxies. The direction of production costs (GuyProdCos) is significantly positive in univariate tests, and the direction of R&D expenses (GuyRes&Dev) is insignificant. The results suggest that high CEO ownership is associated with more REM of R&D expenses cut and overproduction, which supports hypothesis $H_{2\text{-}3d}$.

Moreover, CEO ownership has significant negative relationships with abnormal SGA expenses (GuySGA) and abnormal discretionary expenses (LaraDiscExp). The directions of SGA expenses (GuySGA) and discretionary expenses (LaraDiscExp) are significantly negative in univariate tests, indicating that these behaviours are used to boost earnings. The results indicate that high CEO ownership is associated with more REM of SGA expense cuts and discretionary expense cuts, which supports hypothesis $H_{2\text{-}3d}$.

Therefore, high CEO ownership is associated with more REM in year T-1 preceding IBOs. This is evidence that high levels of managerial ownership could lead to entrenchment effects. High levels of shareholding give managers more control and power, hence managers find that they can follow their own objectives with less fear of discipline from other shareholders on a board (Morck et al., 1988). As the incidence of IBOs is difficult to predict, managers will engage in every available REM method to increase earnings once they perceive that their firm has been undervalued.

Equity ownership by non-executive directors

Equity ownership by non-executive directors (NonExecHd) has a significant negative relationship with abnormal discretionary expenses (RowDiscExp and LaraDiscExp) and abnormal SGA expenses (GuySGA). The directions of discretionary expenses (RowDiscExp and LaraDiscExp) and abnormal SGA expenses (GuySGA) are significantly negative in univariate tests. This finding suggests that high levels of equity ownership by non-executive directors are associated with more REM, which helps firms to appear more valuable.

Moreover, equity ownership by non-executive directors (NonExecHd) has a significant positive relationship with abnormal production costs (LaraProdCos), and the direction of production costs (LaraProdCos) is significantly positive in univariate tests. This suggests that high levels of equity ownership by non-executive directors are associated with more REM in order to portray firms as more valuable, which is inconsistent with hypothesis $H_{2\text{-}3e}$.

As equity ownership is expected to align the interests of directors with those of external shareholders, more equity ownership by directors might create a personal incentive to actively monitor managers (Bhagat et al., 1999). However, higher ownership might also make non-executive directors less independent, and thus impede effective monitoring. Moreover, non-executive directors may perform little or no real monitoring role as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). In addition, IBO targets usually have undervalued shares in the market, and non-executive directors might therefore put pressure on managers to increase a firm's performance. Managers might be less able to improve firm performance in the short term, thus they engage in positive REM to make the firm look more valuable.

CEO duality

CEO duality (Duality) has a significant negative relationship with abnormal CFO (RowCFO). The direction of CFO (RowCFO) is significantly negative in univariate tests. This means that CEO duality is associated with more REM of sales manipulation, which supports hypothesis $H_{2\text{-}3g}$.

CEO duality enables CEOs to effectively control the information that is available to other board members, and thus may impair effective monitoring (Jensen, 1993). Moreover, CEO duality concentrates power in the CEO’s position without effective controls and balances (Cornett et al., 2008). Preceding IBOs, the optimal REM method should be difficult to detect and affect only short-term operations. Hence, sales manipulation is subject to a powerful CEO’s choice.

However, CEO duality (Duality) has a significant negative relationship with abnormal R&D expenses (GuyRes&Dev). The direction of R&D expenses (GuyRes&Dev) is insignificant in univariate tests. This means that CEO duality is associated with less REM, which does not support hypothesis $H_{2\text{-}3g}$.

CEO duality increases the responsibility held by a CEO, which implies high levels of trust from shareholders. As R&D expense cuts is easy to spot and cause more damage to the long-term success of firms than other forms of REM do, any detection of REM in R&D expenses cut will affect a CEO’s reputation. Furthermore, as duality increases a CEO's power to control the results of corporate events, CEOs worry less about unexpected IBOs. CEO duality also leads CEOs to consider the long-term success of their firms, and to maintain their reputation, resulting in less REM by R&D expense cuts but more sales manipulation.

Board size

Board size (BoardSz) has a significant negative relationship with abnormal CFO (RowCFO). The direction of CFO (RowCFO) is significantly negative in univariate tests, which portrays a firm as more valuable. This means that large board size is associated with more REM of sales manipulation, which does not support hypothesis $H_{2\text{-}3h}$.

Preceding IBOs, larger boards may face more problems when it comes to coordinating activities and communicating, as it is more difficult for them to arrange board meetings and reach a consensus, leading to slower and less-efficient decision-making and directors becoming less likely to criticise the behaviour of top managers (Jensen, 1993; Yermack, 1996). Moreover, the director free-riding problem may also increase as the monitoring cost to any individual director falls in proportion to board size (Lipton and Lorsch, 1992). Hence, large board size lead to more REM of sales manipulation.

However, board size (BoardSz) has a significant negative relationship with abnormal R&D expenses (GuyRes&Dev), and the direction of R&D expenses (GuyRes&Dev) is insignificant in univariate tests. This means that board size is associated with less REM of R&D expense cuts, which supports hypothesis $H_{2\text{-}3h}$. As R&D expense cuts are more damaging to the long-term success of firms than sales manipulation is, having more board members might increase the possibility of mitigating R&D expense cuts.

Table 3.4.1B summarises the relationships rather than correlations from the multiple OLS regression test results for IBO samples in year T-2. Further details of the regression tests and correlations are listed in Panel B of Tables 3.4.2 to 3.4.9 at the end of this section. It seems that some corporate governance mechanisms have inconsistent effects on REM in T-1 and T-2, preceding IBOs.

In Section 3.6.1.2, the results show that managers engage in positive REM, including sales manipulation, overproduction and decreasing discretionary R&D expenses, to increase reported earnings, in year T-2 preceding IBOs.

Table 3.4.1B Summary of the relationships (not Correlations) of regressions results for IBOs Year T-2

	Year T-2							
REM proxy	RowCFO	RowProdCos	RowDiscExp	GuyRes&Dev	GuySGA	GuyProdCos	LaraProdCos	LaraDiscExp
Sign[1]	-***	+**	-**	-**	-	+**	+	-**
InsShare	-	-	+	-	+	+	-	+
Concentr3%	- *	+	+	-	+	+	-	+
Concentr5%	-	+	-	+	+	+	-	-
Block10%	+ **	-	-	+ **	+	-	-	+
Block20%	-	-	-	- *	+	-	-	+
CeoHd	-	+	-	+	-	+	+	-
CeoHdSq	- **	+	-	- *	- **	+	+	-
NonExecHd	+	+	-	+	-	+	+	-
Ned%	-	+	+	-	-	+ *	+	+
Duality	-	-	+	+	+	-	-	+
BoardSz	-	-	+	-	+	+	+	+
LnAssets	+	+	-	+	-	+	-	+
SalesGrow	+	-	+	+ **	-	-	-	+
Mark2Book	+	-	+	-	+	+	+	+
ROA	+	-	+	-	-	-	-	+
Leverage	- **	-	-	-	-	-	+	-
AssTurn	+ *	+	-	+	+	+	-	-
DealVal	+	-	-	-	+	+ **	+	-

1. The sign direction and significant level of REM proxies from univariate tests section
2. Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1
3. Table 3.4.1B summarises the relationships rather than correlations from multiple OLS

regression test results for IBO samples for year T-2.

Outside ownership concentration

Outside ownership concentration (Concentr3%) has a significant negative relationship with abnormal CFO (RowCFO). The direction of CFO (RowCFO) is significantly negative in univariate tests. This indicates that the presence of outside shareholders with substantial holdings is associated with more REM of sales manipulation, which is inconsistent with hypothesis $H_{2\text{-}3a}$.

IBO targets usually have undervalued shares in the market, and outside shareholders with substantial holdings might concern about the firm performance. They might put pressure on managers by asking them to improve firm performance. Managers might then engage in positive REM in order to make their firm look more valuable, as they are less likely to be able to improve firm performance in the short term. Hence, outside ownership concentration leads to more REM in year T-2 preceding IBOs.

Non-managerial large blockholders

The presence of non-managerial large blockholders (Block10%) has a significant positive relationship with abnormal CFO (RowCFO) and abnormal R&D expenses (GuyRes&Dev). The directions of CFO (RowCFO) and R&D expenses (GuyRes&Dev) are significantly negative in univariate tests. This means that large blockholders, with at least 10% shareholdings, are associated with less REM of sales manipulation and R&D expenses cut, which is consistent with hypothesis $H_{2\text{-}3c}$.

Large blockholders are shareholders who have the capacity to determine the outcome of particular corporate policy decisions. Among major shareholders, large blockholders have the strongest incentives to be active owners, and they may have a significant impact on the level of managerial discretions (Florackis and Ozkan, 2009). Thus the presence of large blockholders mitigates REM in year T-2 preceding IBOs. Moreover, as blockholders may perceive overproduction and R&D expense cuts as too damaging to the short and long-term growth potential of a firm, these findings might indicate greater focus on abnormal changes of production costs and R&D expenses by blockholders.

The presence of non-managerial large blockholders is associated with less REM in year T-2 but more REM in year T-1 preceding IBOs. In year T-2, as IBO firms may have insignificant share undervaluation in the market, blockholders effectively monitor managers and lead to less REM. However, IBO firms might have significant share undervaluation in the market in year T-1. Managers therefore may have stronger motivation to engage in REM, which might make them more determined to resist pressure by blockholders. Furthermore, preceding buyouts, blockholders might be side with management for strategic alignment or that they have been influenced by existing business relationships with management, and thus to support management decisions rather than to question them (Pound, 1988).

CEO ownership

CEO ownership (CeoHd) has no significant linear relationships with REM. However, the squared transformation of CEO ownership (CeoHdSq) has a significant negative relationship with abnormal CFO (RowCFO). The direction of CFO (RowCFO) is significantly negative in univariate tests. This reveals that managerial ownership has a non-linear relationship with REM, and high managerial ownership is associated with more REM of sales manipulation. The result is consistent with hypothesis $H_{2\text{-}3d}$.

High levels of shareholding give managers more control and power, enabling them to follow their own objectives with less fear of discipline (Morck et al., 1988). Hence, prior to IBOs, high levels of managerial ownership entrench managers and lead to high levels of sales manipulation.

Moreover, the squared transformation of CEO ownership (CeoHdSq) has a significant negative relationship with abnormal SGA expenses (GuySGA). The direction of SGA expenses (GuySGA) is insignificant in univariate tests. This reveals that managerial ownership has a non-linear relationship with REM, and high managerial ownership is associated with less REM of SGA expense cuts. This finding is inconsistent with hypothesis $H_{2\text{-}3d}$.

High shareholdings might force managers to consider the long-term success of their firms. While cuts to SGA expenses might affect the long-term operations of a firm, sales manipulation only interferes with short-term operations. Moreover, SGA expense cuts are easier to detect than sales manipulation. Choosing just one of these REM methods might reduce the chance of REM being detected. Furthermore, as high shareholdings by managers may increase their power to control the results of corporate events, managers with high ownership might be less concerned about unexpected IBOs. Thus managers with high shareholdings may focus on the long-term success of their firms, and may therefore choose to engage only in sales manipulation rather than SGA expense cuts in T-2, prior to IBOs.

Percentage of non-executive directors on board

The percentage of non-executive directors on boards (Ned%) has a positive relationship with abnormal production costs (GuyProdCos). The direction of production costs (GuyProdCos) is significantly positive in univariate tests. This suggests that high percentages of non-executive directors on boards are associated with more REM of overproduction, which is inconsistent with hypothesis $H_{2\text{-}3f}$.

Undervaluation of a firm is less likely to maximise the wealth of its shareholders, but overproduction could improve short-term earnings to reduce value undervaluation and to increase the market's confidence in the future performance of a firm. Overproduction interferes in the normal operations of a firm in the short term while minimising interference in its long-term operations. When non-executive directors put pressure on managers to improve firm performance, they may engage in REM of overproduction to increase their firm's value in the short term, thereby ensuring the long-term success of the business. Thus, having more non-executive directors on a board leads to more REM of overproduction.

In addition, as non-executive directors may perceive overproduction as too damaging to a firm’s short-term growth potential, this finding might indicate that non-executive directors have a greater focus on abnormal changes to production costs. On the other hand, firm undervaluation may result in an IBO, and buyout firms are not required to hire as many non-executive directors as listed firms are. Non-executive directors might therefore be afraid of losing their position on a board after a buyout, and thus support managers in facilitating REM preceding IBOs.

Summary of findings for institutional buyouts

In summary, outside ownership concentration is associated with more REM in T-2, but it has no significant relationship with REM in T-1. IBO targets usually have undervalued shares in the market, and significant shareholders might put pressure on managers to improve firm performance. Managers might therefore engage in positive REM to make the firm look more valuable. Hence outside ownership concentration leads to more REM in year T-2 preceding IBOs.

The presence of non-managerial large blockholders is associated with more REM in year T-1, but less REM in year T-2. As IBOs are difficult to predict, the optimal monitoring strategy for blockholders might to focus on the long-term success of a firm, and thus mitigate REM in year T-2 preceding IBOs. However, as firm undervaluation might increase in year T-1 preceding IBOs, managers might be more determined to signal the potential growth prospects of their firms to the market through engaging in positive REM. In addition, preceding buyouts, blockholders might be side with management for strategic alignment, which leads them to support management decisions rather than to question them (Pound, 1988).

CEO ownership is associated with more REM in year T-1. As the incidence of IBOs is difficult to predict, managers will engage in every available REM method to increase earnings once they perceive that their firm has been undervalued in year T-1 preceding IBOs. In year T-2, the squared transformation of CEO ownership is associated with more REM of sales manipulation, but less SGA expenses cut. Managers with high shareholding may focus on the long-term success of their firm, and in turn choose to engage only in sales manipulation rather than SGA expenses cut in year T-2 prior to IBOs.

Equity ownership by non-executive directors is associated with more REM of discretionary expense cuts in year T-1, but it has no significant relationship with REM in year T-2. Higher ownership might make non-executive directors less independent, and thus impede effective monitoring and lead to significant relationship in year T-2. In year T-1, when non-executive directors put pressure on managers to improve firm performance, managers may engage in REM to increase short-term firm value.

High percentage of non-executive directors on boards is associated with more REM in year T-2, but it has no significant relationship with REM in year T-1. The undervaluation of a firm might result in an IBO. Buyout firms are not required to hire as much non-executive directors as listed firms are. Hence non-executive directors might be afraid of losing their positions on the board after a buyout, and may therefore support managers preceding IBOs.

CEO duality is associated with more REM of sales manipulation but less REM of R&D expenses cut in year T-1. As duality leads CEOs to think about the long-term success of a firm and to maintain their reputation, CEOs choose to engage in sales manipulation rather than in R&D expense cuts. However, CEO duality has no relationship with REM in year T-2.

Large board sizes are associated with more REM of sales manipulation but less REM of R&D expenses cut in year T-1. As R&D expense cuts are more damaging to the long-term success of firms than sales manipulation, having more board members might increase the possibility of mitigating R&D expense cuts. However, board size has no relationship with REM in year T-2.

Table 3.4.2 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: RowCFO)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.012			0.013		-0.063			-0.037	
	(0.195)			(0.212)		(-1.140)			(-0.706)	
Concentr3%		0.016			0.054		-0.090*			-0.008
		(0.278)			(0.913)		(-1.778)			(-0.177)
Concentr5%			0.038					-0.021		
			(0.627)					(-0.433)		
Block10%	-0.017	-0.018		-0.018		0.049**	0.055**		0.042**	
	(-0.698)	(-0.743)		(-0.707)		(2.208)	(2.587)		(2.008)	
Block20%			-0.057		-0.060			-0.010		-0.007
			(-1.546)		(-1.632)			(-0.417)		(-0.276)
CeoHd	0.001	0.002	0.052	0.034	0.047	-0.064	-0.064	-0.094	0.346	0.372
	(0.003)	(0.013)	(0.316)	(0.089)	(0.141)	(-0.378)	(-0.382)	(-0.551)	(1.322)	(1.265)
CeoHdSq				-0.067	0.028				-0.901**	-1.025**
				(-0.119)	(0.053)				(-2.188)	(-2.192)
NonExecHd	0.160	0.165	0.189	0.156	0.216	0.028	0.018	0.084	-0.043	-0.013
	(0.682)	(0.709)	(1.035)	(0.639)	(1.031)	(0.271)	(0.183)	(0.726)	(-0.392)	(-0.103)
Ned%	-0.144	-0.144	-0.100	-0.141	-0.097	-0.071	-0.069	-0.074	-0.025	-0.019
	(-1.302)	(-1.328)	(-0.938)	(-1.199)	(-0.856)	(-0.869)	(-0.861)	(-0.884)	(-0.313)	(-0.232)
Duality	-0.075*	-0.075*	-0.084**	-0.076*	-0.084**	-0.019	-0.021	-0.020	-0.023	-0.024
	(-1.903)	(-1.925)	(-2.284)	(-1.894)	(-2.300)	(-0.487)	(-0.542)	(-0.447)	(-0.607)	(-0.584)
BoardSz	-0.015*	-0.015*	-0.013*	-0.015*	-0.013*	-0.010	-0.010	-0.009	-0.009	-0.009
	(-1.887)	(-1.888)	(-1.697)	(-1.886)	(-1.673)	(-1.318)	(-1.353)	(-1.210)	(-1.256)	(-1.166)
LnAssets	0.012	0.013	0.015	0.012	0.016	0.012	0.010	0.012	0.016	0.017
	(1.112)	(1.161)	(1.370)	(1.164)	(1.488)	(0.966)	(0.853)	(1.050)	(1.300)	(1.410)
SalesGrow	-0.004	-0.004	-0.008	-0.004	-0.008	0.023	0.023	0.025	0.022	0.024
	(-0.265)	(-0.264)	(-0.460)	(-0.266)	(-0.475)	(1.125)	(1.190)	(1.243)	(1.073)	(1.227)
Mark2Book	0.001**	0.001**	0.001**	0.001**	0.001*	0.002	0.002	0.003	0.003	0.004
	(2.315)	(2.278)	(2.147)	(2.309)	(1.964)	(0.309)	(0.347)	(0.427)	(0.429)	(0.527)
ROA	-0.037	-0.037	-0.038	-0.037	-0.040	0.016	0.009	0.017	0.015	0.016
	(-0.725)	(-0.735)	(-0.807)	(-0.731)	(-0.858)	(0.178)	(0.101)	(0.198)	(0.171)	(0.179)
Leverage	-0.140*	-0.141*	-0.147*	-0.142*	-0.154**	-0.213**	-0.203**	-0.200**	-0.245**	-0.238**
	(-1.806)	(-1.831)	(-1.962)	(-1.849)	(-2.099)	(-2.146)	(-2.113)	(-2.197)	(-2.299)	(-2.317)
AssTurn	0.046**	0.046**	0.043**	0.047**	0.044**	0.018	0.017	0.018	0.034	0.037*
	(2.060)	(2.087)	(2.172)	(2.060)	(2.094)	(0.915)	(0.889)	(0.987)	(1.583)	(1.746)
DealVal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	-0.000
	(0.940)	(0.944)	(0.748)	(0.935)	(0.738)	(0.557)	(0.582)	(-0.055)	(0.476)	(-0.087)
Constant	0.025	0.019	-0.048	0.020	-0.068	0.011	0.032	0.018	-0.079	-0.078
	(0.218)	(0.163)	(-0.371)	(0.166)	(-0.518)	(0.089)	(0.260)	(0.156)	(-0.608)	(-0.618)
Observations	85	85	85	85	85	78	78	78	78	78
R-squared	0.355	0.355	0.375	0.355	0.378	0.366	0.379	0.325	0.393	0.362

F-test	3.494	3.601	3.404	3.004	3.583	1.230	1.438	1.003	1.315	1.089
Prob > F	0.000	0.000	0.000	0.001	0.000	0.278	0.163	0.462	0.221	0.385

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.3 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: RowProdCos)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.182			0.152		0.008			-0.029	
	(1.102)			(0.911)		(0.035)			(-0.136)	
Concentr3%		0.165			0.035		0.050			0.003
		(1.012)			(0.236)		(0.233)			(0.018)
Concentr5%			0.126					0.078		
			(0.776)					(0.363)		
Block10%	0.017	0.022		0.026		-0.030	-0.038		-0.020	
	(0.263)	(0.337)		(0.393)		(-0.435)	(-0.536)		(-0.302)	
Block20%			0.132*		0.147**			-0.040		-0.036
			(1.898)		(2.070)			(-0.496)		(-0.446)
CeoHd	0.702	0.700	0.583	-0.143	-0.167	0.503	0.504	0.533	-0.080	-0.066
	(1.497)	(1.483)	(1.374)	(-0.125)	(-0.159)	(1.440)	(1.445)	(1.560)	(-0.111)	(-0.088)
CeoHdSq				1.701	1.460				1.275	1.294
				(0.994)	(0.892)				(0.990)	(0.973)
NonExecHd	0.387	0.369	0.237	0.521	0.310	0.442	0.452	0.492	0.544	0.598
	(0.709)	(0.674)	(0.497)	(0.956)	(0.601)	(0.884)	(0.903)	(1.020)	(1.051)	(1.134)
Ned%	0.250	0.253	0.159	0.188	0.110	0.265	0.260	0.263	0.204	0.205
	(0.918)	(0.928)	(0.632)	(0.686)	(0.435)	(1.226)	(1.187)	(1.154)	(0.914)	(0.904)
Duality	0.011	0.008	0.022	0.041	0.056	-0.086	-0.084	-0.086	-0.079	-0.082
	(0.106)	(0.075)	(0.224)	(0.344)	(0.500)	(-1.075)	(-1.030)	(-1.078)	(-0.928)	(-0.973)
BoardSz	0.014	0.014	0.009	0.014	0.009	-0.001	-0.000	-0.000	-0.001	-0.000
	(0.869)	(0.822)	(0.555)	(0.856)	(0.557)	(-0.031)	(-0.024)	(-0.023)	(-0.069)	(-0.025)
LnAssets	-0.017	-0.014	-0.020	-0.024	-0.029	0.020	0.022	0.025	0.014	0.016
	(-0.662)	(-0.566)	(-0.785)	(-0.924)	(-1.099)	(0.747)	(0.797)	(0.911)	(0.506)	(0.578)
SalesGrow	-0.027	-0.026	-0.007	-0.024	-0.002	-0.011	-0.013	-0.010	-0.010	-0.009
	(-0.793)	(-0.771)	(-0.183)	(-0.721)	(-0.056)	(-0.209)	(-0.260)	(-0.200)	(-0.181)	(-0.167)
Mark2Book	0.000	0.000	0.001	0.000	0.001	-0.002	-0.002	-0.003	-0.003	-0.004
	(0.348)	(0.327)	(0.603)	(0.158)	(0.439)	(-0.172)	(-0.178)	(-0.250)	(-0.291)	(-0.304)
ROA	0.008	0.011	0.012	0.020	0.019	-0.254	-0.246	-0.237	-0.255	-0.252
	(0.067)	(0.089)	(0.098)	(0.154)	(0.145)	(-1.215)	(-1.200)	(-1.157)	(-1.180)	(-1.181)
Leverage	0.219	0.218	0.241	0.260	0.277	-0.026	-0.035	-0.052	0.017	0.007
	(1.276)	(1.292)	(1.581)	(1.435)	(1.619)	(-0.179)	(-0.235)	(-0.340)	(0.117)	(0.047)
AssTurn	-0.072	-0.070	-0.060	-0.095	-0.083	0.004	0.006	0.008	-0.018	-0.017
	(-1.334)	(-1.320)	(-1.264)	(-1.603)	(-1.458)	(0.124)	(0.164)	(0.236)	(-0.383)	(-0.364)
DealVal	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.967)	(0.937)	(1.619)	(1.009)	(1.504)	(-0.501)	(-0.490)	(-0.377)	(-0.474)	(-0.439)
Constant	-0.122	-0.146	-0.002	0.017	0.167	-0.299	-0.320	-0.380	-0.176	-0.230
	(-0.488)	(-0.561)	(-0.008)	(0.058)	(0.558)	(-1.108)	(-1.171)	(-1.430)	(-0.587)	(-0.754)
Observations	82	82	82	82	82	75	75	75	75	75
R-squared	0.211	0.209	0.251	0.224	0.256	0.133	0.134	0.135	0.143	0.142

F-test	0.687	0.681	0.990	0.940	1.150	0.876	0.885	0.790	4.787	4.960
Prob > F	0.779	0.784	0.473	0.527	0.333	0.587	0.578	0.676	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.4 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: RowDiscExp)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.119			-0.063		0.131			0.189	
	(-0.521)			(-0.268)		(0.481)			(0.689)	
Concentr3%		-0.168			-0.120		0.018			0.052
		(-0.722)			(-0.531)		(0.062)			(0.202)
Concentr5%			-0.164					-0.000		
			(-0.775)					(-0.000)		
Block10%	-0.051	-0.046		-0.080		-0.017	0.000		-0.043	
	(-0.557)	(-0.505)		(-0.830)		(-0.226)	(0.003)		(-0.503)	
Block20%			-0.051		-0.049			-0.028		-0.032
			(-0.787)		(-0.718)			(-0.352)		(-0.426)
CeoHd	-0.612	-0.659	-0.622	0.475	0.092	-0.438	-0.441	-0.433	0.213	-0.081
	(-1.497)	(-1.577)	(-1.463)	(0.542)	(0.106)	(-0.923)	(-0.922)	(-0.922)	(0.209)	(-0.082)
CeoHdSq				-2.112	-1.391				-1.412	-0.721
				(-1.360)	(-0.977)				(-0.790)	(-0.442)
NonExecHd	-0.660*	-0.715*	-0.680	-0.818**	-0.811*	-0.704	-0.722	-0.677	-0.832	-0.733
	(-1.741)	(-1.877)	(-1.617)	(-2.073)	(-1.866)	(-1.162)	(-1.203)	(-1.124)	(-1.291)	(-1.136)
Ned%	0.005	0.011	0.078	0.071	0.118	0.271	0.291	0.307	0.341	0.335
	(0.021)	(0.050)	(0.347)	(0.336)	(0.509)	(1.161)	(1.219)	(1.289)	(1.314)	(1.356)
Duality	0.029	0.030	0.015	-0.009	-0.013	0.106	0.096	0.090	0.097	0.088
	(0.502)	(0.527)	(0.250)	(-0.153)	(-0.238)	(1.404)	(1.307)	(1.177)	(1.331)	(1.198)
BoardSz	-0.000	0.000	0.003	-0.002	0.000	0.030	0.030	0.030	0.030	0.030
	(-0.011)	(0.025)	(0.168)	(-0.117)	(0.001)	(1.252)	(1.265)	(1.304)	(1.252)	(1.254)
LnAssets	-0.012	-0.018	-0.012	-0.002	-0.008	-0.012	-0.018	-0.017	-0.002	-0.010
	(-0.482)	(-0.651)	(-0.422)	(-0.098)	(-0.254)	(-0.346)	(-0.455)	(-0.472)	(-0.041)	(-0.236)
SalesGrow	0.059***	0.058***	0.059***	0.054**	0.058***	0.001	0.008	0.015	0.000	0.013
	(2.705)	(2.771)	(2.971)	(2.226)	(3.059)	(0.016)	(0.132)	(0.244)	(0.007)	(0.212)
Mark2Book	0.003**	0.003**	0.003**	0.003**	0.003**	0.014	0.013	0.012	0.016	0.013
	(2.226)	(2.320)	(2.119)	(2.278)	(2.012)	(1.166)	(1.095)	(0.988)	(1.300)	(1.026)
ROA	0.141	0.154	0.135	0.129	0.130	0.225	0.215	0.202	0.207	0.195
	(0.956)	(1.012)	(0.876)	(0.857)	(0.799)	(0.653)	(0.613)	(0.587)	(0.571)	(0.547)
Leverage	0.082	0.094	0.049	0.055	0.042	-0.156	-0.132	-0.122	-0.188	-0.156
	(1.031)	(1.147)	(0.642)	(0.662)	(0.477)	(-0.954)	(-0.780)	(-0.714)	(-1.072)	(-0.878)
AssTurn	-0.040	-0.043	-0.039	-0.015	-0.020	-0.005	-0.011	-0.012	0.025	0.005
	(-1.091)	(-1.155)	(-0.983)	(-0.316)	(-0.425)	(-0.112)	(-0.218)	(-0.244)	(0.370)	(0.076)
DealVal	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.376)	(-0.314)	(-0.591)	(-0.573)	(-0.319)	(-0.658)	(-0.505)	(-0.618)	(-0.782)	(-0.696)
Constant	0.203	0.283	0.141	0.052	0.065	-0.192	-0.116	-0.127	-0.375	-0.251
	(0.598)	(0.709)	(0.370)	(0.142)	(0.138)	(-0.415)	(-0.225)	(-0.270)	(-0.646)	(-0.450)
Observations	66	66	66	66	66	61	61	61	61	61
R-squared	0.285	0.291	0.294	0.310	0.303	0.202	0.194	0.195	0.212	0.199

F-test	14.31	13.99	16.98	17.48	19.31	0.994	1.016	1.031	1.527	1.262
Prob > F	0.000	0.000	0.000	0.000	0.000	0.475	0.454	0.442	0.136	0.265

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.5 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: GuyRes&Dev)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.005			-0.004		-0.006			-0.005	
	(-0.958)			(-0.942)		(-1.299)			(-0.868)	
Concentr3%		-0.003			-0.001		-0.004			0.004
		(-0.720)			(-0.213)		(-0.707)			(0.652)
Concentr5%			-0.001					0.007		
			(-0.239)					(1.235)		
Block10%	0.002	0.002		0.002		0.004**	0.003**		0.003*	
	(1.177)	(1.072)		(1.125)		(2.301)	(2.038)		(1.891)	
Block20%			-0.000		-0.000			-0.007*		-0.006
			(-0.107)		(-0.078)			(-1.862)		(-1.627)
CeoHd	0.025**	0.025**	0.025**	0.032	0.036	0.003	0.003	0.002	0.032	0.036
	(2.342)	(2.306)	(2.207)	(1.002)	(1.085)	(0.253)	(0.265)	(0.166)	(1.328)	(1.555)
CeoHdSq				-0.014	-0.021				-0.064	-0.074*
				(-0.261)	(-0.392)				(-1.645)	(-1.992)
NonExecHd	0.012	0.013	0.018	0.011	0.016	0.006	0.007	0.021	0.001	0.014
	(0.840)	(0.913)	(1.124)	(0.779)	(1.009)	(0.616)	(0.624)	(1.627)	(0.125)	(1.028)
Ned%	-0.005	-0.005	-0.007	-0.004	-0.006	-0.011	-0.012	-0.010	-0.008	-0.007
	(-0.747)	(-0.779)	(-0.968)	(-0.669)	(-0.853)	(-1.595)	(-1.633)	(-1.471)	(-1.234)	(-1.032)
Duality	-0.003*	-0.003*	-0.003	-0.004	-0.003	0.002	0.003	0.003	0.002	0.002
	(-1.777)	(-1.726)	(-1.618)	(-1.478)	(-1.346)	(1.251)	(1.364)	(1.386)	(1.152)	(1.162)
BoardSz	-0.001**	-0.001**	-0.001*	-0.001**	-0.001**	-0.001	-0.001	-0.000	-0.001	-0.000
	(-2.078)	(-2.055)	(-1.992)	(-2.077)	(-2.005)	(-1.197)	(-1.137)	(-0.819)	(-1.154)	(-0.789)
LnAssets	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(1.011)	(0.893)	(0.896)	(1.051)	(0.947)	(1.099)	(1.031)	(1.584)	(1.382)	(1.654)
SalesGrow	-0.001	-0.001	-0.001	-0.001	-0.001	0.002	0.002	0.003**	0.002	0.002**
	(-0.937)	(-1.007)	(-1.282)	(-0.941)	(-1.269)	(1.599)	(1.478)	(2.079)	(1.553)	(2.017)
Mark2Book	-0.000	-0.000	0.000	-0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.055)	(-0.047)	(0.266)	(-0.010)	(0.330)	(-1.280)	(-1.195)	(-1.591)	(-1.091)	(-1.218)
ROA	-0.013***	-0.013***	-0.013***	-0.013***	-0.013***	-0.006	-0.006	-0.006	-0.006	-0.007
	(-2.998)	(-2.956)	(-2.981)	(-2.968)	(-2.918)	(-1.131)	(-1.102)	(-0.980)	(-1.105)	(-1.060)
Leverage	-0.007*	-0.007*	-0.007*	-0.007*	-0.007*	-0.001	-0.001	-0.003	-0.003	-0.004
	(-1.675)	(-1.694)	(-1.913)	(-1.669)	(-1.789)	(-0.298)	(-0.310)	(-0.770)	(-0.884)	(-1.148)
AssTurn	-0.003***	-0.003***	-0.004**	-0.003**	-0.003**	-0.001	-0.000	0.000	0.001	0.001
	(-2.752)	(-2.716)	(-2.645)	(-2.444)	(-2.323)	(-0.548)	(-0.486)	(0.058)	(0.605)	(1.017)
DealVal	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.621)	(-0.555)	(-1.190)	(-0.600)	(-1.079)	(-0.240)	(-0.201)	(-1.483)	(-0.356)	(-1.623)
Constant	0.012	0.013	0.014	0.011	0.012	0.001	0.001	-0.008	-0.005	-0.013
	(1.418)	(1.364)	(1.430)	(1.420)	(1.275)	(0.162)	(0.064)	(-0.844)	(-0.616)	(-1.250)
Observations	84	84	84	84	84	78	78	78	78	78
R-squared	0.351	0.347	0.335	0.352	0.337	0.171	0.157	0.226	0.194	0.236

F-test	2.311	2.233	2.359	2.073	2.073	1.206	1.103	1.138	2.014	2.359
Prob > F	0.011	0.015	0.010	0.022	0.022	0.294	0.373	0.344	0.028	0.009

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.6 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: GuySGA)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.108			-0.086		0.043			0.108	
	(-1.236)			(-0.935)		(0.451)			(1.159)	
Concentr3%		-0.142			-0.077		0.023			0.115
		(-1.551)			(-0.822)		(0.203)			(1.116)
Concentr5%			-0.079					0.078		
			(-0.857)					(0.816)		
Block10%	-0.002	0.002		-0.013		0.061	0.064		0.032	
	(-0.034)	(0.029)		(-0.230)		(1.075)	(1.071)		(0.494)	
Block20%			-0.048		-0.044			0.006		0.014
			(-1.092)		(-0.970)			(0.094)		(0.217)
CeoHd	-0.447**	-0.483**	-0.419**	-0.027	-0.140	-0.360	-0.358	-0.397	0.378	0.446
	(-2.394)	(-2.527)	(-2.247)	(-0.056)	(-0.336)	(-1.197)	(-1.184)	(-1.262)	(0.913)	(1.021)
CeoHdSq				-0.815	-0.566				-1.601*	-1.782**
				(-1.054)	(-0.868)				(-1.766)	(-2.283)
NonExecHd	-0.325	-0.363	-0.271	-0.386*	-0.343	-0.125	-0.128	-0.134	-0.270	-0.308
	(-1.438)	(-1.554)	(-1.324)	(-1.676)	(-1.427)	(-0.487)	(-0.492)	(-0.456)	(-1.010)	(-0.982)
Ned%	-0.056	-0.052	-0.021	-0.030	-0.004	-0.140	-0.137	-0.131	-0.061	-0.052
	(-0.327)	(-0.306)	(-0.135)	(-0.184)	(-0.028)	(-0.833)	(-0.805)	(-0.767)	(-0.332)	(-0.288)
Duality	0.049	0.050	0.039	0.034	0.029	0.058	0.056	0.055	0.048	0.043
	(0.954)	(1.018)	(0.819)	(0.550)	(0.497)	(0.951)	(0.921)	(0.981)	(0.781)	(0.742)
BoardSz	-0.010	-0.009	-0.007	-0.010	-0.009	0.006	0.006	0.005	0.006	0.005
	(-0.923)	(-0.865)	(-0.738)	(-0.991)	(-0.860)	(0.466)	(0.461)	(0.439)	(0.492)	(0.434)
LnAssets	-0.013	-0.018	-0.009	-0.010	-0.008	-0.026	-0.027	-0.025	-0.014	-0.013
	(-0.734)	(-0.936)	(-0.479)	(-0.525)	(-0.473)	(-1.285)	(-1.273)	(-1.132)	(-0.665)	(-0.568)
SalesGrow	-0.028	-0.028	-0.033	-0.030	-0.033	-0.045	-0.043	-0.037	-0.046	-0.043
	(-1.009)	(-1.033)	(-1.273)	(-1.034)	(-1.290)	(-1.356)	(-1.316)	(-0.992)	(-1.424)	(-1.208)
Mark2Book	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000	0.000	0.002	0.002
	(-0.839)	(-0.707)	(-0.942)	(-0.730)	(-0.763)	(-0.008)	(-0.069)	(0.023)	(0.323)	(0.282)
ROA	0.095	0.105	0.084	0.090	0.084	-0.131	-0.133	-0.133	-0.151	-0.155
	(1.074)	(1.186)	(0.968)	(0.985)	(0.951)	(-0.765)	(-0.786)	(-0.744)	(-0.884)	(-0.884)
Leverage	-0.012	-0.003	-0.033	-0.022	-0.030	-0.058	-0.054	-0.027	-0.094	-0.081
	(-0.171)	(-0.040)	(-0.495)	(-0.312)	(-0.413)	(-0.652)	(-0.604)	(-0.284)	(-0.991)	(-0.820)
AssTurn	-0.011	-0.013	-0.012	-0.001	-0.006	0.018	0.017	0.021	0.051	0.056
	(-0.574)	(-0.708)	(-0.701)	(-0.061)	(-0.273)	(0.511)	(0.494)	(0.595)	(1.047)	(1.306)
DealVal	-0.000	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000	0.000
	(-0.408)	(-0.331)	(-1.061)	(-0.539)	(-0.890)	(0.459)	(0.486)	(0.231)	(0.135)	(0.048)
Constant	0.322*	0.386**	0.241	0.264	0.233	0.295	0.306	0.299	0.087	0.078
	(1.850)	(2.042)	(1.441)	(1.489)	(1.343)	(1.252)	(1.245)	(1.170)	(0.324)	(0.282)
Observations	66	66	66	66	66	61	61	61	61	61
R-squared	0.196	0.207	0.219	0.207	0.226	0.156	0.154	0.129	0.183	0.171

F-test	2.462	2.959	2.831	20.35	9.857	1.089	1.070	0.814	4.384	3.941
Prob > F	0.010	0.002	0.003	0.000	0.000	0.392	0.408	0.650	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.7 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: GuyProdCos)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.136			0.112		0.102			0.056	
	(0.972)			(0.785)		(0.533)			(0.309)	
Concentr3%		0.122			0.081		0.101			0.029
		(0.894)			(0.592)		(0.528)			(0.193)
Concentr5%			0.148					0.072		
			(0.991)					(0.417)		
Block10%	0.021	0.025		0.027		-0.047	-0.047		-0.035	
	(0.332)	(0.396)		(0.426)		(-0.729)	(-0.706)		(-0.540)	
Block20%			0.040		0.051			-0.014		-0.017
			(0.740)		(0.970)			(-0.221)		(-0.268)
CeoHd	0.626*	0.625*	0.589	-0.009	-0.006	0.293	0.292	0.317	-0.437	-0.486
	(1.725)	(1.709)	(1.649)	(-0.011)	(-0.007)	(0.995)	(0.998)	(1.112)	(-0.732)	(-0.797)
CeoHdSq				1.279	1.165				1.597	1.751
				(0.952)	(0.886)				(1.345)	(1.482)
NonExecHd	0.359	0.345	0.338	0.460	0.409	0.367	0.372	0.356	0.495	0.516
	(0.911)	(0.872)	(0.837)	(1.148)	(0.961)	(0.818)	(0.823)	(0.835)	(1.059)	(1.113)
Ned%	0.281	0.284	0.228	0.231	0.190	0.318*	0.316*	0.318*	0.242	0.235
	(1.302)	(1.310)	(1.104)	(1.054)	(0.907)	(1.890)	(1.879)	(1.845)	(1.318)	(1.282)
Duality	-0.023	-0.025	-0.020	0.001	0.008	-0.039	-0.039	-0.041	-0.030	-0.033
	(-0.302)	(-0.334)	(-0.286)	(0.009)	(0.095)	(-0.577)	(-0.573)	(-0.646)	(-0.410)	(-0.474)
BoardSz	0.015	0.014	0.012	0.015	0.012	0.003	0.003	0.002	0.002	0.002
	(1.080)	(1.043)	(0.927)	(1.052)	(0.919)	(0.204)	(0.178)	(0.117)	(0.145)	(0.114)
LnAssets	-0.013	-0.011	-0.012	-0.018	-0.018	0.002	0.003	0.004	-0.006	-0.005
	(-0.673)	(-0.581)	(-0.606)	(-0.897)	(-0.879)	(0.085)	(0.148)	(0.188)	(-0.310)	(-0.278)
SalesGrow	-0.040	-0.039	-0.035	-0.038	-0.030	-0.034	-0.033	-0.030	-0.032	-0.030
	(-1.198)	(-1.170)	(-0.939)	(-1.125)	(-0.842)	(-0.870)	(-0.879)	(-0.797)	(-0.825)	(-0.750)
Mark2Book	-0.001	-0.001	-0.000	-0.001	-0.001	0.003	0.002	0.001	0.001	0.000
	(-1.001)	(-1.031)	(-0.778)	(-1.153)	(-0.895)	(0.420)	(0.314)	(0.183)	(0.157)	(0.016)
ROA	0.022	0.024	0.026	0.030	0.029	-0.106	-0.103	-0.100	-0.107	-0.107
	(0.197)	(0.213)	(0.233)	(0.263)	(0.251)	(-0.787)	(-0.795)	(-0.752)	(-0.761)	(-0.762)
Leverage	0.071	0.070	0.086	0.101	0.107	-0.048	-0.055	-0.060	0.006	0.004
	(0.632)	(0.630)	(0.849)	(0.837)	(0.890)	(-0.455)	(-0.504)	(-0.545)	(0.053)	(0.038)
AssTurn	-0.054	-0.053	-0.051	-0.072	-0.068	0.007	0.007	0.008	-0.021	-0.024
	(-1.429)	(-1.405)	(-1.375)	(-1.596)	(-1.481)	(0.212)	(0.232)	(0.253)	(-0.479)	(-0.566)
DealVal	0.000	0.000	0.000*	0.000	0.000*	0.000	0.000	0.000**	0.000	0.000**
	(1.598)	(1.572)	(1.841)	(1.579)	(1.678)	(1.588)	(1.593)	(2.008)	(1.669)	(2.063)
Constant	-0.125	-0.142	-0.087	-0.025	0.029	-0.170	-0.177	-0.193	-0.017	-0.025
	(-0.590)	(-0.641)	(-0.399)	(-0.104)	(0.115)	(-0.789)	(-0.802)	(-0.935)	(-0.071)	(-0.110)
Observations	81	81	81	81	81	75	75	75	75	75
R-squared	0.173	0.171	0.183	0.183	0.184	0.145	0.144	0.136	0.166	0.162

F-test	1.469	1.423	1.619	2.319	2.423	2.226	2.246	2.413	7.057	7.119
Prob > F	0.148	0.168	0.097	0.010	0.007	0.017	0.016	0.009	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.8 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: LaraProdCos)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.048			0.012		-0.006			-0.024	
	(0.476)			(0.123)		(-0.046)			(-0.179)	
Concentr3%		0.015			0.014		-0.014			-0.090
		(0.155)			(0.131)		(-0.101)			(-0.632)
Concentr5%			0.060					-0.049		
			(0.470)					(-0.324)		
Block10%	-0.010	-0.004		0.000		-0.059	-0.058		-0.055	
	(-0.177)	(-0.078)		(0.008)		(-0.965)	(-0.900)		(-0.871)	
Block20%			-0.032		-0.032			-0.000		0.000
			(-0.625)		(-0.670)			(-0.007)		(0.006)
CeoHd	0.131	0.124	0.157	-0.858	-0.873	0.352	0.352	0.392	0.061	0.012
	(0.415)	(0.389)	(0.493)	(-1.046)	(-1.084)	(1.203)	(1.199)	(1.365)	(0.107)	(0.021)
CeoHdSq				1.992	2.068				0.636	0.808
				(1.387)	(1.455)				(0.567)	(0.767)
NonExecHd	0.617*	0.585	0.635*	0.774**	0.808**	0.182	0.180	0.152	0.233	0.207
	(1.716)	(1.636)	(1.865)	(2.019)	(2.049)	(0.584)	(0.574)	(0.466)	(0.688)	(0.597)
Ned%	-0.005	0.001	0.012	-0.077	-0.063	0.292	0.293	0.285	0.262	0.253
	(-0.022)	(0.004)	(0.057)	(-0.347)	(-0.299)	(1.635)	(1.624)	(1.557)	(1.391)	(1.341)
Duality	-0.063	-0.063	-0.070	-0.027	-0.028	-0.101	-0.101	-0.105	-0.097	-0.100
	(-0.780)	(-0.784)	(-0.864)	(-0.280)	(-0.290)	(-1.496)	(-1.498)	(-1.670)	(-1.366)	(-1.531)
BoardSz	0.008	0.007	0.008	0.007	0.008	0.006	0.006	0.004	0.005	0.004
	(0.494)	(0.473)	(0.531)	(0.479)	(0.546)	(0.383)	(0.387)	(0.314)	(0.353)	(0.270)
LnAssets	0.010	0.009	0.012	0.001	0.002	-0.007	-0.007	-0.007	-0.010	-0.012
	(0.517)	(0.477)	(0.597)	(0.051)	(0.075)	(-0.368)	(-0.378)	(-0.337)	(-0.509)	(-0.555)
SalesGrow	-0.035	-0.035	-0.040	-0.032	-0.037	-0.045	-0.045	-0.047	-0.044	-0.044
	(-1.438)	(-1.430)	(-1.616)	(-1.266)	(-1.503)	(-1.308)	(-1.313)	(-1.362)	(-1.281)	(-1.221)
Mark2Book	0.002**	0.002**	0.002**	0.002**	0.002**	0.006	0.006	0.005	0.005	0.004
	(2.386)	(2.410)	(2.400)	(2.051)	(2.087)	(0.602)	(0.605)	(0.536)	(0.531)	(0.468)
ROA	0.008	0.010	0.012	0.022	0.023	-0.036	-0.038	-0.034	-0.037	-0.039
	(0.052)	(0.066)	(0.079)	(0.140)	(0.153)	(-0.251)	(-0.269)	(-0.231)	(-0.248)	(-0.262)
Leverage	0.017	0.021	0.019	0.064	0.066	0.002	0.004	-0.004	0.023	0.032
	(0.202)	(0.258)	(0.248)	(0.749)	(0.778)	(0.020)	(0.040)	(-0.035)	(0.230)	(0.297)
AssTurn	-0.010	-0.011	-0.012	-0.038	-0.042	-0.012	-0.012	-0.013	-0.023	-0.027
	(-0.302)	(-0.323)	(-0.366)	(-0.875)	(-0.948)	(-0.358)	(-0.366)	(-0.399)	(-0.496)	(-0.634)
DealVal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.504)	(0.476)	(0.494)	(0.532)	(0.396)	(0.713)	(0.713)	(1.215)	(0.734)	(1.164)
Constant	-0.152	-0.141	-0.186	0.011	0.000	-0.039	-0.034	-0.057	0.023	0.043
	(-0.688)	(-0.627)	(-0.841)	(0.047)	(0.000)	(-0.170)	(-0.149)	(-0.247)	(0.086)	(0.162)
Observations	82	82	82	82	82	75	75	75	75	75
R-squared	0.098	0.096	0.099	0.127	0.130	0.143	0.143	0.125	0.146	0.134

F-test	7.534	10.03	6.850	13.02	13.90	2.443	2.439	2.328	8.967	7.529
Prob > F	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.012	0.000	0.000

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4.9 Regressions results for IBOs Year T-1 and Year T-2 (Dependent Variable: LaraDiscExp)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.176			-0.146		0.106			0.188	
	(-0.943)			(-0.765)		(0.461)			(0.816)	
Concentr3%		-0.213			-0.165		0.048			0.050
		(-1.074)			(-0.859)		(0.197)			(0.249)
Concentr5%			-0.193					-0.071		
			(-1.084)					(-0.329)		
Block10%	-0.015	-0.012		-0.031		0.001	0.010		-0.035	
	(-0.188)	(-0.151)		(-0.370)		(0.019)	(0.124)		(-0.415)	
Block20%			-0.037		-0.036			0.085		0.073
			(-0.680)		(-0.614)			(1.182)		(1.068)
CeoHd	-0.537	-0.586*	-0.545	0.057	-0.163	-0.375	-0.374	-0.445	0.547	0.317
	(-1.563)	(-1.677)	(-1.564)	(0.076)	(-0.223)	(-1.015)	(-1.003)	(-1.249)	(0.815)	(0.470)
CeoHdSq				-1.155	-0.753				-2.001	-1.558
				(-0.907)	(-0.614)				(-1.522)	(-1.368)
NonExecHd	-0.794**	-0.835**	-0.774**	-0.880**	-0.859**	-0.546	-0.555	-0.709	-0.727	-0.831
	(-2.246)	(-2.359)	(-2.131)	(-2.381)	(-2.269)	(-0.891)	(-0.911)	(-1.201)	(-1.212)	(-1.399)
Ned%	0.077	0.077	0.119	0.113	0.135	0.032	0.041	0.031	0.131	0.096
	(0.387)	(0.384)	(0.616)	(0.586)	(0.683)	(0.173)	(0.224)	(0.167)	(0.630)	(0.493)
Duality	0.065	0.067	0.058	0.044	0.042	0.085	0.080	0.078	0.073	0.078
	(0.870)	(0.921)	(0.811)	(0.525)	(0.536)	(1.354)	(1.288)	(1.195)	(1.157)	(1.142)
BoardSz	0.001	0.002	0.004	-0.000	0.001	0.007	0.006	0.006	0.007	0.005
	(0.039)	(0.097)	(0.249)	(-0.026)	(0.090)	(0.335)	(0.328)	(0.325)	(0.352)	(0.258)
LnAssets	-0.009	-0.016	-0.009	-0.004	-0.008	0.007	0.005	-0.008	0.022	0.009
	(-0.426)	(-0.649)	(-0.387)	(-0.190)	(-0.326)	(0.290)	(0.172)	(-0.310)	(0.797)	(0.361)
SalesGrow	0.022	0.021	0.019	0.019	0.019	0.026	0.030	0.017	0.025	0.015
	(1.657)	(1.616)	(1.499)	(1.398)	(1.439)	(0.584)	(0.709)	(0.367)	(0.571)	(0.324)
Mark2Book	0.001	0.001	0.001	0.001	0.001	0.010	0.009	0.012	0.013	0.012
	(0.617)	(0.764)	(0.587)	(0.674)	(0.636)	(1.070)	(1.030)	(1.375)	(1.368)	(1.462)
ROA	0.006	0.020	0.003	-0.001	0.003	0.217	0.211	0.230	0.192	0.215
	(0.044)	(0.153)	(0.023)	(-0.005)	(0.019)	(1.128)	(1.067)	(1.153)	(0.921)	(1.013)
Leverage	0.064	0.074	0.036	0.049	0.045	-0.003	0.009	0.048	-0.048	-0.027
	(0.945)	(1.092)	(0.518)	(0.695)	(0.639)	(-0.034)	(0.084)	(0.454)	(-0.451)	(-0.251)
AssTurn	-0.013	-0.016	-0.013	0.001	-0.004	-0.004	-0.007	-0.013	0.038	0.023
	(-0.359)	(-0.439)	(-0.378)	(0.034)	(-0.102)	(-0.104)	(-0.157)	(-0.294)	(0.629)	(0.462)
DealVal	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.306)	(-0.242)	(-0.761)	(-0.427)	(-0.455)	(-0.876)	(-0.764)	(-0.621)	(-1.179)	(-0.938)
Constant	0.133	0.221	0.091	0.051	0.077	-0.224	-0.187	-0.013	-0.483	-0.282
	(0.447)	(0.628)	(0.291)	(0.167)	(0.202)	(-0.599)	(-0.457)	(-0.034)	(-1.082)	(-0.687)
Observations	66	66	66	66	66	61	61	61	61	61
R-squared	0.198	0.207	0.215	0.209	0.216	0.173	0.167	0.180	0.200	0.197

F-test	5.106	5.478	4.096	7.298	5.898	0.796	0.832	0.923	4.266	2.743
Prob > F	0.000	0.000	0.000	0.000	0.000	0.668	0.632	0.542	0.000	0.005

Robust t-statistics in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

3.6.2.3 Comparison of the results between the two types of buyouts

High outside ownership concentration is associated with less REM in year T-2 preceding MBOs, but with more REM in year T-2 preceding IBOs. Preceding MBOs, substantial equity ownership by outsiders generates greater incentives and ability to monitor (Cornett et al., 2008), and leads to better monitoring of REM behaviours. However, preceding an IBO, significant shareholders might be concerned about a firm's performance and put pressure on managers who may in turn respond by engaging in positive REM to make their firm look more valuable.

High levels of institutional shareholding are associated with less REM in year T-2 preceding MBOs. Institutional investors provide a high degree of monitoring, removing incentives for managers to engage in REM behaviours in order to meet short-term earnings goals (Bushee, 1998). Furthermore, as REM has real economic consequences for the long-term value of firms, institutional investors are likely to have a better understanding of the long-term impact of their operating decisions, leading them to make more effort in monitoring and controlling REM activities. Preceding IBOs, institutional shareholding has no effect on REM. This might be because, given a larger firm size, there are more institutional investors in IBO firms than there are in MBO firms. As the role of institutions is ambiguous and varies across firms, an increase in institutional shareholding leads to a decrease in monitoring in IBO firms. Furthermore, as institutional investors might have large portfolios, they are less likely to focus on all of their investments. As a result, there may be an increase in free-riding problem for institutional investors in IBO firms, as the monitoring cost to any individual institution falls in proportion to all institutions.

The presence of non-managerial large blockholders is associated with more REM both in years T-1 and in T-2 preceding MBOs. As the role of blockholders is ambiguous and varies across firms, these shareholders are generally passive and are likely to support managers rather than monitoring them (Gibbs, 1993). As suggested by the results from the univariate tests, managers engage in positive REM in order to increase reported earnings preceding MBOs. This supports blockholders in their quest for growth. Moreover, as blockholders might invest to fund MBOs, they are more likely to side with management for strategic alignment preceding buyouts. Positive REM, which eventually maximises the interests of non-managerial large blockholders, might facilitate the overall execution of MBOs.

However, preceding IBOs, the presence of non-managerial large blockholders is associated with more REM in year T-1, but less REM in year T-2. This might be because non-managerial large blockholders have the strongest incentives to be active owners, as well as having the capacity to determine the outcome of particular corporate policy decisions. Hence, as IBOs are difficult to predict, the optimal monitoring strategy for these shareholders might be to focus on the long-term success of a firm, and thus mitigate REM in year T-2. However, as the undervaluation of a firm may increase in year T-1, managers may have stronger motivations to engage in REM, which might make them more determined to resist pressure from blockholders. Managers might also attempt to signal their competence and the growth prospects of their firms to the market through engaging in positive REM. Furthermore, managers might use to positive REM, which could lead to an increase of a firm’s value, as a respond to the pressure from blockholders.

Preceding MBOs, CEO ownership has a hump-shaped relationship with REM in year T-1. In the context of MBOs, low levels of managerial ownership are insufficient to act as incentive mechanism. As managers tend to buy their firm in an MBO, engaging in REM in order to facilitate the execution of MBOs is in their best interests. However, as managers will remain in a firm after a buyout, high levels of ownership make them consider the long-term success of their business, leading to lower levels of REM. Furthermore, if selling shareholders perceive that managers with high levels of ownership have cheated by engaging in REM preceding MBOs, they will demand a higher transaction price or even make a legal challenge against management.

In year T-2, high CEO ownership is associated with more discretionary expenses cut, but with less overproduction. As managers might plan MBOs several years ahead, they can systematically plan their REM methods, schedule their manipulation, and gauge the appropriate extent to which they can engage in REM. Cutting discretionary expenses has negative economic consequence for a firm in the long term, but overproduction has immediate short-term negative economic consequences. Interference in short-term operations might lead to abnormal firm performance and is likely to attract the attention of shareholders, and thus affect the overall execution of an MBO. Managers therefore ensure the overall success of MBOs by minimising short-term interference in normal operations.

Preceding IBOs, CEO ownership is associated with more REM in year T-1. High levels of shareholding give managers more control and power, hence managers find that they can follow their own objectives with less fear of discipline (Morck et al., 1988). As the incidence of IBOs is difficult to predict, managers will engage in every available REM method to increase earnings once they perceive that their firm has been undervalued in year T-1 preceding IBOs. However, the squared transformation of CEO ownership is associated with more REM of sales manipulation, but with less SGA expenses cut in year T-2 preceding IBOs. High shareholdings might also make managers considers the long-term success of their firms. SGA expenses cut might affect the long-term operations of a firm, whereas sales manipulation only interferes in short-term operations. Moreover, SGA expenses cut is easier to detect than sales manipulation is. Therefore, engaging in only one of these REM methods at a time might reduce the chances of the REM being detected. Thus managers with high ownership may focus on the long-term success of their firm by engaging only in sales manipulation rather than cutting SGA expenses in year T-2 prior to IBOs.

Therefore, it can be seen that CEO ownership has complex effects on REM preceding buyouts. Preceding MBOs, managers might plan MBOs several years ahead, thus they can systematically plan their REM activities, manipulation schedule, and gauge the appropriate extent to which they can engage. High levels of ownership generally lead managers to choose an optimal REM plan that ensures the long-term success of their business after a buyout. Preceding IBOs, high levels of ownership may lead managers to focus on the long-term success of their firm, leading to less REM in T-2. However, in year T-1, the pressure of firm undervaluation may cause managers worry about becoming the target of an IBO, and high ownership may lead them to use more opportunities to engage in REM.

Equity ownership by non-executive directors is associated with more REM in year T-1, but it has no significant relationship with REM in year T-2 prior to IBOs. In year T-2, higher ownership might make non-executive directors less independent, and thus impede their effectiveness as monitors. Moreover, non-executive directors may perform little or no real monitoring role as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). In year T-1, REM could be used to improve short-term earnings, reduce the undervaluation of a firm and increase the market's confidence in its future performance. Managers might engage in positive REM in response to pressure from non-executive directors. Preceding MBOs, equity ownership by non-executive directors has no relationship with REM. Managers might have several years to plan MBOs ahead. They can systematically plan their REM methods, manipulation schedule and the appropriate extent to which they engage. This makes it difficult for non-executive directors to spot the REM. Furthermore, non-executive directors might be afraid of losing their position on a board after a buyout, which in turn compromises their ability to monitor REM behaviours.

High percentages of non-executive directors on boards are associated with more REM in year T-2 preceding IBOs. Managers might be under pressure from non-executive directors to improve firm performance and they may respond by engaging in REM through overproduction in order to increase their firm's value in the short term firm and to ensure the long-term success of the business. Furthermore, certain types of REM could improve short-term earnings to reduce undervaluation and to increase the market's confidence in the future performance of a firm. Thus having more non-executive directors on a board leads to more REM of overproduction. Moreover, as non-executive directors may perceive overproduction as too damaging to a firm’s short-term growth potential, the findings in this study might indicate that non-executive directors have a great focus on abnormal changes to production costs. In addition, a firm might have increased undervaluation, placing it at risk of an IBO. As buyout firms are not required to hire as many non-executive directors as listed firms are, non-executive directors might be afraid of losing their position on boards after buyouts; therefore, they support managers in positive REM preceding IBOs. Prior to MBOs, if managers have a systematic plan for REM, it will be difficult for non-executive directors to detect, and thus the percentages of non-executive directors on boards has no relationship with REM preceding MBOs.

CEO duality is associated with more SGA expense cuts, but with less R&D expense cuts in year T-1 preceding MBOs. CEO duality concentrates power in the CEO's position (Cornett et al., 2008) and facilitates the CEO to effectively control the information that is available to other board members, potentially impairing their role as effective monitors (Jensen, 1993). Hence, CEO duality is associated with greater SGA expense cuts. As R&D expense cuts cause more damage to the long-term success of a firm than SGA expense cuts do, a CEO's reputation will be affected if any REM by R&D expense cuts is detected. If selling shareholders perceive that managers have cheated by engaging in REM preceding MBOs, they will demand a higher transaction price or even make a legal challenge. CEO duality is also associated with more REM of overproduction in year T-2 preceding MBOs. Since managers will remain in a firm after an MBO, they prefer to increase its long-term success by choosing to engage in REM that only causes short-term interference in normal operations. In addition, as managers might plan MBOs several years ahead, they can systematically plan their REM resolutions, manipulation schedule, and the appropriate extent to engage. Thus, the inconsistency of these results might be because of the systematic arrangement of REM strategies.

Preceding IBOs, CEO duality is associated with more REM of sales manipulation but less REM of R&D expenses cut in year T-1. Prior to IBOs, sales manipulation is the optimal REM method as it may be difficult to detect and it only affects short-term operations. Cutting R&D expenses causes more damage to a firm's long-term success than other forms of REM do, and it will affect a CEO's reputation if it is detected. Furthermore, as duality increases a CEO's power to control the results of corporate events, they are less concerned about the possibility of unexpected IBOs. CEO duality also leads CEOs to think about the long-term success of a firm, and to maintain their reputation. Hence, CEO duality lead to less REM of R&D expense cuts preceding IBOs.

Larger boards are associated with more REM in years T-1 and T-2 preceding MBOs. Larger sizes might be detrimental to boards' effectiveness and cohesiveness as they make it more difficult to arrange board meetings and reach a consensus, leading to slower and less-efficient decision-making, and to directors becoming less likely to criticise the behaviour of top managers (Jensen, 1993; Yermack, 1996). Hence, larger boards result in a weaker monitoring of REM preceding MBOs.

Larger boards are associated with more REM of sales manipulation but less REM of R&D expenses cut in year T-1 preceding IBOs. Problems associated with coordination and communication and free-riding directors might arise in larger boards (Jensen, 1993; Yermack, 1996), hence large board sizes lead to more REM of sales manipulation. However, as R&D expense cuts are easier to spot than sales manipulation is, having more board members might increase the ability of a board to monitor and detect cuts to R&D expenses, leading to less REM.

To conclude, high outside ownership concentration mitigates REM preceding MBOs, but it facilitates REM preceding IBOs. Moreover, high institutional shareholding mitigates REM preceding MBOs. In addition, the presence of non-managerial large blockholders facilitates REM in year T-1 preceding both MBOs and IBOs. However, it mitigates REM in year T-2 preceding IBOs. Furthermore, CEO ownership has complex effects on REM preceding buyouts. Preceding MBOs, high ownership generally leads managers to choose an optimal REM plan that ensures the long-term success of a business after a buyout. However, the pressures of firm undervaluation might cause managers to worry about becoming an IBO target, and high ownerships may lead managers to use more opportunities to engage in REM preceding IBOs. Additionally, high equity ownership by non-executive directors and high percentages of non-executive directors on boards facilitates REM prior to IBOs. CEO duality and large boards facilitate REM preceding both MBOs and IBOs, but R&D expense cuts are always mitigated.

3.7 Sensitivity Analysis

This section investigates three potential factors that might drive the results of this study:

1) Leveraged buyout targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986), and the degree of undervaluation might affect the results in multivariate tests.

2) The interpretation of the results of multivariate tests is different from that in prior literature if the values of dependent variables have been indicated as significantly negative in univariate tests.

3) High correlations between sales growth (Sales Growth) and return on assets (ROA) in year T-2 preceding MBOs might lead to a problem of multicollinearity in the multivariate regression models.

The results of sensitivity analysis suggest that these three factors do not drive the results of this study. Therefore, the results in this study are robust.

With regard to the first concern, that the research might be affected by the undervaluation of buyout firms, I control for this factor in multivariate tests to ensure the robustness of this research. Self-motivated managers are likely to exercise REM either to depress earnings in preparation for MBOs or to increase earnings to prevent any potential IBOs. As managers cannot precisely anticipate IBO offers, they use the industry-adjusted price-earnings ratio as a benchmark to trigger their REM behaviour. Therefore, I re-run all multivariate tests with firm undervaluation as an additional control variable in all the regression models. As in prior studies (e.g. Alford, 1992; Francis et al., 2005), the undervaluation of a firm is measured as the industry-adjusted price-earnings ratio, which is the difference between the target firm's price–earnings ratio and the median industry price–earnings ratio (PE Ratio).

Table 3.1.6 shows the t-test results for the industry-adjusted price-earnings ratio in years T-1 and T-2. The industry-adjusted price-earnings ratio of MBOs is significantly negative in both years, which suggests that MBO firms had lower price–earnings ratios than their industry peers had. Moreover, the industry-adjusted price–earnings ratio of IBOs is significantly negative in year T-1, which suggests that IBO firms had lower price–earnings ratios than their industry peers had one year before the buyouts. Hence, preceding buyouts, both MBO and IBO firms were undervalued relative to firms that remained public, which is consistent with the findings of prior studies (e.g. Weir and Wright, 2006; Jensen, 1986). Therefore, it is rational to control for firm undervaluation in this study.

Table 3.1.6 T-test results of industry-adjusted price-earnings ratio

Table 1.6 T-test results of industry-adjusted price earnings ratio					
	Hypothesis	Year T-1		Year T-2	
	Ho[1]: mean=0	t-Stat[2]	p-Value	t-Stat	p-Value
MBOs	Ha: < 0	--2.5915***	0.0054	-2.3274**	0.0108
IBOs	Ha: < 0	-1.6643**	0.0499	-0.0267	0.4894

Note 1: Ho: is Null Hypothesis, and Ha: is Alternative Hypothesis;
Note 2: Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1

In order to investigate whether firm undervaluation affects the regression results, I re-run all the regression tests with undervaluation (PE Ratio) as an additional control variable. The OLS regression model in this sensitivity analysis is as follows:

$$REM_{it} = \beta_0 + \beta_1 InsShare + \beta_2 Concentr3\% + \beta_3 Concentr5\% + \beta_4 Block10\% + \beta_5 Block20\% + \beta_6 CeoHd + \beta_7 CeoHdSq + \beta_8 Ned\% + \beta_9 Duality + \beta_{10} BoardSz + \beta_{11} LnAssets + \beta_{12} SalesGrow + \beta_{13} Mark2Book + \beta_{14} ROA + \beta_{15} Leverage + \beta_{16} AssTurn + \beta_{17} DealVal + \beta_{18} PE\ \ Ratio + \varepsilon$$

Variables definitions:

PE Ratio: is the industry-adjusted price-earnings ratio (= the difference between the target firm's price–earnings ratio and the median industry price–earnings ratio

Panels A and B of Tables 3.5.1 in the Appendix report one example of the OLS regression test results from the sensitivity analysis for MBOs in years T-1 and T-2. Panels A and B of Tables 3.6.1 in the Appendix report one example of the OLS regression test results from the sensitivity analysis for IBOs in years T-1 and T-2.[15]

After controlling for undervaluation in the sensitivity analysis, the regression results are consistent with those from the multivariate tests in Section 3.6.2. This suggests that the degree of undervaluation does not drive the results of this study. Hence, the results of this study are robust in this respect.

Secondly, as discussed before, the interpretation of regression results in the multivariate tests section will be different from prior literature, as this study includes dependent variables for which the value has been indicated as significantly negative in univariate tests. Specifically, all the dependent variables are REM proxies. If a REM proxy in univariate tests are significantly negative, a positive correlation between this REM proxy and corporate

[15] Additional sensitivity analysis tables available from the author.

governance mechanisms indicates that governance mechanisms mitigate the REM, and a negative correlation between them indicates that governance mechanisms facilitate the REM. In order to investigate the robustness of the results and ensure this kind of interpretation is correct, I have transformed all the dependent variables into absolute values and then re-run all of the same multivariate regression models.

By transforming all dependent variables into absolute values in sensitivity analysis, dependent variables for which the value has been indicated as significantly negative in univariate tests will not drive the interpretation of the findings of this study. No matter whether the sign of the dependent variable that has been indicated in univariate tests is significantly positive, significantly negative, or insignificant, the interpretation of the results will be the same. More specifically, a positive correlation between an REM proxy and corporate governance mechanisms indicates that the governance mechanisms facilitate the REM, and a negative correlation between an REM proxy and a corporate governance mechanism indicates that the governance mechanism mitigates the REM.

Panels A and B of Tables 3.7.1 to 3.7.2 in the Appendix report some example of the OLS regression test results from the sensitivity analysis obtained by transforming all dependent variables into absolute values for MBOs in years T-1 and T-2. Panels A and B of Tables 3.8.1 in the Appendix report one example of the OLS regression test results from the sensitivity analysis obtained by transforming all the dependent variables into absolute values for IBOs in years T-1 and T-2. [16]

From Table 3.7.1 to 3.8.1, the results in the sensitivity analysis are largely

[16] Additional sensitivity analysis tables available from the author.

consistent with those from the multivariate tests in Section 3.6.2. Specifically, although the level of significance changes for few variables, the correlations between the absolute values of REM proxies and corporate governance mechanisms are largely consistent with the interpretations from the multivariate tests in Section 3.6.2. For instance, abnormal SGA expenses (GuySGA) in year T-1 preceding MBOs has been indicated as significantly negative in the univariate tests in Section 3.6.1.1, and it has a significant negative relationship with CEO duality (Duality) in the multivariate tests of Section 3.6.2.1. This indicates that CEO duality is associated with more REM in year T-1 prior to MBOs. In Panel A of Table 3.7.2, the absolute value of SGA expenses (GuySGA) has a positive relationship with CEO duality (Duality), which also suggests that CEO duality is associated with more REM in year T-1 prior to MBOs. In this respect, the results from the sensitivity analysis are consistent with the results from the multivariate tests. Therefore, the interpretation of the multivariate test results for dependent variables for which the value has been indicated as significantly negative in univariate tests is correct, and the results of this study in this respect are robust.

Third, the high correlation between sales growth (SalesGrow) and return on assets (ROA) in year T-2 of MBOs leads to a multicollinearity problem in several regression models. Specifically, the regression models with dependent variables of discretionary expenses (RowDiscExp), SGA expenses (GuySGA), and discretionary expenses (LaraDiscExp) have multicollinearity problems. In order to check the validity of the multivariate regression results, this study controls for multicollinearity and re-runs the same regression models while omitting each of these highly correlated variables in turn to check the validity of the models and results.[17] The results suggest that the tests from the sensitivity

[17] The OLS regression results by omitting each of these highly correlated variables in turn are available from the author.

analysis are consistent with those from the multivariate tests. Therefore, the results in this study are robust, and multicollinearity is not problematic.

3.8 Conclusion

Since the beginning of the 1990s, there has been a significant increase in the number and value of leveraged buyouts in the UK. As leveraged buyouts are a distinct and increasingly important type of acquisition in the financial market, the self-interested behaviour of managers prior to buyouts may significantly affect the buyout transactions. Therefore, this paper investigates whether managers engage in different REM behaviours preceding MBOs and IBOs in the UK.

As REM uses managerial discretions over operational business decisions, good corporate governance should limit managers' ability and thus may potentially restrict REM behaviours. Hence, this study also examines whether corporate governance mechanisms, especially outside shareholders and board characteristics, can mitigate REM activities. This study extends the REM and corporate governance literature to leveraged buyouts setting in a way that differs from prior studies in at least five aspects: (1) it extends the study of REM and corporate governance to the context of takeovers; (2) by specifying different managerial incentives preceding leveraged buyouts, the sample is subdivided into MBO and IBO firms for investigation; (3) the effects of corporate governance mechanisms on REM behaviours in leveraged buyout settings are examined; (4) if the dependent variables of REM proxies in univariate tests are significantly negative, a positive correlation between a REM proxy and corporate governance mechanisms indicates that the governance mechanisms mitigate REM, and a negative correlation between them indicates that the governance mechanisms facilitate the REM; and (5) it extends REM study in the UK context.

I hypothesise that managers may engage in negative REM preceding MBOs in an attempt to convince shareholders to accept a lower buyout price. In MBOs, managers are buyers and are likely to remain with the firm. They usually have high levels of personal investment in firms after buyouts. In the context of MBOs, the direct involvement of managers in the transaction generates conflicts of interests. Managers wish to pay the lowest possible purchase price, whereas their shareholders wish to sell their shares for the highest possible price. Managers' personal economic stake may motivate them to depress pre-buyout accounting earnings in order to portray their firm as underperforming, hence increasing the possibility that shareholders will accept a lower buyout price (Perry and Williams, 1994).

I also hypothesise that managers may engage in positive REM preceding MBOs, possibly to secure external funding when they have external financing requirements. In most cases of MBOs, internal financing by managers is insufficient to raise the cash they require to implement a buyout. Managers need additional financing from external sources through secured bank loans, and further external debt financing through private placements of subordinated claims from institutional investors. Managers will be concerned about their ability to access external sources of finance, especially when they have fewer fixed assets available to secure loans. Hence, managers might manipulate earnings upward to enhance prospective external financiers' perceptions of a firm's value in order to secure financing (Fischer and Louis, 2008).

Moreover, I hypothesise that managers engage in positive REM preceding IBOs to reduce the undervaluation of their firms and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding. IBO targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986). Managers are concerned about undervaluation as its potential consequence is an IBO. IBO buyers argue that the undervaluation of shares results from the poor decisions of prior managers, and they may see a leveraged buyout as a means of turning a failing company around (Hafzalla, 2009; Renneboog et al., 2007; Weir et al., 2005b). Managers will wish to retain their managerial discretions within a firm, but third-party buyers may wish to take control and engage in active monitoring or make changes to a firm's existing management team after a buyout (Hafzalla, 2009). There is also uncertainty associated with the potential for a business to be re-sold again within several years, threatening managers' job security (Denis and Denis, 1995). Therefore, managers may be motivated to engage in positive REM to reduce firm undervaluation and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding.

This chapter investigates four types of REM: sales manipulation, production manipulation, manipulation of discretionary SG&A expenditures and manipulation of R&D expenses. Sales manipulation refers to the behaviour of managers that attempts to manipulate sales in an effort to affect reported earnings. Managers could cut prices or offer more lenient credit terms towards the end of a year in an effort to accelerate sales from the next fiscal year into the current year. Managers may also increase prices or offer less lenient credit terms towards the end of the year in an effort to delay sales from the current year into the next fiscal year. Production manipulation can be achieved by producing more (or less) units than necessary. The fixed overhead costs of production can thus be spread over a larger (or smaller) number of units, thus lowering (or increasing) the fixed costs per unit. Hence, production manipulation can decrease (or increase) reported COGS, and the firm can report higher (or lower) profits in the current year. Furthermore, as portions of SG&A expenses and R&D expenditures are subject to managerial discretion, managers may reduce (or increase) these in an effort to increase (or decrease) profits in the current year.

Empirical tests addresses all UK leveraged buyout companies from 1997 to 2011, and cross-sectional models developed by Roychowdhury (2006) are used to estimate REM proxies in signed values. Specifically, abnormal CFO proxies for sales manipulations, abnormal production costs proxies for overproduction and abnormal discretionary expenses proxies for discretionary expenses manipulation. In addition, alternative REM proxies in signed value from the models of Gunny (2010) and Lara et al. (2012) have been used to increase the robustness of this study.

The results show that managers engage in positive REM to increase reported earnings in both years T-1 and T-2 preceding MBOs (defining the occurrence of buyouts at year T-0). Managers engage in positive REM through sales manipulation of offering excessive price discount or more credit sales, overproduction to reduce COGS and cutting discretionary expenses. This supports hypotheses $H_{2\text{-}2ai}$, $H_{2\text{-}2bi}$, $H_{2\text{-}2ci}$, and $H_{2\text{-}2di}$. The findings might be explained by the research of Fischer and Louis (2008), which indicates that managers engage in positive accrual earnings management to secure external funding under external financing requirements and to lower their financing costs.

Moreover, the results show that managers may use more opportunities to engage in positive REM in year T-1 than they do in year T-2 prior to MBOs, as the results for discretionary expense cuts become less significant, or insignificant, in year T-2. The results signal that managers intensively engage in REM in the last year before buyouts.

The results also show that either abnormal SG&A expense cuts or abnormal R&D expenditure cuts are significant in a given year. This suggests that SG&A expense cuts and R&D expenditure cuts could be used as alternatives when managers engage in positive REM prior to MBOs. As these types of REM are easy to spot, engaging in only one type of discretionary expenses manipulation at a time minimises the risks of detection.

In addition, there is no evidence of mean reversion from year T-2 preceding MBOs. The results of aggregate REM measures (year T-1 + year T-2) are the same as those for year T-1 preceding MBOs, which suggests that managers do engage in positive REM preceding MBOs, and no mean reversion. This indicates that some managers might systematically plan the manipulation of REM more than two years ahead.

The results reveal that managers engage in positive REM to increase reported earnings in years T-1 and T-2 prior to IBOs. Managers engage in positive REM through sales manipulation of offering excessive price cuts or more credit sales, overproduction to reduce COGS, and cutting discretionary expenses. This supports hypotheses $H_{2\text{-}1a}$, $H_{2\text{-}1b}$, $H_{2\text{-}1c}$, and $H_{2\text{-}1d}$. Based on known IBOs, the results suggest that managers use positive REM to increase pre-buyout earnings in an attempt to increase the perceived value of their firms and/or increase the potential costs of a buyout, thus decreasing the probability of an IBO actually occurring

Prior to IBOs, the results also show that either abnormal SG&A expense cuts or abnormal R&D expenditure cuts is significant in a given year. This suggests that managers might engage in either of these practices one at a time (but not together), thereby reducing the risk of being detected and minimising interference with normal operations.

In addition, the results of aggregate REM measures (year T-1 + year T-2) are almost the same as those from both years T-1 and T-2 preceding IBOs, which indicates that there is no evidence of mean reversion preceding IBOs. As managers do not have much time to prepare REM strategies before IBOs, this finding also suggests that managers do not systematically plan REM manipulation for years. Furthermore, as IBOs are difficult to predict, once managers realise their firms are undervalued, they will engage in nearly every REM methods available in order to increase the value of their firm.

As REM uses managerial discretions over operational business decisions, weak corporate governance enables greater managerial discretions to manipulate earnings, but good corporate governance limits managers' ability and thus potentially restricts REM behaviours. Hence, corporate governance might be important for mitigating REM behaviours. This study provides a new angle on REM by examining whether corporate governance mechanisms can mitigate REM activities. Boards have essential functions in respect to monitoring management behaviour and ensuring that a company operates in the long-term interests of its shareholders (Ronen and Yaari, 2008). Outside shareholders, especially institutional investors, also have strong incentives to monitor managers and remove the incentives for managerial myopic behaviours (Bushee, 1998). Close monitoring by a board and outside shareholders may reduce the self-interested use of managerial discretions, thus mitigating REM behaviour. Therefore, this study investigates whether corporate governance mechanisms related to outside shareholders and board characteristics can mitigate REM activities.

The results of the multivariate tests suggest that corporate governance mechanisms have different effects on REM preceding MBOs and IBOs.

Outsiders who hold significant blocks of shares have the opportunity, resources, and ability to monitor, discipline, and influence managers (Cornett et al., 2008). Their substantial equity ownership means that they can function as effective agents of external shareholders, and they have greater incentives and capabilities when it comes to monitoring and restricting managerial discretions

(Bhagat et al., 1999). Therefore, highly concentrated outside ownership is expected to compel managers to make choices that maximise the wealth of shareholders rather than serving their own interests by manipulating earnings.

Prior to MBOs, high outside ownership concentration is associated with less REM in year T-2, which supports hypothesis $H_{2\text{-}3a}$. Preceding MBOs, substantial equity ownership by outsiders generates greater incentives and ability to monitor managers (Cornett et al., 2008), and leads to better monitoring of REM behaviours. However, high outside ownership concentration is associated with more REM in year T-2 preceding IBOs, which is inconsistent with hypothesis $H_{2\text{-}3a}$. Preceding IBOs, outside shareholders with substantial holdings might be concerned about firm undervaluation and put pressure on managers to improve firm performance. Managers might then engage in positive REM to make the firm look more valuable as they are unlikely to be able to genuinely improve firm performance in the short term. Hence high outside ownership concentration mitigates REM behaviours prior to MBOs, but it facilitates REM preceding IBOs.

Institutional investors remove the incentives for managers to make self-interested use of their discretions by closely monitoring their behaviour. This monitoring can occur either explicitly, through governance practices, or implicitly, by information gathering and correctly pricing the impact of managerial decisions. If institutions hold substantial equity in the long term, they have strong incentives to incur the cost of explicitly monitoring and ensure managers do not use REM to meet short-term earnings goals (Bushee, 1998). Institutional investors also tend to be more experienced and knowledgeable than other investors are, and they are likely to have a better understanding of the long-term impact of firms' operating decisions. Institutional investors therefore often make more effort to monitor and control REM activities than other investors do.

The results indicate that high levels of institutional shareholding are associated with less REM in year T-2 preceding MBOs, which supports hypothesis $H_{2\text{-}3b}$. Institutional investors provide a high degree of monitoring, removing incentives for managers to engage in REM behaviour just to meet short-term earnings goals (Bushee, 1998). Furthermore, as REM has real economic consequences for the long-term value of firms, institutional investors are likely to have a better understanding of the long-term impact of their operating decisions, leading them to make a greater effort to monitor and control REM activities. Preceding IBOs, institutional shareholding has no effect on REM, which is inconsistent with hypothesis $H_{2\text{-}3b}$. This might be because, given a larger firm size, there are more institutional investors in IBO firms than there are in MBO firms. As the role of institutions is ambiguous and varies across firms, increasing the numbers of institutional investors leads to a decrease their monitoring function in IBO firms. Furthermore, institutional investors might hold large portfolios and only focus on the most significant investments. Hence, the problem of investor free-riding may arise in IBO firms as the monitoring cost for any individual institution falls in proportion to all institutions. Therefore, high levels of institutional shareholding mitigate REM preceding MBOs, but have no effect on REM prior to IBOs.

Non-managerial large blockholders hold sufficient numbers of shares to give them an influential voice in respect to particular corporate policy decisions. They have a strong incentive in using their influence and may be effective in limiting managerial discretions (Florackis and Ozkan, 2009). Hence, the presence of large blockholders may mitigate REM behaviours. Following the majority previous literature (e.g. La Porta et al., 1999), this study tries both a 10% and a 20% threshold to capture the monitoring and control effects of blockholders for robustness.

The presence of non-managerial large blockholders is associated with more REM in both years T-1 and T-2 preceding MBOs, which is inconsistent with hypothesis $H_{2\text{-}3c}$. As the role of blockholders is ambiguous and varies across firms, these shareholders are generally passive and are likely to support managers rather than monitoring them (Gibbs, 1993). As suggested by the results from the univariate tests, managers engage in positive REM to increase earnings preceding MBOs, which supports blockholders' quest for growth. Furthermore, as blockholders might invest to fund MBOs, they are likely to side with management for strategic alignment preceding buyouts. Positive REM might actually facilitate the overall execution of MBOs, which eventually maximises the long-term interests of non-managerial large blockholders

Preceding IBOs, the presence of non-managerial large blockholders is associated with more REM in year T-1, but less REM in year T-2, which does not support hypothesis $H_{2\text{-}3c}$. Non-managerial large blockholders have the strongest incentives to be active owners, and they have the capacity to determine the outcome of particular corporate policy decisions. Hence, as IBOs are difficult to predict, the optimal monitoring strategy for these shareholders might be to focus on the long-term success of a firm, and thus mitigate REM in year T-2. However, as firm undervaluation may increase in year T-1, managers might have stronger motivations to engage in REM, which may make them more determined to resist any pressure from blockholders. Positive REM might also help managers to signal their competence and their firms' potential growth perspectives to the market. Moreover, IBO targets usually have undervalued shares in the market, and blockholders might put pressure on management to improve firm performance. Hence, managers might engage in REM to make their firm appear more valuable. Therefore, the presence of non-managerial large blockholders facilitates REM behaviours preceding MBOs and IBOs in year T-1.

Managerial ownership can give rise to agency problems, such as REM, which are influenced by a variety of alignment and entrenchment effects (Short and

Keasey, 1999). Jensen and Meckling (1976) suggested that where managers hold shares in their company, their interests are more likely to align with those of other shareholders and discourage them from making decisions that compromise the principles of firm value maximisation. However, Morck et al. (1988) found that high levels of managerial ownership could lead to entrenchment effects. If managers have too much ownership of a firm, they can turn back to pursuing their own objectives and ignore the interests of other owners, such as consumption of perquisites (Short and Keasey, 1999). Hence, similar to prior studies, this study tests for the non-linear effect of management ownership on REM.

The results indicate that CEO ownership is generally associated with more REM preceding MBOs, which supports hypothesis $H_{2\text{-}3d}$. In year T-1, CEO ownership has a hump-shaped relationship with REM. In the context of MBOs, low levels of managerial ownership are insufficient to act as incentive mechanism. As managers tend to buy their firm, engaging in REM to facilitate the execution of an MBO is in their best interests. However, as managers will remain in the firm after buyouts, high levels of ownership lead managers to consider the long-term success of a business, resulting in lower levels of REM. Furthermore, if selling shareholders perceive that managers with high ownership have cheated by engaging in REM preceding MBOs, they will demand a higher transaction price or even make a legal challenge against management.

In year T-2, high CEO ownership is associated with more cuts to discretionary expenses, but less manipulation of sales. As managers might plan MBOs several years ahead, they can systematically plan their REM resolutions, schedule their manipulation and gauge the appropriate extent to which they can engage in. Interference in short-term operations might lead to abnormal firm performance, which is likely to attract the attention of shareholders, and thus affect the overall MBO execution plan. By planning to minimise short-term interference in normal operations, managers ensure the overall success of MBOs.

Preceding IBOs, CEO ownership generally is associated with more REM, which also supports hypothesis $H_{2\text{-}3d}$. In year T-1 preceding IBOs, CEO ownership is associated with more REM. High levels of shareholding gives managers more control and power, enabling managers to follow their own objectives with less fear of discipline (Morck et al., 1988). As the incidence of IBOs is difficult to predict, managers will engage in every REM methods available to increase earnings once they perceive that their firm has been undervalued in year T-1. However, CEO ownership is associated with more REM of sales manipulation, but with less SGA expense cuts in year T-2 preceding IBOs. High shareholdings might also encourage managers to consider the long-term success of their firms. SGA expense cuts might affect long-term operations, while sales manipulation only interferes with short-term operations. Moreover, SGA expense cuts are easier to detect than sales manipulation is. Engaging in only one of these methods of REM at a time might reduce the chance of detection. Managers with high shareholdings may therefore focus on the long-term success of their firm by choosing to engage only in sales manipulation in year T-2 prior to IBOs.

It can be seen, then, that CEO ownership has complex effects on REM preceding leveraged buyouts, but high levels of CEO ownership generally lead to high levels of REM. Preceding MBOs, as managers might plan MBOs several years ahead, high ownership generally leads management to choose the optimal REM plan, which ensures the long-term success of the business after buyouts. Preceding IBOs, high ownership may also lead managers to focus on the long-term success of their firms, leading to less REM in year T-2. However, in year T-1, the pressure of firm undervaluation may cause managers worry about becoming an IBO target, and high ownership may lead managers to use more opportunities to engage in REM.

Non-executive directors with high equity ownership should be more likely to protect the interests of other shareholders, as their ownership in a firm aligns their interests more to those of external shareholders and gives them good reason to monitor managers (Bhagat et al., 1999). High levels of equity ownership by non-executive directors are therefore expected to mitigate REM.

The results suggest that equity ownership by non-executive directors has no relationship with REM preceding MBOs, which is inconsistent with hypothesis $H_{2\text{-}3e}$. Managers might systematically plan their REM strategies several years ahead of MBOs, this makes it difficult for non-executive directors to spot REM behaviours, and may explain why equity ownership by non-executive directors has no relationship with REM preceding MBOs.

Prior to IBOs, equity ownership by non-executive directors is associated with more REM in year T-1, which is inconsistent with hypothesis $H_{2\text{-}3e}$. Higher ownership might make non-executive directors less independent, and thus impede their ability to effectively monitor managers. Moreover, non-executive directors may perform little or no real monitoring role as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). In addition, IBO targets usually have undervalued shares in the market, and non-executive directors might put pressure on management to improve firm performance. Managers might be less likely to genuinely improve firm performance in the short term and respond to the pressure by engaging in positive REM to make firms look more valuable. Therefore, equity ownership by non-executive directors does not mitigate REM prior to MBOs, and it facilitates REM prior to IBOs.

Non-executive directors have more independence than executive directors have. This may mean that they will be more incentivised in respect to monitoring managers (Fama and Jensen, 1983a). They have no economic or psychological affiliation with the management that may interfere with their ability to challenge managerial operational practices (Fama, 1980). A high percentage of non-executive directors is therefore expected to mitigate REM preceding buyouts.

The results indicate that high percentages of non-executive directors on boards have no impact on REM prior to MBOs, which is inconsistent with hypothesis $H_{2\text{-}3f}$. This may be because systematic planning by managers preceding MBOs makes it difficult for non-executive directors to spot REM. Moreover, non-executive directors may perform little or no real monitoring role as they lack the necessary independence, time, expertise and information in order to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991).

Preceding IBOs, the results suggest that high percentages of non-executive directors on boards facilitate REM in year T-2 preceding IBOs. This is inconsistent with hypothesis $H_{2\text{-}3f}$. Managers might be under pressure from non-executive directors to improving firm performance. In response to this pressure, managers may engage in REM by overproduction in order to increase a firm's value in the short term and to ensure the long-term success of the business. Furthermore, certain types of REM could improve short-term earnings and reduce undervaluation in order to increase market confidence in the future performance of a firm. Moreover, as non-executive directors may perceive overproduction as too damaging to a firm’s growth potential in the short term, this finding might indicate that non-executive directors pay significant attention to abnormal changes of production costs. In addition, there might be an increase in firm undervaluation, which might result in an IBO. As buyout firms are not required to hire as many non-executive directors as listed firms are, non-executive directors might be afraid of losing their position on a board after a buyout, leading them to support managers in positive REM preceding IBOs.

CEO duality facilitates a CEO to conceal or reveal certain information to members of a board, reducing transparency and potentially impairing a board's ability to monitor business operations effectively (Jensen, 1993). It also impedes certain controls and balances that normally curb the activities of CEOs (Cornett et al., 2008). CEO duality might therefore impede effective monitoring and lead to more REM. The results suggest that CEO duality is associated with more REM preceding both MBOs and IBOs, except in the case of R&D expense cuts, which supports hypothesis $H_{2\text{-}3g}$. As cutting R&D expenses causes more damage to the long-term success of a firm than other forms of REM do, a CEO's reputation will be affected if this form of REM is detected. Furthermore, CEO duality leads CEOs to consider the long-term success of a firm and therefore leads to less REM by R&D expense cuts.

Large board may ensure a minimum required knowledge base (Vafeas, 2005), and provide more resources (Hillman and Dalziel, 2003). Initially, adding more directors to serve a board may extend the ability of monitoring, and especially increasing the number of non-executives is expected to have a more positive impact than increasing executive directors (Andres et al., 2005; Guest, 2009). Larger boards are therefore expected to mitigate REM preceding buyouts. The results suggest that large boards are associated with more REM preceding both MBOs and IBOs, which is inconsistent with hypothesis $H_{2\text{-}3h}$. Larger board sizes might in fact be detrimental the effectiveness and cohesiveness of boards, as they make it more difficult to arrange board meetings and reach a consensus, leading to slower and less-efficient decision-making, and to directors becoming less likely to criticise the behaviour of top managers (Jensen, 1993; Yermack, 1996).

In the sensitivity analysis section, I investigated three potential factors that might drive the results of this study: 1) Leveraged buyout targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986), and the degree of firm undervaluation might affect the results in the multivariate tests. 2) The interpretation of the results from the multivariate tests differs from that in prior literature if the value of dependent variables has been indicated as significantly negative in the univariate tests. 3) High correlations between sales growth (SalesGrow) and return on assets (ROA) in year T-2 of MBOs might lead to a problem of multicollinearity in multivariate regression models. The sensitivity analysis results suggest that these three factors do not drive the results of this study. Therefore, the results in this study are robust.

In summary, my findings have implications for policy-makers regarding board characteristics and outside shareholders. My results suggest that managers are motivated to engage in positive REM to secure external funding and to lower their financing costs preceding MBOs. Furthermore, managers are motivated to use positive REM to increase pre-buyout earnings in an attempt to increase the perceived value of their firm and/or increase the potential buyout costs, thus decreasing the probability of any potential IBO bidding, which might threaten their long-term job security.

My results suggest that managers engage in REM prior to both MBOs and IBOs. This implies that shareholders and potential investors should carefully scrutinise the relevant accounting earnings figures, as managers have been found to engage in REM prior to leveraged buyouts. Moreover, good corporate governance mechanisms can mitigate REM preceding leveraged buyouts. Specifically, high concentrations of outside ownership and high levels of institutional shareholding mitigate REM behaviours prior to MBOs. High CEO ownership, the presence of non-managerial large blockholders, CEO duality, and large boards all facilitate REM prior to both MBOs and IBOs. High equity ownership by non-executive directors and high percentages of non-executive directors on board facilitate REM prior to IBOs.

This study has focused on managerial REM behaviours preceding leveraged buyouts. It suggests that managers use positive REM to reduce firm undervaluation and increase potential buyout costs in an attempt to impede any potential IBO bidding. In other words, the IBO samples in this study are firms that might attempted to increase their firm value by engaging in positive earnings management, but fail to conceal their underperformance and ultimately become IBO targets. It would be ideal to have a control group including firms that might attempt to increase their firm value by engaging in positive earnings management, successfully concealing their underperformance and ultimately impeding any IBO bidding. Due to the limitations of the data, this study does not have such a control group. In other words, this study is based on actual rather than predicted IBO events data. Future research may overcome this issue by including a control group of firms that are not subject to IBO biddings but have high likelihood of being at risk of a takeover. Drawing on prior literature, future research could construct a model to identify firms with a high likelihood of being taken over in the market. By adding IBO firm characteristics into the model, it might be possible to distinguish firms with high likelihood of IBO takeover risks from firms with high likelihood of other takeover type risks. This might be a solution for this issue.

One corporate governance mechanism is identified as possibly having different effects on different types of REM simultaneously. For instance, CEO duality (Duality) is associated with more SGA expenses (GuySGA) but less R&D expenses (GuyRes&Dev) in year T-1 preceding MBOs. My explanation is based on the perception of short or long-term firm value maximisation from the perspective of a firm's governance authority. Future research may explore other factors that might influence the effectiveness of corporate governance mechanisms on different types of REM. For instance, if future research could consider the specific business environments or characteristics of a firm, the effectiveness of corporate governance mechanisms might change. For instance, in an industry that usually requires high levels of R&D investment, the governance authority might have high likelihood to constrain the reduction of R&D expenses.

Finally, although it was hypothesised that managers might engage in negative REM to conceal the real performance of a firm preceding MBOs, increasing the possibility of shareholders accepting a lower buyout price, the result was inconsistent with this hypothesis. This might be because managers systematically use multiple earnings management tools at the same time (both REM and AEM), and this issue will be explored in Chapter 4.

4. Chapter 4: The Relationship between Accrual-Based Earnings Management and Real Earnings Management Prior to Leveraged Buyouts

4.1 Introduction

This study aims to investigate the relationship between two types of earnings management, AEM and REM, preceding leveraged buyouts. This question is important because examining only one earnings management technique at a time may not explain the overall effect of earnings management activities if managers use AEM and REM as complements or as substitutes for each other (Fields et al., 2001). Depending on whether they participate in leveraged buyouts or not, managers might have different incentives for engaging in earnings management, and their choice of earnings management strategies might be different. Thus I subdivide leveraged buyouts into MBOs and IBOs.

In Chapters 1 and 2 respectively, I investigated managers' AEM and REM behaviours prior to leveraged buyouts. As discussed in prior chapters, in MBOs, managers are buyers that are likely to remain with the firm. They usually have high levels of personal investment in the firm after the buyouts. Hence I hypothesised that managers' personal economic stake may motivate them to engage in negative earnings management to portray the firm as relatively underperforming, so that shareholders might accept a lower buyout price. My findings in the previous two chapters suggest that managers engage in negative AEM preceding MBOs, which is consistent with this hypothesis. However, my findings also suggest that managers engage in positive REM preceding MBOs, which counters the hypothesis. Considering both approaches in conjunction, it is worth asking whether or not there is a relationship between AEM and REM preceding MBOs.

With regard to IBOs, IBO targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986). Firm undervaluation attracts IBO buyers, who wish to take control and engage in active monitoring or make changes to the firm's existing management team after the buyout (Hafzalla, 2009). Even if managers are not dismissed initially, the uncertainty regarding whether the business will be re-sold again within several years threatens managers' job security (Denis and Denis, 1995). As firm undervaluation attracts IBO buyers, the reduction of firm undervaluation is likely to reduce the possibility of becoming an IBO target. Hence I hypothesised that, in order to avoid becoming a target, managers might engage in positive earnings management to reduce firm undervaluation and/or increase the potential buyout costs in an attempt to impede any potential IBO bidding. The research indicates no evidence of systematic AEM compared to non-buyout firms prior to IBOs, which is inconsistent with this hypothesis. However, previous findings suggest that managers engage in positive REM preceding IBOs, which is consistent with this hypothesis.

Table 4.1.1 summarises the earnings management results in the previous two chapters.

Table 4.1.1 Summary of earnings management hypotheses and results

	Hypotheses	Actual Results	
		AEM (Accruals)	REM (Real)
MBOs	-	-	+
IBOs	+	/	+

Note: '+' means positive earnings management; '-' means negative earnings management; '/' means no evidence of systematic earnings management.

The inconsistency of the results in Table 4.1 raises the first research question:

1) Is there any relationship between AEM and REM preceding MBOs and IBOs?

Although both types of earnings management aim to conceal a company's actual performance, AEM and REM have distinct characteristics and impacts on firm performance. AEM is achieved by changing discretionary accrual choices within the boundary of GAAP. AEM typically takes place after the fiscal year end, and it changes the amount of accounting accruals without affecting cash flows (Kim and Sohn, 2013; Gunny, 2010). However, AEM has relatively higher risks of detection and, in the long-term, AEM carried out in the current period must be reversed in the future (Cohen and Zarowin, 2010a; Young, 1999). Furthermore, managers may have limited flexibility to exercise AEM (Gunny, 2010).

REM involves changing the operating decisions of a business, and managers have greater discretion when making operating decisions. REM consists of sub-optimal operating decisions made during a financial year, which are less likely to be scrutinised by internal and external auditors. However, REM affects current and future cash flows as well as accounting accruals (Kim and Sohn, 2013). For instance, sales manipulation of excessive credit sales leads to higher trade receivable but lower cash flows. Furthermore, managers do not have perfect control over the exact amount of REM attained (Zang, 2012). In addition, REM distorts the current period's normal operations, which is generally value destroying, particularly for the long-term success of a business (Kim and Sohn, 2013).

Both AEM and REM are associated with relative benefits and drawbacks. Therefore, managers may balance the use of different types of earnings management to meet their earnings manipulation targets in different circumstances, and to minimise the associated risks and costs at the same time. Accordingly, I hypothesise that there is a relationship between AEM and REM preceding both MBOs and IBOs.

A few prior studies examined the relationship between AEM and REM (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a; Zang, 2012). Cohen et al. (2008) investigated the impact of the post-SOX (Sarbanes–Oxley Act) scrutiny of accounting practices on the levels of AEM and REM. They found that firms switched from AEM to REM due to the increase in potential AEM costs imposed by SOX. Cohen and Zarowin (2010a) focused on both AEM and REM activities around seasoned equity offerings, and found that the costs of using AEM were positively related to the tendency to use REM in the year of seasoned equity offerings. These studies do not examine the costs of engaging in REM; hence they do not show the substitutive relationship as a function of the relative costs of the two earnings management strategies (Zang, 2012).

Zang (2012) introduced a set of variables that explain the constraints of each earnings management methods in investigating the relationship between AEM and REM. She established a recursive equation system that captures a sequence of decisions, in which AEM occurs after REM in order to offset an unexpectedly high (or low) REM impact. She found that managers trade off the two types of earnings management based on their relative costs, and adjust the level of AEM according to the level of REM realised. The limitation of the study by Zang (2012) is that her study is based on the whole market, while managers might have different incentives for their choice of earnings management strategies in different settings, such as leveraged buyouts. The above three studies do not adopt a simultaneous equations system that considers the decisions made for AEM and REM as being determined jointly.

Prior literature usually assumes that AEM and REM might be related sequentially in the sense that REM is engaged prior to AEM (e.g. Lara et al., 2012; Zang, 2012). This is because REM needs to be engaged in reasonably far ahead of the publication of the corporate reports in order to be feasible, whereas AEM is likely to be more flexibly arranged in the short run after fiscal year end (Kim and Sohn, 2013). Zang (2012) even suggests that AEM occurs after REM in order to offset an unexpectedly high (or low) REM impact. However, this sequential relationship is merely based the expectations on theoretical and/or practical considerations that REM must be made during an accounting period, and AEM is made after a fiscal year end. Moreover, if AEM and REM have a sequential relationship, which sequence the relationship is likely to be in. Prior studies do not actually test whether they get the sequence right.

Hence, this raises the question that whether there might really be a relationship given AEM and REM have distinct differences. Specifically, AEM is managerial discretion which focuses on distorting the impression of a firm’s financial position through changing discretionary accrual choices within the boundary of GAAP. It therefore directly influences the amount of accounting accruals and has no direct effect on cash flows (Kim and Sohn, 2013). REM distort normal operations in the current period to influence both accounting accruals and cash flows, and this impact is less likely to reverse in future (Kim and Sohn, 2013).

In contrast to prior literature, this study suggests that managers might consider both AEM and REM jointly, rather than consecutively. Given the availability of two earnings management methods, managers might consider the degree that they could engage in each type of earnings management before they really engage in each of them. This might because the limited flexibility to exercise AEM constrains managers, and they also face uncertainty as to which accounting treatments the auditor will allow at that time (Gunny, 2010). Moreover, both AEM and REM are associated with different drawback, the risk preference might lead managers to balance the use of each earnings management method.

Prior literature tends to simply use the aggregate measure of REM to investigate its potential relationship with AEM (e.g. Lara et al., 2012; Zang, 2012). The aggregation of quite different types of REM activities in prior studies might have increased the noise in the measure, which might lead to spurious results. This is because managers might adopt different strategies in terms of the different types of REM according to their potential long-term or short-term effects.

There might be a potential link between AEM and REM. In contrast to argue the sequence of AEM and aggregated REM, this study examines whether AEM and disaggregated REM might be related. As managers might adopt different strategies in terms of the different types of REM, the potential relationship between AEM and disaggregate types of REM might be different. Hence, this study uses disaggregate types of REM in investigation, which might provide a relatively more reliable result.

However, a potential relationship between AEM and REM is not a foregone conclusion. As AEM and REM have distinct differences, investigating AEM and REM behaviours separately is still valid. Moving from independent AEM and REM to interdependent AEM and REM, this chapter makes a further method based development to investigate the potential relationship between AEM and REM.

This study differs from prior literature in at least two aspects: First, this study extends the research on the relationship between AEM and REM into leveraged buyout settings by considering the impact of managerial incentives in different types of leveraged buyouts. Specifically, as managers may have different earnings management incentives in different types of leveraged buyouts, their earnings management strategy might vary. Hence I subdivide leveraged buyouts into MBO and IBO groups to examine the potential different effects. My sample includes all UK firms who made leveraged buyout announcements during the period from 1997 to 2011 and were finally delisted from the London Stock Exchange. Accordingly, the sample has been divided into MBOs and IBOs.

Before comparing the MBO and IBO samples, it is worth first considering management's choice to participate in buyouts. Before choosing to participate in an MBO, the earnings management behaviours of managers are driven by incentives that are unrelated to the buyouts, such as pursuing annual bonus plans or meeting analysts' expectations. These incentives for MBO firms are similar to those for IBO firms or non-buyout firms. However, once managers decide to take part in an MBO, the buyout-related incentives might begin to drive earnings management behaviour of managers. From then on, as long as the new incentives are unrelated to the earnings management that is already being made, comparing MBO and IBO samples is appropriate and makes it an ideal setting for this investigation. In other words, earnings management behaviours in IBO firms are expected to be different from those in MBO firms once managers decide to take part in MBOs.

Moreover, managerial incentives in earnings management decisions may be confounded by other factors that are unrelated to the buyout, such as beating expectation benchmark. This study has excluded these factors by using the earnings management of non-leveraged buyout industrial peers as a standard setting to calculate the abnormal AEM and REM of buyout firms. Therefore, any abnormal AEM or REM detected in this process is taken to be earnings management relating to leveraged buyouts. Due to this control, exploring earnings management behaviours prior to MBOs and IBOs is appropriate.

Managers have different incentives to engage in earnings management in different types of leveraged buyouts. These may have different effects on the relationships between AEM and REM. Prior to MBOs, as discussed before, managers might engage in negative earnings management in order to portray their firm as relatively underperforming, so that shareholders accept a lower buyout price (DeAngelo, 1986; Perry and Williams, 1994). Managers would then expect to increase their firm's value and profitability once the buyout was completed, in order to maximise the value of their equity. In this case, AEM is the best choice, as it can conceal real firm value in the present and reverse firm value in future. Furthermore, AEM only affects accounting accruals, and it causes little or no interference in the operation of the firm’s normal business. However, the cost of AEM is the associated high risk of detection it carries, in comparison with REM. Nevertheless, In MBOs, internal and external auditors might be less likely to scrutinise negative AEM than traditional positive AEM, which implies a low risk of detection. In contrast, REM cannot be reversed, and it interferes with a firm's normal operation in the current period, which is generally a value-destroying strategy in the long term (Kim and Sohn, 2013). Therefore, managers are likely to engage in more AEM or they might prefer to engage in AEM preceding MBOs.

In the previous two chapters, I demonstrated the findings of my study, which reveal that managers engage in negative AEM, and also in positive REM, preceding MBOs. By considering the managerial preference on AEM, it may be possible to detect a relationship between AEM and REM, and the potential relationship might be as follows:

In most MBO cases, managers find that internal financing is insufficient to meet the cash required to implement the buyouts. Hence, managers will engage in positive REM to enhance prospective external financiers’ perceptions of the firm’s value to secure financing (Fischer and Louis, 2008). However, positive REM might increase a firm's value, and thus shareholders might demand a higher selling price. As managers intend to buy their firm at a relatively cheap price, they will also engage in negative AEM. The advantage of AEM makes it as an ideal tool to adjust the final earnings figures and pre-buyout firm value.

Hence managers might engage in positive REM during the accounting period, to increase earnings, and engage in negative AEM after the end of the accounting period, to adjust earnings down to the target level of earnings management in total. The total level of earnings management should be relatively positive in order to enhance external financiers’ perceptions of the firm’s value preceding MBOs. Moreover, as only AEM can be reversed in the future, the combination of positive REM and negative AEM could conceal more of a firm's value prior to an MBO, for a pre-set earnings target. In addition, engaging in both AEM and REM might make the analysis of the real performance of a firm more complicated for outsiders. Hence it might help to persuade shareholders to accept managers’ offer price and make potential competing bidders spend more time preparing their bids.

Therefore, if the total earnings management target is slightly positive and easy to achieve, managers might engage in more positive REM and more negative AEM to conceal more of a firm's value. Hence AEM and REM might have a complementary relationship. Moreover, if the total earnings management target is aggressively positive and difficult to beat, managers might engage in more positive REM and less negative AEM with the primary goal of achieving the target level of earnings management. Thus AEM and REM might have a substitutive relationship. Therefore, there might be a complimentary or substitutive relationship between AEM and REM prior to MBOs.

Prior to IBOs, managers might engage in positive earnings management to minimise the undervaluation of their firm, so that to retain their control and management positions (Hafzalla, 2009). While AEM can be used to increase earnings figures without affecting the normal operation of a business, it is associated with a higher risk of detection in comparison to REM. Prior to IBOs, managers' ability to predict IBOs is much less accurate, and they usually do not have a long time to prepare. Furthermore, when the positive AEM is reversed in the future, it might affect the firm's value leading to further undervaluation. In contrast, REM is less likely to be scrutinised by internal and external auditors, as it involves changing operating decisions. The negative effects of REM are more likely to occur in the long term compared to AEM reversion, but it is not a concern of management at the time. Therefore, preceding IBOs, managers are likely to engage in more REM or they might prefer to engage in REM.

In the previous two chapters, I predicted that managers might engage in positive earnings management preceding IBOs in an attempt to increase the value of their firm and impede any IBO bids. My findings suggest that managers engaged in positive REM preceding IBOs, whereas there was no evidence of greater AEM being carried out than in non-buyout firms prior to IBOs. By considering the managerial preference for REM, it may be possible to detect a relationship between AEM and REM, and the potential relationship might be as described below.

Prior to IBOs, the total level of earnings management should be positive, in order to increase a firm's value. As managers usually do not have a long time to prepare earnings management strategies, they are likely to start positive REM during the accounting period to increase earnings. Moreover, managers might also consider how much AEM they could engage when they manipulate REM, as AEM could be engaged after an accounting period end. Hence, if the earnings management target is easy to beat, managers might increase REM and decrease AEM in consideration of the relative benefits and risks. In this case, AEM and REM might have a substitutive relationship. If the earnings management target is hard to beat, managers might increase both REM and AEM practices concurrently to ensure that the earnings management target can be achieved. Hence AEM and REM might have a complementary relationship. Therefore, there might be a substitutive or complimentary relationship between AEM and REM prior to IBOs.

Second, this study constructs a simultaneous equation system to capture the relationship between AEM and REM. Prior literature suggests that AEM and REM jointly depend on each other (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a). For instance, if a cost-related factor affects the level of one earnings management method, managers may adjust the level of another earnings management method simultaneously. This implies that, although managers engage in AEM and REM at different points in time, decisions about the level of different earnings management methods are made simultaneously.

Related researches have used a simultaneous equation system to examine how managers use multiple accounting and operating measures to achieve one or more goals. For instance, Beatty et al. (1995) constructed a simultaneous equations system to investigate how managers in the banking industry use two accruals accounts (loan loss provisions and loan charge-offs) and three operating transactions (pension settlement transactions, miscellaneous gains and losses due to asset sales, and issuance of new securities) to achieve three goals (optimal primary capital, reported earnings, and taxable income levels). Barton (2001) and Pincus and Shivaram (2002) also used simultaneous equations systems, and found that derivative hedging and accruals management are simultaneously determined in order to manage earnings volatility. Therefore, a simultaneous equations system might be suitable for capturing the relationships between AEM and REM preceding leveraged buyouts.

Moreover, prior literature has investigated the relationship between AEM and REM by considering a set of factors that may constrain managers' ability to engage in earnings management and the degree to which they can do so (e.g. Zang, 2012; Lara et al., 2012). They indicate that the relative costs and managers' ability to use AEM and REM constrain the relationship between the two earnings management methods. For instance, if managers are less able to use REM or the associated costs are high, they tend to use more AEM. Similarly, if the abilities to use AEM are constrained or the costs attached are high, managers tend to use more REM. In respect to the buyouts setting, this raises a second research question:

2) Do the constraints of earnings management methods have asymmetric effects on the relationship between AEM and REM preceding MBOs and IBOs?

As in previous studies (e.g. Cohen and Zarowin, 2010a; Zang, 2012), this study assumes that AEM is constrained by scrutiny from auditors, the corporate governance mechanisms of audit committees and flexibility within a firm's accounting systems.

This study uses Big 5 auditors and auditor tenure as a proxy for scrutiny from auditors. Larger audit firms tend to deliver a higher audit quality than smaller, less well-known firms do, because they are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (e.g. Becker et al., 1998). Audit quality increases with tenure, as the risk of not detecting errors due to unfamiliarity decreases (Stice, 1991).

Larger audit committees are desirable to elevate their organisational status, and are thus more likely to be acknowledged as an authoritative body by the external and internal audit functions (Louis Braiotta et al., 2010). This may enhance the performance of the internal audit function of audit committees (Abbott et al., 2004; Vafeas, 2005). Higher equity ownership by audit committee members aligns the interests of these directors with those of external shareholders, which creates a personal incentive to actively monitor managers (Bhagat et al., 1999). Audit committee members with high levels of shareholding are less likely to collude with management to manipulate earnings, because it would ultimately harm their own interests (Vafeas, 2005).

The length of operating cycles is used as a proxy for the flexibility within a firm’s accounting systems. Firms with longer operating cycles have greater flexibility for AEM as they have larger accruals accounts and a longer period for accruals to reverse (Zang, 2012).

Moreover, in line with previous literature (e.g. Zang, 2012; Lara et al., 2012), this study expects that REM is likely to be constrained by firm performance, market-leader status in the industry, financial health, institutional ownership, the degree of firm undervaluation, board size and the percentage of non-executive directors on boards.

Firms with relatively good performance are less likely to use REM to improve their earnings figures because managers do not need to engage in earnings management to produce better accounting results when their firm already perform well (Becker et al., 1998; Bédard et al., 2004). Firms without market-leader status are less likely to use REM because it erodes their competitive advantage. Market-leader firms usually have more competitive advantages than their followers do, including greater cumulative experience and bargaining power with suppliers and customers, which makes REM less costly for them (Zang, 2012). Firms with poor financial health tend to bear a relatively high marginal cost of deviating from optimal business strategies, so REM might be perceived as relatively costly manipulations (Graham et al., 2005; Zang, 2012). Firms with high institutional ownership are less likely to engage in REM because their operation is closely monitored by institutions (Roychowdhury, 2006). Institutional investors are more sophisticated and informed than other investors, and they provide a high degree of monitoring, removing the incentives for myopic behaviour among managers (Bushee, 1998). Firms with a high degree of undervaluation are more likely to use REM to improve their firm value to secure their external financing prior to MBOs, or to impede any potential IBOs.

Larger boards may have increased abilities when it comes to monitoring management, and they bring various skills and expertise to support and review the performance of a firm (Ronen and Yaari, 2007). Non-executive directors are better advisers, as they provide or facilitate access to external resources which are critical to a firm’s success (Daily et al., 2003). Non-executive directors are also more independent than executive directors, and are therefore expected to have greater incentives to carry out monitoring (Fama and Jensen, 1983a).

In the previous two chapters, I investigated the existence of AEM and REM. I also investigated how corporate governance mechanisms, such as board structure and audit committee characteristics, affect the two earnings management methods. However, this chapter differs from the prior chapters as it investigates the relationship between AEM and REM using a simultaneous equations system. I also investigate how the constraints of the two earnings management methods affect the potential relationship between AEM and REM. Specifically, in addition to the corporate governance mechanisms discussed in the previous two chapters, this chapter includes firm characteristics, such as market-leader status in the industry, as additional constraints on the two earnings management methods.

The remainder of this paper is structured as follows: Section 2 reviews the prior literature and develops hypotheses. Section 3 outlines the proposed research design. Section 4 reports the empirical results and findings. Section 5 is sensitive analysis. Section 6 presents the conclusion.

4.2 Literature Review and Hypothesis Development

4.2.1 The relationship between accruals and real earnings management

Although both types of earnings management aim to conceal a company's actual performance, AEM and REM have distinct characteristics and impacts on firm performance. AEM involves changing discretionary accrual choices within the boundary of GAAP. It therefore directly influences the amount of accounting accruals and has no direct effect on cash flows (Kim and Sohn, 2013). AEM typically takes place after the end of a fiscal year, when the need for earnings management is certain (Gunny, 2010). However, as AEM is achieved by changing the accounting methods or estimates used, ex-post aggressive accounting choices with respect to accruals carry a higher risk of attracting scrutiny from auditors or regulators (Cohen and Zarowin, 2010a). Moreover, AEM must take place after most real operating activities are completed, and relying on AEM only is risky for managers. Managers may have limited flexibility to exercise AEM, and they also face uncertainty as to which accounting treatments the auditor will allow at that time (Gunny, 2010). Furthermore, from a long-term perspective, AEM carried out in the current period, must be reversed in the future (Young, 1999).

REM involves changing the operating decisions of a business, and managers have great discretion about making operating decisions. Hence REM is sub-optimal operating decisions made during a financial year, and it is less likely to be scrutinised by internal and external auditors. The drawback is that REM can have direct consequences on current and future cash flows as well as accounting accruals (Kim and Sohn, 2013). For instance, sales manipulation in the form of excessive credit sales leads to higher trade receivable but lower cash flows. Moreover, when managers alter real business operating decisions to manage earnings, they usually do not have perfect control over the exact amount of real activities manipulation attained (Zang, 2012). In addition, REM influences short-term reported earnings at the expense of distorting normal operations in the current period, and thus it is generally value destroying, particularly for the long-term success of the business (Kim and Sohn, 2013).

As both AEM and REM are associated with relative benefits and drawbacks, engaging either one alone might not be a wise choice for managers. However, given the portfolio of earnings management strategies, managers are likely to use multiple earnings management tools at the same time to meet their earnings manipulation targets in different circumstances. Managers may also balance the use of different types of earnings management to minimise the associated risks and costs at the same time (Zang, 2012). Hence there might be a potential substitutive or complementary relationship between AEM and REM. Generally, if an earnings management targets is difficult to beat, managers might use AEM and REM as complements in an attempt to achieve the expected earnings management level. Moreover, if an earnings management target is easy to achieve, managers might use AEM and REM as substitutes according to their relative costs and benefits. In addition, given that REM should be engaged prior to AEM, if the realised unexpected level of REM is too high, AEM might be used to offset the unexpected level of earnings management to achieve desired goal in total.

A number of empirical studies have investigated how managers use combinations of accounting accruals and real activities manipulation to achieve one or more goals, and their results suggest that there is a relationship between AEM and REM (e.g. Beatty et al., 1995; Barton, 2001; Pincus and Shivaram, 2002; Badertscher, 2011; Cohen et al., 2008; Cohen and Zarowin, 2010a; Lara et al., 2012; Zang, 2012).

Barton (2001) investigated managers' incentives to maintain a desired level of earnings volatility through derivative hedging and accruals management, using data from 1994 to 1996 for a sample of non-financial, non-regulated Fortune 500 firms. He found a negative relationship between foreign exchange and interest rate derivative holdings and discretionary accruals, which suggests they are partial substitutes for smoothing earnings.

Pincus and Shivaram (2002) examined managers' incentives to maintain a desired level of earnings volatility through hedging with commodity derivatives and manipulating accruals accounts in oil and gas producing firms. They found a sequential process whereby managers first determine the extent to which they hedge oil price risk by derivatives and then, especially in the fourth quarter, manage the volatility of residual earnings by trading off abnormal accruals and hedging with derivatives in order to smooth the income.

Beatty et al. (1995) investigated how commercial bank managers minimised the combination costs of deviating from optimal primary capital, taxable income levels and reported earnings by manipulating two accruals accounts (loan loss provisions and loan charge-offs) and three operating transactions (pension settlement transactions, miscellaneous gains and losses such as asset sales, and issuance of new securities). Beatty et al. (1995) found that managers simultaneously manipulated discretionary accounts (loan loss provisions and loan charge-offs) and one operating transaction (issuance of new securities) to adjust the level of regulatory capital. They also found that the discretion in each of these manipulation choices depended on the levels of the other two as well as on the level of miscellaneous gains and losses.

Badertscher (2011) examined how the degree and duration of overvaluation affected managers' choice of alternative earnings management mechanisms. He found that, during a sustained period of overvaluation, managers engage in accruals management in the early stages and then move to real transactions management in order to sustain their overvalued equity. Moreover, they found that the longer a firm is overvalued, the more likely its managers engage in accruals management outside the boundaries of GAAP. Badertscher (2011) suggested that the duration of overvaluation is an important determinant in managers' choice of earnings management strategies.

These empirical studies reveal that there is a relationship between AEM and REM because managers use both of them simultaneously to achieve one or more earnings manipulation targets. In contrast to previous studies, this research examines the relationship between AEM and REM in leveraged buyout settings. As managers have different earnings management incentives in different types of leveraged buyouts, which may affect the relationships between AEM and REM differently prior to MBOs and IBOs.

4.2.2 The relationships of earnings management preceding management buyouts

In MBOs, managers will remain in the firm after buyouts. As discussed before, managers intend to engage in negative earnings management to portray the firm as relatively underperforming prior to a buyout, so that shareholders accept a lower buyout price (DeAngelo, 1986; Perry and Williams, 1994). Once the buyout transaction is completed, managers then expect to increase their firm value and profitability as much as possible to increase the value of their equity. Thus the optimal earnings management method for managers is the one that conceals real firm performance prior to a buyout, and allows the concealed earnings to then be reversed after the buyout. As AEM can be used to do both, it is a suitable choice for managers prior to a buyout. Further, AEM only affects accounting accruals, and it has little or no interference of the firm's normal business operations. However, the cost of AEM is the associated high risk of detection in comparison with REM. Yet in MBOs, internal and external auditors might be less likely to scrutinise negative AEM than traditional positive AEM, which implies a lower risk of detection. In contrast, REM made in the current period cannot be reversed in the future, and thus is not an ideal method of earnings manipulation. In addition, REM influences short-term reported earnings at the expense of distorting current operations, hence it generally destroys firm value, particularly for the long-term success of the business (Kim and Sohn, 2013). Therefore, preceding MBOs, managers are likely to engage in more AEM or they might prefer to engage in AEM.

In the previous two chapters, I predicted that managers might engage in negative earnings management preceding MBOs in an attempt to buy their firm at a relatively cheap price. My findings suggested that managers engage in negative AEM preceding MBOs, but managers engage in positive REM preceding MBOs. By considering the managerial preference on AEM, this may suggest a relationship between AEM and REM, which might be as follows:

In MBOs, management is part of the investment group buying the firm. In most cases, the internal financing by managers is insufficient to meet the cash required to implement the buyout. Managers will therefore consider their ability to access external funding, and thus they will engage in positive REM to enhance prospective external financiers' perceptions of the firm's value (Fischer and Louis, 2008). However, this apparent increased value of the firm may lead shareholders to demand a higher selling price, which in turn increases the cost of an MBO. Therefore, in order to buy their firm at a relatively cheap price, managers will also engage in negative AEM practices. As discussed above, AEM is an ideal tool for adjusting the final earnings figures and pre-buyout firm value, because it can be used to conceal present real firm value, which may then be reversed without interfering with normal business operations.

Hence, by carefully planning the buyout case, managers are likely to engage in positive REM during the accounting period to increase sales and earnings figures and then, after the accounting period ends, they may engage in negative AEM to decrease those earnings figures according to the realised positive REM in order to achieve the target level of earnings management in total. By considering the combined effects of AEM and REM practices, the total level of earnings management should be relatively positive, which may positively influence external financiers' perceptions of the firm's value, helping firms to secure financing preceding MBOs. Moreover, as only AEM will reverse in future, for a pre-set goal of earnings management in total, a combination of positive REM and negative AEM practices may enable managers to conceal more of a firm's value prior to MBOs. In other words the purpose of negative AEM is to adjust earnings figures down, and to conceal the real value of a firm prior to MBOs. In addition, engaging in both AEM and REM might make it more difficult for outsiders to analyse a firm's real performance and thus assess its true value. This may help persuade shareholders accept managers' offer price, and cause potential competing bidders to spend more time preparing their biddings.

Therefore, if the total earnings management target is slightly positive and easy to achieve, managers might engage in more positive REM and more negative AEM to conceal more of the value of a firm before a buyout, and then reverse the firm value after buyouts. This may imply that AEM and REM have a complementary relationship, more positive REM being associated with more negative AEM prior to MBOs, or more negative AEM being associated with more positive REM. Moreover, if the total earnings management target is aggressively positive and difficult to beat, managers might engage in more positive REM and less negative AEM with the primary goal to achieve the target level of earnings management in total. This may imply that AEM and REM have a substitutive relationship, more positive REM being associated with less negative AEM prior to MBOs, or more negative AEM being associated with less positive REM. Therefore, there might be a complimentary or substitutive relationship between AEM and REM prior to MBOs. Accordingly, I hypothesise as follows:

Either

$H_{3\text{-}1a}$: There is a positive relationship between AEM and REM preceding MBOs

or

$H_{3\text{-}1b}$: There is a negative relationship between AEM and REM preceding MBOs

4.2.3 The relationships of earnings management preceding institutional buyouts

In IBOs, managers are motivated to engage in positive earnings management to minimise firm undervaluation and thus to retain their control and management position (Hafzalla, 2009). AEM improves earnings figures without interfering with the normal operating of the business. However, as previously mentioned, the cost of AEM is the associated high risk of detection in comparison with REM. Furthermore, managers' ability to predict IBOs is much less accurate than in MBOs, and they tend to be much more uncertain about the actual event happening. Hence managers usually do not have a long time to prepare for it, and cannot therefore carefully plan the degree of AEM manipulation or the time schedule. Thus managers bear relatively higher risks when engaging in AEM than REM. Furthermore, AEM made in the current period must be reversed in the future (Young, 1999). When the mean reversion of AEM occurs in the near future, it might further reduce the firm value and make the situation worse.

In contrast, REM is less likely to be scrutinised by internal and external auditors, as it involves changing discretionary business operating decisions. Moreover, REM made in the current period is less likely to reverse in the future. REM might affect the long-term success of the business, which is likely to occur in the long future in comparison to AEM reversion. Nevertheless, the long-term success of the business is often not a concern of management at the time of engaging in earnings management, when the focus is on increasing current earnings. Therefore, preceding IBOs, managers are likely to engage in more REM or they might prefer to engage in REM.

In the previous two chapters, I predicted that managers might engage in positive earnings management preceding IBOs in an attempt to increase firm value and thus impede any IBO biddings. My findings suggested that managers engage in positive REM preceding IBOs, whereas there is no evidence of making more use of AEM than non-buyout firms prior to IBOs. By considering the managerial preference on REM, there might be a relationship between AEM and REM. I attempt to describe this potential relationship below.

Prior to IBOs, firm undervaluation attracts potential IBO buyers, who wish to take control of the firm, to engage in active monitoring or to make changes to the firm’s existing management team after the buyouts (Hafzalla, 2009). In order to retain their position in management, their control of the firm and even long-term job security, managers are motivated to engage in positive earnings management in order to minimise firm undervaluation. As managers do not usually have a long time in which to prepare earnings-management strategies, and as they tend to prefer REM in this circumstance, they are likely to engage in positive REM during the accounting period to increase sales and earnings figures. Managers might also consider how much AEM they could engage after the accounting period end when they manipulate REM.

The total level of earnings management should be relatively positive in order to increase a firm's value preceding an IBO. Hence if the earnings management target is easy to achieve, managers might increase REM and decrease AEM practices by considering the relative benefits and risks. In this case, AEM and REM may appear to have a substitutive relationship, more positive REM being associated with less positive AEM prior to IBOs, or more positive AEM being associated with less positive REM. Moreover, if the earnings management target is hard to beat, managers might increase positive REM and positive AEM concurrently to ensure that their earnings management target can be achieved. This may imply that AEM and REM have a complementary relationship, in which more positive REM is associated with more positive AEM prior to IBOs, or more positive AEM is associated with more positive REM. Therefore, there might be a complimentary or substitutive relationship between AEM and REM prior to IBOs. Accordingly, I hypothesise as follows:

Either
$H_{3\text{-}2a}$: There is a positive relationship between AEM and REM preceding IBOs
or

$H_{3\text{-}2b}$: There is a negative relationship between AEM and REM preceding IBOs

4.2.4 Constraints affecting the relationship between accruals and real earnings management

The relationship between AEM and REM might be affected by the relative constraints on the two earnings management methods. Both AEM and REM are costly: AEM has relatively high risks of detection (Cohen and Zarowin, 2010a) and REM interferes with normal business operation (Kim and Sohn, 2013). Managers' ability to use earnings management methods might be constrained by the accounting environment and firm-specific characteristics. In other words, given a desired level of earnings management, when discretion is more constrained for one earnings management tool, managers will tend to use more of the other (Zang, 2012). Therefore, the constraints of the two earnings management methods should be included in the investigation of the relationships between AEM and REM.

Two studies examined the impact of the constraints of AEM on the choice of earnings management strategies. Cohen et al. (2008) focused on the heightened post-SOX scrutiny of accounting practice and its impact on the levels of AEM and REM. They found that AEM declined but REM increased after the passage of SOX, which suggests that firms switched from AEM to REM due to the increased potential costs of AEM imposed by SOX. Cohen and Zarowin (2010a) examined both AEM and REM activities around seasoned equity offerings. They controlled a set of variables that explain managers' ability to use AEM, including auditor characteristics and the probability of litigation, and the costs of doing so. They found that the costs of using AEM were positively related to the tendency to use REM in the year of seasoned equity offerings. Neither of the studies examined the constraints of engaging in REM, hence they do not show the substitutive relationship as a function of the relative costs of the two earnings management strategies (Zang, 2012).

Lara et al. (2012) investigated the association between accounting conservatism and both AEM and REM by controlling for the constraints of both AEM and REM. They found a negative association between accounting conservatism and AEM, but a positive association between accounting conservatism and REM. They suggest that conservatism facilitated the monitoring of managerial accounting choices, potentially limiting the opportunities for engaging in AEM and leading managers to shift to potentially more costly REM practices.

Zang (2012) investigated the relationship between AEM and REM by including a set of variables that explain the constraints of both earnings management methods. She suggests that AEM occurs after REM, and that AEM is used to offset an unexpectedly high or low impact from REM. She established a recursive equation system to capture the sequence of managers' decisions. She found that managers balance the use of the two types of earnings management based on their relative constraints, and that managers adjust the level of AEM according to the level of REM realised.

While these studies examined the relationship between AEM and REM in a general setting, managers might have different incentives for their choice of earnings management strategies in other settings, such as leveraged buyouts. Furthermore, although the above studies include the incentive of constraints when examining the choices of managerial earnings-management strategies, they do not adopt a simultaneous equation system that considers the decisions made for AEM and REM as being jointly determined.

Different from prior literature, this study will examine whether managerial incentives in MBOs and IBOs affect the relationships between AEM and REM in addition to the relative constraints associated with each method of earnings management. As the buyout settings provide more complicated incentives for managers to determine their earnings management strategies, the relationship between AEM and REM might be more than the simple substitutive relationship shown in prior studies.

4.2.5 Constraints on accruals earnings management

Similar to previous literature (e.g. Cohen and Zarowin, 2010a; Zang, 2012), this study expects that AEM is constrained by scrutiny from auditors, corporate governance mechanisms of audit committees, and flexibility within firms' accounting systems. This study uses Big 5 auditors and auditor tenure to proxy for scrutiny from auditors. Audit committee size and equity ownership by members of the audit committee are used to proxy for corporate governance mechanisms of audit committee. The length of operating cycles is used to proxy for flexibility within firms' accounting systems.

4.2.5.1 Big 5 auditors

Big 5 audit firms are expected to deliver a higher audit quality than smaller, less well-known firms, because large audit firms are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (Becker et al., 1998). They also have more resources to invest in improving the quality of their work. Hence Big 5 audit firms have greater incentives to detect and disclose misstatement by managers, which differentiates the quality of their audits (DeAngelo, 1981). Prior literature suggested that Big 5 auditor firms have lower litigation rates and charge higher audit fees for a higher audit quality, or have a monopoly on pricing (e.g. Palmrose, 1986a; Palmrose, 1988). Big 5 auditors are likely to be more experienced, and they are likely to constrain accruals earnings management (Francis et al., 1999). Hence firms with Big 5 auditors may have a lower level of AEM. Similar to prior studies (e.g. Palmrose, 1986a; Palmrose, 1988), this study uses a dummy variable to measure whether a firm's auditor is one of the Big 5 auditors (Big5). Accordingly, I hypothesise as follows:

$H_{3\text{-}3a}$: Preceding MBOs, firms with Big 5 auditors have a lower level of AEM

$H_{3\text{-}3b}$: Preceding IBOs, firms with Big 5 auditors have a lower level of AEM

4.2.5.2 Auditor tenure

The audit quality increases with tenure, as the risk of not detecting errors due to unfamiliarity decreases (Stice, 1991). New auditors lack sufficient knowledge regarding firm-specific risks, and they usually incur significant start-up costs in initial audits as they familiarise themselves with a client's operations. In this case, there is an increased risk that they will not detect errors. Auditors learn during auditing process and their experience with a client increases, thereby resulting in greater efficiency in the collection and evaluation of evidence (Stice, 1991). Research by Myers et al. (2003) found that longer audit firm tenure is associated with less extreme income-increasing and income-decreasing accruals, which suggests that AEM becomes more limited over longer tenures. Hence firms with longer auditor tenure may have a lower level of AEM.

However, some researchers argued that extended auditor-client relationships might impair auditor independence and thus decrease the quality of audits. Extended auditor tenure might have a detrimental effect on an auditor's independence as its objectivity about a client may be reduced over time. Decreased auditor independence might lead auditors to support more aggressive accounting choices that reach the boundaries of GAAP and ultimately result in failures to detect material fraud and/or misstatements (Myers et al., 2003).

Similar to prior literature (Zang, 2012), this study measures auditor tenure (LNAuditTn) as the natural logarithm of the number of total consecutive years that a firm is audited by the same auditor. In respect to these arguments, I hypothesise as follows:

$H_{3\text{-}4a}$: Preceding MBOs, firms with longer auditor tenure have a lower level of AEM

$H_{3\text{-}4b}$: Preceding IBOs, firms with longer auditor tenure have a lower level of AEM

4.2.5.3 Audit committee size

The board is the provider of various resources, and larger numbers of directors will expand the available resources of the board (Hillman and Dalziel, 2003). Adding more directors to serve an audit committee may ensure a minimum required knowledge base (Vafeas, 2005). In addition, the effectiveness of an audit committee is significantly related to audit committee power (Kalbers and Fogarty, 1993). Larger audit committees have a higher organisational status, and are thus more likely to be acknowledged as an authoritative body by external and internal audit functions (Louis Braiotta et al., 2010). The increased organisational status and power of the audit committee may enhance the performance of its internal audit function (Abbott et al., 2004; Vafeas, 2005). Hence firms with larger audit committees may have a lower level of AEM. Similar to prior researches (e.g. Xie et al., 2003; Vafeas, 2005; Bédard et al., 2004; Lin et al., 2006), this study uses the number of members in an audit committee as a measurement of its size (AudComSz). Accordingly, I hypothesise as follows:

$H_{3\text{-}5a}$: Preceding MBOs, firms with larger audit committees have a lower level of AEM

$H_{3\text{-}5b}$: Preceding IBOs, firms with larger audit committees have a lower level of AEM

4.2.5.4 Equity ownership by members of the audit committee

Directors who own more equity in a firm are expected to protect shareholder interests more effectively (Jensen and Meckling, 1976). As equity ownership aligns the interests of directors and external shareholders, more equity ownership by the directors creates a personal incentive to actively monitor (Bhagat et al., 1999). Furthermore, large shareholders have a powerful personal incentive to exercise effective monitoring, because their equity ownership makes them an effective agent of external shareholders (Bhagat et al., 1999). A higher level of equity ownership held by audit committee members is likely to mitigate the risk of these directors colluding with management to manipulate earnings, because such collusion would also ultimately harm their own interests (Vafeas, 2005).

As discussed in previous chapters, prior to MBOs, managers are likely to adopt negative AEM in an attempt to depress the MBO offer price. As a lower MBO offer price generates a lower premium for selling shareholders, the negative AEM harms the interests of selling shareholders. Thus members of an audit committee with high equity ownership are inclined to actively monitor negative AEM, which leads to less AEM preceding MBOs.

However, prior to IBOs, the findings in prior chapters suggest that managers are likely to exercise positive AEM in an attempt to increase the value of a firm. The share ownership might impair the independence of audit committee members and lead to a reduced level of monitoring. Hence members of audit committee holding high equity ownership might compromise to upwards AEM, leading to higher levels of AEM preceding IBOs. Similar to prior literature (Klein, 2002; Lin et al., 2006; Xie et al., 2003), this study uses the common stock cumulatively owned by audit committee members to proxy for this constraint (AudShare). Accordingly, I hypothesise as follows:

$H_{3\text{-}6a}$: Preceding MBOs, higher equity ownership by members of the audit committee have a lower level of AEM

$H_{3\text{-}6b}$: Preceding IBOs, higher equity ownership by members of the audit committee have a higher level of AEM

4.2.5.5 Length of operating cycle

The length of operating cycles is used to measure for the flexibility within firms' accounting systems. Firm with longer operating cycles have greater flexibility for AEM as they have larger accruals accounts and a longer period for accruals to reverse (Zang, 2012). For instance, if a firm has larger credit trading with suppliers and customers than their industry peers have, they will also have higher accruals. Hence firms with shorter lengths of operating cycle might have a lower level of AEM as it offers less flexibility for AEM. Similar to prior literature (Lara et al., 2012), this study measures the operating cycle (OpeCycle) as the days receivable plus the days inventory less the days payable at the beginning of the year, as defined by Dechow (1994). Accordingly, I hypothesise as follows:

$H_{3\text{-}7a}$: Preceding MBOs, firms with shorter length of operating cycle have a lower level of AEM

$H_{3\text{-}7b}$: Preceding IBOs, firms with shorter length of operating cycle have a lower level of AEM

4.2.6 Constraints on real earnings management choices

Similar to previous studies (e.g. Zang, 2012; Lara et al., 2012) this study expects REM to be constrained by firm performance, market-leader status in the industry, financial health, institutional ownerships, board size and the percentage of non-executive directors on board.

4.2.6.1 Firm performance

Firms with relatively better performance are less likely to use REM to improve their earnings figures. Therefore, in more profitable firms, managers are less likely to engage in income-increasing earnings management behaviours to produce better accounting results, as their firm already performs well (Becker et al., 1998; Bédard et al., 2004). Consequently, pernicious earnings management, such as REM, is rarely exercised in firms that are more profitable. Similar to prior literature (e.g. Bédard et al., 2004), this study measures firm performance by the current year's return on assets (ROA). Accordingly, I hypothesise as follows:

$H_{3\text{-}8a}$: Preceding MBOs, firms with better performance have a lower level of REM

$H_{3\text{-}8b}$: Preceding IBOs, firms with better performance have a lower level of REM

4.2.6.2 Market-leader status in the industry

REM is unlikely to increase the long-term value of a firm, as it departs from optimal operating decisions for a business. REM might be particularly costly for firms in industries with intense competition. Within an industry, firms are likely to face various levels of competition, and thus deviating from optimal business strategies may lead to different impacts on their performance. Market-leader firms usually enjoy more competitive advantages than their followers do because they have greater cumulative experience, higher ability to benefit from economies of scale, more bargaining power with suppliers and customers, higher attention from investors and greater influence on their competitors (Woo, 1983). Hence REM might be less costly for market-leader firms where the erosion of their competitive advantage would be relatively small (Zang, 2012). Similar to prior literature (e.g. Lara et al., 2012; Zang, 2012), this study measures market-leader status by a firm’s market share in its industry (MarketSh). Accordingly, I hypothesise as follows:

$H_{3\text{-}9a}$: Preceding MBOs, firms without market-leader status have a lower level of REM

$H_{3\text{-}9b}$: Preceding IBOs, firms without market-leader status have a lower level of REM

4.2.6.3 Financial health

A firm with poor financial health is likely to bear a relatively high marginal cost of deviating from optimal business strategies, such as sharp decreases in cash flow for a financial difficulty firm. In this case, REM might be perceived as a relatively high-cost manipulation, while the primary goal of managers is to improve operations (Zang, 2012). Evidence from the survey by Graham et al. (2005) suggests that if a firm experiences financial distress, managers' efforts to survive will dominate their reporting concerns. Therefore, a firm with poor financial health is likely to engage in less REM. Similar to prior literature (e.g. Lara et al., 2012; Zang, 2012), a modified Altman's Z-score (Altman, 2000) is used in this study as a proxy for financial health (Z-score). Accordingly, I hypothesise as follows:

$H_{3\text{-}10a}$: Preceding MBOs, firms with poor financial health have a lower level of REM

$H_{3\text{-}10b}$: Preceding IBOs, firms with poor financial health have a lower level of REM

4.2.6.4 Institutional ownership

Managers find it difficult to engage in REM when their operations are being monitored closely by institutional investors (Bushee, 1998). Institutional investors provide a high degree of monitoring for removing incentives on managerial myopic behaviour. This can occur either explicitly, through governance practices, or implicitly, through information gathering concerning the quality of operating decisions and correctly pricing the impact of managerial decisions. Institutions that intend to hold substantial equity in the long-term have strong incentives to incur the cost of explicit monitoring to ensure that managers do not use REM to meet short-term earnings goals (Bushee, 1998).

Moreover, institutional investors are more sophisticated and informed than other investors are. As REM has real economic consequences for the long-term value of firms, institutional investors are likely to have a better understanding of the long-term impact of firms' operating decisions, leading to more effort in monitoring REM activities. Prior studies suggest that institutional investors play a monitoring role in reducing REM practice.[18] Bushee (1998) reports that firms with high institutional ownership are less likely to cut R&D expenditures to avoid a decline in earnings. Roychowdhury (2006) found a negative relationship between institutional ownership and REM to avoid reporting negative earnings. Similar to prior literature (e.g. Bushee, 1998), this study measures institutional ownership (InsShare) as the total percentages of shares that are held by institutions. Accordingly, I hypothesise as follows:

$H_{3\text{-}11a}$: Preceding MBOs, firms with higher institutional ownership have a lower level of REM

$H_{3\text{-}11b}$: Preceding IBOs, firms with higher institutional ownership have a lower level of REM

4.2.6.5 The degree of firm undervaluation

Firms with a high degree of share undervaluation are more likely to use REM

[18] However, there is also evidence that 'transient' institutions, or those with a high portfolio turnover and highly diversified portfolio holdings, increase managerial myopic behaviour (e.g. Bushee 1998; Bushee 2001). In this study, I focus on the average effect of institutional ownership on firms' earnings management activities without looking into the investment horizon of different institutions.

to increase earnings figures because they are particularly likely to become the target of a takeover. Leveraged buyout targets usually have undervalued shares in the market relative to firms that remain public (Weir and Wright, 2006; Jensen, 1986), and the degree of firm undervaluation might affect REM behaviours preceding buyouts.

Prior to MBOs, managers will consider their ability to access external funding to support their buyout and highly undervalued firms might struggle to access external funding. Hence managers in firms with a high degree of undervaluation are more likely to engage in positive REM to enhance prospective external financiers' perceptions of their firm's value (Fischer and Louis, 2008).

Prior to IBOs, firms with a high degree of undervaluation are more likely to attract potential IBO buyers, as it could be an avenue for turning a failing company around by imposing a more efficient system of corporate governance or hiring a different management team (Hafzalla, 2009). Hence, in order to retain their control and management position even long-term job security, managers in firms with a high degree of undervaluation are more likely to engage in positive REM to minimise firm undervaluation. As managers cannot precisely anticipate IBO offers, they might use the industrial adjusted price-earnings ratio as a benchmark to trigger their REM behaviours. Similar to prior studies (e.g. Alford, 1992; Francis et al., 2005), this study measures the undervaluation of a firm as the industry-adjusted price-earnings ratio (PE Ratio), which is the difference between the target firm's price-earnings ratio and the median industry price-earnings ratio. Accordingly, I hypothesise as follows:

$H_{3\text{-}12a}$: Preceding MBOs, firms with a higher degree of firm undervaluation have a higher level of REM

$H_{3\text{-}12b}$: Preceding IBOs, firms with a higher degree of firm undervaluation have a higher level of REM

4.2.6.6 Board size

A larger board provides various resources (Hillman and Dalziel, 2003) and ensure a minimum required knowledge base (Vafeas, 2005). Moreover, the ability of a board to monitor managers can increase as more directors are added. Increasing the number of non-executives is expected to have a more positive impact than increasing executive directors would have (Andres et al., 2005; Guest, 2009). Boards have two essential functions: monitoring management and bringing various skills and expertise to support and review the performance of a firm (Ronen and Yaari, 2007). Both of these functions are associated with the responsibilities of mitigating managerial REM behaviours, because REM may rely on managerial discretions in making operational decisions. Hence firms with larger board size may have an increased monitoring function, leading to a lower level of REM. Similar to prior research (e.g. Vafeas, 2005; Lipton and Lorsch, 1992), board size in this study is measured by the total number of directors on the board (BoardSz). Accordingly, I hypothesise as follows:

$H_{3\text{-}13a}$: Preceding MBOs, firms with a larger board size have a lower level of REM

$H_{3\text{-}13b}$: Preceding IBOs, firms with a larger board size have a lower level of REM

4.2.6.7 The percentage of non-executive directors the board

Adding non-executive directors to serve a board will expand the available resources of the board (Hillman and Dalziel, 2003). While executive directors have better knowledge about a company and its industry, non-executive directors are 'boundary spanners' who provide knowledge and resources. Non-executive directors function as advisers, as they provide or facilitate access to external resources which are critical to a firm's success (Daily et al., 2003). Moreover, the ability of a board to monitor can increase as more directors are added, and especially increasing the number of non-executives is expected to have a more positive impact than increasing executive directors (Andres et al., 2005; Guest, 2009).

Agency theory suggests that non-executive directors are more independent than executive directors are, thus they are expected to have greater incentives to monitor managers (Fama and Jensen, 1983a; Elshandidy and Hassanein, 2014). Furthermore, apart from being directors of a firm, non-executive directors have no economic or psychological affiliation that may interfere with their ability to question management (Fama, 1980). Conversely, as part of the management team, executive directors often have incentives to underperform their monitoring role (Vafeas, 2005). As non-executive directors can monitor managers more effectively, adding more non-executive directors is expected to lead to less REM. Hence firms with a higher percentage of non-executive directors on their boards might have lower levels of REM. Similar to prior research (e.g. Fama and Jensen, 1983a; Osma, 2008), in this study, the percentage of non-executive directors on a board is measured by the proportion of non-executive directors to all directors (NED%). Accordingly, I hypothesise as follows:

$H_{3\text{-}14a}$: Preceding MBOs, firms with a higher percentage of non-executive directors on the board have a lower level of REM

$H_{3\text{-}14b}$: Preceding IBOs, firms with a higher percentage of non-executive directors on the board have a lower level of REM

4.3 Methodology

4.3.1 Data and sampling

This study investigates all UK leveraged buyouts of listed firms in the London Stock Exchange who made buyout announcements during the period from 1997 to 2011. This setting has significant advantages: First, most of what is currently known about leveraged buyouts results from research based on US samples from the 1980s and 1990s (e.g. DeAngelo, 1986; Perry and Williams, 1994). It is questionable whether the US evidence can be generalised to the UK. In the UK, leveraged buyouts are less likely to be related to hostile takeovers, have lower debt levels, focus more on growth opportunities and are commonly financed by privately placed mezzanine funds rather than junk bonds (Toms and Wright, 2005).

Second, the period studied covers the second wave of leveraged buyouts in the UK, which is different from the first wave in the 1980s. In this wave, more private equity and debt financiers provided financial backup in the buyout transactions. There was increased support from target shareholders through, for example, irrevocable undertakings (a binding agreement on target shareholders to accept a buyout offer) (Renneboog et al., 2007). Moreover, the increased use of squeeze-out provisions aiming to acquire all shares reduced the risks for buyers and facilitated the completion of going-private transactions (Davis and Day, 1998).

The data for the samples is collected from Thomson ONE Banker. I exclude 39 firms in the financial industry (ICB code between 8000 and 8999) because they are subject to the external scrutiny of bodies like the Financial Services Authority (Weir et al., 2005a), which may affect their corporate governance. The corporate governance data is hand collected from annual reports and

Datastream provides the earnings, total assets, and other financial data needed to detect abnormal AEM and REM.

This study uses the cross-sectional model developed by Dechow et al. (1995) to estimate abnormal AEM. The model parameters are estimated by industry and I require each firm-year to have at least six observations with the same four-digit ICB code[19]. Four-digit codes are used for matching wherever possible, and if no appropriate match is found, three-digit or two-digit codes are used. This approach reflects the research design of Perry and Williams (1994). Moreover, this study uses the cross-sectional regression models by Roychowdhury (2006) to estimate abnormal CFO, production costs and discretionary expenses for each firm. The model parameters are estimated by industry and I require each firm-year to have at least six observations with the same two-digit code. The industry-matched firms are collected from firms not involved in an leveraged buyouts. Two-digit codes are used for matching wherever possible, as in Roychowdhury (2006).

As the last year prior to a buyout offer first being made public is the most likely period to reflect systematic earnings manipulation, as suggested by prior literature (e.g. Perry and Williams, 1994), this study examines the relationships between AEM and REM behaviours in the last year prior to buyouts. After deleting observations with missing data, the number of initial and final regression samples is listed on table 4.1.2[20].

As it is difficult to collect financial data for firms undergoing buyouts, the final

[19] As suggested by Defond and Jiambalvo (1994), a minimum of six firms are needed in each firm-year portfolio in order to give the minimum degrees of freedom to perform statistical tests.

[20] For the leveraged buyouts studies in the UK, this sample size is large enough in comparison to Weir et al.'s (2005a) examination of 96 LBOs; Renneboog et al. (2007) investigate 177 leveraged buyouts.

sample still has some missing financial data, which varies between different observations. As detecting each type of REM requires different financial data in models, some observations might have missing data in one model but have complete data for all other models. For instance, some observations might have complete data on abnormal overproduction costs detection but incomplete data on abnormal R&D investment cuts detection. Hence the number of observations varies in different REM proxies.

Table 4.1.2 Sample

	MBOs	IBOs
Initial sample	149	102
Deleting	Financial firms	
	25	14
Non-financial firms	124	88
Deleting	Observations with missing financial data	
	6	1
AEM & REM sample	118	87
Deleting	Observations with missing corporate governance data	
	3	2
Final sample	115	85

4.3.2 Accruals earnings management measures

Similar to Chapter 2, this study adopts discretionary accruals from the cross-sectional model of Dechow et al. (1995) to proxy for AEM[21].

Normal accruals are estimated using the following model:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 + \alpha_i\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}\left(\frac{\Delta Sales_{it} - \Delta AR_{it}}{A_{it-1}}\right) + \beta_{2i}\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it} \qquad (1)$$

[21] This paper adopts the same approach as that of prior studies by breaking the total accruals into two components: discretionary accruals (abnormal accrual) and nondiscretionary accruals (normal accruals) (e.g. Healy, 1985; Jones, 1991; Dechow et al., 1995; Subramanyam, 1996; Sok-Hyon and Sivaramakrishnan, 1995).

Where:

TA_{it}: is the current total accruals, calculated as the change in non-cash current assets minus the change in current liabilities, excluding the current portion of long-term debt, minus depreciation and amortization

A_{it}: is the total assets at the end of period t, and **A_{it-1}** is lagged total assets

$Sales_{it}$: is the sales during period t, and **$(\Delta)Sales_{it}$**=$Sale_t$-$Sales_{t-1}$

Δ**AR_{it}**: is the change in receivables

PPE_{it}: is the property, plant, and equipment

Total accruals are first regressed on the equation (1) using data from peer firms in year t to estimate the parameters for calculating the expected normal accruals for each leveraged buyouts firm in year t. The parameter estimates a_0, a_i, b_{1i}, and b_{2i} of α_0, α_i, β_{1i}, and β_{2i} from the previous step are then combined with the data for each leveraged buyout firm in the event year t, to generate estimated discretionary accruals ($AccruDe_{it}$), as follows:

$$AccruDe_{it} = \frac{TA_{it}}{A_{it-1}} - [\alpha_0 + \alpha_i\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}\left(\frac{\Delta Sales_{it} - \Delta AR_{it}}{A_{it-1}}\right) + \beta_{2i}\left(\frac{PPE_{it}}{A_{it-1}}\right)] \quad (2)$$

Where:

- **$AccruDe_{it}$**: is abnormal accrual or discretionary accruals

The estimated abnormal discretionary accruals (AccruDe) represent the magnitude of accruals earnings management, which is the difference between current accruals and expected normal accruals. Specifically, zero abnormal discretionary accruals indicate that a firm’s current accruals are the same as expected, which means no earnings management is detected. Positive abnormal discretionary accruals indicate income-increasing earnings management, while negative abnormal discretionary accruals indicate income-decreasing earnings management.

Kothari, et al.'s (2005) model and Dechow et al.'s (1995) are developed to detect AEM behaviours in the US firms. The differences of accounting systems between the UK and the US might affect the effectiveness of model, thus might compromise the reliability of the models to apply in the UK context. For instance, Yoon and Miller (2002) and Yoon et al. (2006) suggest that the modified Jones model does not fit for Korean firms in AEM detection. Thus, this study uses the models developed by Dechow et al. (1995) and Jones's (1991) alternatively to increase the robustness of my results.

4.3.3 Real earnings management measures

Similar to Chapter 3, this study adopt three measures to detect the level of REM from the cross-sectional models developed by Roychowdhury (2006): abnormal levels of CFO, production costs and discretionary expenses. Following the method employed in other studies, this study decomposes the actual CFO, production costs and discretionary expenses into their normal (expected) portion and abnormal (unexpected) portion by estimating the following equations for each industry and year. The abnormal level of CFO, production costs and discretionary expenses, which indicate REM practices, are the difference between their actual level and their normal level. The models are shown as follows:

The normal level of CFO is assumed to be a linear function of sales and changes in sales, and is estimated from:

$$\frac{CFO_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_t}{A_{t-1}} + \alpha_3 \frac{\Delta Sales_t}{A_{t-1}} + \varepsilon_t$$

The normal level of production costs is estimated from:

$$\frac{ProdCos_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_t}{A_{t-1}} + \alpha_3 \frac{\Delta Sales_t}{A_{t-1}} + \alpha_4 \frac{\Delta Sales_{t-1}}{A_{t-1}} + \varepsilon_t$$

The normal level of discretionary expenses is estimated from:

$$\frac{DiscExp_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{Sales_{t-1}}{A_{t-1}} + \varepsilon_t$$

Where:

CFO_t: is cash flow from operations of Roychowdhury (2006) model

$ProdCos_t$: is production costs, according to Roychowdhury's (2006) model, calculated as the sum of costs of goods sold and changes of inventory

$DiscExp_t$: is discretionary expenses according to Roychowdhury's (2006) model, calculated as the sum of advertising, research and development (R&D), and selling, general and administrative (SG&A) expenses (advertising data is not available for UK firms, and it is considered as part of SG&A)

$Sales_t$: is the sales during period t, and **(Δ)Salest**=$Sale_t$-$Sales_{t-1}$

A_t: is the total assets at the end of period t

This study also uses Gunny's (2010) models to capture REM activities from R&D expense and SG&A expenditure.

The normal level of R&D expense is estimated using the following model:

$$\frac{Res\&Dev_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{RD_{t-1}}{A_{t-1}} + \varepsilon_t$$

Where:

$Res\&Dev_t$: is the R&D expense according to Gunny's (2010) model

MV_t: is the natural log of market value

Q_t: is Tobin's Q

INT_t: is internal funds (calculated as Income before Extraordinary Items + Depreciation and Amortization + R&D Expense)

The normal level of SG&A is estimated using the following model:

$$\frac{SGA_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{\Delta Sales_t}{A_{t-1}} + \beta_5 \frac{\Delta Sales_t}{A_{t-1}} * DD + \varepsilon_t$$

Where:

SGA_t: is selling, general and administrative (SG&A) expenses according to Gunny's (2010) model

DD: is the dummy variable equal to one when total sales decrease between t-1 and t, zero otherwise.

Specifically, R&D expense cuts and SG&A expenditure cuts are normal business operating decisions at managers' discretion. In contrast, AEM involves changing discretionary accrual choices within the boundary of GAAP. It therefore directly influences the amount of accounting accruals, and has no direct effect on cash flows (Kim and Sohn, 2013). Hence, R&D expense cuts and SG&A expenditure cuts are REM behaviours rather than AEM practices.

For robustness, this study uses two types of aggregate REM, which is similar to those used in prior studies (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a; Zang, 2012). The first aggregation includes abnormal production costs and abnormal discretionary expenses (*Prod+DisEx*)[22]. It equals the sum of

[22] Abnormal production costs is not multiplied by minus one because higher production costs indicate overproduction to reduce the cost of goods sold. We do not combine abnormal production costs and abnormal CFO. Roychowdhury (2006) suggests that the same

abnormal production costs and abnormal discretionary expenses multiply by minus one [= abnormal production costs + (-1* abnormal discretionary expenses)]. A higher amount of *Prod+DisEx* indicates a higher likelihood that the firm engaged in overproduction and cut discretionary expenditures to manipulate reported earnings upwards. The second aggregation includes abnormal CFO and abnormal discretionary expenses (*CFO+DisEx*). It equals the sum of abnormal CFO and abnormal discretionary expenses, after each have been multiplied by minus one [= (-1* abnormal CFO) + (-1* abnormal discretionary expenses)]. Higher *CFO+DisEx* indicates a higher likelihood that the firm engaged in sales manipulations and cut discretionary expenditures to manipulate reported earnings upwards.

The existing REM detecting models are developed by the US research to detect REM behaviours in the US financial market (e.g. Gunny, 2010; Roychowdhury, 2006). The differences of financial market and accounting systems between the UK and the US might affect the effectiveness of REM detecting models, thus the reliability of the models in UK application might be compromised. Hence, this study adopts different REM detection models as alternatives, both Roychowdhury's (2006) and Gunny's (2010) models, to increase the robustness and reliability of results in this study. A consistent result might imply that the country difference is insignificant and my results are reliable.

4.3.4 Control variables and variable measurements

This study includes firm size to control for size effects. Larger firms are likely to be under close scrutiny by outsiders, such as financial or investment analysts, than small firms are, which can potentially reduce managers' opportunities to exercise earnings management (Koh, 2003; Hussain, 2000). Moreover, large firms might have alternative methods of influencing investors' perceptions of

activities that lead to abnormally high production costs also lead to abnormally low CFO, thus adding these two amounts leads to double counting (Cohen and Zarowin,2010).

their performance because they produce more information for public access, and thereby reduces the need for earnings management (LaFond and Watts, 2008). Hence firm size may affect managers' earnings management practices. In line with previous research, this study uses the natural logarithm of total assets as a proxy for firm size (LnAssets).

This study controls for the potential sales growth prospects of firms, because firms with higher growth prospects are more likely to engage in earnings management. Market has greater reaction to earnings announcements from firms with high-growth opportunities (Collins and Kothari, 1989). Moreover, Skinner and Sloan (2002) report that market has asymmetric response to positive vs. negative earnings surprises, and the absolute magnitude of the price response to negative surprises is significantly greater than the price response to positive surprises, particularly for high-growth firms. This implies that managers of high-growth firms have greater incentives to avoid negative earnings surprises, such as missing earnings expectations (Matsumoto, 2002). Thus managers of high-growth firms may have strong incentives to engage in earnings management to avoid negative earnings surprises. Similar to prior studies, growth prospects in this study are measured as the market value of equity divided by the book value of common equity (Mark2Book).

Financial leverage shows debt-contracting motivations for earnings management. High leverage is associated with the closeness of debt covenants violations (Press and Weintrop, 1990), and debt covenant violation is related to the choice of earnings management strategy (DeFond and Jiambalvo, 1994). Highly leveraged firms tend to have income-increasing earnings management in order to prevent violation of their debt covenants. Moreover, higher leverage ratios are associated with higher costs of debt financing (Piot and Janin, 2007). As debt increases, managers may use income-increasing earnings management to present a more favourable financial position when negotiating with lenders. Thus leverage ratio is likely to have a relationship with earnings management. Similar to prior studies, leverage in this study is measured by the ratio of total debt to total assets (Leverage).

This study controls for the potential financial constraints of acquirers. If a firm is financially constrained but has potential valuable projects in which to invest, it can use earnings management to signal its positive prospects and raise its share price in the short term. Hence this enables a firm to raise capital to make the investments (Linck et al., 2013). Prior studies use the ability of acquirers to obtain external finance as a proxy for financial constraints such as financial leverage or free cash flows (e.g. Park and Shin, 2004). However, financial information on acquirers was unavailable for this study. The key issue in this setting is whether acquirers are able to raise sufficient cash to complete their buyout. Hence this study measures the potential financial constraints of acquirers by the relative value of the deal, a reflection of how much money is required for a buyout. Deal value shows the ability of acquirers to seek external financing, and therefore it is an appropriate proxy for financial constraint. Specifically, the deal value is the total cash paid to shareholders in buyout transactions. In IBOs, as the acquirer comes from outside the firm, financial constraint is measured by the total deal value. In MBOs, as managers are acquirers and they only need to purchase shares held by other shareholders, financial constraint is measured by deal value, excluding the portion assumed to purchase shares owned by managers. Accordingly, financial constraint is measured by deal value (DealVal).

4.3.5 Model

Given a portfolio of earnings management strategies, prior literature suggests that AEM and REM are likely to be jointly dependent (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a). Specifically, if managers set or change a target level of one earnings management method, they will adjust the level of another earnings management method simultaneously to achieve an optimal level of total earnings management. Moreover, managers are likely to consider the relative costs and their own abilities when planning their overall earnings management strategies (Zang, 2012). Hence, as AEM and REM are likely to be jointly determined, estimating the relationship between AEM and REM using OLS regression might be subject to the problem of endogeneity.

In order to account for potential simultaneity when examining how managers use multiple accounting and operating measures, prior empirical research has used a system of simultaneous equations (e.g. Beatty et al., 1995; Barton, 2001; Pincus and Shivaram, 2002; Badertscher, 2011).

Beatty et al. (1995) investigated how commercial bank managers minimised the combination costs of deviating from optimal primary capital, taxable income levels and reported earnings by manipulating two accrual accounts (loan loss provisions and loan charge-offs) and three operating transactions (pension settlement transactions, miscellaneous gains and losses such as asset sales, and issuance of new securities). They suggest that minimising the combination costs by engaging in each of the five earnings management methods results in a system of five simultaneously determined equations. Each of the equations includes one earnings management proxy as a dependent variable, and all other earnings management methods are treated as endogenous variables in the right-hand side of the equation.

Barton (2001) investigated managers' incentives to maintain a desired level of earnings volatility through derivative hedging and accruals management. He developed a set of simultaneous equations in which AEM is an endogenous variable in a derivatives equation and the derivatives is an endogenous variable in the AEM equation. Moreover, he embedded a correction for self-selection equation in the simultaneous equations system. This additional equation aims to control for the factor that only about 72% of the sample firms reported using derivatives, and each factor behind the decision to use derivatives might have a different effect on the extent of derivatives used.

Pincus and Shivaram (2002) examined managers' incentives in oil and gas producing firms to maintain a desired level of earnings volatility through hedging with commodity derivatives and manipulating accruals accounts. They suggest that, given a firm hedging, managers' decisions about the extent of hedging and smoothing with accruals are likely to be simultaneous, and each of these decisions can affect the others. In their simultaneous equations, the 'extent-of-smoothing' with accruals is an endogenous variable in the 'extent-of-hedging' equation, and the extent of hedging is an endogenous variable in the extent-of-smoothing with accruals equation.

Badertscher (2011) examined how the degree and duration of overvaluation affects management’s choice of alternative earnings management mechanisms (AEM, REM and AEM outside the boundaries of GAAP). Badertscher (2011) suggests that firm overvaluation and the three earnings management methods are endogenous variables in a system of simultaneous equations, in which each equation includes the dependent variables from the three other equations as right-hand-side variables.

To address potential simultaneity, these prior studies used a 2SLS instrumental variables approach. In the first stage, each endogenous variable is regressed on all exogenous variables and instruments. In a well-specified model, where instruments are uncorrelated with the unobserved errors term but correlated with the endogenous variables, the predicted values of the endogenous variables from the first stage are uncorrelated with the errors term. In the second stage, these predicted values replace the endogenous variables in the right-hand-side of the equation and yield consistent parameter estimations (Beatty et al., 1995; Greene, 2011; Hussain, 2000). 2SLS is a single-equation estimation method, which estimates each equation in the simultaneous system separately (Greene, 2011).

Under the null hypothesis that none of the earnings management methods is jointly determined, OLS provides a consistent and efficient estimation, while 2SLS provides a consistent but inefficient estimation. Under the alternative that some of the earnings management variables are jointly dependent, only the 2SLS estimates will be consistent. The Hausman (1978) test compares the vector of coefficients between the two estimations, and a significant difference between the coefficients indicates a rejection of the null hypothesis. Thus, there are problems of endogeneity between earnings management methods, and 2SLS estimation for a simultaneous equations system is appropriate (Beatty et al., 1995).

A 3SLS instrumental variables approach could also be used to address potential simultaneity. 3SLS is the most common system estimation method, which estimates a system of structural equations jointly. 3SLS produces estimates from a three-step process: The first stage regresses each endogenous variable on all exogenous variables and obtains predicted values for the endogenous regressors. The second stage produces a 2SLS to obtain a consistent estimate for the covariance matrix of the equation disturbances. The third stage performs a generalised least squares (GLS)-type estimation using the covariance matrix produced in the second stage, with the instrumented values in place of the right-hand-side endogenous variables (Greene, 2011; StataCorp, 2013; Hussain, 2000).

3SLS estimates a system of structural equations jointly, while 2SLS estimates each equation in the simultaneous system separately. Under the null of no misspecification, 3SLS is efficient and consistent whereas 2SLS is consistent but not efficient. However, any specification error in the structure of the model will be transmitted throughout the system by inconsistent estimated covariance matrix in 3SLS. In contrast, in 2SLS, the limited information estimators will confine the misspecification to the particular equation in which it appears (Beatty et al., 1995; Greene, 2011). Moreover, as the finite-sample variation of the estimated covariance matrix is transmitted throughout the system in 3SLS, the finite-sample variance of 3SLS may will be as large as or larger than that of 2SLS (Greene, 2011).

As in prior research (e.g. Beatty et al., 1995; Barton, 2001; Pincus and Shivaram, 2002; Badertscher, 2011), simultaneous equations system is appropriate for this study when estimating the relationships between AEM and REM preceding leveraged buyouts. Therefore, this study uses the following simultaneous equations system to address the potential simultaneity. For every endogenous variable, this study uses one instrument, which is correlated with the endogenous variable but is exogenous to the structural equation. The system is properly identified as each equation includes only one endogenous variable (AEM proxy/REM proxy), and excludes three or more exogenous variables (constraints of REM/AEM). The system of equations used in this study is as follows:

$$\begin{aligned} REM_t = \beta_0 + \alpha_1 AEM_t + \beta_1 ROA_t + \beta_2 MarketSh_t + \beta_3 Zscore_t + \beta_4 InsShare_t \\ + \beta_5 PE\ \ Ratio_t + \beta_6 BoardSz_t + \beta_7 NED\%_t + \rho_1 LnAssets_t \\ + \rho_2 Mark2Book_t + \rho_3 Leverage_t + \rho_4 DealVal_t + u_t \qquad (1) \end{aligned}$$

$$\begin{aligned} AEM_t = \gamma_0 + \theta_1 REM_t + \gamma_1 Big5_t + \gamma_2 LNAuditTn_t + \gamma_3 AudComSz_t \\ + \gamma_4 AudShare_t + \gamma_5 OpeCycle_t + \varphi_1 LnAssets_t + \varphi_2 Mark2Book_t \\ + \varphi_3 Leverage_t + \varphi_4 DealVal_t + v_t \qquad (2) \end{aligned}$$

Where:

REM_t: is the abnormal REM according to Roychowdhury’s (2006) models and Gunny's (2010) models as follows:

CFO: is the abnormal cash flow from operation (CFO) detected using Roychowdhury’s (2006) model

ProdCos: is the abnormal production costs detected using Roychowdhury's (2006) model

DiscExp: is the abnormal discretionary expenses detected using Roychowdhury's (2006) model

Res&Dev: is the abnormal R&D expense detected using Gunny's (2010) model

SGA: is the abnormal selling, SG&A expense detected using Gunny's (2010) model

Instrumental variables of REM_t:

CFO_{t-1}, $ProdCos_{t-1}$, $DisExp_{t-1}$, $Res\&Dev_{t-1}$, SGA_{t-1}: are lagged values of REM proxies

AEM_t: is accruals earnings management detected by the cross-sectional model of Dechow et al. (1995) (**AccruDe**)

Instrumental variables of AEM_t:

SalesGrow: is the sales-growth ratio, which is an instrument of AEM_t

AEM constraints:

Big5: is a dummy variable, coded as 1 if a firm is audited by one of the Big 5 auditors

LNAuditTn: is the natural logarithm of auditor tenure years (measured by the number of consecutive years in which a firm uses the same auditor)

AudComSz: is the audit committee size, which is the total number of members on the audit committee

AudShare: is the cumulative common stock owned by audit committee members

OpeCycle: is the length of operating cycles, measured as the days inventory outstanding (DIO) plus the days sales outstanding (DSO) minus the days payable outstanding (DPO) (length of operating cycles = DIO+DSO-DPO)

REM constraints:

ROA: is the return on assets ratio, which measures firm performance

MarketSh: is the market-leader status in the industry, which is measured by a firm's market share in its industry using the two-digits industry code

Z-score: is the financial health status of a firm, which is measured by a modified Altman's Z-score

InsShare: is institutional ownership, which is the accumulated percentage of institutional shareholding

BoardSz: is the number of directors on the board

NED%: is the percentage of non-executive directors on the main board

Control Variables:

LnAssets: is the natural logarithm of total assets

Mark2Book: is the market capitalization divided by the book value of shareholders' equity

Leverage: is the ratio of long-term debt to total assets

PE Ratio: is the industry-adjusted price to earnings ratio (= the difference between the target firm's price-earnings ratio and the median industry price-earnings ratio)

DealVal: is the total cash paid to shareholders in buyout transactions; for MBOs, it is the deal value excluding the portion assumed to purchase shares owned by managers (=Deal Value * (1- CEO's shareholding); for IBOs, it is the total deal value (unit: Million Pounds)

In MBOs, it is predicted that AEM and REM have relationships, and thus α_1 in equation 1 and θ_1 in equation 2 are expected to be positive or negative.

Moreover, In IBOs, it is predicted that AEM and REM have relationships, and thus α_1 in equation 1 and θ_1 in equation 2 are expected to be positive or negative.

Due to potential endogeneity, this study applies a simultaneous equations system, and use 2SLS and 3SLS to estimate the endogenous equations. Besides 2SLS and 3SLS, generalised method of moments (GMM) could also be used to estimate endogenous equation. However, GMM estimation is consistent and efficient only if the endogenous equation have heteroskedasticity or autocorrelation problem (Wooldridge, 2010). Moreover, GMM models tend to use multiple time lagged data, which would mean that I will lose a lot of sample size due to limited past data availability.

Both 2SLS and 3SLS estimation approaches require instrument variable. A good instrument variable should satisfy three conditions: (1) it is not a weak instrument that only marginally relevant; (2) it must be an exogenous variable in the endogenous equation; (3) it should highly correlated with the endogenous variables (Wooldridge, 2013). This research tests whether the instrument variables used are acceptable. The results suggest that lagged REM works quite well as REM instrument, while sales growth is not a good instrument of AEM but still acceptable. The detailed discussion of instruments is in section 4.3.6. This might suggest that the results should be interpreted properly.

Moreover, as the data availability in leveraged buyouts setting constrains this study, it is not feasible to include more variables in the simultaneous equation models as prior literature (e.g. Lara et al., 2012; Zang, 2012), such as marginal tax rates.

4.3.6 Endogeneity and instrument variables

The variables analysed are subject to a potential endogeneity bias, since the decisions on levels of AEM and REM might be determined simultaneously. Similar to prior studies (e.g. Beatty et al., 1995; Barton, 2001; Pincus and Shivaram, 2002; Badertscher, 2011), this research uses a simultaneous equations system to address potential simultaneity. Prior literature also suggests that the solution for endogeneity is to use a 2SLS regression model, which relies upon instrumental variables to generate predicted values of the endogenous variables (Larcker and Rusticus, 2010). Valid instruments used to predict the explanatory variables must be highly correlated with the explanatory variables deemed to be endogenous, but must also be uncorrelated with the error term from the structural models used to explain each earnings management choice (Badertscher, 2011; Greene, 2011). Moreover, when the instruments are weak or partially endogenous, 2SLS methods can produce estimates that are more biased than OLS methods are. Hence this study would need to obtain powerful, exogenous instrumental variables for each of the earnings management variables. However, it is difficult to identify instrumental variables that satisfy the aforementioned conditions in most accounting research settings, and accounting theory does not provide guidance on how to find good instruments for earnings management (Larcker and Rusticus, 2010). This is particularly true with respect to earnings management because there is no well-developed theory of the economic determinants for the different earnings management choices (Badertscher, 2011).

Despite the potential concerns regarding identifying proper instruments, it is still important to control for endogeneity. In order to identify instruments for REM, I relied upon the accounting and finance literature (e.g. Larcker and Rusticus, 2010), and found that lagged endogenous regressor might be a potential instrument for endogenous variables. In this case, an implicit assumption has been made that the exogenous part of the regressor persists over time, but that the endogenous part does not persist over time (Larcker and Rusticus, 2010).

For REM, this study adopts a two-stage process to investigate whether lagged regressor (REM_{t-1}) is a valid instrument of it. First, for the two-stage least squares estimation to be reliable, there is a 'rule of thumb' that the t-statistic of instruments in first-stage regressions must be greater than about 3.3. A t-statistic of less than 3.3 indicates a weak instrument (Adkins and Hill, 2011). In this study, the t-statistic of the instrument, lagged regressor of REM (REM_{t-1}), is greater than 3.3 for both MBOs and IBOs, which pass the rule of thumb.

Second, one commonly used diagnostic of weak instruments is the F statistic for joint significance of the instruments in first-stage regression. A widely used 'rule of thumb' suggested by Staiger and Stock (1997) views an F statistic of less than 10 as an indication of weak instruments. Moreover, a formal test for weak instruments is proposed by Stock and Yogo (2005). The test statistic used is the minimum eigenvalue of a matrix analog of the F statistic, which was originally proposed by Cragg and Donald (1993) to test nonidentification. Stock and Yogo (2005) presumed identification and interpret a low minimum eigenvalue as indicating weak instruments. Hence, the null hypothesis is that the instruments are weak against the alternative that they are strong (Cameron and Trivedi, 2009). The test of Stock and Yogo (2005) concerns that weak instruments can lead to size distortion of Wald tests on the parameters in finite samples. The Wald test is a joint statistical significance of the endogenous regressors in the structural model at a 5% level (Cameron and Trivedi, 2009). If we are willing to tolerate distortion of a 5% Wald test based on the 2SLS estimator, so that the true size can be at most 15%, then we reject the null hypothesis if the test statistic exceeds the test statistic tabulated by Stock and Yogo (2005) (Cameron and Trivedi, 2009).

In this study, the F statistic for the joint significance of the instrument, lagged regressor of REM (REM_{t-1}), is greater than 10 both for MBOs and for IBOs, which pass the rule of thumb. Furthermore, the minimum eigenvalue of the F statistic is greater than critical values tabulated by Stock and Yogo (2005) both for MBOs and for IBOs, which rejects the null hypothesis that the instruments are weak. Therefore, the lagged regressor of REM (REM_{t-1}) is a valid instrument of REM both for MBOs and for IBOs in this study.

Follow this approach, this study investigates whether lagged regressor of AEM (AEM_{t-1}) is a valid instrument of AEM. However, the t-statistic of the instruments and the F statistic for the joint significance of instruments in the first-stage regressions suggests that the lagged regressor of AEM (AEM_{t-1}) is a weak instrument of AEM, both for MBOs and for IBOs.

In order to identify an appropriate instrument for AEM, this study draws more widely on relevant literature in accounting and finance fields and tested every potential instrument suggested in these studies, such as operating earnings volatility (Hazarika et al., 2012), auditing quality and auditor characteristics (Cornett et al., 2009), the two-year lagged regressor of AEM (Aerts and Zhang, 2014) and managerial ownership (Short and Keasey, 1999). Unfortunately, these instruments are all weak both for MBOs and for IBOs in this study.

However, sales growth (SalesGrow) is identified as a potential instrument for AEM. Sales growth is likely to affect earnings management, as growth in sales will affect accruals, such as inventory and receivables, which in turn affects AEM. Furthermore, large growth in sales often inflates the market's expectations of future cash flows, which could affect earnings management (Ahmed and Duellman, 2007). In times of rapid growth, a company may also experience pressure to maintain or exceed its anticipated growth rates, and thus causes the practices of earnings management to achieve a targeted growth rate, or alternatively to mask downturns (Carcello and Nagy, 2004).

In order to test whether sales growth (SalesGrow) is a valid instrument of AEM, this study used the same aforementioned two-stage process. First, it is found that the t-statistic of the instrument, sales growth, is greater than 3.3 for MBOs, which passed the 'rule of thumb'. Second, the F statistic for the joint significance of the instrument, sales growth, is greater than 10 for MBOs, which pass the 'rule of thumb'. The minimum eigenvalue of the F statistic for MBOs is also greater than critical values tabulated by Stock and Yogo (2005), which rejects the null hypothesis that the instruments are weak. Therefore, sales growth is a valid instrument of AEM for MBOs in this study. However, the t-statistic of instruments and the F statistic for joint significance of instruments in first-stage regressions suggested that sales growth is a weak instrument of AEM for IBOs.

This study has tested almost every potential instrument for AEM that is available, and sales growth (SalesGrow) is the only valid instrument found, even though it is a strong instrument for MBOs only. I also tested whether sales growth is a valid instrument of AEM for the whole sample (mixed both MBOs and IBOs). The t-statistic of instrument, sales growth, is greater than 3.3, which pass the 'rule of thumb'. Furthermore, the F statistic for joint significance of the instrument, sales growth, is greater than 10, which pass the 'rule of thumb'. Moreover, the minimum eigenvalue of the F statistic is greater than critical values tabulated by Stock and Yogo (2005), which rejects the null hypothesis that the instrument is weak. Therefore, sales growth (SalesGrow) is a valid instrument of AEM for the sample as a whole (mixed both MBOs and IBOs) in this study.

In this study, as the variables of AEM and REM are subject to a potential endogeneity bias, the Hausman test (Hausman, 1978) is used to investigate potential endogeneity. The principal of Hausman test provides a way to test whether an explanatory variable is endogenous or not in a structural equation. The null hypothesis of the Hausman test is that the regressor is exogenous against the alternative that it is endogenous. If there is little difference between the OLS and instrument variable estimators, we could conclude that the regressor is exogenous, and there is no need to instrument. Otherwise, if there is considerable difference between OLS and instrument variable estimators, we reject the null hypothesis, and conclude that the regressor is endogenous (Cameron and Trivedi, 2009).

For the MBOs, in structural equation 1, I use sales growth as the instrument of AEM in Hausman test. In structural equation 2, I use lagged REM as the instrument of REM in Hausman test. Table 4.3.1 in the Appendix shows the results of Hausman tests. The results of Hausman tests for model REM (1) (in which the dependent variable is CFO) and model AEM (1) are significant, which suggests that these two models do not pass Hausman test. This means abnormal CFO and AEM are endogenous in model REM (1) and model AEM (1). Moreover, the result of Hausman tests for model REM (4) (in which the dependent variable is R&D expense) is significant, which suggests this model does not pass Hausman test. However, the reverse relationship in model AEM (4) passes Hausman test, as the result of Hausman test is insignificant. This means AEM is endogenous in model REM (4) and R&D expense is exogenous in model AEM (4). Furthermore, the results suggest that model AEM (3) does not pass Hausman test, but the reverse relationship in model REM (3) (in which the dependent variable is discretionary expenses) passes Hausman test. This means abnormal discretionary expenses is endogenous in model AEM (3) and AEM is exogenous in model REM (3).

For the IBOs, in structural equation 1, I use sales growth as the instrument of AEM in Hausman test. In structural equation 2, I use lagged REM as the instrument of REM in Hausman test. Table 4.3.2 in the Appendix shows the results of Hausman tests. The result of Hausman test for model REM (3) (in which the dependent variable is discretionary expenses) is significant, which suggests that this model does not pass Hausman test. But the reverse relationship in model AEM (3) passes Hausman test. This means AEM is endogenous in model REM (3) and abnormal discretionary expense is exogenous in model AEM (3). Moreover, the results in Table 4.3.2 suggest that no other model is subject to a potential endogeneity bias.

4.3.7 Summary statistics and correlation matrix

Table 4.2.1 shows the summary statistics of all variables for MBOs. Table 4.2.2 shows the summary statistics of all variables for IBOs. Tables 4.2.3 and 4.2.4 show the Pearson correlation matrix for MBOs and IBOs respectively.

Table 4.2.1 Summary Statistics for MBOs

Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
CFO	118	-0.025	0.130	-0.876	-0.060	-0.012	0.024	0.287
ProdCos	117	0.043	0.242	-0.919	-0.050	0.039	0.128	0.991
DisExp	96	-0.111	0.317	-1.876	-0.206	-0.089	0.032	1.014
Res&Dev	117	0.000	0.008	-0.036	-0.000	0.000	0.000	0.044
SGA	96	-0.038	0.163	-0.724	-0.082	-0.016	0.023	0.382
CFO_{t-1}	116	-0.014	0.111	-0.763	-0.052	-0.008	0.027	0.259
$ProdCos_{t-1}$	113	0.034	0.219	-0.733	-0.056	0.028	0.154	0.756
$DisExp_{t-1}$	96	-0.028	0.274	-0.573	-0.148	-0.065	0.057	1.578
$Res\&Dev_{t-1}$	115	-0.001	0.006	-0.048	-0.001	0.000	0.000	0.009
SGA_{t-1}	96	-0.017	0.159	-0.569	-0.063	-0.008	0.011	0.588
Accruals	114	-0.013	0.091	-0.316	-0.052	-0.009	0.010	0.431
SalesGrow	117	0.350	2.175	-0.554	-0.064	0.036	0.139	21.687
Big5	118	0.669	0.472	0.000	0.000	1.000	1.000	1.000
AuditTn(years)	117	7.162	4.173	1.000	3.000	7.000	11.000	15.000
LNAuditTn	117	1.734	0.764	0.000	1.099	1.946	2.398	2.708
AudComSz	118	2.576	1.317	0.000	2.000	3.000	3.000	8.000
AudShare	118	0.048	0.106	0.000	0.000	0.003	0.034	0.563
OpeCycle	115	69.95	213.62	-662.09	13.27	65.72	105.75	1,474.76
ROA	117	0.063	0.182	-1.054	0.026	0.090	0.139	0.521
MarketSh	118	0.004	0.007	0.000	0.001	0.002	0.004	0.045
Z-score	117	1.560	4.694	-46.661	1.319	1.960	2.732	8.218
InsShare	117	0.355	0.218	0.000	0.197	0.321	0.502	0.890
PE Ratio	117	-3.836	16.718	-58.560	-12.100	-4.090	0.000	88.090
BoardSz	117	6.060	1.544	3.000	5.000	6.000	7.000	11.000
NED%	117	0.442	0.143	0.000	0.375	0.429	0.500	0.750
TotalAssets(£1,000)	117	123,822	346,748	1,370	22,582	53,357	101,019	3376400
LnAssets	117	10.822	1.260	7.223	10.025	10.885	11.523	15.032
Mark2Book	117	1.729	1.774	-1.676	0.798	1.225	2.104	10.741
Leverage	117	0.098	0.125	0.000	0.000	0.068	0.148	0.715
DealVal(£1,000)	117	163.363	910.358	0.110	11.637	31.831	82.601	9,802.954

Table 4.2.2 Summary Statistics for IBOs

Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
CFO	87	-0.043	0.106	-0.616	-0.079	-0.031	0.008	0.226
ProdCos	83	0.073	0.232	-0.462	-0.009	0.076	0.171	1.275
DisExp	67	-0.050	0.204	-0.609	-0.122	-0.051	0.019	0.524
Res&Dev	85	0.000	0.007	-0.028	-0.000	0.000	0.001	0.029
SGA	67	-0.022	0.118	-0.269	-0.089	-0.021	0.008	0.326
CFO_{t-1}	82	-0.030	0.088	-0.489	-0.067	-0.019	0.015	0.136
$ProdCos_{t-1}$	79	0.046	0.209	-0.564	-0.015	0.037	0.149	0.676
$DisExp_{t-1}$	65	-0.054	0.212	-0.696	-0.145	-0.039	0.031	0.493
$Res\&Dev_{t-1}$	80	-0.002	0.007	-0.032	-0.001	-0.000	0.000	0.016
SGA_{t-1}	63	-0.021	0.146	-0.419	-0.114	-0.006	0.040	0.518
Accruals	82	-0.000	0.082	-0.449	-0.035	-0.002	0.044	0.245
SalesGrow	86	0.230	0.716	-0.895	0.010	0.085	0.230	5.169
Big5	87	0.828	0.380	0.000	1.000	1.000	1.000	1.000
AuditTn(years)	86	6.558	4.497	1.000	3.000	6.000	9.000	18.000
LNAuditTn	86	1.609	0.793	0.000	1.099	1.792	2.197	2.890
AudComSz	87	2.874	0.986	0.000	3.000	3.000	3.000	5.000
AudShare	87	0.028	0.072	0.000	0.000	0.001	0.010	0.393
OpeCycle	84	47.85	190.87	-749.96	16.30	41.57	83.55	1,154.14
ROA	86	0.033	0.205	-0.876	0.028	0.073	0.110	0.413
MarketSh	87	0.008	0.018	0.000	0.001	0.003	0.007	0.139
Z-score	86	1.327	1.661	-5.024	0.713	1.255	2.320	7.554
InsShare	86	0.372	0.186	0.000	0.288	0.370	0.500	0.905
PE Ratio	86	-2.069	16.341	-52.470	-7.400	-3.220	3.550	74.700
BoardSz	86	6.721	1.719	1.000	5.000	7.000	8.000	10.000
NED%	86	0.527	0.131	0.000	0.444	0.528	0.625	0.750
TotalAssets(£1,000)	86	551,899.	1452680	3,447	41,021	118,081	533,565	11700000
LnAssets	86	11.773	1.749	8.145	10.622	11.678	13.187	16.278
Mark2Book	86	2.085	15.146	-92.143	0.861	1.681	2.409	103.703
Leverage	86	0.200	0.193	0.000	0.036	0.162	0.308	0.825
DealVal(£1,000)	86	510.559	1,369.592	1.010	26.030	114.375	531.220	11,730.530

High correlations between right hand side variables may lead to the risk of multicollinearity in regression analysis. There is a rule of thumb that if correlations exceed 0.7, there might be a potential multicollinearity in the regression analysis (Tabachnick and Fidell, 2012). Moreover, VIFs provide a formal test of multicollinearity, and the VIFs are lower than the critical value of 10, indicating no risk of multicollinearity (Tabachnick and Fidell, 2012). I have checked correlations and VIFs and find no multicollinearity problems in any of the models.

Table 4.2.3 Pearson pairwise Correlation matrix for MBOs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)CFO	1																
(2)ProdCos	-0.299	1															
(3)DisExp	0.169	-0.466	1														
(4)Res&Dev	-0.118	0.085	-0.075	1													
(5)SGA	-0.174	-0.521	0.515	0.015	1												
(6)Prod+DisEx	-0.242	0.800	-0.904	0.134	-0.568	1											
(7)CFO+DisEx	-0.505	0.475	-0.936	0.134	-0.389	0.861	1										
(8)CFO_{t-1}	0.443	-0.425	0.014	-0.28	-0.019	-0.148	-0.14	1									
(9)$ProdCos_{t-1}$	-0.169	0.773	-0.391	0.149	-0.496	0.662	0.383	-0.34	1								
(10)$DisExp_{t-1}$	-0.049	-0.406	0.479	0.165	0.466	-0.466	-0.4	-0.318	-0.558	1							
(11)$Res\&Dev_{t-1}$	-0.147	0.12	-0.197	0.344	-0.163	0.199	0.232	-0.12	0.146	-0.261	1						
(12)SGA_{t-1}	-0.082	-0.554	0.509	-0.073	0.766	-0.559	-0.417	-0.041	-0.573	0.641	-0.291	1					
(13)$Prod+DisEx_{t-1}$	-0.05	0.676	-0.445	-0.049	-0.508	0.629	0.398	0.094	0.859	-0.904	0.249	-0.652	1				
(14)$CFO+DisEx_{t-1}$	-0.101	0.597	-0.51	0.007	-0.482	0.576	0.479	-0.084	0.743	-0.918	0.353	-0.656	0.941	1			
(15)Accruals	-0.014	0.134	-0.061	0.227	-0.153	0.122	0.059	-0.304	0.106	0.301	-0.011	-0.14	-0.132	-0.167	1		
(16)SalesGrow	-0.123	0.12	0.028	0.466	-0.001	0.052	0.024	-0.572	0.077	0.516	0.011	0.004	-0.316	-0.275	0.428	1	
(17)Big5	0.104	-0.042	0.127	-0.058	-0.055	-0.105	-0.17	-0.039	-0.177	0.136	-0.031	0.114	-0.157	-0.136	-0.008	-0.001	1
(18)LNAuditTn	0.107	-0.047	0.032	0.055	-0.049	-0.018	-0.063	0.077	0.016	-0.07	0.018	-0.021	0.084	0.044	-0.044	-0.187	-0.038
(19)AudComSz	0.048	0.036	0.125	0.046	-0.069	-0.062	-0.108	-0.092	0.036	0.091	-0.016	-0.13	-0.037	-0.053	0.148	0.051	0.117
(20)AudShare	0.019	-0.007	-0.035	-0.043	-0.025	0.02	0.048	0.131	0.011	-0.05	-0.003	-0.135	0.033	0.022	0.117	-0.063	-0.186
(21)OpeCycle	0.022	0.026	-0.144	-0.18	-0.015	0.111	0.12	0.169	0.054	-0.154	-0.027	0.032	0.119	0.084	-0.162	-0.357	0.007
(22)ROA	0.208	-0.093	-0.196	-0.152	-0.32	0.033	0.096	0.273	-0.121	-0.28	0.048	-0.246	0.08	0.187	-0.043	-0.208	0.099
(23)MarketSh	0.087	-0.080	0.047	0.010	-0.131	-0.077	-0.066	0.067	-0.150	0.012	0.066	0.066	-0.105	-0.039	0.024	-0.075	0.201
(24)Z-score	0.067	-0.034	-0.068	-0.018	-0.066	0.028	0.035	0.095	-0.034	-0.054	0.001	-0.046	0.017	0.015	-0.035	-0.044	0.164

(25)InsShare	-0.051	-0.069	0.227	-0.02	0.218	-0.253	-0.171	-0.06	-0.093	0.096	0.04	0.238	-0.136	-0.089	-0.115	-0.06	0.016
(26)PE Ratio	-0.365	-0.006	-0.291	-0.028	-0.033	0.211	0.403	0.126	-0.017	-0.089	0.01	-0.05	0.032	0.04	0.001	-0.066	0.035
(27)BoardSz	0.022	-0.01	0.101	0.153	-0.176	-0.012	-0.082	-0.037	-0.071	0.146	0.026	-0.116	-0.086	-0.123	0.177	0.134	0.098
(28)NED%	0.08	-0.07	0.018	-0.048	-0.03	-0.063	-0.04	-0.065	-0.149	0.171	-0.108	0.05	-0.222	-0.151	0.043	0.025	0.113
(29)LnAssets	0.029	-0.077	0.185	0.039	-0.163	-0.198	-0.168	-0.004	-0.105	0.01	0.161	-0.033	-0.095	-0.013	0.039	0.008	0.3
(30)Mark2Book	0.191	-0.075	-0.069	-0.104	-0.208	-0.009	-0.021	0.15	-0.094	-0.134	-0.292	-0.15	0.014	0.085	0.079	-0.053	-0.021
(31)Leverage	-0.138	0.009	0.1	-0.013	0.002	-0.146	-0.044	-0.02	-0.017	0.011	0.081	-0.059	-0.051	-0.032	0.071	-0.051	-0.078
(32)DealVal	0.059	-0.087	0.114	0.002	-0.072	-0.137	-0.123	0.043	-0.179	0.099	0.029	0.132	-0.175	-0.124	0.033	-0.029	0.097

	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
(18)LNAuditTn	1														
(19)AudComSz	0.059	1													
(20)AudShare	0.055	0.317	1												
(21)OpeCycle	0.088	-0.045	0.069	1											
(22)ROA	-0.016	0.078	0.044	0.236	1										
(23)MarketSh	0.099	0.302	-0.077	0.012	0.143	1									
(24)Z-score	0.14	0.204	0.044	0.253	0.673	0.15	1								
(25)InsShare	0.009	-0.013	-0.375	-0.153	-0.209	0.069	-0.202	1							
(26)PE Ratio	-0.072	-0.018	0.249	0.036	0.158	-0.008	0.102	-0.162	1						
(27)BoardSz	0.076	0.437	-0.073	-0.049	0.104	0.353	0.116	0.048	-0.093	1					
(28)NED%	-0.013	0.197	-0.046	-0.007	-0.168	0.057	-0.24	0.282	-0.163	-0.008	1				
(29)LnAssets	0.12	0.351	-0.156	0.029	0.301	0.606	0.27	0.174	-0.065	0.431	0.207	1			
(30)Mark2Book	-0.045	0.143	-0.087	-0.06	0.395	0.242	0.19	-0.04	0.044	0.109	-0.011	0.07	1		
(31)Leverage	0.032	0.13	-0.091	-0.047	-0.021	-0.028	-0.045	0.272	-0.149	0.125	0.204	0.262	-0.117	1	
(32)DealVal	-0.016	0.058	-0.06	0.001	0.066	0.577	0.044	-0.053	0.002	0.158	0.152	0.403	0.059	0.047	1

Table 4.2.4 Pearson pairwise Correlation matrix for IBOs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)CFO	1																
(2)ProdCos	-0.426	1															
(3)DisExp	-0.168	-0.752	1														
(4)Res&Dev	0.027	0.024	-0.278	1													
(5)SGA	-0.136	-0.732	0.559	-0.004	1												
(6)Prod+DisEx	0.044	0.933	-0.94	0.206	-0.733	1											
(7)CFO+DisEx	-0.261	0.798	-0.908	0.298	-0.49	0.909	1										
(8)CFO_{t-1}	0.665	-0.524	0.229	0.185	0.124	-0.262	-0.435	1									
(9)$ProdCos_{t-1}$	-0.111	0.642	-0.783	0.348	-0.667	0.839	0.807	-0.303	1								
(10)$DisExp_{t-1}$	-0.11	-0.672	0.831	-0.338	0.542	-0.805	-0.767	0.224	-0.844	1							
(11)$Res\&Dev_{t-1}$	0.071	-0.238	0.04	0.412	0.201	-0.066	-0.06	0.154	0.001	-0.118	1						
(12)SGA_{t-1}	-0.021	-0.639	0.548	-0.032	0.759	-0.635	-0.526	0.149	-0.612	0.542	0.216	1					
(13)$Prod+DisEx_{t-1}$	-0.028	0.764	-0.852	0.321	-0.638	0.865	0.85	-0.296	0.961	-0.96	0.002	-0.611	1				
(14)$CFO+DisEx_{t-1}$	-0.052	0.678	-0.81	0.255	-0.52	0.797	0.818	-0.512	0.855	-0.952	0.056	-0.525	0.939	1			
(15)Accruals	-0.254	0.198	0.048	-0.075	-0.18	0.024	-0.012	-0.219	0.116	0.021	0.057	-0.071	0.01	0.003	1		
(16)SalesGrow	-0.03	-0.042	0.295	-0.105	-0.125	-0.188	-0.284	0.093	-0.073	0.033	-0.028	-0.021	-0.098	-0.077	0.133	1	
(17)Big5	-0.068	0.162	0.008	0.018	-0.136	0.091	0.042	-0.15	0.104	-0.101	-0.144	-0.117	0.132	0.138	-0.047	-0.092	1
(18)LNAuditTn	-0.053	-0.054	0.073	0.052	0.108	-0.093	-0.049	0.103	-0.083	0.119	0.186	0.096	-0.099	-0.159	0.055	-0.22	0.039
(19)AudComSz	0.046	-0.112	0.064	-0.092	-0.057	-0.085	-0.052	0.059	-0.199	0.247	-0.102	-0.03	-0.224	-0.223	-0.065	-0.059	0.252
(20)AudShare	0.069	0.067	-0.251	0.103	-0.117	0.248	0.208	0.162	0.1	-0.208	0.172	-0.1	0.176	0.13	0.119	0.009	-0.045
(21)OpeCycle	-0.048	0.19	-0.128	-0.006	-0.234	0.21	0.158	-0.175	0.17	-0.048	-0.013	-0.209	0.129	0.119	0.009	-0.328	0.265
(22)ROA	0.146	-0.029	0.138	-0.267	-0.062	-0.057	-0.207	0.091	-0.139	0.007	-0.126	-0.145	-0.069	-0.036	0.051	0.164	0.085
(23)MarketSh	0.074	-0.08	0.118	-0.055	0.038	-0.106	-0.145	-0.024	-0.084	0.109	0.015	0.043	-0.103	-0.073	-0.023	-0.083	0.149
(24)Z-score	0.34	-0.11	-0.16	-0.315	-0.121	0.108	-0.008	0.139	-0.07	-0.162	-0.074	-0.113	0.066	0.126	0.043	0.067	-0.024

(25)InsShare	-0.148	0.201	0.09	-0.064	-0.041	0.048	-0.03	-0.228	0.104	-0.024	0.101	0.083	0.041	0.117	0.198	0.007	0.054
(26)PE Ratio	-0.021	0.048	-0.088	0.089	-0.141	0.091	0.108	0.018	0.11	-0.119	0.021	-0.221	0.134	0.108	0.179	-0.054	0.02
(27)BoardSz	-0.231	0.119	-0.059	-0.199	-0.205	0.12	0.156	-0.242	0.052	0.108	-0.084	-0.124	0.067	-0.003	-0.012	-0.031	0.131
(28)NED%	-0.219	0.276	-0.11	0.066	-0.202	0.213	0.194	-0.292	0.262	-0.015	-0.072	-0.119	0.141	0.099	-0.012	-0.025	0.171
(29)LnAssets	-0.098	-0.025	0.211	-0.076	-0.088	-0.084	-0.101	-0.048	0.032	0.086	0.036	-0.14	-0.022	-0.012	-0.016	0.013	0.344
(30)Mark2Book	0.152	0.064	0.219	-0.051	-0.031	-0.072	-0.235	0.165	-0.17	0.138	-0.078	0.077	-0.164	-0.194	-0.117	0.039	-0.001
(31)Leverage	-0.323	0.255	0.125	-0.039	-0.101	0.027	-0.007	-0.461	0.062	0.009	0.086	-0.157	-0.011	0.124	0.228	0.034	0.165
(32)DealVal	0.028	0.013	0.1	-0.058	-0.124	-0.037	-0.087	-0.025	0.021	0.061	-0.028	-0.082	-0.038	-0.026	0.079	-0.056	0.129

	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
(18)LNAuditTn	1														
(19)AudComSz	0.051	1													
(20)AudShare	-0.055	0.086	1												
(21)OpeCycle	0.279	0.129	-0.024	1											
(22)ROA	0.178	-0.12	0.074	0.028	1										
(23)MarketSh	0.089	0.271	-0.113	0.029	0.065	1									
(24)Z-score	0.107	-0.055	0.224	0.097	0.745	0.025	1								
(25)InsShare	-0.148	-0.081	-0.183	0.02	-0.041	-0.066	-0.156	1							
(26)PE Ratio	-0.145	0.013	0.083	-0.001	0.042	-0.066	0.008	0.061	1						
(27)BoardSz	0.208	0.384	-0.223	0.15	0.011	0.256	-0.082	-0.092	-0.034	1					
(28)NED%	-0.113	0.232	-0.025	0.093	-0.226	-0.034	-0.321	0.085	-0.099	0.081	1				
(29)LnAssets	0.241	0.219	-0.28	0.104	0.15	0.405	-0.103	-0.071	-0.023	0.436	0.05	1			
(30)Mark2Book	-0.076	-0.223	-0.091	0.013	0.418	-0.019	0.117	0.15	0.025	-0.124	-0.01	0.077	1		
(31)Leverage	-0.009	0.012	-0.187	-0.106	0.017	0.087	-0.327	0.259	0.122	0.099	0.27	0.451	0.186	1	
(32)DealVal	0.021	0.035	-0.12	0.029	0.06	0.226	-0.064	-0.187	-0.088	0.284	-0.005	0.562	0.022	0.23	1

4.4 Results and Findings

This section reports the results for the relationships between AEM (AccruDe) and REM from the simultaneous equations system. Five measures are used as proxies for different REM tools: sales manipulation (CFO), overproduction (ProdCos), discretionary expense cuts (DisExp), R&D expense cuts (Res&Dev) and SG&A expenditure cuts (SGA). Hence, for the simultaneous equations system, there are 5 sets of models for each of the REM measures respectively.

Prior research tends to aggregate REM when investigating the relationships between AEM and REM (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a; Zang, 2012). While I also do this, I subsequently disaggregate the components of REM, as different types of REM might cancel each other and result in weak or insignificant relationships between AEM and aggregate REM. Managers also have different incentives for specific types of REM, due to their potential long or short-term effects as well as the costs associated with each strategy. This might result in diverse relationships between AEM and different types of REM. My investigation is expected to reveal a clearer relationship between AEM and different types of REM, thus providing a better understanding of managers' earnings-management strategies and behaviours.

Tables 4.3.2 and 4.3.4 at the end of section 4.4.1 and section 4.4.2 respectively show the results of simultaneous equations system estimated by 2SLS for MBOs and IBOs respectively. It can be seen that AEM has some impact on REM, but REM has an unclear impact on AEM in MBOs. For IBOs, AEM and REM have unclear impacts on each other.

Tables 4.3.1 and 4.3.3 at the end of section 4.4.1 and section 4.4.2 respectively show the results of simultaneous equations system estimated by 3SLS for

MBOs and IBOs respectively. It can be seen that AEM and REM have an impact on each other for MBOs and IBOs. As discussed before, 2SLS estimates each equation in the simultaneous system separately, while 3SLS estimates the whole system of structural equations jointly by performing a third stage GLS-type estimation using the covariance matrix produced in the second stage (Greene, 2011; StataCorp, 2013). Hence 3SLS might better address the simultaneous relationships, and thus the results of 3SLS estimation might be more reliable. This study therefore interprets the results from the 3SLS estimations.

The interpretation of these regression results will be different from that in prior literature. This study includes AEM and REM proxies as dependent variables, and some of their signed values have been indicated as significantly negative in univariate tests in previous chapters (AEM proxy in Section 2.5.1, Univariate tests, in Chapter 2 and REM proxies in Section 3.6.1, Univariate tests, in Chapter 3). Mathematically, if a dependent variable has different sign to the independent variable, a positive relationship between them actually means that the independent variable leads to lower levels of earnings management, and a negative relationship between them actually means that the independent variable leads to higher levels of earnings management. For instance, the sign direction of sales manipulation (CFO) is significantly negative in univariate tests for MBOs. Firm performance (ROA) has a positive relationship with sales manipulation (CFO), suggesting that firm performance leads to less sales manipulation. This means that firms with better performance are associated with less REM of sales manipulation.

4.4.1 Results for management buyouts

Prior to MBOs, managers have been found to engage in positive REM. As discussed in univariate tests section of Chapter 3, managers engage in four out of five types of REM to boost earnings. Sales manipulation, by cutting price or offering more lenient credit terms toward the end of the year in an effort to accelerate sales from the next fiscal year into the current year, leads to significant negative abnormal CFO (- CFO). Overproduction, by producing more units than necessary to spread fixed costs over a larger number of units in order to lower fixed costs per unit, can decrease reported COGS in an attempt to increase profits, leading to significant positive abnormal production costs (+ ProdCos). Discretionary expenses can be cut to increase profits, leading to significant negative abnormal discretionary expenses (- DisExp). R&D expenses can be manipulated in an effort to affect profits, but the results for abnormal R&D expense cuts in univariate tests is insignificant (Res&Dev). This means managers have no systematic R&D expense cuts behaviour, but this does not mean no manager engage in it. As R&D expenses tend to be beneficial for future firm performance, cutting R&D expenses might be seen as detrimental to the firm, and thus managers might try to avoid it. SG&A expenses can also be cut in an effort to increase profits, leading to significant negative abnormal SG&A expenses (- SGA). Managers possibly engage in positive REM to enhance prospective external financiers' perceptions of the firm's value to secure financing for MBOs.

Further, managers have been also found to engage in negative AEM to decrease earnings figures. As discussed in univariate tests of Chapter 2, managers engage in negative discretionary accruals, leading to significantly negative abnormal discretionary accruals (- Accruals). Managers might use negative AEM to conceal the real value of a firm prior to MBOs, so that they do not have to pay much to outside shareholders.

Considering the combined effects of AEM and REM practices, the total level of earnings management should be relatively positive in order to enhance external financiers' perceptions of a firm's value to secure financing preceding MBOs.

Panel A of Table 4.1.3 shows the results for the combined effects of AEM and REM practices for MBOs. It can be seen that the total level of earnings management (the combination of AEM and both types of REM aggregations: AEM+Prod+DisEx and AEM+CFO+DisEx) is significantly positive prior to MBOs. This is consistent with the prediction that the total level of earnings management would be positive preceding MBOs.

Table 4.1.3 Panel A Summary Statistics of earnings management in total for MBOs

Panel A Total level of earnings management for MBOs

Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho[1]: mean=0	t-Stat[2]	p-Value	REM[3]
AEM+Prod+DisEx	95	0.150	0.460	-1.114	1.954	Ha: > 0	3.174***	0.001	+
AEM+CFO+DisEx	96	0.123	0.381	-0.941	2.083	Ha: > 0	3.158***	0.001	+

Note 1. Ho: is Null Hypothesis; Ha: is Alternative Hypothesis
Note 2: Note of T-test significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$
Note 3: This column indicates the direction of AEM+REM. '+' means income increasing earnings management; '-' means income decreasing earnings management. The significance of the positive or negative REM is shown by the '*' in t-Stat column.

Table 4.3.1 shows the results for the relationships between AEM and REM prior to MBOs, estimated by 3SLS. Panel B of Table 4.3.1 shows the results of 3SLS regressions for the AEM and REM aggregations, prior to MBOs. It can be seen that AEM and REM aggregations (both Prod+DisEx and CFO+DisEx) have no impact on each other. However, Panel A of Table 4.3.1 reveals that AEM and specific types of REM have impacts on each other. Table 4.1.4 summarises the results for the relationships between AEM and specific types of REM prior to MBOs.

Table 4.1.4 Summary of 3SLS regressions results for MBOs (not regression correlations)

Table 4.1.4 Summary of **3SLS** regressions results for MBOs (not regression correlations)

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	Accruals	ProdCos	Accruals	DisExp	Accruals	Res&Dev	Accruals	SGA	Accruals
Sign[1]	(-)	(-)	(+)	(-)	(-)	(-)	( )	(-)	(-)	(-)
Accruals(-)[1]	- ***		+ ***		+ ***		+ ***		- ***	
CFO(-)		- ***								
ProdCos(+)				+ ***						
DisExp(-)						+ *				
Res&Dev( )								+ ***		
SGA(-)										- ***
ROA	+ *								- **	
MarketSh					- *					
Z-score									+ *	
InsShare					+ *					
PE Ratio	- ***				- ***					
BoardSz										
NED%					- **					
Big5										
LNAuditTn										
AudComSz										
AudShare										
OpeCycle										

Note 1: This is sign direction of earnings management proxies in bracket from univariate tests of prior chapters. (+) means significantly positive; (-) means significantly negative; ( ) means insignificant sign direction.

Table 4.3.1 Panel A 3SLS Regressions for MBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruDe	ProdCos	AccruDe	DisExp	AccruDe	Res&Dev	AccruDe	SGA	AccruDe
Sign	(-)	(-)	(+)	(-)	(-)	(-)	(?)	(-)	(-)	(-)
Accruals	-0.992***		2.434***		1.918***		0.109***		-1.049***	
	(-4.026)		(4.344)		(3.156)		(7.465)		(-3.239)	
CFO		-0.316***								
		(-3.362)								
ProdCos				0.230***						
				(6.170)						
DisExp						0.095*				
						(1.842)				
Res&Dev								8.915***		
								(8.312)		
SGA										-0.291***
										(-3.990)
ROA	0.172*		-0.023		-0.046		-0.001		-0.349**	
	(1.906)		(-0.116)		(-0.178)		(-0.287)		(-2.551)	
MarketSh	0.916		-0.163		-10.928*		-0.009		-1.151	
	(0.399)		(-0.033)		(-1.658)		(-0.106)		(-0.334)	
Z-score	-0.002		0.001		-0.004		0.000		0.008*	
	(-0.817)		(0.177)		(-0.504)		(0.196)		(1.900)	
InsShare	-0.051		0.029		0.257*		0.001		0.097	
	(-0.949)		(0.240)		(1.654)		(0.390)		(1.190)	
PE Ratio	-0.002***		-0.000		-0.003***		-0.000		0.000	
	(-4.120)		(-0.329)		(-2.655)		(-0.039)		(0.144)	
BoardSz	0.003		-0.008		-0.018		0.000		-0.007	
	(0.389)		(-0.491)		(-0.912)		(0.093)		(-0.696)	
NED%	0.114		-0.119		-0.442**		-0.001		-0.051	
	(1.432)		(-0.683)		(-2.055)		(-0.335)		(-0.453)	
Big5		-0.001		0.003		0.003		0.001		-0.004
		(-0.075)		(0.210)		(0.141)		(0.151)		(-0.174)
LNAuditTn		-0.004		-0.001		-0.002		-0.001		0.000
		(-0.347)		(-0.130)		(-0.139)		(-0.189)		(0.024)
AudComSz		0.005		0.003		0.011		0.000		0.007
		(0.742)		(0.450)		(1.144)		(0.013)		(0.772)
AudShare		0.037		0.070		0.117		0.020		0.048
		(0.456)		(0.903)		(1.192)		(0.474)		(0.495)
OpeCycle		-0.000		-0.000		-0.000		-0.000		-0.000
		(-0.930)		(-1.122)		(-1.151)		(-0.036)		(-1.478)
LnAssets	-0.008	0.001	-0.009	0.003	0.082**	-0.004	0.000	-0.004	-0.007	-0.004
	(-0.615)	(0.062)	(-0.294)	(0.394)	(2.357)	(-0.407)	(0.507)	(-0.487)	(-0.393)	(-0.352)
Mark2Book	0.012	0.008	-0.019	0.006	-0.011	0.010	-0.001*	0.009*	0.005	0.004
	(1.597)	(1.461)	(-1.151)	(1.268)	(-0.476)	(1.394)	(-1.740)	(1.819)	(0.383)	(0.582)

Leverage	-0.122	0.003	-0.101	0.048	-0.219	0.031	-0.008	0.076	0.029	0.040
	(-1.155)	(0.032)	(-0.425)	(0.629)	(-0.794)	(0.352)	(-0.955)	(0.951)	(0.204)	(0.462)
DealVal	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000
	(0.400)	(0.449)	(-0.535)	(0.595)	(1.431)	(0.060)	(-0.291)	(0.353)	(0.340)	(0.129)
Constant	-0.023	-0.047	0.312	-0.087	-0.708**	-0.004	-0.001	0.004	0.059	-0.013
	(-0.175)	(-0.547)	(1.050)	(-1.014)	(-2.108)	(-0.034)	(-0.090)	(0.048)	(0.333)	(-0.135)
Observations	111	111	110	110	93	93	109	109	93	93
R-squared	-0.185	-0.124	-0.511	-0.143	-0.235	-0.054	-0.695	-0.294	-0.085	-0.014
Wald chi2	48.21	15.98	25.91	41.97	28.80	14.54	70.89	81.53	29.00	22.38
Prob > chi2	0.000	0.100	0.011	0.000	0.004	0.150	0.000	0.000	0.004	0.013

Note: z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.1 Panel B 3SLS Regressions for MBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruDe	CFO+DisEx	AccruDe
Accruals	0.325		-0.987	
	(0.325)		(-1.359)	
Prod+DisEx		0.038		
		(1.288)		
CFO+DisEx				-0.011
				(-0.255)
ROA	0.110		-0.139	
	(0.266)		(-0.458)	
MarketSh	9.746		9.442	
	(0.946)		(1.218)	
Z-score	0.001		0.007	
	(0.054)		(0.710)	
InsShare	-0.426*		-0.204	
	(-1.699)		(-1.118)	
PE Ratio	0.003*		0.006***	
	(1.751)		(4.337)	
BoardSz	0.023		0.019	
	(0.737)		(0.829)	
NED%	0.355		0.377	
	(1.051)		(1.502)	
Big5		-0.002		0.001
		(-0.088)		(0.039)
LNAuditTn		-0.001		-0.001
		(-0.077)		(-0.053)
AudComSz		0.011		0.011
		(1.103)		(1.169)
AudShare		0.095		0.112
		(0.909)		(1.082)
OpeCycle		-0.000*		-0.000
		(-1.683)		(-1.588)
LnAssets	-0.076	0.004	-0.074*	0.000
	(-1.437)	(0.368)	(-1.885)	(0.006)
Mark2Book	-0.013	0.009	-0.008	0.009
	(-0.364)	(1.401)	(-0.288)	(1.379)
Leverage	-0.052	0.047	0.289	0.035
	(-0.131)	(0.546)	(0.949)	(0.405)
DealVal	-0.000	0.000	-0.000	0.000
	(-1.393)	(0.221)	(-1.379)	(0.139)
Constant	0.848	-0.106	0.702*	-0.061
	(1.643)	(-1.054)	(1.859)	(-0.600)
Observations	92	92	93	93

R-squared	0.154	0.113	0.147	0.073
Wald chi2	15.98	10.28	29.92	10.14
Prob > chi2	0.192	0.416	0.003	0.429

Note: z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.2 Panel A 2SLS Regressions for MBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruDe	ProdCos	AccruDe	DisExp	AccruDe	Res&Dev	AccruDe	SGA	AccruDe
Sign[1]	(-)	(-)	(+)	(-)	(-)	(-)	(?)	(-)	(-)	(-)
Accruals	-0.342***		0.595**		-0.493		0.097***		-0.275**	
	(-3.137)		(2.331)		(-1.157)		(7.514)		(-2.319)	
CFO		-0.538								
		(-1.381)								
ProdCos				0.065						
				(1.617)						
DisExp						0.306				
						(1.096)				
Res&Dev								-0.062		
								(-0.040)		
SGA										-0.077
										(-0.906)
ROA	0.220**		-0.136		-0.566		-0.006		-0.420***	
	(2.423)		(-1.028)		(-1.501)		(-0.671)		(-4.012)	
MarketSh	0.897		-0.323		-11.925**		-0.011		-1.592	
	(0.546)		(-0.078)		(-2.086)		(-0.066)		(-0.793)	
Z-score	-0.003		0.002		0.006		0.000		0.011***	
	(-1.521)		(0.597)		(0.661)		(0.963)		(4.596)	
InsShare	-0.046		-0.046		0.187		0.006		0.161***	
	(-1.053)		(-0.365)		(1.246)		(1.093)		(2.817)	
PE Ratio	-0.002*		-0.000		-0.003		-0.000		0.000	
	(-1.836)		(-0.407)		(-1.593)		(-0.098)		(0.034)	
BoardSz	0.002		-0.003		0.004		-0.000		-0.012	
	(0.196)		(-0.143)		(0.256)		(-0.268)		(-1.144)	
NED%	0.110		-0.125		-0.377		-0.007		-0.072	
	(1.484)		(-0.806)		(-0.938)		(-0.839)		(-0.847)	
Big5		0.016		0.005		-0.016		-0.004		-0.006
		(0.645)		(0.292)		(-0.514)		(-0.225)		(-0.294)
LNAuditTn		0.009		-0.002		0.000		-0.002		-0.003
		(0.603)		(-0.144)		(0.011)		(-0.192)		(-0.178)
AudComSz		0.004		0.004		0.010		0.006		0.011
		(0.481)		(0.546)		(0.701)		(0.768)		(1.095)
AudShare		0.127		0.121		0.055		0.105		0.084
		(0.856)		(1.071)		(0.270)		(0.928)		(0.727)
OpeCycle		-0.000		-0.000		-0.000		-0.000		-0.000
		(-1.114)		(-1.106)		(-0.071)		(-1.002)		(-1.011)
LnAssets	-0.009	-0.001	-0.003	0.002	0.079	-0.013	0.000	-0.000	-0.009	0.000
	(-0.667)	(-0.065)	(-0.130)	(0.217)	(1.399)	(-0.585)	(0.371)	(-0.045)	(-0.520)	(0.019)
Mark2Book	0.007	0.011*	-0.008	0.005	0.016	0.009	-0.001	0.003	-0.001	0.008
	(1.033)	(1.666)	(-0.468)	(0.957)	(0.489)	(0.724)	(-0.962)	(0.535)	(-0.058)	(1.226)

Leverage	-0.214*	-0.015	0.028	0.052	-0.060	0.004	-0.009	0.036	-0.002	0.033
	(-1.786)	(-0.145)	(0.130)	(0.705)	(-0.310)	(0.031)	(-1.230)	(0.466)	(-0.021)	(0.394)
DealVal	0.000	0.000	-0.000	0.000	0.000***	-0.000	-0.000	0.000	0.000	0.000
	(0.902)	(1.298)	(-1.336)	(0.769)	(4.405)	(-0.237)	(-0.036)	(0.766)	(1.429)	(0.341)
Constant	0.016	-0.077	0.200	-0.065	-0.869*	0.135	0.001	-0.027	0.126	-0.055
	(0.123)	(-0.661)	(0.821)	(-0.740)	(-1.700)	(0.473)	(0.121)	(-0.306)	(0.724)	(-0.491)
Observations	114	111	113	110	96	93	113	109	96	93
R-squared	0.239		0.040	0.085	0.218			0.064	0.239	0.100
Wald chi2	66.88	7.350	63.21	14.42	109.2	6.167	329.6	10.86	51.31	17.23
Prob > chi2	0.000	0.692	0.000	0.155	0.000	0.801	0.000	0.368	0.000	0.070
Hausman (F)	3.354*	4.769**	0.450	0.088	0.364	8.326***	18.417***	0.715	0.482	.001

Note: Robust z-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Note 1: Sign is the sign direction from univariate tests of Chapter One and Chapter Two, (-) means significant negative, (+) means significant positive, and (?) means insignificant direction.

Table 4.3.2 Panel B 2SLS Regressions for MBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	Accruals	CFO+DisEx	Accruals
Accruals	0.615*		0.824*	
	(1.800)		(1.865)	
Prod+DisEx		-0.042		
		(-0.653)		
CFO+DisEx				-0.138
				(-0.904)
ROA	0.163		0.378	
	(0.504)		(0.958)	
MarketSh	9.474		9.525	
	(1.242)		(1.559)	
Z-score	0.000		-0.003	
	(0.035)		(-0.390)	
InsShare	-0.387*		-0.130	
	(-1.730)		(-0.762)	
PE Ratio	0.003		0.005*	
	(1.442)		(1.723)	
BoardSz	0.019		-0.003	
	(0.662)		(-0.150)	
NED%	0.318		0.306	
	(0.680)		(0.725)	
Big5		-0.007		-0.016
		(-0.309)		(-0.633)
LNAuditTn		-0.001		-0.004
		(-0.089)		(-0.250)
AudComSz		0.012		0.010
		(1.088)		(0.883)
AudShare		0.082		0.081
		(0.612)		(0.507)
OpeCycle		-0.000		-0.000
		(-0.912)		(-0.622)
LnAssets	-0.075	-0.000	-0.068	-0.004
	(-1.138)	(-0.018)	(-1.168)	(-0.270)
Mark2Book	-0.018	0.009	-0.029	0.006
	(-0.333)	(1.235)	(-0.776)	(0.603)
Leverage	-0.120	0.019	0.196	0.024
	(-0.363)	(0.186)	(0.823)	(0.232)
DealVal	-0.000***	-0.000	-0.000***	-0.000
	(-3.659)	(-0.005)	(-3.765)	(-0.208)
Constant	0.884	-0.046	0.815	0.026
	(1.440)	(-0.362)	(1.530)	(0.143)
Observations	95	92	96	93

R-squared	0.155		0.211	
Wald chi2	170.0	11.95	96.69	9.836
Prob > chi2	0.000	0.288	0.000	0.455
Hausman (F)	0.095	2.643	1.408	2.169

Note: z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.4.1.1 Results for earnings management relationships

AEM and sales manipulation

AEM has a negative impact on REM of sales manipulation (CFO), and REM of sales manipulation also has a negative impact on AEM. The sign directions of AEM and sales manipulation are both significantly negative, suggesting that sales manipulation leads to less AEM, or AEM leads to less sales manipulation, which is consistent with hypothesis $H_{3\text{-}1b}$. This also implies a causal relationship between AEM and sales manipulation: managers' decisions on the level of AEM and sales manipulation are likely to be made jointly, and they depend on each other. Managers tend to have relatively more leeway in terms of the volume and detectability with sales manipulation, so they are likely to be somewhat overaggressive in this to ensure they hit minimum benchmarks.

AEM and overproduction

AEM has a positive impact on REM of overproduction (ProdCos), and REM of overproduction also has a positive impact on AEM. The sign direction of AEM is significantly negative, but the sign direction of overproduction is significantly positive. This suggests that overproduction leads to less AEM, or AEM leads to less overproduction, which is consistent with hypothesis $H_{3\text{-}1b}$. This also implies a causal relationship between AEM and overproduction: managers' decisions on the level of AEM and overproduction are likely to be made jointly, and they depend on each other.

AEM and sales, general and administrative expenditure cuts

AEM has a negative impact on REM of SG&A expenditure cuts (SGA), and REM of SG&A expenditure cuts also has a negative impact on AEM. The sign directions of AEM and SG&A expenditure cuts are both significantly negative. Hence, this suggests that SG&A expenditure cut leads to less AEM, or AEM leads to less SG&A expenditure cut, which is consistent with hypothesis $H_{3\text{-}1b}$. This also implies a causal relationship between AEM and SG&A expenditure cuts: managers' decisions on the levels of AEM and SG&A expenditure cuts are likely to be made jointly, and they depend on each other.

Summary and explanation

To sum up, prior to MBOs, REM of sales manipulation (CFO), overproduction (ProdCos), and SG&A expenditure cuts (SGA) leads to less AEM. AEM also leads to less REM of sales manipulation, overproduction, and SG&A expenditure cuts. Thus these types of REM and AEM might have a substitutive relationship.

Prior to MBOs, managers have been found to engage in positive REM and negative AEM. Managers engage in positive REM to increase earnings and portray a better future performance to external financiers. Positive REM is expected to enhance external financiers' perceptions of a firm's value in order to secure finance preceding MBOs. Managers also engage in negative AEM to conceal the true value of their firm so they will not have to pay too much to outside shareholders. External financiers might not be concerned about AEM, as it will only decrease the price they have to pay in the transaction. Preceding MBOs, management might have the primary goal of securing external financing, thus they might set an aggressively positive target for total earnings management. Panel A of Table 3.1.3 shows that the level of earnings management in total is significantly positive prior to MBOs, which is consistent with this prediction. Hence managers might choose to engage in more positive

REM and less negative AEM, and thus result in REM of sales manipulation, overproduction, and SG&A expenditure cuts lead to less AEM prior to MBOs.

Moreover, managers might have asymmetric control over the exact amount of different REM tools attained. Managers tend to have relatively more leeway in terms of the volume and detectability with sales manipulation (CFO) than they have with overproduction and SG&A expenditure cuts. This might be because managers can precisely determine the level of inventory they hold for an accounting period, and they can precisely determine the level of SG&A expenditure cuts for an accounting period. Hence, by consistently using multiple REM tools to boost earnings and decreasing negative AEM, managers might increase their chances of achieving their target level of earnings management in total.

In addition, exceeding the earnings management target might lead to higher buyout costs for managers, and a failure to beat the target might lead to difficulties when it comes to seeking funds for an MBO. Hence combining these tools might help managers to achieve their overall earnings management target precisely. Furthermore, if managers run out of REM options, AEM could also be used to adjust the overall effects of earnings management.

AEM and research and development expense cuts

AEM has a positive impact on REM of R&D expense cut (Res&Dev), and REM of R&D expense cut also has a positive impact on AEM. The sign direction of AEM is significantly negative. There is no evidence of systematic R&D expense cuts if only considers R&D expense cuts. This suggests that R&D expense cut leads to less AEM, or AEM leads to less R&D expense cut, which is consistent with hypothesis $H_{3\text{-}1b}$. This also implies a causal relationship between AEM and R&D expense cuts: managers' decisions on the level of AEM and R&D expense cuts are likely to be made jointly, and they depend on each other.

AEM and discretionary expenses cut

AEM has a positive impact on REM of discretionary expenses cut (DisExp), and REM of discretionary expenses cut also has a positive impact on AEM. The sign directions of AEM and discretionary expense cuts are both significantly negative, suggesting that cutting discretionary expenses leads to more AEM, or AEM leads to more cutting of discretionary expenses, which is consistent with hypothesis $H_{3\text{-}1a}$. This also implies a causal relationship between AEM and cutting discretionary expenses: managers' decisions on the level of AEM and discretionary expense cuts are likely to be made jointly, and they depend on each other.

Discretionary expenses includes both SG&A expenditures and R&D expenses. SG&A expenditure cuts (SGA) are significantly negative in univariate tests, which suggest positive REM. There is no systematic R&D expense manipulation (Res&Dev). Increasing R&D expenses tends to be beneficial for the future success of firms, while cutting R&D expenses might be detrimental to the firm. Thus managers might try to minimise the manipulation of R&D expenses. Some managers might engage in negative REM by increasing R&D expenses, while others may engage in positive REM by decreasing R&D expenses, leading to insignificant results in univariate tests. Hence the combined effects of R&D expenses manipulation might lead to a positive impact between discretionary expenses cut and AEM. This might suggest that cutting discretionary expenses is a complementary of AEM.

4.4.1.2 Results for constraints on earnings management

Table 4.3.1 also shows the results for the relationships between earnings management and its constraints, estimated by 3SLS, prior to MBOs. Table 4.1.4 also summarises the results for these relationships.

Firm performance

Firm performance (ROA) has a positive relationship with REM of sales manipulation (CFO). The sign direction of sales manipulation is significantly negative, suggesting that firms with better performance are associated with less sales manipulation, which is consistent with hypothesis $H_{3\text{-}8a}$.

Managers are less likely to engage in income-increasing earnings management to produce better accounting results in more profitable firms, as their firm already perform well (Becker et al., 1998; Bédard et al., 2004). Hence, firms with relatively better performance might be less likely to engage in sales manipulation.

Moreover, firm performance has a negative relationship with REM of SG&A expenditure cuts (SGA). The sign direction of SG&A expenditure cuts is significantly negative. This suggests that firms with better performance are associated with more SG&A expenditure cutting, which is inconsistent with hypothesis $H_{3\text{-}8a}$.

As discussed in Chapter 2, cutting SG&A expenditure might have negative economic consequence for a firm in the long-term, but sales manipulation brings an immediate short-term negative economic consequence. Interfering in short-term operations might lead to abnormal firm performance, which is likely to attract the attention of shareholders and thus affect the overall execution plan for an MBO. Managers in better-performing firms might be more eager to execute MBOs. Hence, in better-performing firms, managers might choose to minimise short-term rather than long-term interference in normal operations. Moreover, managers in a firm with better performance might need slightly positive REM in order to secure financing. As SG&A expenditure cuts are easier to control, and the effects can be more precisely estimated, managers in better-performing firms might choose to cut SG&A expenditure rather than engage in sales manipulation prior to MBOs.

Market-leader status

Market-leader status in the industry (MarketSh) has a negative relationship with REM of discretionary expense cuts (DisExp). The sign direction of discretionary expenses cuts is significantly negative, suggesting that firms without market-leader status are associated with less discretionary expenses cutting, which is consistent with hypothesis $H_{3\text{-}9a}$.

REM might be particularly costly for firms in an industry with intense competition, as it departs from optimal operating decisions of the business. Deviating from optimal business strategies may lead to different impact on firm performance. Market-leader firms usually have more competitive advantages than their followers, such as greater cumulative experience, economies of scale, more bargaining power with suppliers and customers, higher attention from investors and greater influence on their competitors (Woo, 1983). This might suggest that REM might be less costly for market-leader firms, as the erosion of their competitive advantage is relatively small (Zang, 2012). This implies that firms without market-leader status are less likely to engage in REM due to the relatively high costs. Hence firms without market-leader status have a lower level of REM of discretionary expenses cut prior to MBOs.

Financial health

Financial health (Z-score) has a positive relationship with REM of SG&A expenditure cut (SGA). The sign direction of SG&A expenditure cuts is significantly negative, suggesting that firms with poor financial health have a higher level of SG&A expenditure cuts, which is inconsistent with hypothesis $H_{3\text{-}10a}$.

A firm in financial distress might be less likely to find external financial support for an MBO and might have difficulty repaying debts after a buyout. Cutting SG&A expenditure might have a negative impact on a firm's performance in the long-term, but this manipulation is easy to implement and control. Hence managers might choose to cut SG&A expenditure to improve their financial situation in the short term and to support the execution of an MBO

Institutional ownership

Institutional ownership (InsShare) has a positive relationship with REM of discretionary expense cuts (DisExp). The sign direction of discretionary expenses cuts is significantly negative, suggesting that firms with higher institutional ownership have lower levels of discretionary expense cutting, which is consistent with hypothesis $H_{3\text{-}11a}$.

As institutional investors provide a high degree of monitoring through governance practices and information gathering concerning the quality of operating decisions, managers find it difficult to manipulate REM when institutional investors closely monitor their operations (Bushee, 1998). Moreover, institutions with the intention of holding substantial equity ownership over a long-term have strong incentives to incur the cost of explicitly monitoring for removing incentives on managerial myopic behaviour. Furthermore, institutional investors might have a better understanding of the long-term impact of firms' operating decisions, leading to more effort in monitor and control REM activities. In addition, as discretionary expense cuts is easier to spot than other types of REM, institutional investors might have high chance to spot it in close monitoring. Therefore, firms with higher institutional ownership have lower levels of discretionary expense cuts.

Firm undervaluation

The degree of firm undervaluation (PE Ratio) has a negative relationship with

REM of sales manipulation (CFO). The sign direction of sales manipulation is significantly negative, suggesting that firms with higher degrees of undervaluation are associated with more sales manipulation, which is consistent with hypothesis $H_{3\text{-}12a}$.

Moreover, the degree of firm undervaluation (PE Ratio) has a negative relationship with REM of discretionary expense cuts (DisExp). The sign direction of discretionary expenses cuts is significantly negative, suggesting that firms with higher degrees of firm undervaluation are associated with more discretionary expenses cuts, which is consistent with hypothesis $H_{3\text{-}12a}$.

I have found that MBO firms are undervalued in the market. Prior to MBOs, managers' ability to access external funding might be constrained in highly undervalued firms. Hence managers in firms with high degree of undervaluation are more likely to engage in positive REM to enhance prospective external financiers' perceptions of the firm's value to secure external financing (Fischer and Louis, 2008). Therefore, firms with higher degree of firm undervaluation are associated with more sales manipulation and discretionary expense cuts.

Percentage of non-executive directors on board

The percentage of non-executive directors on board (NED%) has a negative relationship with REM of discretionary expense cuts (DisExp). The sign direction of discretionary expense cuts is significantly negative, suggesting that firms with higher percentages of non-executive directors on their boards are associated with more cutting of discretionary expenses, which is inconsistent with hypothesis $H_{3\text{-}12a}$.

Non-executive directors might perform little or no real monitoring role, as they lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and

Kraakman, 1991). Hence a board with a high percentage of non-executive directors might be less likely to challenge managers, leading to more use of discretionary expenses cuts. Moreover, buyout firms are not required to hire as many non-executive directors as listed firms are. Non-executive directors might be afraid of losing their position on a board after a buyout, and thus they support managers who engage in REM preceding MBOs.

4.4.2 Results for institutional buyouts

Prior to IBOs, managers are motivated to engage in positive earnings management in an attempt to minimise firm undervaluation. I have found in prior chapters that IBO firms have undervalued shares in the market. Firm undervaluation tends to attract IBO buyers (Hafzalla, 2009), and IBOs threaten managers' long-term job security (Denis and Denis, 1995). Under these conditions, managers are likely to engage in positive earnings management to avoid becoming a potential target for an IBO. They often do not have much time to prepare an earnings-management strategy, and they prefer REM in this circumstance. Thus, given the portfolio of earnings management strategies, managers are likely to engage in both REM and AEM according to their expected earnings management target in total and the associated benefits and drawbacks.

Managers have been found to engage in positive REM prior to IBOs. As discussed in univariate tests section of Chapter 3, managers engage in four out of five types of REM to boost earnings prior to IBOs, and their REM behaviours are the same as those prior to MBOs. They engage in sales manipulation (- CFO), overproduction (+ ProdCos), cutting discretionary expenses (- DisExp) and cutting SG&A expenses (- SGA). Nevertheless, the result of abnormal R&D expense cuts in univariate tests is insignificant (Res&Dev), suggesting no evidence of greater R&D expense cuts behaviour compared to non-buyout firms.

This study has found no evidence that, prior to IBOs, managers engage in AEM to a greater degree than non-buyout firms do. As discussed in univariate tests section of Chapter 2, managers show no systematic AEM behaviour, resulting in an insignificant sign direction for abnormal discretionary accruals (AccruDe), but this does not mean no manager engage in AEM.

Considering the combination effects of AEM and REM practices, the total level of earnings management should be positive in order to increase the firm value preceding IBOs. Panel B of Table 4.1.3 shows the results of the combination effects of AEM and REM practices for IBOs. It can be seen that the total level of earnings management (the combination of AEM and both types of REM aggregations: AEM+Prod+DisEx and AEM+CFO+DisEx) is significantly positive prior to IBOs. This is consistent with the prediction that the total level of earnings management is positive preceding IBOs.

Table 4.1.3 Panel B Summary Statistics of earnings management in total for IBOs

Panel B Total level of earnings management for IBOs									
Variable	Obs.	Mean	Std.Dev.	Min	Max	Ho[1]: mean=0	t-Stat[2]	p-Value	REM[3]
AEM+Prod+DisEx	64	0.100	0.378	-0.862	1.124	Ha: > 0	2.115**	0.019	+
AEM+CFO+DisEx	67	0.093	0.221	-0.449	0.609	Ha: > 0	3.429***	0.001	+

Note 1. Ho: is Null Hypothesis; Ha: is Alternative Hypothesis;
Note 2: Note of T-test significance: *** p<0.01, ** p<0.05, * p<0.1
Note 3: This column indicates the direction of AEM+REM. '+' means income increasing earnings management; '-' means income decreasing earnings management. The significance of the positive/negative real earnings management is indicated by the '*' in t-Stat column.

Table 4.3.3 shows the results for the relationships between AEM and REM, estimated by 3SLS, prior to IBOs. Panel B of Table 4.3.3 shows the results of 3SLS regressions for AEM and REM aggregations prior to IBOs. It can be seen that AEM and the first type of REM aggregation (CFO+DisEx) do influence each other, and the second type of REM aggregation (Prod+DisEx) has a single-direction impact on AEM but not reverse. This is consistent with the findings of prior studies (e.g. Cohen et al., 2008; Cohen and Zarowin, 2010a; Zang, 2012): AEM and aggregation of REM have impact on each other.

However, the inclusion of the REM aggregation might make inconsistent results more difficult to interpret. Managers have different incentives for specific types of REM due to potential long-term or short-term effects as well as different costs associated, thus different types of REM might cancel each other or give rise to inconsistent results. It is better to focus on the relationships between AEM and specific types of REM in Panel A of Table 4.3.3. The interpretation of the results for the relationships between AEM and specific types of REM might provide a better understanding of managers' earnings management strategies and behaviours preceding IBOs. Table 4.1.5 summarises the results for the relationships between AEM and specific types of REM prior to IBOs.

As discussed previously in the methodology section, sales growth (SalesGrow) is a weak instrument of AEM for IBOs, hence the results for the relationships between AEM and REM from structural equation 1 (model REM (1)-(5)) for IBOs might be not as reliable as those for MBOs.

Table 4.1.5 Summary of 3SLS regressions results for IBOs (not regression correlations)

Table 4.1.5 Summary of **3SLS** regressions results for IBOs (not regression correlations)

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	Accruals	ProdCos	Accruals	DisExp	Accruals	Res&Dev	Accruals	SGA	Accruals
Sign[1]	(-)	( )	(+)	( )	(-)	( )	( )	( )	(-)	( )
Accruals( )[1]	- **		+ **		+ **					
CFO(-)		- ***								
ProdCos(+)				+ ***						
DisExp(-)						+ ***				
Res&Dev( )										
SGA(-)										- ***
ROA										
MarketSh										
Z-score					- *		- *			
InsShare										
PE Ratio										
BoardSz							- **			
NED%										
Big5										
LNAuditTn										
AudComSz										
AudShare								+ *		
OpeCycle										

Note 1: sign direction of earnings management proxies in bracket from univariate tests of prior chapters. (+) means significantly positive; (-) means significantly negative; ( ) means insignificant sign direction.

Table 4.3.3 Panel A 3SLS Regressions for IBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruDe	ProdCos	AccruDe	DisExp	AccruDe	Res&Dev	AccruDe	SGA	AccruDe
Sign	(-)	(?)	(+)	(?)	(-)	(?)	(?)	(?)	(-)	(?)
Accruals	-2.480**		4.591**		2.844**		0.041		-1.452	
	(-2.392)		(2.011)		(2.069)		(0.743)		(-1.415)	
CFO		-0.302***								
		(-3.574)								
ProdCos				0.147***						
				(3.561)						
DisExp						0.185***				
						(3.594)				
Res&Dev								-1.301		
								(-0.696)		
SGA										-0.374***
										(-4.610)
ROA	-0.121		0.034		0.375		0.004		0.038	
	(-1.003)		(0.120)		(1.436)		(0.447)		(0.262)	
MarketSh	0.333		-0.231		0.682		0.002		0.128	
	(0.477)		(-0.146)		(0.513)		(0.038)		(0.177)	
Z-score	0.024		-0.018		-0.063*		-0.002*		-0.011	
	(1.333)		(-0.378)		(-1.817)		(-1.946)		(-0.489)	
InsShare	0.056		-0.007		-0.076		-0.008		0.009	
	(0.564)		(-0.029)		(-0.348)		(-1.298)		(0.055)	
PE Ratio	0.000		-0.000		-0.000		0.000		-0.000	
	(0.762)		(-0.242)		(-0.908)		(0.619)		(-0.447)	
BoardSz	-0.006		0.017		-0.014		-0.001**		-0.012	
	(-0.791)		(0.931)		(-0.843)		(-2.442)		(-1.064)	
NED%	-0.047		0.222		-0.117		0.002		-0.095	
	(-0.495)		(0.980)		(-0.566)		(0.281)		(-0.754)	
Big5		-0.000		0.000		-0.010		-0.004		-0.010
		(-0.015)		(0.013)		(-0.423)		(-0.148)		(-0.471)
LNAuditTn		-0.002		0.001		-0.004		0.010		-0.003
		(-0.232)		(0.122)		(-0.288)		(0.682)		(-0.188)
AudComSz		-0.002		-0.004		-0.000		-0.007		-0.008
		(-0.333)		(-0.612)		(-0.035)		(-0.745)		(-0.847)
AudShare		0.041		0.070		0.098		0.219*		0.089
		(0.412)		(0.700)		(0.783)		(1.752)		(0.706)
OpeCycle		0.000		0.000		0.000		0.000		0.000
		(0.370)		(0.322)		(0.887)		(1.017)		(0.356)
LnAssets	-0.031	-0.013*	0.024	-0.008	0.061*	-0.014	0.001	-0.013*	-0.002	-0.003
	(-1.467)	(-1.875)	(0.540)	(-1.144)	(1.913)	(-1.426)	(1.007)	(-1.703)	(-0.108)	(-0.329)
Mark2Book	0.002	0.001	0.001	0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000
	(1.073)	(0.833)	(0.140)	(0.129)	(-0.028)	(-0.149)	(-0.235)	(0.186)	(0.043)	(0.263)

Leverage	0.169	0.084	-0.384	0.100*	-0.423*	0.129*	-0.013	0.195***	0.080	0.089
	(0.821)	(1.499)	(-0.792)	(1.804)	(-1.749)	(1.959)	(-1.138)	(3.608)	(0.490)	(1.295)
DealVal	0.000*	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	-0.000
	(1.805)	(1.605)	(-0.731)	(0.983)	(-0.679)	(0.358)	(-0.678)	(1.108)	(-0.466)	(-0.191)
Constant	0.279	0.129*	-0.327	0.073	-0.439	0.164	0.004	0.116	0.139	0.051
	(1.392)	(1.712)	(-0.739)	(0.932)	(-1.249)	(1.502)	(0.386)	(1.490)	(0.661)	(0.467)
Observations	76	76	75	75	62	62	74	74	60	60
R-squared	-2.029	0.112	-1.557	0.045	-0.698	-0.055	0.045	0.189	-0.587	-0.092
Wald chi2	21.62	27.23	19.79	31.21	16.12	17.57	15.26	17.49	22.49	31.27
Prob > chi2	0.042	0.002	0.071	0.001	0.186	0.063	0.228	0.064	0.032	0.001

Note: z-statistics in parentheses,

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.3 Panel B 3SLS Regressions for IBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruDe	CFO+DisEx	AccruDe
Accruals	-2.786		-2.493*	
	(-1.129)		(-1.869)	
Prod+DisEx		-0.064**		
		(-2.048)		
CFO+DisEx				-0.203***
				(-3.695)
ROA	-0.755		-0.293	
	(-1.458)		(-1.132)	
MarketSh	-1.811		-1.049	
	(-0.725)		(-0.790)	
Z-score	0.131		0.044	
	(1.515)		(1.315)	
InsShare	0.265		0.057	
	(0.592)		(0.268)	
PE Ratio	0.001		0.000	
	(0.905)		(0.731)	
BoardSz	0.036		0.017	
	(1.165)		(0.993)	
NED%	0.421		0.173	
	(1.051)		(0.848)	
Big5		-0.013		-0.009
		(-0.477)		(-0.398)
LNAuditTn		-0.002		-0.004
		(-0.161)		(-0.283)
AudComSz		-0.003		-0.001
		(-0.282)		(-0.096)
AudShare		0.158		0.111
		(1.155)		(0.856)
OpeCycle		0.000		0.000
		(1.024)		(0.998)
LnAssets	-0.051	-0.008	-0.036	-0.010
	(-0.975)	(-0.787)	(-1.138)	(-1.018)
Mark2Book	0.003	0.000	-0.001	-0.000
	(0.560)	(0.287)	(-0.306)	(-0.419)
Leverage	0.551	0.132*	0.465*	0.157**
	(1.231)	(1.940)	(1.957)	(2.320)
DealVal	0.000	0.000	-0.000	-0.000
	(0.413)	(0.178)	(-0.085)	(-0.077)
Constant	-0.124	0.093	0.182	0.124
	(-0.205)	(0.835)	(0.523)	(1.152)
Observations	61	61	62	62

R-squared	-0.071	0.039	-0.585	-0.119
Wald chi2	9.717	8.09	15.59	18.60
Prob > chi2	0.641	0.620	0.211	0.046

Note: z-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.4 Panel A 2SLS Regressions for IBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruDe	ProdCos	AccruDe	DisExp	AccruDe	Res&Dev	AccruDe	SGA	AccruDe
Sign	(-)	(?)	(+)	(?)	(-)	(?)	(?)	(?)	(-)	(?)
Accruals	-0.032		58.599		4.118		-0.074		-1.647*	
	(-0.032)		(0.041)		(1.524)		(-1.085)		(-1.689)	
CFO		-0.092								
		(-0.677)								
ProdCos				0.043						
				(0.765)						
DisExp						0.041				
						(0.887)				
Res&Dev								-0.366		
								(-0.132)		
SGA										-0.006
										(-0.052)
ROA	-0.189**		-1.597		0.750**		0.004		0.000	
	(-2.517)		(-0.040)		(2.018)		(0.468)		(0.003)	
MarketSh	0.524		-6.471		1.764		0.010		0.227	
	(1.205)		(-0.044)		(1.170)		(0.313)		(0.444)	
Z-score	0.031***		-0.361		-0.137**		-0.002		0.001	
	(2.607)		(-0.041)		(-2.291)		(-1.291)		(0.057)	
InsShare	-0.011		-4.226		-0.406		0.001		0.160	
	(-0.116)		(-0.040)		(-1.071)		(0.146)		(1.063)	
PE Ratio	0.000		-0.010		-0.001		0.000		0.000	
	(0.313)		(-0.041)		(-1.603)		(1.399)		(0.177)	
BoardSz	-0.014**		-0.009		-0.025		-0.001*		-0.012	
	(-2.247)		(-0.011)		(-1.217)		(-1.656)		(-1.250)	
NED%	-0.047		2.083		-0.005		-0.000		-0.259*	
	(-0.672)		(0.051)		(-0.014)		(-0.001)		(-1.813)	
Big5		-0.010		-0.013		-0.016		-0.009		-0.018
		(-0.549)		(-0.633)		(-0.834)		(-0.467)		(-0.884)
LNAuditTn		0.005		0.007		-0.002		0.003		-0.005
		(0.577)		(0.767)		(-0.231)		(0.311)		(-0.386)
AudComSz		-0.004		-0.004		-0.008		-0.005		-0.007
		(-0.627)		(-0.551)		(-1.178)		(-0.742)		(-1.016)
AudShare		0.184*		0.169		0.220**		0.194*		0.194*
		(1.692)		(1.432)		(2.243)		(1.705)		(1.746)
OpeCycle		0.000		0.000		0.000		0.000		0.000
		(0.959)		(0.727)		(1.175)		(1.277)		(0.979)
LnAssets	0.008	-0.013	0.762	-0.011	0.046	-0.006	-0.001	-0.013	-0.001	-0.004
	(0.378)	(-1.581)	(0.039)	(-1.381)	(1.145)	(-0.455)	(-0.501)	(-1.466)	(-0.054)	(-0.306)
Mark2Book	0.002	0.000	0.074	0.000	-0.001	0.000	-0.000	0.000	-0.001	0.000
	(1.396)	(1.108)	(0.041)	(0.647)	(-0.261)	(0.314)	(-0.930)	(0.811)	(-0.747)	(0.959)

Leverage	-0.156	0.158*	-8.357	0.161**	-0.408	0.124	0.004	0.193**	0.069	0.128
	(-0.834)	(1.894)	(-0.040)	(2.048)	(-1.190)	(1.363)	(0.322)	(2.410)	(0.538)	(1.314)
DealVal	0.000	0.000**	-0.001	0.000*	-0.000	0.000	0.000	0.000*	-0.000	0.000
	(0.725)	(2.084)	(-0.040)	(1.866)	(-0.752)	(0.198)	(0.757)	(1.776)	(-0.184)	(0.126)
Constant	-0.026	0.115	-5.883	0.102	-0.011	0.074	0.015	0.118	0.135	0.053
	(-0.162)	(1.572)	(-0.041)	(1.331)	(-0.028)	(0.618)	(1.258)	(1.552)	(0.601)	(0.466)
Observations	82	76	79	75	67	62	82	74	67	60
R-squared	0.338	0.187		0.172		0.105		0.186		0.103
Wald chi2	46.27	22.73	0.095	22.68	112.8	17.57	16.91	25.62	26.20	16.42
Prob > chi2	0.000	0.012	1	0.012	0.000	0.063	0.153	0.004	0.010	0.088
Hausman (F)	0. 041	0.002	0.226	0.276	9.063***	0.007	2.046	0.072	0.924	0.483

Note: z-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.4 Panel B 2SLS Regressions for IBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruDe	CFO+DisEx	AccruDe
Accruals	17.444		-4.224**	
	(0.578)		(-1.992)	
Prod+DisEx		-0.010		
		(-0.400)		
CFO+DisEx				-0.040
				(-0.856)
ROA	0.643		-0.704**	
	(0.239)		(-1.980)	
MarketSh	1.064		-2.426	
	(0.139)		(-1.515)	
Z-score	-0.193		0.118**	
	(-0.340)		(2.136)	
InsShare	-1.678		0.452	
	(-0.483)		(1.290)	
PE Ratio	-0.003		0.001*	
	(-0.468)		(1.730)	
BoardSz	0.003		0.032	
	(0.028)		(1.447)	
NED%	1.734		0.049	
	(0.684)		(0.145)	
Big5		-0.016		-0.016
		(-0.808)		(-0.823)
LNAuditTn		-0.001		-0.002
		(-0.119)		(-0.197)
AudComSz		-0.008		-0.008
		(-1.091)		(-1.154)
AudShare		0.206*		0.223**
		(1.954)		(2.234)
OpeCycle		0.000		0.000
		(1.116)		(1.208)
LnAssets	0.086	-0.005	-0.026	-0.005
	(0.286)	(-0.394)	(-0.657)	(-0.386)
Mark2Book	-0.001	0.000	0.000	0.000
	(-0.108)	(0.770)	(0.010)	(0.194)
Leverage	-1.184	0.122	0.437	0.130
	(-0.422)	(1.336)	(1.337)	(1.417)
DealVal	-0.000	0.000	0.000	0.000
	(-0.351)	(0.151)	(0.364)	(0.109)
Constant	-0.619	0.059	-0.225	0.063
	(-0.295)	(0.526)	(-0.523)	(0.554)
Observations	64	61	67	62

R-squared		0.097		0.100
Wald chi2	4.527	16.12	110.2	17.13
Prob > chi2	0.972	0.096	0.000	0.071
Hausman (F)	1.895	0.359	20.395***	0 .108

Note: z-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

4.4.2.1 Results for earnings management relationships

AEM and sales manipulation

AEM has a negative impact on REM of sales manipulation (CFO), and REM of sales manipulation also has a negative impact on AEM. The sign direction of sales manipulation is significantly negative. There does not appear to be a systematic AEM behaviour if only AEM manipulation is considered. This suggests that sales manipulation leads to more AEM, or AEM leads to more sales manipulation, which is consistent with hypothesis $H_{3\text{-}2a}$. This also implies a causal relationship between AEM and sales manipulation: managers' decisions on the levels of AEM and sales manipulation are likely to be made jointly, and they depend on each other. As previously discussed, managers tend to have relatively more leeway both in volume and detectability with sales manipulation, so they are likely to be somewhat overaggressive to ensure they hit minimum benchmarks.

AEM and overproduction

AEM has a positive impact on REM of overproduction (ProdCos), and REM of overproduction also has a positive impact on AEM. The sign direction of overproduction (ProdCos) is significantly positive. There is no evidence of systematic AEM behaviour when only consider AEM manipulation. This suggests that overproduction leads to more AEM, or AEM leads to more overproduction, which is consistent with hypothesis $H_{3\text{-}2a}$. This also implies a causal relationship between AEM and overproduction: managers' decisions on the levels of AEM and overproduction are likely to be made jointly, and they depend on each other.

AEM and sales, general and administrative expenditure cuts

REM of SG&A expenditure cut (SGA) has a negative impact on AEM, but AEM has no impact on REM of SG&A expenditure cuts. The sign direction of SG&A expenditure cuts is significantly negative. There is no evidence of systematic AEM behaviour if only AEM manipulation is considered. This implies that the causality of this relationship runs from SG&A expenditure cuts to AEM: managers' decisions on the levels of SG&A expenditure cuts are likely to affect their decision to engage in AEM, and no reverse impact. This also suggests that cutting SG&A expenditure leads to more AEM, which is consistent with hypothesis $H_{3\text{-}2a}$.

Summary and explanation

To sum up, prior to IBOs, REM by sales manipulation (CFO), overproduction (ProdCos) and cutting SG&A expenditure (SGA) leads to more AEM prior to IBOs. Furthermore, AEM leads to more REM by sales manipulation and overproduction. Thus these types of REM and AEM might have a complementary relationship.

Prior to IBOs, managers appear to engage in positive REM, but there is no evidence of systematic AEM. Managers engage in positive REM to increase earnings in an attempt to increase firm value and impede any potential IBO bidding. Shareholders may be concerned about improvements in firm performance and while not caring about REM behaviours. This might be because firm undervaluation will not maximise their wealth. There is no evidence of systematic AEM behaviour if only AEM manipulation is considered, but this does not mean AEM does not take place.

Preceding IBOs, management might have a primary goal to increase their firm's value, thus they might set an aggressively positive target for total earnings management. Panel B of Table 4.1.3 shows that the total earnings management is significantly positive prior to IBOs, which is consistent with this prediction. Managers might choose to engage in more positive REM and more AEM. Thus REM of sales manipulation, overproduction and SG&A expenditure cuts leads to more AEM prior to IBOs.

Moreover, as previously discussed, managers might have more leeway in terms of the amount and detectability of sales manipulation than they have with overproduction and SG&A expenditure. Managers might therefore consistently use multiple REM methods to boost earnings in order to increase their chances of achieving their target level of overall earnings management.

In addition, exceeding the earnings management target might lead to higher expectations from investors regarding future performance, which might be difficult to achieve. Failure to beat the earnings management target might have an insignificant impact on a firm's value, so it would still attract IBO bids. Hence, combining these earnings management tools might help managers to beat their overall earnings management target appropriately. Furthermore, if managers run out of the REM methods, AEM could be used as a last resort to achieve the overall effects of earnings management.

AEM and research and development expense cuts

AEM has no impact on REM of R&D expense cuts (Res&Dev), and REM of R&D expense cuts has no impact on AEM. Managers have neither systematic R&D expense cuts behaviour nor AEM behaviour if only one of these behaviours is considered. This implies that there is no causality of relationship between AEM and R&D expense cuts: managers’ decisions on the levels of AEM and R&D expense cuts are likely to be made separately. This also suggests that cutting R&D expenses and AEM have no impact on each other, which is inconsistent with hypotheses $H_{3\text{-}2a}$ and $H_{3\text{-}2b}$.

Since managers usually do not have a long time to prepare earnings management strategies prior to IBOs, they might cut R&D expenses and use AEM at the time when they need it. This implies that managers might have no systematic manipulation of R&D expense cuts and AEM, and thereby the stochastic manipulation of R&D expense cuts and AEM might lead to no relationship between R&D expense cuts and AEM prior to IBOs.

AEM and discretionary expenses cuts

AEM has a positive impact on REM of discretionary expense cuts (DisExp), and REM of discretionary expense cuts also has a positive impact on AEM. The sign direction of discretionary expense cuts is significantly negative. There does not appear to be a systematic AEM behaviour if only AEM manipulation is considered. This suggests that cutting discretionary expenses leads to less AEM, or that AEM leads to less cutting of discretionary expenses, which is consistent with hypothesis $H_{3\text{-}2b}$. This also implies a causal relationship between AEM and cutting discretionary expenses: managers' decisions on the levels of AEM and discretionary expense cuts are likely to be made jointly, and depend on each other.

Discretionary expenses consists of both SG&A expenditure and R&D expense. Cuts in SG&A expenditure (SGA) are found to be significantly negative in univariate tests, which suggests positive REM. There is no systematic manipulation of R&D expenses (Res&Dev) if only abnormal R&D expenses are considered. Since increasing R&D expenses is likely to increase the future success of a firm, and cutting R&D expenses is generally detrimental to a firm's performance, managers are likely to cut R&D expenses only as a last resort. As is the case with IBOs, some managers might engage in negative REM by increasing R&D expense, while others engage in positive REM by decreasing

R&D expense, and thus leads to insignificant results in univariate tests. Hence the overall effects of R&D expense manipulation might lead to a negative impact between discretionary expenses cut and AEM, suggesting that discretionary expenses cut is a substitutive of AEM.

4.4.2.2 Results for constraints on earnings management

Table 4.3.4 also shows the results on the relationships between earnings management and its constraints, estimated by 3SLS, prior to MBOs. Table 4.1.5 also summarises the results on the relationships between them prior to IBOs.

Financial health

Financial health (Z-score) has a negative relationship with REM of discretionary expense cuts (DisExp). The sign direction of discretionary expenses cuts is significantly negative, suggesting that firms with poor financial health are associated with less cutting of discretionary expenses, which is consistent with hypothesis $H_{3\text{-}10b}$.

Moreover, financial health has a negative relationship with R&D expense cuts (Res&Dev). The sign direction of R&D expense cuts is insignificant, suggesting that firms with poor financial health are associated with more R&D expense cutting, which is inconsistent with hypothesis $H_{3\text{-}10b}$. In other words, firms with good financial health will not cut R&D expenditure as it is good for firm growth, but 'desperate' firms would cut it in order to improve their earnings.

As discussed in Section 4.2.6.3, firms with poor financial health are likely to bear a relatively high marginal cost when deviating from optimal business strategies, and this REM strategy might be perceived as too costly when managers are primarily aiming to improve operations (Zang, 2012). However, I have found in Chapter 3 that IBO firms are undervalued in the market, and managers have the incentive to engage in earnings management to improve firm performance and impede any potential IBO bids. The negative impact of R&D expense cuts might happen in the long-term future in comparison to potential IBOs in short-term future, and managers might have more precise control in terms of the volume and detectability of it. In order to impede any potential IBO bids, managers in firms with poor financial health might choose to cut expenditure selectively. Firms with poor financial health have a higher level of R&D expense cutting but a lower level of discretionary expenses cuts.

Board size

Board size (BoardSz) has a negative relationship with REM by cutting R&D expenses (Res&Dev). The sign direction of R&D expense cuts is insignificant. This suggests that firms with larger board sizes are associated with less cutting of R&D expenses, which is consistent with hypothesis $H_{3\text{-}13b}$.

As previously discussed, firms with larger boards may have increased abilities in monitoring, leading to lower levels of REM (Andres et al., 2005; Guest, 2009). Although larger boards might be less efficient, the cutting of R&D expenditure is easy to spot and likely to have further impacts on the long-term success of a business. This explains why firms with larger board sizes are associated with less R&D expense cutting.

Audit committee equity ownership

Equity ownership by members of the audit committee (AudShare) has a positive relationship with AEM (AccruDe). There is no evidence of systematic AEM behaviour compared to non-buyout firms. This suggests that higher equity ownership by members of the audit committee is associated with more AEM, which is consistent with hypothesis $H_{3\text{-}6b}$.

The share ownership might jeopardise the independence of audit committee members. Members of audit committees with higher equity ownership might therefore perform less monitoring. Hence higher equity ownership by audit committee members might compromise to upwards AEM, leading to higher levels of AEM preceding IBOs.

4.4.3 Comparison of results between the two types of buyouts

4.4.3.1 Comparison of earnings management relationships

Prior to MBOs, managers typically engage in four out of five types of REM in order to boost earnings: sales manipulation (CFO), overproduction (ProdCos), discretionary expense cuts (DisExp) and SG&A expense cuts (SGA). There is no evidence of systematic use of the fifth type of REM, R&D expense cuts (Res&Dev), but this does not mean that managers do not use them. Increasing R&D expenditure is good for firm growth, and cutting R&D expenditure is generally detrimental to firm performance in the future, thus managers might use it as last resort. Positive REM might increase earnings, implying to external financiers that managers are diligent and that the firm will have better performance in the future. It is expected to enhance external financiers' perceptions of a firm's value in order to secure finance prior to MBOs. Managers also engage in negative AEM in order to decrease their earnings figures, but external financiers might not be concerned about this, as it will reduce the price they have to pay in the MBO transactions.

Considering the combined effects of AEM and REM practices, I found the total level of earnings management to be positive. Panel A of Table 4.1.3 shows that the total level of earnings management (both AEM+Prod+DisEx and AEM+CFO+DisEx) is significantly positive prior to MBOs. This may be in order to enhance external financiers' perceptions of a firm's value, and thereby to secure financing, preceding MBOs.

Prior to IBOs, managers have been found typically engaged in four out of five types of REM in an effort to increase earnings. They engage in sales manipulation (CFO), overproduction (ProdCos), discretionary expenses cut (DisExp), and SG&A expenses cut (SGA). There is no evidence of systematic R&D expense cuts (Res&Dev), suggests that this strategy is only used as a last resort. Furthermore, there is no evidence that managers engage in AEM to a greater degree than non-buyout firms prior to IBOs. As AEM is at high risk of detection, managers might engage in AEM on different degree. Firm undervaluation preceding IBOs will not maximise shareholders' wealth, thus shareholders might be concerned about the improvement of firm performance and do not care about REM or AEM behaviours in this circumstance.

Considering the combined effects of AEM and REM practices, I found the total level of earnings management to be positive, possibly to increase firm value preceding IBOs. Panel B of Table 4.1.3 shows that the total level of earnings management (both AEM+Prod+DisEx and AEM+CFO+DisEx) is significantly positive prior to IBOs. This may be in order to minimise firm undervaluation, and thereby to impede any IBO bids prior to IBOs.

The relationships between AEM and different types of REM vary between MBOs and IBOs, this might be due to the different incentives for each strategy. Prior to MBOs, sales manipulation (CFO) and AEM have a negative causal relationship, which suggests either that sales manipulation leads to less AEM, or more AEM leads to less sales manipulation. Overproduction (ProdCos) and AEM have a negative causal relationship that either overproduction leads to less AEM, or more AEM leads to less overproduction. SG&A expenditure cuts (SGA) and AEM have a negative causal relationship that either SG&A expenditure cuts lead to less AEM, or more AEM leads to less SG&A expenditure cuts. Thus, REM of sales manipulation, overproduction, and SG&A expenditure cut might have substitutive relationships with AEM. This also implies that managers' decisions AEM and these types of REM are likely to be made jointly and depending on each other.

Prior to MBOs, managers have been found to engage in positive REM, in an attempt to secure financing, and negative AEM, possibly to conceal the true value of the firm. As the total level of earnings management is positive, the primary goal of managers might be to secure external finance. Hence managers might set an aggressively positive target for total earnings management and, therefore, engage in more positive REM and less negative AEM, resulting in a negative impact between AEM and REM of sales manipulation, overproduction, and SG&A expenditure cut prior to MBOs.

Moreover, R&D expense cut (Res&Dev) and AEM have a negative causal relationship, which implies either that R&D expense cuts lead to less AEM, or more AEM leads to less R&D expense cut. This suggests that R&D expense cuts and AEM might have a substitutive relationship. Furthermore, discretionary expenses cut (DisExp) and AEM have a positive relationship that either discretionary expenses cuts lead to more AEM, or more AEM leads to more discretionary expense cuts. This might suggest that discretionary expense cuts and AEM have a complementary relationship. Discretionary expenses consist of SG&A expenditure and R&D expense cut. Managers might vary the use of R&D expense manipulation, and thereby cutting or increasing R&D expenditure based on the long- or short-term goals of the business. Hence the combined effects of R&D expenses manipulation might be lead to a positive impact between discretionary expense cuts and AEM. This also means that managers' decisions on AEM and these specific REM are likely to be made jointly and depending on each other.

Prior to IBOs, sales manipulation (CFO) and AEM have a positive causal relationship, which suggests either that sales manipulation leads to more AEM, or more AEM leads to more sales manipulation. Overproduction (ProdCos) and AEM have a positive relationship, which suggests that either overproduction leads to more AEM, or more AEM leads to more overproduction. SG&A expenditure cuts (SGA) lead to less AEM, and the causality of this relationship runs only from SG&A expenditure cuts to AEM. Thus, REM by sales manipulation, overproduction and SG&A expenditure cuts might have complementary relationships with AEM. This also means that managers' decisions on the levels of AEM and these types of REM are likely to be made jointly, and that they depend on each other.

Prior to IBOs, managers are motivated to engage in positive earnings management in an attempt to increase the value of their firm and thereby impede any IBO bidding. Managers have been found to engage in positive REM, but show no systematic AEM behaviour. As the total level of earnings management is positive, managers might aim to engage both in AEM and in REM in order to increase a firm's value. Hence, managers might set an aggressively positive target for total earnings management using more positive REM and more AEM, which results in a positive relationship between AEM and REM by sales manipulation, overproduction and SG&A expenditure cuts, prior to IBOs.

Moreover, R&D expense cuts (Res&Dev) and AEM have no impact on each other, suggesting no causality of relationship between them. This means managers' decisions to use AEM and R&D expense cuts are likely to be made separately. There is no systematic behaviour of cutting R&D expense or AEM if only one of them is considered. Due to the time constraints prior to IBOs, managers might cut R&D expenditures or using AEM that is available when they need it. Hence, the stochastic manipulation of R&D expense cuts and AEM might explain why there is no relationship between them prior to IBOs.

Furthermore, discretionary expenses cut (DisExp) and AEM have a negative causal relationship, which implies either that discretionary expenses cuts lead to less AEM, or more AEM leads to less discretionary expenses cuts. This might suggest that discretionary expense cuts and AEM have a substitutive relationship. This also means that managers' decisions AEM and discretionary expense cuts are likely to be made jointly and depending on each other. Managers might be diverse in their use of R&D expense cuts, depending on their long or short-term vision for their business. They might also have different AEM behaviours according to their levels of risk aversion regarding the likelihood of AEM being detected. Hence the combined effects may explain the negative relationship between discretionary expenses cuts and AEM.

In summary, there are some differences regarding the relationships between AEM and REM between MBOs and IBOs. Prior to MBOs, managers have been found to engage in positive REM, in an attempt to secure financing for MBOs, and negative AEM, possibly to conceal the true value of their firms. Managers might attempt to achieve the primary goal of securing external financing, and thus choose to engage in more positive REM and less negative AEM. This might explain the negative relationship between AEM and sales manipulation, overproduction and SG&A expenditure cuts, prior to MBOs. Although there is no evidence of systematic R&D expense cutting behaviour, R&D expense cuts and AEM have a negative impact on each other. Hence REM of sales manipulation, overproduction, SG&A expenditure cuts and R&D expense cuts have substitutive relationships with AEM. In addition, discretionary expense cuts and AEM have a positive impact on each other, suggesting REM by cutting discretionary expenses has a complementary relationship with AEM.

Prior to IBOs, managers are motivated to engage in positive earnings management in an attempt to increase their firm's value. There is evidence that they engage in positive REM but no evidence of systematic AEM. In order to achieve the target of positive total earnings management, managers might engage in more positive REM and more AEM. This might explain the positive relationship between AEM and REM of sales manipulation, overproduction and SG&A expenditure cuts, prior to IBOs. Hence each of these three REM methods has complementary relationships with AEM. Furthermore, discretionary expense cuts and AEM have a negative impact on each other, suggesting discretionary expense cuts have a substitutive relationship with AEM. In addition, there is no impact between R&D expense cuts and AEM, and this might be because there are no systematic R&D expense cuts and AEM behaviours.

These differences can be explained by the fact that managers usually have a long time to prepare earnings-management strategies and choose the best volume proportion of both AEM and REM prior to MBOs. Managers use positive REM to enhance prospective external financiers' perceptions of the firm's value to secure managers' external financing. Positive REM could increase earnings, thus to imply management efforts and better future performance of the firm to external financiers. Furthermore, external financiers might have no concern of AEM, as this will reduce the money they have to pay in the transaction.

However, managers usually do not have a long time to prepare earnings management strategies prior to IBOs. Managers might have the needs to engage in both AEM and REM to boost earnings. Shareholders might have no concern about AEM and REM behaviours preceding IBOs. This might because firm undervaluation will not maximise shareholders' wealth. Hence managers might engage in AEM or REM when they have the needs to do positive earnings management. As the need for earnings management can occur at any time during an accounting period, managers might have no choice of which strategies to employ. They only engage in the earnings management method that is available in that time. Hence they do not have a systematic approach to earnings management, resulting in less relationship being detected between AEM and REM in the case of IBOs. Moreover, as it is difficult to find a proper instrument for accounting researches, the weak instrument of AEM for IBOs might impede this study to find more relationships between AEM and REM.

4.4.3.2 Comparison of constraints on earnings management

Prior to MBOs, firms with better performance (ROA) are associated with less REM of sales manipulation (CFO). Managers in more profitable firms tend to engage in less income-increasing earnings management to produce better accounting results, as their firm already perform well (Becker et al., 1998; Bédard et al., 2004). Moreover, firms with better firm performance are associated with more REM of SG&A expenditure cuts (SGA). SG&A expenditure cuts might have negative economic consequence of a firm in the long-term, but sales manipulation has immediate short-term negative economic consequence. The interference of short-term operations might lead to abnormal firm performance and attracts the attention of shareholders, thus affecting the overall MBO execution plan. Managers in better-performing firms might be more eager to execute MBOs, and thus might choose to minimise short-term rather than long-term interference in normal operations. These managers might also need a slightly positive REM in order to enhance prospective external financiers' perceptions of their firm's value and to secure financing. As SG&A expenditure cuts are easier to control and their effects can be more precisely estimated, managers in better-performing firms might choose to engage in SG&A expenditure cutting rather than sales manipulation prior to MBOs.

Prior to IBOs, firm performance (ROA) has no impact on REM. I have found in prior chapters that IBO firms have undervalued shares in the market. Firm undervaluation attracts IBO buyers (Hafzalla, 2009), and IBOs threaten managers' long-term job security (Denis and Denis, 1995). Managers might be reluctant to take any risk on their job security, and choose to engage in REM no matter how their firm is performing preceding IBOs. Hence, prior to IBOs, firm performance might not be a constraint on REM.

Prior to MBOs, firms without market-leader status (MarketSh) are associated with less REM of discretionary expense cuts (DisExp). REM is unlikely to increase the long-term value of a firm, as it departures from optimal operating decisions of the business. Market-leader firms usually have more competitive advantages over their followers, as they usually have greater cumulative experience, higher ability to benefit from economies of scale, more bargaining power with suppliers and customers, higher attention from investors, and greater influence on their competitors (Woo, 1983). Hence REM might be less costly for market-leader firms, as the erosion to their competitive advantage is relatively small (Zang, 2012). Prior to IBOs, market-leader status (MarketSh) has no impact on REM. As previous discussed, I have found in prior chapter that firm undervaluation of IBO targets attracts IBO buyers (Hafzalla, 2009), and thereby threaten managers' long-term job security (Denis and Denis, 1995). Managers might be reluctant to risk their job security and choose to engage in REM even without market-leader status. Hence market-leader status might not be a constraint on REM prior IBOs.

Prior to MBOs, firms with poor financial health (Z-score) are associated with more REM of SG&A expenditure cuts (SGA). A financial distressed firm might be less likely to find external investors to support MBOs as well as to repay the debts after buyouts. SG&A expenditure cut might have a negative impact on the long-term performance of a firm, but this manipulation is easy to implement and control. Hence managers might focus on the short-term operating and choose to cut SG&A expenditures in order to improve the perception of their financial situation.

Prior to IBOs, firms with poor financial health (Z-score) are associated with less REM of discretionary expense cuts (DisExp). Moreover, firms with poor financial health are associated with more REM of R&D expense cuts (Res&Dev). This implies that financial healthy firms would not cut R&D expenses as it is good for firm growth, but “desperate” firms would cut R&D expenses to improve their performance. A firm with poor financial health is likely to bear a relatively high marginal cost from deviating of optimal business strategies, such as sharply decrease of cash flow for a financial difficulty firm. Hence REM might be perceived as relatively high costly manipulations, and the primary goal of managers is to improve operations (Zang, 2012). However, as previously discussed, firm undervaluation threatens managers’ long-term job security, and thereby managers have incentive to engage in earnings management to improve earnings in order to impede any potential IBO biddings. Cutting R&D expenses might have negative impact on of a firm’s long-term success among all other types of discretionary expenses cuts, but this might happen in the long-term future in comparison to potential IBOs in the short-term future. Moreover, managers might have precise control both in volume and detectability of R&D expense cuts, and this manipulation are less likely to affect short-term firm performance. Hence, in order to impede any potential IBO bidding, managers in firms with poor financial health might choose to engage in REM selectively.

Prior to MBOs, firms with higher institutional ownership (InsShare) are associated with less REM of discretionary expense cuts (DisExp). Institutional investors provide a high degree of monitoring through either governance practices or information gathering and correctly pricing the quality of operating decisions (Bushee, 1998). Moreover, as REM has real economic consequences for firms’ long-term value, institutional investors, who are more sophisticated and informed than other investors, are likely to have a better understanding of the long-term impact of firms’ operating decisions, leading to more effort in monitor and control REM activities. In addition, as discretionary expense cuts is easier to spot than other types of REM, institutional investors might have high chance to spot it in close monitoring. Prior to IBOs, institutional ownership (InsShare) has no impact on REM. Firm value undervaluation will not maximise shareholders' wealth, or even not lead to a good sales price in buyouts. Prior to IBOs, institutional investors might expect the market to value their investments correctly, and thus they do not mitigate positive REM, which could signal the future performance of a firm to the market.

Prior to MBOs, firms with higher degrees of undervaluation (PE Ratio) are associated with more REM of sales manipulation (CFO). Moreover, firms with higher degrees of undervaluation are associated with more REM of discretionary expense cuts (DisExp). Prior to MBOs, managers will consider their ability to access external finance to support MBOs, as highly undervalued firms might have difficulty to find external funding. Hence managers in firms with high degree of firm undervaluation are more likely to engage in positive REM to enhance prospective external financiers' perceptions of the firm's value to secure external financing (Fischer and Louis, 2008). Prior to IBOs, the degree of firm undervaluation (PE Ratio) has no impact on REM. Since most of the IBO firms in the sample suffer from some degree of undervaluation, there might not be sufficient variability in the data.

Prior to MBOs, board size (BoardSz) has no impact on REM. This might be because the variable of board size picks up different things in different circumstances. Prior to IBOs, larger board size (BoardSz) are associated with less REM of R&D expense cut (Res&Dev). The monitor ability of a board can increase as more directors are added, and especially increasing the number of non-executives is expected to have a more positive impact than increasing executive directors (Andres et al., 2005; Guest, 2009). Furthermore, board has essential functions of bringing various skills and expertise to support and review the performance of a firm (Ronen and Yaari, 2007), which are associated with the responsibilities of mitigating REM behaviours. In addition, cutting R&D expenses is easier to spot, and R&D expense cuts might have further impacts on the long-term success of the business.

Prior to MBOs, firms with higher percentages of non-executive directors on their boards (NED%) are associated with more REM of discretionary expense cuts (DisExp). Non-executive directors might lack the necessary independence, time, expertise and information to challenge management activities effectively, and thereby perform little or no real monitoring role (Patton and Baker, 1987; Gilson and Kraakman, 1991). Hence high proportions of non-executive directors on board might be less likely to challenge managers, leading to more REM of discretionary expense cuts. Moreover, it is not required for buyout firms to hire as much non-executive directors as listed firms. Non-executive directors might be afraid of losing their position on the board after buyouts, and thus support managers to engage in REM preceding MBOs. Prior to IBOs, the percentage of non-executive directors on board (NED%) has no impact on REM. As previously discussed, non-executive directors might perform little or no real monitoring role (Patton and Baker, 1987; Gilson and Kraakman, 1991), high percentages of non-executive directors on board might be less likely to constrain REM behaviours.

Prior to MBOs, equity ownership by members of the audit committee (AudShare) has no impact on AEM (AccruDE). This might be because that non-executive directors are more likely to mitigate traditionally positive AEM rather than negative AEM. Although high levels of shareholding increases the incentives for audit committee members to monitor managers, it is still difficult for them to spot negative AEM preceding MBOs. Prior to IBOs, higher equity ownership by members of the audit committee (AudShare) is associated with more AEM. Directors with more equity ownership are expect to protect shareholder interests more effectively (Jensen and Meckling, 1976). However, high equity ownership might reduce the independence of audit committee members, and thus lead to lower levels of monitoring. Hence higher equity ownership by audit committee members might compromise to upwards AEM, leading to higher levels of AEM preceding IBOs.

To conclude, the results show that better firm performance (ROA) is associated with less sales manipulation but more SG&A expenditure cuts preceding MBOs. Firms without market-leader status (MarketSh) and high institutional ownership (InsShare) are associated with less discretionary expense cuts prior to MBOs. High degrees of firm undervaluation (PE Ratio) is associated with more sales manipulation and more discretionary expense cuts prior to MBOs. High percentage of non-executive directors on board (NED%) is associated with more discretionary expense cuts prior to MBOs.

Firms with poor financial health (Z-score) are associated with more SG&A expenditure cuts prior to MBOs. But poor financial health (Z-score) is associated with less discretionary expenses cut (DisExp) and more R&D expense cut (Res&Dev) prior to IBOs. In addition, large board sizes (BoardSz) are associated with less R&D expense cut (Res&Dev) prior to IBOs. High equity ownership by members of the audit committee (AudShare) is associated with more AEM prior to IBOs.

4.5 Sensitivity Analysis

This section investigates two potential factors that might drive the results of this study: 1) the validity of using 3SLS to explore the impact of simultaneous equations system on the relationships between AEM and REM; 2) the results are not sensitive to this particular measure of AEM.

With regard to the first concern, this study compares the results of the simultaneous equations system estimated by 3SLS, 2SLS, and OLS approach. The results of the OLS estimation are listed in Table 4.3.5 (OLS Regression Results for MBOs) and Table 4.3.6 (OLS Regression Results for IBOs) in the Appendix. It can be seen that the 3SLS estimation finds the most significant relationships between potentially endogenous variables. The 2SLS estimation also estimation finds some significant relationships between potential endogenous variables. But the OLS estimation seems fail to find significant relationships between potential endogenous variables.

The significant results from the 2SLS estimations are consistent with the significant results from the 3SLS estimation. Furthermore, 3SLS estimates the whole system of structural equations jointly by performing a third stage GLS-type estimation using the covariance matrix produced in the second stage (Greene, 2011; StataCorp, 2013). This might suggest that 3SLS better address the simultaneous relationships than other methods. Hence this suggests that the results of 3SLS regressions regarding the relationships between the two endogenous variables (AEM and REM) are valid. The results also suggest that OLS regression does not estimate simultaneous relationships in structural equations system. This is consistent with the suggestion in prior literature (e.g. Greene, 2011) that 3SLS and 2SLS approaches rather than OLS could be able to estimate potential simultaneity.

The findings regarding constraints on earnings management from the 3SLS estimation are largely consistent with those from the 2SLS and OLS regressions. The constraints of earnings management variables are not endogenous variables. Hence, the consistent results in 3SLS regressions, 2SLS regressions, and OLS regressions suggest that the findings regarding constraints on earnings management are robust for both MBOs and IBOs in this study. Therefore, my results estimated by 3SLS approach are robust.

Second, this study adopts discretionary accruals from Jones's (1991) cross-sectional model as an alternative to proxy for AEM in order to investigate whether the results are sensitive to a particular measure of AEM. Jones's (1991) model are as follows:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 + \alpha_i\left(\frac{1}{A_{it-1}}\right) + \beta_{1i}\left(\frac{\Delta Sales_{it}}{A_{it-1}}\right) + \beta_{2i}\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it} \qquad (1)$$

Where:

TA_{it}: is current total accruals, calculated as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization

A_{it}: is total assets at the end of period t, and **A_{it-1}** is lagged total assets

$Sales_{it}$: is the sales during period t, and **$(\Delta)Sales_{it}$**$=Sale_t - Sales_{t-1}$

PPE_{it}: is property, plant, and equipment

Jones's (1991) model proposed an assumption that nondiscretionary accruals vary with a firm's economic circumstances. The results in Jones (1991) show that this model successfully explains around one quarter of the variation in total accruals (Dechow et al., 1995). Jones's (1991) model attempts to control for contemporaneous performance in estimating nondiscretionary accruals, whereas empirical assessments (e.g. Dechow et al., 1995) of this models suggest that estimated discretionary accruals might be significantly influenced by a firm's both contemporaneous and past performance (Kothari et al., 2005). The following empirical studies provides evidence to support the validity of Jones's (1991) model (e.g. Frankel et al., 2002; Becker et al., 1998; Klein, 2002; Xie et al., 2003).

Table 4.1.6 shows the summary statistics for alternative AEM (AccruJo) as detected using Jones's (1991) cross-sectional model. Panel A of Table 4.1.6

shows the detailed summary statistics for alternative AEM. Panel B of Table 4.1.6 shows the T-test results of alternative AEM. It can be seen that alternative AEM is significantly negative prior to MBOs. This indicates that managers engage in negative AEM prior to MBOs, which is consistent with the results in Chapter 2. Alternative AEM has insignificant difference with 0 prior to IBOs. This indicates that managers do not have a systematic AEM behaviours compared to non-buyout firms prior to IBOs, which is consistent with the results in Chapter 2. Panel C of Table 4.1.6 reports the percentage of AEM directions prior to buyouts.

Table 4.1.6 Summary Statistics for AEM from Jones's (1991) model

Panel A. Summary Statistics for AEM

Group	Variable	Obs	Mean	Std.Dev.	Min	p25	Median	p75	Max
MBO	AccruJo	114	-0.012	0.074	-0.211	-0.041	-0.006	0.011	0.438
IBO	AccruJo	82	-0.002	0.086	-0.449	-0.034	-0.001	0.047	0.239

Panel B. T-test for AEM in Signed Value

Group	Variable	Obs	Mean	Std.Dev.	H_0[a]: mean=0	t-Stat[b]	p-Value	AEM[c]
MBO	AccruJo	114	-0.012	0.074	Ha: < 0	-1.751**	0.041	-
IBO	AccruJo	82	-0.002	0.086	Ha: < 0	-0.224	0.412	?

Panel C. The direction of AEM (1=positive, 0= negative)

Group	Variable	Obs	Mean	Std.Dev.
MBO	AccruJo	114	0.398	0.491
IBO	AccruJo	82	0.476	0.502

Note a: H_0: is Null Hypothesis; Ha: is Alternative Hypothesis;
Note b: T-test significance: *** p<0.01, ** p<0.05, * p<0.1
Note c: This column indicates the AEM direction. "+" means positive AEM; "-" means negative AEM; "?" means insignificant in direction.

Table 4.4.1 and Table 4.4.2 in the Appendix shows the results of 3SLS regression by using AEM from the cross-sectional model of Jones (1991).[23] It can be seen that the results by replacing AEM with the proxy from cross-sectional model of Jones (1991) are largely consistent with the results in main

[23] The detailed 2SLS and OLS regression results by using AEM from the cross-sectional model of Jones (1991) are available from the author.

tests and previous two sensitivity tests. Therefore, the results of this study are not sensitive to the particular measure of AEM.

4.6 Conclusion

This study investigates the relationship between AEM and REM preceding both MBOs and IBOs. This question is important because examining only one earnings management method at a time may not explain the overall effect of earnings management activities if managers use AEM and REM as complements or as substitutes for each other (Fields et al., 2001). This study also examines the relationship between AEM and REM by controlling for a set of factors that may constrain managers' ability and the degree to engage in earnings management. Similar to previous research (e.g. Cohen and Zarowin, 2010a; Zang, 2012), this study assumes that AEM is constrained by scrutiny from auditors, the corporate governance mechanisms of audit committees and the level of flexibility within firms’ accounting systems. Furthermore, in line with previous literature (e.g. Zang, 2012; Lara et al., 2012), this study expects that REM is likely to be constrained by firm performance, market-leader status in the industry, financial health, institutional ownership, the degree of firm undervaluation, board size and the percentage of non-executive directors on the board. I extends the earnings management literature by investigating the relationship between AEM and REM into leveraged buyout settings. I also use a simultaneous equations system to estimate the relationships between AEM and REM. I find that 3SLS and 2SLS approaches provide better estimations of potential simultaneity than OLS regression.

AEM and REM have distinct characteristics and impacts on the performance of a firm. AEM typically takes place after the fiscal year end, and it changes the amount of accounting accruals without affecting cash flows (Kim and Sohn, 2013; Gunny, 2010). However, AEM has relatively higher risks of detection and, from a long-term perspective, AEM made in the current period must reverse in the future (Cohen and Zarowin, 2010a; Young, 1999). Furthermore, managers may have limited flexibility to exercise AEM (Gunny, 2010). By contrast, REM is sub-optimal operating decisions made during a financial year, which is less likely to be scrutinised by internal and external auditors. However, REM affects current and future cash flows as well as accounting accruals (Kim and Sohn, 2013). Moreover, managers do not have perfect control over the exact amount of REM attained (Zang, 2012). In addition, REM distorts current period normal operations, which is generally value destroying, particularly for the long-term success of a business (Kim and Sohn, 2013). Therefore, as both AEM and REM are associated with relative benefits and drawbacks, managers may balance the use of different types of earnings management to beat their earnings manipulation targets in different circumstances and also to minimise the associated risks and costs.

Prior to MBOs, my findings in Chapter 3 suggested that managers engaged in four out of five types of REM to boost earnings. Sales manipulation, by cutting price or offering more lenient credit terms toward the end of the year in an effort to accelerate sales from the next fiscal year into the current year, leads to significant negative abnormal CFO (- CFO). Overproduction, by producing more units than necessary to spread fixed costs over a larger number of units, lowers fixed costs per unit. This behaviour could decrease reported COGS in order to increase profits. Overproduction results in significant positive abnormal production costs (+ ProdCos). Discretionary expenses cuts increase profits, leading to significant negative abnormal discretionary expenses (- DisExp). Increasing or cutting R&D expenses could affect profits, but the results of abnormal R&D expense cuts in univariate tests is insignificant (Res&Dev). This means that managers have no systematic R&D expense cuts behaviour if it is only considered, but this does not mean no manager engage in it. SG&A expense cuts increase profits, leading to significant negative abnormal SG&A

expenses (- SGA). Positive REM could increase earnings, thus to imply management diligence and better firm performance in the future to external financiers. Furthermore, my findings in Chapter 2 suggested that managers engaged in negative AEM to decrease earnings figures. As discussed in the univariate tests section, managers engage in negative AEM and results in significantly negative discretionary abnormal accruals (- AccruDe).

Considering the combined effects of AEM and REM practices, I find in this chapter, that the total level of earnings management is positive. This may be to enhance external financiers' perceptions of a firm's value to secure financing preceding MBOs. Therefore, managers might engage in positive REM and negative AEM proportionately to achieve a slightly positive total earnings management. Hence, I hypothesise that there is a positive relationship between AEM and REM preceding MBOs (hypothesis $H_{3\text{-}1a}$). Moreover, managers might also choose to engage in more positive REM and less negative AEM to achieve an aggressively positive total earnings management. Accordingly, I hypothesise that there is a negative relationship between AEM and REM preceding MBOs (hypothesis $H_{3\text{-}1b}$).

Prior to IBOs, managers might be motivated to engage in positive earnings management in an attempt to increase their firm's value. I found in prior chapters that IBO firms had undervalued shares in the market. Firm undervaluation attracts potential IBO buyers (Hafzalla, 2009), and IBOs threaten managers' long-term job security (Denis and Denis, 1995). Hence once managers aware their firm has been undervalued, they are likely to engage in positive earnings management in order to increase their firm's value and avoid becoming a potential IBO target.

My findings in Chapter 3 suggested that managers engaged in four out of five types of REM to boost earnings. Managers' REM behaviours in IBOs are similar to those they use in MBOs. They engage in sales manipulation (- CFO), overproduction (+ ProdCos), cutting discretionary expenses (- DisExp) and cutting SG&A expenses (- SGA). Nevertheless, the result of abnormal R&D expense cuts in univariate tests is insignificant (Res&Dev), which suggests that firms do not systematically engage in R&D expense cuts to manipulate earnings if only R&D expenses manipulation is considered. R&D expenses tend to be beneficial for future firm performance, and cutting R&D expenses might be seen as detrimental to the firm, thus managers might try to avoid it.

Moreover, my findings in Chapter 2 found no evidence that firms subsequently targeted in IBOs engage in AEM to a greater degree than non-buyout firms do (AccruDe). As AEM is at high risk of detection, managers might have diverse degrees of AEM behaviours. Firm undervaluation preceding IBOs will not maximise shareholders' wealth, thus shareholders might concern about the improvement of firm performance and do not care about REM or AEM behaviours in this circumstance.

Considering the combined effects of AEM and REM practices, I find, in this chapter, that the total level of earnings management is positive, possibly to increase firm value preceding IBOs. Therefore, managers might engage in positive REM and AEM proportionately to achieve an aggressively positive total earnings management. Hence I hypothesise that there is a positive relationship between AEM and REM preceding IBOs (hypothesis $H_{3\text{-}2a}$). Moreover, managers might also choose to engage in more positive REM and less AEM to achieve a slightly positive total earnings management. Thus I hypothesise that there is a negative relationship between AEM and REM preceding IBOs (hypothesis $H_{3\text{-}2b}$).

Empirical tests address all UK leveraged buyout firms from 1997 to 2011. Cross-sectional Roychowdhury's (2006) models and Gunny's (2010) models are used to detect REM proxies in signed value. Specifically, abnormal CFO (CFO) proxies for sales manipulations, abnormal production costs (ProdCos) proxies for overproduction, abnormal discretionary expense cuts (DisExp) proxies for the manipulation of discretionary expenses, abnormal R&D expense cuts (Res&Dev) proxies for manipulation of discretionary R&D expenses and abnormal SG&A expenditure cuts (SGA) proxies for the manipulation of discretionary SG&A expenditures. Moreover, this study adopts discretionary accruals from the cross-sectional model of Dechow et al. (1995) to proxy for AEM. Furthermore, this study adopts the cross-sectional model of Jones (1991) as an alternative measure of AEM to investigate whether the results are sensitive to a particular measure of AEM.

Similar to prior literature (e.g. Beatty et al., 1995; Barton, 2001; Pincus and Shivaram, 2002; Badertscher, 2011), this study uses the simultaneous equations system to investigate the potential simultaneity between AEM and REM. This study uses 3SLS and 2SLS to explore the impact of simultaneous equations system on the findings. 3SLS and 2SLS estimations rely upon instrumental variables to generate predicted values of endogenous variables (Larcker and Rusticus, 2010). It is difficult to identify good instrumental variables in most accounting research settings, because there is no well-developed theory of the economic determinants for different earnings management choices (Badertscher, 2011). In order to identify instruments for REM, I rely upon the accounting and finance literature (e.g. Larcker and Rusticus, 2010), and find that lagged regressor of REM (REM_{t-1}) is a valid instrument of REM for both MBOs and IBOs in this study. However, this study have tested almost every potential instrument for AEM by drawing more widely on relevant literature in accounting and finance fields (e.g. Hazarika et al., 2012; Cornett et al., 2009; Aerts and Zhang, 2014), and finally find that sales growth (SalesGrow) is the only valid instrument for AEM, even it is a strong instrument for the MBO data and the mixed whole sample data only.

The results presented in this chapter suggest that the relationships between AEM and different types of REM might vary between MBOs and IBOs due to their different incentives. Prior to MBOs, sales manipulation (CFO) and AEM have a negative causal relationship, which suggests either that sales manipulation leads to less AEM, or more AEM leads to less sales manipulation. Overproduction (ProdCos) and AEM have a negative causal relationship, which implies either that overproduction leads to less AEM, or more AEM leads to less overproduction. SG&A expenditure cuts (SGA) and AEM have a negative causal relationship that either SG&A expenditure cuts leads to less AEM, or more AEM leads to less SG&A expenditure cuts. These results are consistent with hypothesis $H_{3\text{-}1b}$, that there is a negative causal relationship between AEM and REM of sales manipulation (CFO), overproduction (ProdCos), and SG&A expenditure cuts (SGA). These types of REM might therefore have substitutive relationships with AEM. This also means that managers' decisions to use AEM and these types of REM are likely to be made jointly and depend on each other.

Prior to MBOs, managers engaged in positive REM in an attempt to secure financing for MBOs, and negative AEM possibly to conceal the true value of their firm. As the total level of earnings management is positive, the primary goal of managers might be to secure their external financing. Hence, managers might set an aggressively positive target for total earnings management. In order to achieve this target, managers might therefore engage in more positive REM and less negative AEM, resulting in a negative impact between AEM and REM of sales manipulation, overproduction, and SG&A expenditure cuts prior to MBOs.

Moreover, R&D expense cuts (Res&Dev) and AEM have a negative causal relationship, which suggests either that R&D expense cuts lead to less AEM, or more AEM leads to less cutting of R&D expense. This is consistent with hypothesis $H_{3\text{-}1b}$, suggesting that R&D expense cuts and AEM might have a substitutive relationship. Furthermore, discretionary expense cuts ($DisExp$) and AEM have a positive causal relationship that discretionary expense cuts lead to more AEM, or more AEM leads to more discretionary expense cuts. This is consistent with hypothesis $H_{3\text{-}1a}$, and implies that discretionary expense cuts and AEM have a complementary relationship. This also means that managers' decisions to use AEM and these specific REM are likely to be made jointly and depend on each other.

Discretionary expenses includes both SG&A expenditures and R&D expenses. There is no systematic R&D expense cuts if only consider R&D expense manipulation. This might be due to long-term or short-term vision of management toward the business that some managers might increase R&D expense, but others might cut R&D expense. Hence, the combined effects might result in a positive impact between discretionary expense cuts and AEM.

Prior to IBOs, sales manipulation (CFO) and AEM have a positive causal relationship, which suggests that sales manipulation leads to more AEM, or AEM leads to more sales manipulation. Overproduction ($ProdCos$) and AEM have a positive causal relationship, suggesting that overproduction leads to more AEM, or AEM leads to more overproduction. SG&A expenditure cuts (SGA) leads to less AEM, and the causality of this relationship runs only from SG&A expenditure cuts to AEM. These results are consistent with hypothesis $H_{3\text{-}2a}$, that there are positive causal relationships between AEM and REM of sales manipulation, overproduction and SG&A expenditure cuts. Thus, these types of REM might have complementary relationships with AEM. This also means that managers' decisions on the levels of AEM and these types of REM are likely to be made jointly and depend on each other.

Prior to IBOs, managers are motivated to engage in positive earnings management in an attempt to increase firm value and thereby impede any IBO bidding. They have been found to engage in positive REM, and there is no evidence of systematic AEM behaviour. As the total level of earnings management is positive, the primary goal of management might be to engage in both AEM and REM in order to increase the value of their firm. Hence managers might set an aggressively positive target for total earnings management. In order to achieve this target, managers might engage in more positive REM and more AEM, resulting in a positive relationship between AEM and REM of sales manipulation, overproduction and SG&A expenditure cuts prior to IBOs.

Moreover, R&D expense cuts (Res&Dev) and AEM have no impact on each other, thus there is no causality of relationship between them. This is inconsistent with hypotheses $H_{3\text{-}2a}$ and $H_{3\text{-}2b}$. This means that managers' decisions to use AEM and to cut R&D expenses are likely to be made separately. There is no systematic R&D expense cuts and AEM if only one of these variables is considered. Due to the time constraint prior to IBOs, managers might engage in R&D expense cuts and AEM that is available to them at the time when they need. Hence the stochastic manipulation of R&D expense cuts and AEM might explain why there is no relationship between R&D expense cuts and AEM prior to IBOs.

In addition, discretionary expense cuts (DisExp) and AEM have a negative causal relationship, suggesting either discretionary expense cuts lead to less AEM, or more AEM leads to less discretionary expense cuts. This is consistent with hypothesis $H_{3\text{-}2b}$, and implies that discretionary expense cuts and AEM have a substitutive relationship. This means that managers' decisions to use AEM and discretionary expense cuts are likely to be made jointly and depend on each other. Discretionary expenses include both SG&A expenditures and R&D expenses. Managers might have diverse uses of R&D expense cuts due to long-term or short-term vision of their business. They might also have different AEM behaviours due to their levels of risk aversion in respect to the detection of AEM. Hence the combined effects might result in a negative relationship between discretionary expense cuts and AEM.

In summary, there are some differences regarding the relationships between AEM and REM between MBOs and IBOs. Prior to MBOs, there are negative impacts between AEM and REM of sales manipulation (CFO), overproduction (ProdCos), and SG&A expenditure cut (SGA) prior to MBOs. Moreover, although there is no evidence of its systematic use, R&D expense cuts (Res&Dev) and AEM have a negative impact on each other. In addition, as the manipulation of R&D expenses and SG&A expenditure cuts might interfere with or possibly cancel each other, discretionary expenses cuts (DisExp) and AEM have a positive impact on each other. Hence REM of sales manipulation, overproduction, SG&A expenditure cuts and R&D expense cuts have substitutive relationships with AEM. REM of discretionary expenses cuts has a complementary relationship with AEM.

Moreover, prior to IBOs, there are positive impacts between AEM and REM of sales manipulation, overproduction and SG&A expenditure cuts. Furthermore, there is no impact between R&D expense cuts and AEM, and this might be because there is no systematic R&D expense cuts and AEM behaviours. In addition, as the manipulation of R&D expenses and SG&A expenditure cuts might interfere with or possibly cancel each other, discretionary expense cuts and AEM have a negative impact on each other. Hence REM of sales manipulation, overproduction and SG&A expenditure cuts have complementary relationships with AEM. REM of discretionary expense cuts has a substitutive relationship with AEM. R&D expense cuts and AEM have no relationship.

The reason for the differences between AEM and REM might be that managers usually have a long time to prepare earnings management strategies and to decide the optimum volume proportion of AEM and REM prior to MBOs. Managers engage in positive REM in order to enhance prospective external financiers' perceptions of a firm's value and thereby secure external finance. Positive REM could boost earnings, thus to signal managers' work efforts and better future performance of the firm to external financiers. Managers also engage in negative AEM to conceal the true value of their firms so that they have not to pay too much to outside shareholders. Furthermore, future owners of the firm will benefit from the reversal of AEM after an MBO transaction, as this could increase the future firm value. External financiers might therefore have no concerns about AEM, as it will reduce the price they have to pay in the transaction.

However, prior to IBOs, managers usually do not have a long time to prepare earnings management strategies. They might intend to engage in both AEM and REM in order to increase earnings. Shareholders might not care about AEM and REM behaviours preceding IBOs, as firm undervaluation will not maximise their wealth. Hence managers might engage in AEM or REM when they have the needs to do positive earnings management. As the need to manage earnings may occur at any time during an accounting period, managers might have limited choice of earnings management methods at that time. They only engage in the earnings management methods that is available at that time point. Hence managers do not have a systematic plan for their earnings management behaviours, and thus leading to fewer relationships between AEM and REM. Moreover, as it is difficult to find a proper instrument for accounting researches, the weak instrument of AEM for IBOs might impede this study to find more relationships between AEM and REM.

The results presented in this chapter also suggest that the effects of earnings management constraints are likely to vary between MBOs and IBOs.

Firms with relatively better performance are less likely to increase earnings by engaging in income-increasing earnings management, as they already perform well (Becker et al., 1998; Bédard et al., 2004). Consequently, pernicious earnings management, such as REM, is rarely exercised in more profitable firms. The results suggest that, prior to MBOs, firms with better firm performance (ROA) are associated with less REM of sales manipulation (CFO), which is consistent with hypothesis $H_{3\text{-}8a}$. Moreover, firms with better firm performance are associated with more REM of SG&A expenditure cuts (SGA), which is inconsistent with hypothesis $H_{3\text{-}8a}$. SG&A expenditure cuts might have long-term negative economic consequence on a firm, but sales manipulation has immediately short-term negative economic consequence. Interference short-term operations might lead to abnormal firm performance, which are likely to attract the attention of shareholders, hence affecting the overall plan of MBO execution. Managers in better-performing firms might be more eager to execute MBOs, and thus might choose to minimise short-term rather than long-term interference in normal operations.

Prior to IBOs, firm performance (ROA) has no impact on REM, which is inconsistent with hypothesis $H_{3\text{-}8b}$. I have found in Chapter 3 that IBO firms have been undervalued in the market. Firm undervaluation attracts IBO buyers (Hafzalla, 2009), and threatens managers' long-term job security (Denis and Denis, 1995). Managers might be unwilling to take any risk on their job security, and choose to engage in REM no matter their firm performance preceding IBOs. Hence firm performance might not affect REM prior IBOs.

Market-leader firms usually enjoy more competitive advantages than their followers, because they have greater cumulative experience, higher ability to benefit from economies of scale, more bargaining power with suppliers and customers, higher attention from investors, and greater influence on their competitors (Woo, 1983). REM departs from optimal operating decisions of the business, thereby is unlikely to increase the long-term value of a firm. Firms are likely to face various levels of competition in their industry, and thus deviating from optimal business strategies may lead to different impact on firm performance. Hence REM might be less costly for market-leader firms, as the erosion to their competitive advantage is relatively small (Zang, 2012).

The results suggest that, prior to MBOs, firms without market-leader status (MarketSh) are associated with less REM of discretionary expense cuts (DisExp), which is consistent with hypothesis $H_{3\text{-}9a}$. Firms without market-leader status usually have less competitive advantages than their market-leaders, thus the erosion of their competitive advantage by REM is relatively large (Zang, 2012). Hence firms without market-leader status might bear relatively high costs for departures from optimal operating decisions of the business, resulting in less REM. Prior to IBOs, firms with market-leader status has no impact on REM, which is inconsistent with hypothesis $H_{3\text{-}9b}$. As previously discussed, I have found that IBO firms have been undervalued in the market, which threatens managers' long-term job security. Hence managers might choose to engage in REM even without market-leader status to secure their jobs.

Firms with poor financial health are likely to bear a relatively high marginal cost when deviating from optimal business strategies, such as sharp decrease of cash flows for a financial difficulty firm. In this case, REM might be perceived as a relatively high costly behaviour (Zang, 2012). Hence, in a financial distressed firm, managers' efforts to survive in the difficulties will dominate their reporting concerns (Graham et al., 2005). The results suggest that, prior to MBOs, firms with poor financial health (Z-score) are associated with more REM of SG&A expenditure cuts (SGA), which is inconsistent with hypothesis $H_{3\text{-}10a}$. A financial distressed firm might be less likely to find external financial support for MBOs, and might also have difficulty to repay the debts after buyouts.

Although cutting SG&A expenditures might negatively affect firm performance in the long-term, this manipulation is easy to implement and control. Hence managers might focus on short-term operations and choose to engage in SG&A expenditure cuts to improve the perception of their financial situation.

Prior to IBOs, firms with poor financial health (Z-score) are associated with less REM of discretionary expense cuts (DisExp), which is consistent with hypothesis $H_{3\text{-}10b}$. Moreover, firms with poor financial health are associated with more REM of R&D expense cuts (Res&Dev), which is inconsistent with hypothesis $H_{3\text{-}10b}$. This implies that firms with good financial health would not cut R&D expenses as it is good for firm growth, but “desperate” firms would cut R&D expenses to improve their earnings anyway. REM might be perceived as a relatively high costly manipulation in poor financial health firms (Zang, 2012). However, I have found that IBO firms have been undervalued in the market, which might motivate managers to improve firm performance. R&D expense cuts might have negative impact on the long-term success of the firm among all other types of discretionary expenses cuts, but this might happen in the long-term future in comparison to potential IBOs in short-term future. Hence managers in firms with poor financial health might choose to engage in REM selectively, in order to impede any potential IBO bidding.

Institutional investors might provide a high degree of monitoring on REM behaviours either through governance practices, or through information gathering and correctly pricing the impact of managerial decisions (Bushee, 1998). Moreover, institutional investors are more sophisticated and informed than other investors. They are likely to have a better understanding of the long-term impact of firms’ operating decisions, leading to more effort in monitor and control REM activities.

The results suggest that, prior to MBOs, firms with higher institutional ownership

(InsShare) are associated with less REM of discretionary expense cuts (DisExp), which is consistent with hypothesis $H_{3\text{-}11a}$. As discretionary expense cuts are easier to spot than other types of REM, institutional investors might have a high chance to spot it in close monitoring. Prior to IBOs, institutional ownership has no impact on REM, which is inconsistent with hypothesis $H_{3\text{-}11b}$. Institutional investors might have difficulties to spot REM behaviours the same as other shareholders. Moreover, Institutional investors usually have large portfolios of investments, and they are less likely to pay sufficient attention to every investments. Hence high shareholding by institutions may not be particularly helpful in respect to monitoring REM behaviours.

Managers in firms with high degrees of share undervaluation will consider their ability to access external funding to support MBOs, as highly undervalued firms might be difficult to find external financing. Hence, prior to MBOs, managers in highly undervalued firms are more likely to engage in positive REM to enhance prospective external financiers' perceptions of their firms' value in order to secure external financing (Fischer and Louis, 2008). The results suggest that, prior to MBOs, firms with higher degrees of firm undervaluation (PE Ratio) are associated with more REM of sales manipulation (CFO) and more REM of discretionary expense cuts (DisExp), which are consistent with hypothesis $H_{3\text{-}12a}$. Prior to IBOs, the results suggest that, prior to IBOs, the degree of firm undervaluation (PE Ratio) has no impact on REM, which is inconsistent with hypothesis $H_{3\text{-}12b}$. As most of the IBO firms in my sample suffer from some degrees of undervaluation, there might not be sufficient variability in the data.

Larger boards may ensure a minimum required knowledge base (Vafeas, 2005), and make more resources available (Hillman and Dalziel, 2003). Initially, adding more directors to a board may increase its ability to monitor managers (Andres et al., 2005; Guest, 2009). Large boards are therefore expected to mitigate REM. However, the results suggest that, prior to MBOs, board size (BoardSz) has no impact on REM, which is inconsistent with hypothesis $H_{3\text{-}13a}$. This might be because the variable of board size picks up different things in different circumstances. Prior to IBOs, firms with larger board sizes are associated with less REM of R&D expense cuts (Res&Dev), which is consistent with hypothesis $H_{3\text{-}13b}$. R&D expense cuts is easy to spot, and it might have further impacts on the long-term success of a business. As large board may increase the ability of monitoring (Andres et al., 2005; Guest, 2009), increasing directors on a board leads to a lower level of REM.

Non-executive directors are more independent than executive directors, thereby they are expected to have greater monitoring incentives (Fama and Jensen, 1983a). However, as non-executive directors might lack the necessary independence, time, expertise and information to challenge management activities effectively, they are also criticised as performing little or no real monitoring role (Patton and Baker, 1987; Gilson and Kraakman, 1991). Hence high proportion of non-executive directors on board might lead to more REM. The results suggest that, prior to MBOs, firms with higher percentages of non-executive directors on their boards (NED%) are associated with more REM of discretionary expense cuts (DisExp), which is inconsistent with hypothesis $H_{3\text{-}14a}$. This might be because buyout firms are not required to hire as much non-executive directors as listed firms. Non-executive directors might be afraid of losing their position on boards after buyouts, and thus supporting managers to engage in more REM preceding MBOs. Prior to IBOs, the percentage of non-executive directors on a board has no impact on REM, which is inconsistent with hypothesis $H_{3\text{-}14b}$. As previously discussed, non-executive directors might lack the necessary independence, time, expertise, and information to challenge management activities effectively (Patton and Baker, 1987; Gilson and Kraakman, 1991). Hence, high proportion of non-executive directors on board might be less likely to constrain REM behaviours.

Audit committee members with high levels of equity ownership are expected to protect shareholder interests more effectively (Jensen and Meckling, 1976). As equity ownership aligns the interests between directors and external shareholders, more equity ownership by directors creates a higher personally based incentive to monitor (Bhagat et al., 1999). Furthermore, large shareholders have a powerful personal incentive to exercise effective monitoring, because high levels of ownership make them an effective agency of external shareholders (Bhagat et al., 1999).

The results suggest that, prior to MBOs, the equity ownership by members of audit committee (AudShare) has no impact on AEM (AccruDe), which is inconsistent with hypothesis $H_{3\text{-}6a}$. This might be because non-executive directors are more likely to mitigate traditional positive AEM rather than negative AEM. Although high shareholdings increase the incentive of audit committee members to monitor managers, it is still difficult for them to spot negative AEM preceding MBOs. Prior to IBOs, higher equity ownership by members of the audit committee is associated with more AEM, which is consistent with hypothesis $H_{3\text{-}6b}$. This might be because high share ownership might jeopardise the independence of audit committee members, hence they might compromise to upwards AEM, leading to higher levels of AEM preceding IBOs.

To conclude, the relationships of AEM and REM vary between MBOs and IBOs. Prior to MBOs, my findings in prior chapters suggested that managers engaged in positive REM and negative AEM. In this chapter, I find that the total level of earnings management is positive. Moreover, there are negative impacts between AEM and REM of sales manipulation, overproduction and SG&A expenditure cuts prior to MBOs. Furthermore, although there is no evidence of systematic R&D expense cuts, R&D expense cuts and AEM have a negative impact on each other. In addition, discretionary expense cuts and AEM have a positive impact on each other. Prior to MBOs, by combining AEM and REM tools, managers intend to enhance prospective external financiers' perceptions of their firm's value in order to secure external financing for the buyouts. The relationships between AEM and REM also reveal that managers carefully prepare earnings management strategies in respect to the optimum volume proportion of both AEM and REM prior to MBOs.

Prior to IBOs, my findings in prior chapters suggested that managers engaged in positive REM but no evidence of systematic AEM. In this chapter, I find that the total level of earnings management is positive. Moreover, there are positive impacts between AEM and REM of sales manipulation, overproduction and SG&A expenditure cuts. Furthermore, there is no impact between R&D expense cuts and AEM. In addition, discretionary expenses cuts and AEM have a negative impact on each other. Prior to IBOs, by combining AEM and REM tools, managers intend to increase their firm's value in an effort to avoid becoming a potential IBO target. The relationships between AEM and REM also reveal that managers usually do not have a systematic plan for their earnings management behaviours prior to IBOs, and they might simply engage in the earnings management method that is available to them.

Moreover, managers' earnings management behaviours are likely to be constrained prior to leveraged buyouts. However, the effects of these constraints on earnings management are different preceding MBOs and IBOs. Preceding MBOs, better firm performance is associated with less sales manipulation but more SG&A expenditure cuts. Firms without market-leader status and high institutional ownership are associated with less discretionary expense cuts prior to MBOs. High degree of firm undervaluation is associated with more sales manipulation and more discretionary expense cuts prior to MBOs. High percentage of non-executive directors on a board is associated with more discretionary expense cuts prior to MBOs.

This implies that better firm performance constrains sales manipulation, but facilitates SG&A expenditure cuts preceding MBOs. Firms without market-leader status and high institutional ownership constrain REM prior to MBOs. High degree of firm undervaluation motivates managers to engage in more REM prior to MBOs. High percentage of non-executive directors on a board facilitates REM preceding MBOs.

In addition, firms with poor financial health are associated with more SG&A expenditure cuts prior to MBOs. This implies that poorer financial health motivates managers to engage in more REM. Prior to IBOs, poor financial healthy firms are associated with less discretionary expense cuts and more R&D expense cuts. This suggests that poor financial health constrains discretionary expense cuts, but motivate managers to cut more R&D expenses prior to IBOs.

Furthermore, larger board size is associated with less R&D expense cuts prior to IBOs. This implies that large boards mitigate REM prior to IBOs. High equity ownership by members of audit committee is associated with more AEM prior to IBOs, suggesting that high equity ownership by members of audit committee facilitates AEM.

This study contributes to our knowledge of earnings management literature by investigating the relationship between AEM and REM prior to leveraged buyouts. It argues that, given the portfolio of earnings management strategies, managers are likely to use multiple earnings management tools at the same time to meet their earnings manipulation targets in different circumstances. By subdividing leveraged buyouts into MBOs and IBOs, this study finds that managers' earnings management strategies regarding the relationships between AEM and REM is different in each setting. Moreover, this study contributes to knowledge that managers' earnings management behaviours are likely to be constrained by firm performance, market-leader status in the industry, financial health, institutional ownerships, board size and the percentage and equity ownership of non-executive directors on the board. In addition, this study adopts 3SLS and 2SLS methods to explore the impact of simultaneous equations system on the relationships between AEM and REM. The findings suggest that AEM and REM sequentially affect each other.

However, it is difficult to identify good instrumental variables in most accounting research settings, because there is no well-developed theory of the economic determinants for the different earnings management choices (Badertscher, 2011). This study has tested almost every potential instrument for AEM, but only find that sales growth (SalesGrow) is a valid instrument of AEM for MBOs only. Hence the results regarding the relationships between AEM and REM for structural equation 1 (model REM (1)-(5)) of IBOs might not be as reliable as that of MBOs. Future research may overcome this issue by adopting other econometric methods rather than using a weak instrument in 3SLS or 2SLS estimations. Moreover, future research may draw more widely on relevant literature in accounting and finance fields than this study in order to find a valid instrument for investigation, thus increasing the reliability of the results for IBOs. This might be a solution for this issue.

In addition, I do not explore the potential relationships between different types of REM. First, such an investigation would require construct a simultaneous equations model. In the simultaneous equations model, a series of factors that would have impact on specific types of REM only need to be identified in order to distinguish different equations. However, it is difficult to identify the factors that might have impact on specific types of REM only, thus being unable to develop simultaneous equations model for investigation. Second, the simultaneous equations model might not be possible to use because only limited data is available for leveraged buyouts setting, and one missing variable would cause the simultaneous equations model unable to apply. Future research may draw more widely on relevant literature in accounting and finance fields than this study, and thus be able to construct a simultaneous equations system to investigate how different types of REM are simultaneously interrelated. Future research could also investigate the potential relationships between different types of REM in a setting other than leveraged buyouts, which might have sufficient data to support the simultaneous equations model.

5. Chapter 5: Conclusion

5.1 Introduction

Leveraged buyouts are a distinct and increasingly important type of acquisition in the UK financial market. In both MBOs and IBOs, purchasers always seek the lowest possible purchase price, and selling shareholders expect to sell their shares at the highest possible price. However, information asymmetries generally exist between better-informed managers and less well informed outsiders (Jensen and Meckling, 1976). A detailed analysis of earnings information can help shareholders to assess whether the price they have been offered in a leveraged buyout is fair (Bull, 1989). Investment bankers also make extensive use of accounting earnings for firm valuation in leveraged buyouts (DeAngelo, 1990). Earnings information thus has great value relevance to investors and other financiers of a firm, who make increased demands for such information when making decisions (Aharony and Barniv, 2004). Hence the heavy reliance placed on accounting numbers creates powerful incentives for managers to manipulate earnings, thereby earnings management is a potential issue prior to leveraged buyouts.

Corporate governance mechanisms are expected to have an impact on earnings management behaviours (Klein, 2002; Peasnell et al., 2005; Xie et al., 2003). Traditionally, good corporate governance is expected to be related to a lower level of earnings management in general, and less upward manipulation of earnings in particular (e.g. Klein, 2002; Xie et al., 2003). However, in the context of MBO’s, managerial incentives might direct managers towards a downward manipulation of earnings in order to exploit external shareholders, though this might be tempered by the need to seek financial support from private equity investors. In contrast, in the context of IBOs, managerial incentives might drive managers engage in an upward earnings management, in order to protect their long-term job security, rather than maximising the long-term interests of shareholders. If board structure really does have an important influence on corporate governance, it will be interesting to explore whether boards or shareholders with good corporate governance characteristics differ in their influence on earnings management in the context of MBOs or IBOs. Therefore, it is worth investigating earnings management behaviours and corporate governance mechanisms in leveraged buyout settings. As different buyout types may provide managers and shareholders with different incentives regarding earnings management and corporate governance, leveraged buyouts have been subdivided into MBOs and IBOs for investigation.

This research investigated the use of AEM and REM and how they are affected by corporate governance mechanisms preceding MBOs and IBOs in the UK market. There are three empirical studies in this thesis. The first study (Chapter 2) investigated the existence of AEM, and the effects of audit committee characteristics and external audit quality on AEM prior to MBOs and IBOs. The second study (Chapter 3) examined the existence of REM, and the effects of the shareholding by outsiders and board characteristics on REM activities preceding MBOs and IBOs. As managers might have adopt different strategies in terms of the different types of REM, according to their potential long-term or short-term effects, this study investigated disaggregated components of REM in addition to aggregate REM. Moreover, examining either AEM or REM at a time separately may not explain the overall effect of earnings management activities if managers use both of them as complements or as substitutes for each other (Fields et al., 2001). Hence, the third empirical study (Chapter 4) examined the potential relationships between AEM and REM preceding MBOs and IBOs by controlling a set of factors that may constrain managers' ability and the degree to engage in earnings management.

5.2 Results and findings

The first empirical chapter (Chapter 2) focuses on AEM and the effects of corporate governance mechanisms (audit committee characteristics and external audit quality) on AEM prior to MBOs and IBOs. The findings suggest that managers engaged in negative AEM to decrease earnings prior to MBOs. This might because negative AEM could reduce outsiders' perception of the earnings potential of a firm, enabling managers to depress the purchase price of MBOs. This implies that managers are self-interested preceding MBOs, and they engage in negative AEM in an attempt to pay a lower price to selling shareholders.

Regarding IBOs, this study finds no evidence of systematic AEM compared to non-buyout firms. This might be related to the fact that many managers are unable to predict IBOs. Instead, managers' behaviours might be mainly driven by the perception of undervaluation. This study finds that IBO firms have undervalued shares in the market, and undervaluation might make firms become potential IBO targets, rather than the actual IBO offer. IBOs threaten managers' long-term job security (Denis and Denis, 1995), and thus managers' behaviours are likely to be driven by the perception of undervaluation.

As expected, the findings suggest that the effects of corporate governance mechanisms on AEM vary prior to MBOs and IBOs. First, the financial expertise of audit committees has no impact on negative AEM prior to MBOs. It might be that even financially literate directors are usually so focused on avoiding positive AEM and ignore negative AEM. They may perceive negative AEM as accounting conservatism, and therefore do not intervene. Prior to IBOs, the financial expertise of audit committees is associated with less AEM. This implies that including financial experts on audit committees mitigates AEM preceding IBOs, as the financial experts make the internal control judgements of audit committees more like those of experts, hence effectively facilitate the reporting process and reduce agency issues (DeZoort and Salterio, 2001).

Second, equity ownership by audit committee members has no impact on negative AEM prior to MBOs. This might be because audit committee members do not take sufficient care of the MBO context, and are less likely to focus on negative AEM. Prior to IBOs, high equity ownership by audit committee members is associated with more AEM. The share ownership might jeopardise the independence of audit committee members, thereby leading to lower levels of monitoring. Hence audit committee members with high equity ownership might compromise their monitoring role and lead to more AEM preceding IBOs.

Third, Big 5 auditors have no impact on negative AEM prior to MBOs. This might be because Big 5 auditors are usually trained to focus on mitigating positive AEM. They may perceive negative AEM as accounting conservatism, and thus do not intervene. Preceding IBOs, the presence of a Big 5 auditor is associated with less AEM. This implies that hiring Big 5 auditors mitigates AEM behaviours prior to IBOs. Big 5 auditors tend to deliver high quality audits because they are less willing to accept questionable accounting methods and are more likely to detect and report errors and irregularities (e.g. Becker et al., 1998).

To summarise, in relation to corporate governance, the results suggest that the quality of audit committees and external auditing have a greater impact on AEM in IBO firms than it does in MBO firms. This might be because audit committees and external auditors do not take sufficient care of the MBO context to spot negative AEM. Traditionally, they might focus on limiting positive AEM in order to mitigate managers' attempts to boost earnings.

The second empirical chapter (Chapter 3) focuses on REM and the effects of corporate governance mechanisms (the shareholding of outsiders and board characteristics) on REM preceding MBOs and IBOs. This chapter examines five types of disaggregated REM behaviour prior to buyouts in order to explore management strategy in all REM activities. The five types of REM behaviours are as follows: (1) sales manipulation, by cutting prices or offering more lenient credit terms toward the end of the year in an effort to accelerate sales from the next fiscal year into the current year; (2) overproduction, by producing more units than necessary to spread fixed costs over a larger number of units, thus lower fixed costs per unit to decrease the reported costs of goods sold; (3) cutting discretionary expenses to increase reported earnings; (4) cutting SG&A expenses to increase reported profits; (5) cutting R&D expenses to reduce costs and increase profits.

The results suggest that managers engage in the first four types of REM to boost earnings prior to both MBOs and IBOs. For MBOs, this finding seems counter intuitive, as it suggests that managers manipulate the perception of a firm's value upwards. However, it might be related to the need to show good operational performance to external financiers. Private equity investors tend to invest in MBOs if they expect a profitable firm performance (Fischer and Louis, 2008). These financiers are likely to spot AEM, but detecting REM is more difficult for them. As internal financing by managers might be insufficient to implement a buyout, managers may engage in positive REM to enhance prospective external financiers' perceptions of a firm's value and thereby secure financing for MBOs.

Prior to IBOs, the results are in line with expectations that managers tend to protect their long-term job security through positive REM. The findings suggest that IBO firms are undervalued in the market. Firm undervaluation attracts IBO buyers (Hafzalla, 2009), and IBOs threaten managers' long-term job security (Denis and Denis, 1995). Hence once managers are aware that their firm has been undervalued, they are likely to engage in positive REM in an attempt to increase firm value and thereby impede any potential IBO bidding. In addition to this, this study is unable to find any evidence of greater R&D expense cuts for MBOs or IBOs compared with non-buyout firms. This might be because cutting R&D expenses is comparatively easily observable and too damaging to firm growth, and managers might try to minimise it.

As expected, the findings suggest corporate governance mechanisms have different impacts on REM preceding MBOs and IBOs. First, equity ownership by non-executive directors has no impact on positive REM preceding MBOs. Equity ownership might make non-executive directors less independent. These directors might be side with managers and inactively to detect positive REM behaviours. Prior to IBOs, high equity ownership by non-executive directors is associated with more positive REM. Since IBO firms have undervalued shares in the market, non-executive directors might put pressure on managers to improve firm performance. As managers are less likely to improve firm performance in the short term, they may then choose to engage in positive REM.

Second, non-managerial large blockholders are associated with more positive REM preceding both MBOs and IBOs. Prior to MBOs, as blockholders might invest to fund the buyouts, they are likely to side with management for strategic alignment. Furthermore, as positive REM might increase firm performance and share prices, these blockholders might be benefit from selling their shares during a buyout. Prior to IBOs, firm undervaluation might be a concern to non-managerial large blockholders, as they hold quite large portions of shares. These blockholders might therefore put pressure on managers to improve firm performance. In response to this pressure, managers might be more likely to engage in REM in order to portray better firm performance in the short term.

Third, CEO ownership is generally associated with more positive REM preceding MBOs and IBOs. This implies that managers with high shareholdings facilitate REM behaviours. This might be because high levels of ownership entrench managers by enhancing their control and power (Morck et al., 1988). Hence, managers find that they can follow their own objectives with less fear of discipline from other shareholders prior to MBOs and IBOs.

Fourth, CEO duality generally is associated with more positive REM preceding MBOs. This implies that CEO duality facilitates REM prior to MBOs. It concentrates power in the CEO’s position with less effective controls and balances (Cornett et al., 2008). In turn, this may impede effective monitoring and lead to more REM prior to MBOs. Prior to IBOs, the results reveal that CEO duality is associated with more sales manipulation and less R&D expense cuts. As IBOs are unpredictable, CEO duality might make managers consider the long-term success of the firm. Cutting R&D expenses is too damaging to firm growth, hence CEO duality is associated with less cutting of R&D expenses. However, firm undervaluation threatens managers, as they might lose their jobs in IBOs. CEO duality enhances managers' control and power, leading to more REM of sales manipulation, which is less likely to affect the long-term success of the firm.

Fifth, institutional shareholding has no effect on positive REM preceding both MBOs and IBOs. Although institutional investors are likely to have a better understanding of the long-term impact of a firms’ operating decisions (Bushee, 1998), it might still be difficult for them to spot REM behaviours. Moreover, institutions usually have large portfolios of investments, and they are less likely to pay sufficient attention to small proportions of their investment. Hence increasing the shareholding of institutions may not be particularly helpful in respect to monitoring REM behaviours.

To summarise, the results suggest that the high equity ownership by outsiders or board characteristics do not mitigate positive REM prior to MBOs. This might because high shareholding by management and CEO duality increase the control and power of the managers. Hence, they are less fearful of discipline and engage in more positive REM prior to MBOs. Moreover, as REM involves changing business operational decisions, it might be difficult for outsiders to spot REM behaviours prior to MBOs. Thus there might be a bigger agency issue in respect to REM than AEM. Prior to IBOs, the results suggest that the high equity ownership both by outsiders and by managers leads to more positive REM. This might be related to the undervaluation of firms. Outsiders might put pressure on managers to improve a firm's performance, and managers might engage in positive REM in response. Furthermore, high equity ownership entrenches managers, thus they might engage in more positive REM to protect their long-term job security.

The third empirical chapter (Chapter 4) focuses on the potential relationship between AEM and REM preceding MBOs and IBOs. Prior to MBOs, the two preceding chapters reveal that managers engage in positive REM and negative AEM. This raises the question of whether REM and AEM manipulations are strategically used to meet the different incentives or not. Positive REM increases earnings, suggesting that managers are diligent and talented as well as signalling a firm's positive long-term growth prospects to external financiers. External financiers might be less concerned about negative AEM, as it might reduce the cost of a buyout transaction. While prior research (e.g. Gunny, 2010; Zang, 2012) has suggested that AEM is conducted after REM, this research seeks to investigate this potential relationship in more detail. Specifically, this study examines whether AEM and REM are jointly determined or not, and whether their relationship is complementary or substitutive.

Prior to MBOs, I find that positive REM (by means of sales manipulation, overproduction, SG&A expenditure cuts and R&D expense cuts) has substitutive relationships with negative AEM. This suggests that at least part of

REM is pre-planned, not just AEM, as the expectation. This also means that managers' decisions to use AEM and these types of REM are likely to be made jointly and depending on each other. Prior to MBOs, I find that the total level of earnings management is positive, possibly to enhance external financiers' perceptions of a firm's value in order to secure financing preceding MBOs. Managers might have aggressively positive targets for total earnings management, resulting in substitutive relationships between AEM and REM prior to MBOs.

Prior to IBOs, managers are motivated to engage in positive earnings management in an attempt to improve the perception of their firm's value. The prior two chapters reveal that, prior to IBOs, managers engage in positive REM, but there is no evidence of greater use of AEM compared to non-buyout firms. Shareholders might have no concerns regarding REM or AEM behaviours that increase a firm's value, as undervaluation is less likely to maximise their wealth.

Prior to IBOs, the results show that positive REM by means of sales manipulation and overproduction has complementary relationships with AEM. This suggests that both AEM and parts of REM are positively related, and that managers' decisions to use AEM and these types of REM are jointly determined. Moreover, greater SG&A expenditure cuts lead to less AEM, and the causality of this relationship runs only from SG&A expenditure cuts to AEM. This suggests that AEM might be used to make up for potential shortfalls in SG&A expenditure cuts. Prior to IBOs, the total level of earnings management is found to be positive, possibly because managers use positive earnings management in an attempt to increase their firm's value and thereby impede any IBO bidding. Hence managers might pre-set an aggressively positive goal of earnings management prior to IBOs, resulting in complementary relationships between AEM and REM.

The findings also suggest that the constraints of earnings management have different effects preceding MBOs and IBOs. First, firms without market-leader status tend to engage in less positive REM prior to MBOs. This implies that firms with market-leader status engage in more positive REM prior to MBOs. REM might be less costly for market-leader firms, as the erosion to their competitive advantage is relatively small (Zang, 2012). Prior to IBOs, market-leader status has no impact on positive REM. As previously discussed, IBO firms have been found to be undervalued in the market. Firm undervaluation attracts IBO buyers (Hafzalla, 2009), and IBOs threaten managers' long-term job security (Denis and Denis, 1995). Managers might therefore be reluctant to take any risks on their job security, and choose to engage in REM regardless of whether or not their firm has market-leader status.

Second, high degrees of firm undervaluation are associated with more positive REM prior to MBOs. As highly undervalued firms might find it difficult to obtain external funding to support MBOs, managers in these firms are more likely to engage in positive REM. Prior to IBOs, firm undervaluation has no impact on positive REM. Since most of the IBO firms in the sample suffer from some degree of undervaluation, there might not be sufficient variability in the data.

Third, firms with poor financial health are associated with more REM prior to MBOs. Firms that are experiencing financial distress might be less likely to find external financial support for MBOs. They might also have difficulty in repaying debts after buyouts. As a result, the firms' managers are likely to engage in more REM. Prior to IBOs also, firms with poor financial health tend to engage in more positive REM, in this case by cutting R&D expenses. This implies that firms with good financial health minimise the use of REM in order to ensure their future growth, while 'desperate' firms would use REM to improve their earnings.

Fourth, better firm performance is related to less sales manipulation and more SG&A expenditure cuts preceding MBOs. SG&A expenditure cuts might have negative economic consequences for a firm in the long term, but sales manipulation has immediate short-term negative economic consequence. Managers in better-performing firms might be more eager to execute MBOs, and thus they might choose to minimise short-term interference in normal operations. Prior to IBOs, firm performance has no impact on positive REM. As firm undervaluation might affect their long-term job security, managers thus engage in positive REM regardless of their current firm performance.

To summarise, the results suggest that market-leader status, the degree of firm undervaluation, financial health and firm performance are all constraints on REM prior to MBOs. In contrast, prior to IBOs, financial health is the only constraint on REM. This implies that firm characteristics are less likely to constrain REM prior to IBOs. This might be because firm undervaluation causes managers to worry about becoming an IBO target and strongly motivates them to engage in REM.

5.3 Implications

Overall, the findings of Chapters 2, 3 and 4 have several implications for investors, policy makers and regulators for the development of governance mechanisms. These are as follows:

- Prior to MBOs, the findings suggest that managers engage in positive REM and negative AEM. Managers use positive REM to increase earnings, thereby enhancing external financiers' perceptions of a firm's value in order to secure financing. Moreover, managers use negative AEM to reduce the future-earnings expectations of outside shareholders in an attempt to reduce the purchasing price. Therefore, the findings reveal that managers manipulate the perceptions of a firm's value prior to MBOs to cheat shareholders and external financiers. Current shareholders should carefully scrutinise financial reports before agreeing to an MBO offer. Moreover, private equity investors should examine financial accounts more carefully to evaluate the true potential of a firm before investing in MBOs.

- Positive REM by means of sales manipulation, overproduction, SG&A expenditure cuts and R&D expense cuts has substitutive relationships with negative AEM prior to MBOs. This reveals that managers carry out systematic manipulations of AEM and REM prior to MBOs. Shareholders might be able to increase their monitoring of managers in an attempt to protect their wealth prior to MBOs.

- The findings suggest that managers engage in positive REM but show no evidence of greater AEM compared to non-buyout firms prior to IBOs. Shareholders focus on the long-term growth of a firm should increase the monitoring of REM behaviours, as a perception of firm undervaluation might cause managers to engage in REM

- Positive REM by means of sales manipulation, overproduction and SG&A expenditure cuts has complementary relationships with AEM prior to IBOs. This reveals that managers use AEM and REM jointly, and that these two earnings management tools are complementary. Thus, shareholders should pay attention to AEM behaviour. Although there is no systematic AEM, this does not mean managers have no AEM behaviour.

- Non-managerial large blockholders are associated with more positive REM preceding MBOs. This has implications for regulators and policy makers, suggesting that the ownership of each non-managerial shareholder should be limited to less than 10% in order to prevent one individual from becoming a non-managerial large blockholder. Moreover, this implies that shareholders should pay attention to the presence of non-managerial large blockholders in their firms, which might lead to high levels of REM behaviours.

- High CEO ownership and CEO duality lead to more positive REM preceding both MBOs and IBOs. This implies that shareholders should be aware of high managerial ownership, which could lead to high REM behaviours. In addition, separating the role of CEO and chairman could help to mitigate REM behaviours, as managers' control and power might be limited.

- Audit committee characteristics and Big 5 auditors have no impact on negative AEM prior to MBOs. This reveals that audit committees or external auditors are unlikely to mitigate negative AEM prior to MBOs. Audit committees and external auditors should therefore be aware of the MBO context and aim to mitigate negative AEM. Moreover, internal and external auditors should be trained to spot negative AEM in addition to traditionally positive AEM.

- Institutional shareholding does not mitigate positive REM prior to MBOs or IBOs. This suggests that, although institutional investors are likely to have a better understanding of the long-term impact of a firms' operating decisions (Bushee, 1998), it is still difficult for them to spot REM behaviours. This implies that institutional investors are not particularly helpful in respect to mitigate REM behaviours.

5.4 Limitations and suggestions for future research

This thesis is subject to some limitations. First, I suggest that managers use positive earnings management to reduce firm undervaluation and increase the potential buyout costs in an attempt to impede any potential IBO bidding. In other words, the IBO samples in this study are firms that attempted to increase their value by engaging in positive earnings management but failed and eventually became IBO targets. It would be ideal to include a control group in the study, including undervalued firms that attempted to increase their firm value by engaging in positive earnings management and were successful in impeding any IBO bidding. Due to the limitations on the data available, this study does not have such a control group. In other words, this study is based on data from actual rather than predicted IBO events.

Future research might construct a control group that includes firms that are not subject to IBO biddings but do have a high likelihood of takeover risks. Drawing on prior literature, future research might be able to construct a model to identify firms with high likelihood of takeover in the market. Moreover, by adding the characteristics of IBO firms into the model, it might be possible to distinguish firms with a high likelihood of being targeted by an IBO from firms with a risk of being subject to other types of takeover. This might overcome the limitation of this study.

Second, in the Chapter 4, I use a weak instrument for AEM in IBOs. Hence the results regarding the relationships between AEM and REM for IBOs might not be as reliable as those obtained for MBOs. Future research could overcome this issue by adopting other econometric methods rather than using weak instrument in 3SLS or 2SLS approach. Moreover, future research could draw more widely on relevant literature in accounting and finance fields than this study has, in order to find a valid instrument for investigation. This would increase the reliability of the results for IBOs.

Third, the existing AEM and REM detecting models are developed by the US research to detect earnings management behaviours in the US financial market (e.g. Dechow et al., 1995; Gunny, 2010; Kothari et al., 2005; Roychowdhury, 2006). The differences of accounting systems and financial market between the UK and the US might affect the effectiveness of AEM and REM detecting models, thus the reliability of the models in UK application might be compromised. In order to increase the robustness and reliability of my results, this study adopts more than one AEM or REM detection models to generate consistent results.

Moreover, as the data availability in leveraged buyouts setting constrains this study, it is not feasible to include more variables in both multiple OLS models and simultaneous equations system. Hence, this study uses different proxies for the dependent variable to check whether the results are consistent and not sensitive to the selection of variables. Furthermore, a few models in this study have potential endogenous problem, and I use instrument variable as a solution for endogeneity.

The results of this study suggest several potential avenues for future research. First, in the Chapter 3, I suggest that a given corporate governance mechanism may have different effects on different types of REM simultaneously. My explanation is based on the perception of short-term or long-term firm value maximisation of the governance authorities in a firm. Future research could explore other factors that might influence the effectiveness of corporate governance mechanisms on different types of REM. For instance, when the specific business environments or firm characteristics of a firm are considered, the effectiveness of corporate governance mechanisms might change.

Second, I have not explored the potential relationships between different types of REM in this thesis. This is because it is difficult to identify other factors that might affect specific types of REM. Thus it is too complicated to develop a simultaneous equations model for investigation. Moreover, the limitations on available data have prevented this study goes further to explore this issue. Only limited data is available on the leveraged buyouts setting, which might insufficient to support the developed empirical model. Future research might draw more widely on relevant literature in accounting and finance fields than this study has, hence being able to construct a simultaneous equations system to investigate how different types of REM are simultaneously interrelated. Moreover, future research could investigate the potential relationships between different types of REM in a setting other than leveraged buyouts, which might have sufficient data to support the empirical model.

Appendix

List of Variables

Chapter 2

AccruKo: is abnormal accruals, detected using the cross-sectional model of Kothari et al. (2005)

AccruDe: is abnormal accruals, detected using the cross-sectional model of Dechow et al. (1995)

Ned%AudCom: is the percentage of non-executive directors on the audit committee

AudComSz: is the number of members on the audit committee size

AuditSz2BoardSz: is the ratio of audit committee size to board size

FinancialExp: is a dummy variable coded 1 if the audit committee has financial expertise;

AudShare: is the percentage of common stock cumulatively owned by audit committee members

3%holdAudCom: is a dummy variable coded 1 if at least one non-executive director on the audit committee has at least a 3% shareholding

Big5: is a dummy variable coded 1 if the firm uses a Big 5 Auditor

LNAudFees: is the natural logarithm of audit fees

AudFees/AssetsSqrt: is the fee ratio of audit fees to the square root of total assets *LN*

LNNonAudFees: is the natural logarithm of non-audit fees

NonAudit Fees/Assets SQroot: is the fee ratio of non-audit fees to the square root of total assets

NonAudFees/AssetsSqrt: is the fee ratio of non-audit fees to the total auditor fees

NED%: is the percentage of non-executive directors on the main board

BoardSz: is the number of directors on the board

Duality: is a dummy variable coded 1 if the board has CEO duality

LNMarketVal: is the natural logarithm of the market value

InsShare: is the percentage of cumulative institutional Shareholding

LagROA: is the lagged return on assets

Leverage: is the ratio of total debt to total assets

SalesGrow: is the percentage of sales growth

FreeCashFlow: is defined as funds from operations - capital expenditure - cash dividend, scaled by total assets.

Chapter 3

REM_{it}: represents real earnings management proxies of the following variables, which is dependent variable in the model:

1. Main REM proxies from Roychowdhury's (2006) model:

RowCFO: is the abnormal CFO detected using Roychowdhury's (2006) model

RowProdCos: is abnormal production costs

RowDiscExp: is abnormal discretionary expenses

2. Alternative REM proxies from Gunny's (2010) Model:

GuyRes&Dev: is the abnormal R&D expense detected using Gunny's (2010) model

GuySGA: is abnormal SG&A expenses

GuyProdCos: is abnormal production costs

3. Alternative REM proxies from Lara, et al. (2010)'s Model:

LaraProdCos: is the abnormal production costs detected using Lara (2012) model

LaraDiscExp: is abnormal discretionary expenses

Independent variables:

InsShare: is institutional shareholding (=the cumulative institutional shareholding);

Concentr3% (5%): is ownership concentration (=the sum of the shares of firm's outside shareholders with equity ownership greater than 3% (or 5%))

Block10% (20%): is large blockholders, a dummy variable coded 1 if a firm has a non-managerial large shareholder who own at least 10% (or 20%) equity ownership

CeoHd: is the CEO's shareholding

CeoHdSq: is the squared transformation of the CEO's shareholding

NonExecHd: is the non-executive shareholding (=the percentage of equity ownership held by non-executive directors)

Ned%: is the percentage of non-executive directors on a firm's main board

Duality: means CEO duality, a dummy variable coded 1 if a board has CEO duality

BoardSz: is the number of directors on a firm's board

Control variables:

LnAssets: is the natural logarithm of total assets

SalesGrow: is the percentage of sales growth ratio

Mark2Book: is the market-to-book ratio (= market capitalization divided by the book value of shareholders' equity)

ROA: is the return-on-assets ratio (=earnings before interest and taxes divided by total assets)

Leverage: is the financial leverage ratio (= total liabilities divided by total assets)

AssTurn: is the assets turnover ratio (= total sales to total assets)

DealVal: is the total cash paid to shareholders in buyout transactions. For MBOs, it refers to the value of the deal excluding the portion required to purchase shares owned by managers (=Deal Value * (1- CEO's shareholding); for IBOs, it is the total deal value (unit: £million)

Chapter 4

REM_t: is the abnormal REM according to Roychowdhury's (2006) models and Gunny's (2010) models as follows:

CFO: is the abnormal cash flow from operation (CFO) detected using Roychowdhury's (2006) model

ProdCos: is the abnormal production costs detected using Roychowdhury's (2006) model

DiscExp: is the abnormal discretionary expenses detected using Roychowdhury's (2006) model

Res&Dev: is the abnormal R&D expense detected using Gunny's (2010) model

SGA: is the abnormal selling, SG&A expense detected using Gunny's (2010) model

Instrumental variables of REM_t:

CFO_{t-1}, $ProdCos_{t-1}$, $DisExp_{t-1}$, $Res\&Dev_{t-1}$, SGA_{t-1}: are lagged values of REM proxies

AEM_t: is accruals earnings management detected by the cross-sectional model of Dechow et al. (1995) (**AccruDe**)

Instrumental variables of AEM_t:

SalesGrow: is the sales-growth ratio, which is an instrument of AEM_t

AEM constraints:

Big5: is a dummy variable, coded as 1 if a firm is audited by one of the Big 5 auditors

LNAuditTn: is the natural logarithm of auditor tenure years (measured by the number of consecutive years in which a firm uses the same auditor)

AudComSz: is the audit committee size, which is the total number of members on the audit committee

AudShare: is the cumulative common stock owned by audit committee members

OpeCycle: is the length of operating cycles, measured as the days inventory outstanding (DIO) plus the days sales outstanding (DSO) minus the days payable outstanding (DPO) (length of operating cycles = DIO+DSO-DPO)

REM constraints:

ROA: is the return on assets ratio, which measures firm performance

MarketSh: is the market-leader status in the industry, which is measured by a firm's market share in its industry using the two-digits industry code

Z-score: is the financial health status of a firm, which is measured by a modified Altman's Z-score

InsShare: is institutional ownership, which is the accumulated percentage of institutional shareholding

BoardSz: is the number of directors on the board

NED%: is the percentage of non-executive directors on the main board

Control Variables:

LnAssets: is the natural logarithm of total assets

Mark2Book: is the market capitalization divided by the book value of shareholders' equity

Leverage: is the ratio of long-term debt to total assets

PE Ratio: is the industry-adjusted price to earnings ratio (= the difference between the target firm's price-earnings ratio and the median industry price-earnings ratio)

DealVal: is the total cash paid to shareholders in buyout transactions; for MBOs, it is the deal value excluding the portion assumed to purchase shares owned by managers (=Deal Value * (1- CEO's shareholding); for IBOs, it is the total deal value (unit: Million Pounds)

Tables

Table 1.1 Distribution of leveraged buyouts firms with deal value 1997 to 2011

Year	leveraged buyouts	Deal Value (GBP mil)	
		Mean	Total
1997	8	57.3275	458.62
1998	24	72.99708	1751.93
1999	44	116.0811	5107.57
2000	33	143.4227	4732.95
2001	22	83.31	1832.82
2002	22	203.0991	4468.18
2003	22	172.9927	3805.84
2004	9	301.4956	2713.46
2005	15	295.738	4436.07
2006	17	1267.119	21541.03
2007	18	1056.364	19014.56
2008	7	309.8114	2168.68
2009	2	89.04	178.08
2010	4	950.7275	3802.91
2011	9	90.79111	817.12
Total	256	300.1165	76829.82

(Source: Thomson ONE database)

Table 2.7 Panel A Endogeneity Tests Results

Panel A. Audit Committee Characteristics Model								
	MBO 1	MBO 2	MBO 3	MBO 4	IBO 1	IBO 2	IBO 3	IBO 4
VARIABLES	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo
Ned%AudCom	0.001	-0.000	0.028	0.019	0.017	-0.042	-0.016	-0.091
	(0.013)	(-0.013)	(0.540)	(0.407)	(0.273)	(-0.537)	(-0.265)	(-1.176)
FinancialExp	0.002	-0.006	0.007	-0.005	-0.023*	-0.024*	-0.027*	-0.026*
	(0.117)	(-0.384)	(0.311)	(-0.281)	(-1.758)	(-1.677)	(-1.938)	(-1.750)
AudShare	-0.046		-0.067		0.229*		0.313***	
	(-0.840)		(-1.110)		(1.943)		(2.803)	
3%holdAudCom		0.024		0.024		0.040		0.050*
		(1.058)		(0.999)		(1.550)		(1.734)
AudComSz	0.015	0.010			0.004	0.001		
	(1.599)	(1.328)			(0.658)	(0.192)		
AuditSz2BoardSz			0.106*	0.069			-0.067	-0.079
			(1.718)	(1.409)			(-0.924)	(-0.984)
LNMarketVal	0.008*	0.008**	0.010**	0.010**	0.012**	0.013**	0.014***	0.014***
	(1.708)	(1.977)	(2.201)	(2.218)	(2.543)	(2.423)	(3.087)	(2.778)
InsShare	-0.045	-0.028	-0.054	-0.032	0.068	0.071	0.085	0.085
	(-1.372)	(-1.077)	(-1.443)	(-1.115)	(0.802)	(0.786)	(0.964)	(0.902)
LagROA	-0.010	-0.010	-0.008	-0.009	-0.020	-0.008	-0.041	-0.024
	(-1.445)	(-1.461)	(-1.171)	(-1.315)	(-0.576)	(-0.204)	(-1.125)	(-0.573)
SalesGrow	0.006***	0.007***	0.007***	0.007***	-0.037**	-0.035**	-0.038**	-0.034**
	(4.224)	(4.084)	(4.671)	(4.249)	(-2.335)	(-2.165)	(-2.412)	(-2.096)
Leverage	0.021	0.034	0.033	0.045	-0.081	-0.089	-0.088	-0.098
	(0.406)	(0.690)	(0.616)	(0.849)	(-1.324)	(-1.450)	(-1.374)	(-1.488)
FreeCashFlow	0.071	0.059	0.062	0.053	-0.004***	-0.004***	-0.003***	-0.003***
	(0.972)	(0.847)	(0.882)	(0.775)	(-3.565)	(-3.424)	(-3.396)	(-3.538)
Constant	-0.120*	-0.127*	-0.181*	-0.170*	-0.162*	-0.106	-0.109	-0.029
	(-1.664)	(-1.841)	(-1.854)	(-1.796)	(-1.715)	(-0.929)	(-1.149)	(-0.267)
Observations	112	112	112	112	72	72	72	72
R-squared	0.086	0.117	0.034	0.088	0.206	0.189	0.218	0.198
chi2-test	35.64	28.25	37.22	29.25	76.41	68.16	80.25	67.88
Prob > chi2	0.000	0.002	0.000	0.001	0.000	0.000	0.000	0.000
Hausman test Chi2	13.02	0.49	16.93	3.47	1.52	3.58	2.70	3.92
Hausman test Prob > Chi2	0.223	1.000	0.076	0.943	0.999	0.964	0.988	0.951

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note Endogenous variables in these models are: Ned%AudCom, FinancialExp, AudShare, 3%holdAudCom, AudComSz, AuditSz2BoardSz. The lagged values of the endogenous variables are used as instruments.

Table 2.7 Panel B Endogeneity Tests Results

Panel B. Audit Quality Model						
	MBO 1	MBO 2	MBO 3	IBO 1	IBO 2	IBO 3
VARIABLES	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo	AccruKo
Big5	-0.027	-0.027	-0.033	-0.031	-0.036	-0.052
	(-1.366)	(-1.363)	(-1.533)	(-1.298)	(-1.417)	(-0.882)
LNAudFees	0.008			0.022*		
	(0.918)			(1.808)		
AudFees/AssetsSqrt			-0.056			-0.034
			(-1.302)			(-0.355)
LNNonAudFees		0.006			0.016	
		(0.838)			(1.195)	
NonAudFees/AssetsSqrt			0.051			0.075
			(1.341)			(0.494)
NonAudFees/TotalFees	0.076			0.107		
	(1.529)			(0.841)		
NED%	0.129	0.127	0.085	0.058	0.025	0.133
	(1.350)	(1.328)	(0.793)	(0.590)	(0.261)	(0.410)
BoardSz	0.004	0.003	0.007	0.005	0.003	-0.004
	(0.749)	(0.554)	(1.031)	(0.792)	(0.483)	(-0.231)
Duality	0.032	0.030	0.030	0.038	0.036	0.027
	(1.356)	(1.315)	(1.180)	(1.112)	(1.084)	(0.626)
LNMarketVal		0.006	0.008		0.007	0.019
		(1.173)	(1.492)		(1.436)	(0.947)
InsShare	-0.049	-0.050	-0.049	0.082	0.081	0.077
	(-1.537)	(-1.566)	(-1.416)	(0.963)	(0.969)	(0.901)
LagROA	-0.006	-0.006	-0.004	0.035	0.011	0.047
	(-1.048)	(-0.921)	(-0.775)	(0.580)	(0.213)	(0.325)
SalesGrow	0.003	0.004*	0.003	-0.034	-0.039*	-0.054
	(1.417)	(1.653)	(1.044)	(-1.273)	(-1.679)	(-0.968)
Leverage	0.035	0.034	0.030	-0.127**	-0.129**	-0.138
	(0.608)	(0.620)	(0.516)	(-2.094)	(-2.047)	(-1.303)
FreeCashFlow	0.079	0.061		-0.008**	-0.002	
	(1.252)	(0.925)		(-2.500)	(-0.656)	
Constant	-0.145*	-0.156**	-0.146*	-0.202	-0.167**	-0.233
	(-1.914)	(-2.148)	(-1.923)	(-1.559)	(-2.025)	(-0.900)
Observations	112	112	112	72	72	72
R-squared	0.139	0.141	0.125	0.127	0.126	
chi2-test	20.63	21.52	51.17	48.86	56.21	8.452
Prob > chi2	0.037	0.028	0.000	0.000	0.000	0.672
Hausman test Chi2	6.13	5.65	2.68	5.68	4.35	3.80
Hausman test Prob > Chi2	0.865	0.895	0.994	0.899	0.958	0.975

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Endogenous variables in these models are: Big5, LNAudFees, AudFees/AssetsSqrt, LNNonAudFees, NonAudFees/AssetsSqrt, NonAudFees/TotalFees, NED%, BoardSz, Duality. The lagged values of the endogenous variables are used as instruments.

Table 3.5.1 Sensitive tests controlling undervaluation for MBOs Year T-1 and T-2 (Dependent Variable: RowCFO)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.020			-0.035		0.011			-0.007	
	(-0.389)			(-0.579)		(0.183)			(-0.125)	
Concentr3%		-0.020			-0.042		0.005			-0.017
		(-0.287)			(-0.600)		(0.081)			(-0.283)
Concentr5%			-0.037					-0.017		
			(-0.572)					(-0.315)		
Block10%	0.003	0.003		0.010		0.010	0.011		0.014	
	(0.068)	(0.060)		(0.258)		(0.485)	(0.473)		(0.656)	
Block20%			0.020		0.019			0.033		0.029
			(0.609)		(0.556)			(1.258)		(1.192)
CeoHd	-0.117	-0.119	-0.112	-0.394	-0.368	-0.034	-0.036	-0.039	-0.320	-0.305
	(-0.880)	(-0.932)	(-0.944)	(-0.957)	(-0.926)	(-0.475)	(-0.496)	(-0.509)	(-1.622)	(-1.471)
CeoHdSq				0.570	0.515				0.575*	0.537*
				(0.840)	(0.787)				(1.780)	(1.685)
NonExecHd	0.048	0.049	0.022	0.045	0.023	0.170	0.168	0.124	0.168	0.133
	(0.739)	(0.733)	(0.288)	(0.671)	(0.264)	(1.377)	(1.375)	(1.099)	(1.351)	(1.099)
Ned%	0.116	0.113	0.111	0.118	0.111	-0.138	-0.136*	-0.130*	-0.129	-0.125
	(0.938)	(0.952)	(0.929)	(0.953)	(0.943)	(-1.638)	(-1.735)	(-1.764)	(-1.504)	(-1.617)
Duality	0.043	0.043	0.038	0.046	0.041	-0.031	-0.031	-0.034	-0.026	-0.029
	(1.139)	(1.113)	(0.998)	(1.159)	(1.017)	(-1.166)	(-1.174)	(-1.205)	(-0.998)	(-1.020)
BoardSz	0.006	0.006	0.006	0.007	0.006	-0.008	-0.008	-0.008	-0.009	-0.009
	(0.782)	(0.755)	(0.734)	(0.835)	(0.774)	(-1.245)	(-1.270)	(-1.319)	(-1.284)	(-1.340)
LnAssets	-0.012	-0.012	-0.011	-0.013	-0.012	0.001	0.001	0.001	0.001	0.000
	(-1.077)	(-1.131)	(-1.045)	(-1.152)	(-1.115)	(0.093)	(0.111)	(0.095)	(0.062)	(0.009)
SalesGrow	-0.006**	-0.006**	-0.006***	-0.006**	-0.005**	-0.038	-0.038	-0.039	-0.038	-0.040
	(-2.475)	(-2.483)	(-2.652)	(-2.172)	(-2.214)	(-1.484)	(-1.460)	(-1.552)	(-1.524)	(-1.563)
Mark2Book	0.009	0.008	0.008	0.007	0.008	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(1.002)	(0.996)	(1.009)	(0.822)	(0.842)	(-3.930)	(-3.928)	(-3.850)	(-3.985)	(-3.846)
ROA	0.137	0.138	0.132	0.130	0.128	-0.037	-0.037	-0.038	-0.036	-0.037
	(1.640)	(1.628)	(1.536)	(1.614)	(1.556)	(-1.467)	(-1.453)	(-1.513)	(-1.496)	(-1.514)
Leverage	-0.040	-0.040	-0.039	-0.036	-0.039	0.019	0.019	0.020	0.014	0.016
	(-0.494)	(-0.497)	(-0.471)	(-0.441)	(-0.461)	(0.268)	(0.268)	(0.282)	(0.210)	(0.231)
AssTurn	0.003	0.003	0.005	0.004	0.005	0.027	0.027	0.030	0.028	0.031
	(0.254)	(0.257)	(0.376)	(0.291)	(0.391)	(1.414)	(1.414)	(1.510)	(1.488)	(1.574)
DealVal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(1.034)	(1.143)	(1.220)	(1.035)	(1.148)	(1.473)	(1.490)	(1.406)	(1.407)	(1.337)
PE Ratio	-0.000	-0.000	-0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001
	(-0.135)	(-0.150)	(-0.140)	(0.075)	(0.056)	(0.756)	(0.754)	(0.788)	(0.707)	(0.753)
Constant	0.006	0.014	0.006	0.022	0.031	0.052	0.049	0.056	0.064	0.073
	(0.050)	(0.109)	(0.044)	(0.179)	(0.250)	(0.519)	(0.512)	(0.584)	(0.644)	(0.765)

Observations	115	115	115	115	115	114	114	114	114	114
R-squared	0.113	0.113	0.116	0.124	0.125	0.252	0.252	0.259	0.266	0.272
F-test	4.417	4.299	5.245	4.200	4.987	4.325	4.223	4.012	3.745	3.507
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3.6.1 Sensitive tests controlling undervaluation for IBOs Year T-1 and Year T-2 (Dependent Variable: RowCFO)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.005			0.006		-0.046			-0.022	
	(0.079)			(0.096)		(-0.804)			(-0.412)	
Concentr3%		0.011			0.049		-0.070			0.010
		(0.185)			(0.821)		(-1.353)			(0.215)
Concentr5%			0.032					-0.014		
			(0.505)					(-0.293)		
Block10%	-0.017	-0.017		-0.017		0.050**	0.055**		0.043*	
	(-0.679)	(-0.735)		(-0.689)		(2.129)	(2.451)		(1.964)	
Block20%			-0.059		-0.063*			-0.010		-0.009
			(-1.642)		(-1.735)			(-0.495)		(-0.426)
CeoHd	0.004	0.006	0.059	0.036	0.054	-0.058	-0.059	-0.092	0.322	0.348
	(0.020)	(0.030)	(0.354)	(0.095)	(0.161)	(-0.352)	(-0.356)	(-0.542)	(1.210)	(1.159)
CeoHdSq				-0.065	0.030				-0.838**	-0.961**
				(-0.116)	(0.057)				(-2.003)	(-2.003)
NonExecHd	0.168	0.174	0.206	0.163	0.233	0.008	0.001	0.064	-0.057	-0.020
	(0.709)	(0.739)	(1.142)	(0.666)	(1.124)	(0.081)	(0.014)	(0.577)	(-0.512)	(-0.164)
Ned%	-0.153	-0.154	-0.112	-0.151	-0.110	-0.079	-0.077	-0.080	-0.036	-0.029
	(-1.398)	(-1.421)	(-1.049)	(-1.292)	(-0.965)	(-0.960)	(-0.952)	(-0.953)	(-0.441)	(-0.343)
Duality	-0.075*	-0.075*	-0.084**	-0.076*	-0.084**	-0.015	-0.016	-0.016	-0.019	-0.020
	(-1.890)	(-1.905)	(-2.277)	(-1.882)	(-2.298)	(-0.367)	(-0.419)	(-0.354)	(-0.480)	(-0.470)
BoardSz	-0.016**	-0.016*	-0.014*	-0.016**	-0.014*	-0.012	-0.012	-0.011	-0.011	-0.010
	(-2.003)	(-1.993)	(-1.791)	(-1.998)	(-1.769)	(-1.605)	(-1.617)	(-1.505)	(-1.530)	(-1.410)
LnAssets	0.013	0.013	0.017	0.013	0.017	0.011	0.010	0.011	0.016	0.016
	(1.233)	(1.271)	(1.529)	(1.280)	(1.645)	(0.946)	(0.853)	(1.006)	(1.263)	(1.384)
SalesGrow	-0.006	-0.006	-0.011	-0.006	-0.011	0.020	0.020	0.022	0.019	0.021
	(-0.378)	(-0.378)	(-0.652)	(-0.378)	(-0.667)	(1.045)	(1.119)	(1.238)	(0.989)	(1.163)
Mark2Book	0.001**	0.001**	0.001**	0.001**	0.001*	0.000	0.000	0.001	0.001	0.002
	(2.256)	(2.221)	(2.068)	(2.251)	(1.894)	(0.033)	(0.071)	(0.142)	(0.167)	(0.262)
ROA	-0.033	-0.033	-0.033	-0.033	-0.034	-0.009	-0.014	-0.008	-0.008	-0.006
	(-0.628)	(-0.641)	(-0.677)	(-0.635)	(-0.726)	(-0.115)	(-0.170)	(-0.103)	(-0.096)	(-0.065)
Leverage	-0.140*	-0.141*	-0.147*	-0.141*	-0.154**	-0.228**	-0.219**	-0.214**	-0.258**	-0.251**
	(-1.790)	(-1.817)	(-1.978)	(-1.837)	(-2.111)	(-2.314)	(-2.279)	(-2.352)	(-2.423)	(-2.444)
AssTurn	0.044*	0.045*	0.041*	0.045*	0.041*	0.019	0.018	0.020	0.034	0.037*
	(1.900)	(1.925)	(1.962)	(1.914)	(1.908)	(1.005)	(0.981)	(1.068)	(1.611)	(1.765)
DealVal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.807)	(0.821)	(0.565)	(0.804)	(0.566)	(0.908)	(0.900)	(0.287)	(0.822)	(0.262)
PE Ratio	-0.000	-0.000	-0.001	-0.000	-0.001	0.001***	0.001***	0.001**	0.001***	0.001**
	(-0.713)	(-0.717)	(-0.975)	(-0.708)	(-0.994)	(2.822)	(2.697)	(2.506)	(2.718)	(2.249)
Constant	0.027	0.022	-0.046	0.023	-0.067	0.042	0.058	0.053	-0.043	-0.049
	(0.235)	(0.187)	(-0.354)	(0.184)	(-0.505)	(0.343)	(0.477)	(0.447)	(-0.339)	(-0.383)

Observations	85	85	85	85	85	78	78	78	78	78
R-squared	0.357	0.358	0.380	0.357	0.383	0.400	0.408	0.357	0.423	0.388
F-test	3.191	3.285	3.181	2.761	3.335	1.956	2.129	1.594	1.852	1.591
Prob > F	0.001	0.000	0.001	0.002	0.000	0.034	0.020	0.102	0.044	0.099

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3.7.1 Sensitive analysis for MBOs Year T-1 and T-2 (Dep. Var.: Absolute RowCFO)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.007			0.030		-0.038			-0.029	
	(0.172)			(0.605)		(-0.701)			(-0.628)	
Concentr3%		0.014			0.065		-0.016			-0.012
		(0.233)			(1.258)		(-0.276)			(-0.207)
Concentr5%			0.059					-0.006		
			(1.231)					(-0.141)		
Block10%	0.005	0.004		-0.004		-0.022	-0.025		-0.024	
	(0.167)	(0.110)		(-0.145)		(-1.185)	(-1.254)		(-1.172)	
Block20%			-0.039*		-0.035			-0.030		-0.028
			(-1.830)		(-1.660)			(-1.498)		(-1.474)
CeoHd	0.017	0.020	0.005	0.439	0.414	-0.061	-0.053	-0.037	0.073	0.088
	(0.145)	(0.183)	(0.053)	(1.195)	(1.182)	(-1.031)	(-0.904)	(-0.529)	(0.320)	(0.369)
CeoHdSq				-0.873	-0.826				-0.270	-0.257
				(-1.513)	(-1.491)				(-0.694)	(-0.665)
NonExecHd	0.048	0.052	0.115*	0.053	0.112*	-0.009	-0.001	0.026	-0.008	0.019
	(0.863)	(0.887)	(1.781)	(0.956)	(1.686)	(-0.107)	(-0.015)	(0.346)	(-0.098)	(0.226)
Ned%	-0.134	-0.134	-0.133	-0.138	-0.134	0.174*	0.166	0.159*	0.168*	0.158
	(-1.173)	(-1.231)	(-1.204)	(-1.210)	(-1.229)	(1.669)	(1.630)	(1.670)	(1.724)	(1.650)
Duality	-0.026	-0.026	-0.018	-0.031	-0.022	0.031	0.031	0.031	0.028	0.028
	(-0.768)	(-0.740)	(-0.510)	(-0.855)	(-0.611)	(1.234)	(1.284)	(1.249)	(1.233)	(1.258)
BoardSz	-0.011	-0.010	-0.010	-0.012	-0.011	0.006	0.006	0.006	0.006	0.006
	(-1.506)	(-1.470)	(-1.412)	(-1.571)	(-1.471)	(0.545)	(0.550)	(0.527)	(0.546)	(0.530)
LnAssets	0.005	0.005	0.003	0.007	0.005	-0.001	-0.002	-0.001	-0.001	-0.001
	(0.526)	(0.546)	(0.337)	(0.707)	(0.573)	(-0.226)	(-0.342)	(-0.231)	(-0.162)	(-0.100)
SalesGrow	0.007**	0.007**	0.007**	0.006*	0.006*	0.035	0.035	0.037*	0.036	0.038
	(2.024)	(2.030)	(2.478)	(1.675)	(1.949)	(1.651)	(1.598)	(1.694)	(1.655)	(1.651)
Mark2Book	0.005	0.005	0.005	0.007	0.006	-0.001	-0.001	-0.001*	-0.001	-0.001*
	(0.733)	(0.738)	(0.756)	(0.942)	(0.873)	(-1.370)	(-1.304)	(-1.739)	(-1.307)	(-1.768)
ROA	0.001	0.001	0.013	0.008	0.016	0.036*	0.036	0.037*	0.036*	0.037*
	(0.012)	(0.015)	(0.203)	(0.135)	(0.257)	(1.677)	(1.657)	(1.703)	(1.695)	(1.695)
Leverage	0.119**	0.118**	0.114**	0.117**	0.117**	0.041	0.040	0.035	0.043	0.037
	(2.348)	(2.387)	(2.028)	(2.204)	(2.023)	(0.705)	(0.668)	(0.579)	(0.763)	(0.623)
AssTurn	-0.018*	-0.018*	-0.021**	-0.019*	-0.021**	-0.022	-0.023	-0.025	-0.023	-0.026
	(-1.881)	(-1.895)	(-2.167)	(-1.937)	(-2.149)	(-1.324)	(-1.325)	(-1.410)	(-1.325)	(-1.414)
DealVal	-0.000	-0.000	0.000	-0.000	0.000	-0.000*	-0.000*	-0.000*	-0.000**	-0.000*
	(-0.109)	(-0.106)	(0.020)	(-0.094)	(0.052)	(-1.916)	(-1.841)	(-1.812)	(-2.014)	(-1.775)
Constant	0.096	0.092	0.113	0.070	0.072	-0.007	0.001	-0.014	-0.014	-0.023
	(0.860)	(0.853)	(0.973)	(0.661)	(0.711)	(-0.107)	(0.012)	(-0.229)	(-0.206)	(-0.334)
Observations	115	115	115	115	115	114	114	114	114	114
R-squared	0.077	0.077	0.092	0.113	0.125	0.182	0.178	0.178	0.187	0.183

F-test	1.347	1.375	1.684	1.431	1.744	3.436	3.428	3.571	3.295	3.390
Prob > F	0.194	0.179	0.0708	0.148	0.0543	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3.7.2 Sensitive analysis for MBOs Year T-1 and T-2 (Dep. Var.: Absolute GuySGA)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	-0.101			-0.077		-0.035			-0.044	
	(-1.480)			(-1.073)		(-0.436)			(-0.545)	
Concentr3%		-0.067			-0.077		-0.067			-0.158**
		(-0.908)			(-1.057)		(-0.824)			(-2.116)
Concentr5%			-0.129*					-0.172**		
			(-1.749)					(-2.108)		
Block10%	-0.027	-0.032		-0.039		-0.068**	-0.063*		-0.066**	
	(-0.661)	(-0.780)		(-0.878)		(-2.135)	(-1.987)		(-2.055)	
Block20%			-0.005		-0.011			0.041		0.030
			(-0.203)		(-0.405)			(1.135)		(0.845)
CeoHd	-0.079	-0.075	-0.065	0.380	0.372	-0.092	-0.104	-0.043	-0.246	-0.217
	(-0.789)	(-0.733)	(-0.716)	(1.432)	(1.509)	(-0.792)	(-0.898)	(-0.413)	(-1.121)	(-0.937)
CeoHdSq				-0.915*	-0.850*				0.295	0.334
				(-1.737)	(-1.838)				(0.852)	(0.941)
NonExecHd	0.112	0.133	0.124	0.120	0.121	0.364***	0.353***	0.230*	0.365***	0.234*
	(0.991)	(1.073)	(1.139)	(0.995)	(0.900)	(4.104)	(3.752)	(1.958)	(3.915)	(1.983)
Ned%	0.163*	0.143	0.144*	0.155*	0.137	0.148	0.150	0.135	0.156	0.147
	(1.849)	(1.658)	(1.729)	(1.771)	(1.574)	(1.505)	(1.575)	(1.456)	(1.592)	(1.567)
Duality	0.047	0.045	0.047	0.040	0.043	0.024	0.021	0.004	0.027	0.005
	(1.452)	(1.379)	(1.404)	(1.366)	(1.304)	(0.730)	(0.619)	(0.121)	(0.841)	(0.146)
BoardSz	0.000	-0.000	-0.001	-0.001	-0.001	-0.003	-0.004	-0.008	-0.003	-0.008
	(0.035)	(-0.045)	(-0.084)	(-0.071)	(-0.117)	(-0.465)	(-0.585)	(-1.003)	(-0.455)	(-0.964)
LnAssets	0.023*	0.021*	0.022*	0.026**	0.026*	0.013	0.014	0.020	0.012	0.019
	(1.862)	(1.681)	(1.724)	(2.021)	(1.903)	(0.984)	(1.074)	(1.534)	(0.882)	(1.387)
SalesGrow	0.000	0.001	0.001	-0.000	-0.001	0.036	0.041	0.054*	0.036	0.057*
	(0.174)	(0.421)	(0.321)	(-0.182)	(-0.227)	(1.202)	(1.346)	(1.763)	(1.201)	(1.804)
Mark2Book	0.022*	0.022	0.021	0.024*	0.024*	-0.003	-0.003	-0.004	-0.003	-0.005*
	(1.674)	(1.629)	(1.610)	(1.703)	(1.728)	(-1.344)	(-1.362)	(-1.636)	(-1.356)	(-1.835)
ROA	-0.108	-0.095	-0.109	-0.102	-0.102	0.034	0.038	0.046*	0.035	0.050*
	(-1.369)	(-1.214)	(-1.381)	(-1.366)	(-1.314)	(1.323)	(1.447)	(1.733)	(1.342)	(1.848)
Leverage	0.065	0.058	0.074	0.061	0.075	0.036	0.036	0.015	0.034	0.012
	(0.927)	(0.822)	(0.987)	(0.856)	(0.955)	(0.563)	(0.563)	(0.233)	(0.536)	(0.184)
AssTurn	0.065**	0.063**	0.065**	0.066**	0.065**	0.053*	0.055*	0.069**	0.053*	0.067**
	(2.404)	(2.334)	(2.384)	(2.480)	(2.354)	(1.854)	(1.913)	(2.369)	(1.821)	(2.247)
DealVal	-0.000**	-0.000**	-0.000**	-0.000**	-0.000**	-0.000	-0.000	-0.000	-0.000	-0.000
	(-2.498)	(-2.338)	(-2.428)	(-2.598)	(-2.369)	(-0.074)	(-0.184)	(-0.156)	(-0.110)	(-0.112)
Constant	-0.325**	-0.289**	-0.317**	-0.359***	-0.378***	-0.141	-0.134	-0.201	-0.126	-0.182
	(-2.496)	(-2.291)	(-2.403)	(-2.814)	(-2.694)	(-0.863)	(-0.870)	(-1.303)	(-0.752)	(-1.094)
Observations	95	95	95	95	95	94	94	94	94	94
R-squared	0.316	0.307	0.317	0.346	0.328	0.382	0.386	0.364	0.385	0.362

F-test	1.898	1.751	1.847	1.869	1.586	12.15	11.32	10.35	11.97	9.558
Prob > F	0.039	0.062	0.046	0.039	0.097	0.000	0.000	0.000	0.000	0.000

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3.8.1 Sensitive analysis for IBOs Year T-1 and T-2 (Dep. Var.: Absolute RowCFO)

	Panel A: Year T-1					Panel B: Year T-2				
Variables	model 1	model 2	model 3	model 4	model 5	model 1	model 2	model 3	model 4	model 5
InsShare	0.003			-0.013		0.047			0.036	
	(0.053)			(-0.240)		(1.041)			(0.832)	
Concentr3%		-0.001			-0.037		0.068*			0.040
		(-0.022)			(-0.712)		(1.839)			(1.150)
Concentr5%			-0.028					0.045		
			(-0.509)					(1.182)		
Block10%	0.001	0.002		0.006		-0.019	-0.024		-0.016	
	(0.067)	(0.103)		(0.305)		(-1.069)	(-1.435)		(-0.951)	
Block20%			0.031		0.028			-0.011		-0.012
			(0.936)		(0.846)			(-0.591)		(-0.691)
CeoHd	0.371**	0.370**	0.340**	-0.097	-0.110	0.095	0.095	0.107	-0.071	-0.086
	(2.085)	(2.059)	(2.031)	(-0.276)	(-0.326)	(0.659)	(0.662)	(0.756)	(-0.299)	(-0.331)
CeoHdSq				0.953*	0.920*				0.367	0.431
				(1.988)	(1.879)				(0.984)	(1.081)
NonExecHd	-0.203	-0.207	-0.241	-0.134	-0.170	-0.027	-0.019	-0.027	0.002	0.018
	(-1.101)	(-1.127)	(-1.536)	(-0.706)	(-0.931)	(-0.294)	(-0.213)	(-0.301)	(0.023)	(0.185)
Ned%	0.091	0.091	0.074	0.058	0.039	-0.017	-0.019	-0.012	-0.036	-0.037
	(0.943)	(0.964)	(0.795)	(0.576)	(0.403)	(-0.291)	(-0.322)	(-0.211)	(-0.642)	(-0.651)
Duality	0.028	0.028	0.032	0.045	0.049	0.004	0.005	0.005	0.006	0.006
	(0.807)	(0.808)	(0.920)	(1.448)	(1.590)	(0.123)	(0.163)	(0.126)	(0.173)	(0.157)
BoardSz	0.016**	0.016**	0.015**	0.016**	0.015**	0.008	0.008	0.008	0.008	0.008
	(2.417)	(2.411)	(2.299)	(2.512)	(2.430)	(1.412)	(1.442)	(1.384)	(1.395)	(1.425)
LnAssets	-0.014	-0.014	-0.016	-0.017*	-0.019*	-0.017	-0.016	-0.016	-0.019*	-0.018*
	(-1.369)	(-1.393)	(-1.477)	(-1.799)	(-1.952)	(-1.658)	(-1.600)	(-1.667)	(-1.787)	(-1.809)
SalesGrow	-0.001	-0.001	0.002	0.000	0.002	-0.008	-0.008	-0.006	-0.007	-0.007
	(-0.048)	(-0.046)	(0.143)	(0.005)	(0.149)	(-0.540)	(-0.580)	(-0.465)	(-0.501)	(-0.518)
Mark2Book	0.000	0.000	0.000	0.000	0.000	-0.004	-0.005	-0.005	-0.005	-0.005
	(0.428)	(0.432)	(0.615)	(0.208)	(0.468)	(-0.644)	(-0.681)	(-0.756)	(-0.689)	(-0.777)
ROA	0.001	0.001	0.002	0.005	0.006	0.048	0.054	0.049	0.048	0.048
	(0.016)	(0.021)	(0.045)	(0.117)	(0.163)	(1.199)	(1.388)	(1.199)	(1.166)	(1.167)
Leverage	0.090	0.090	0.093	0.110	0.117*	0.154*	0.146	0.144*	0.167*	0.159*
	(1.364)	(1.393)	(1.452)	(1.653)	(1.789)	(1.686)	(1.657)	(1.708)	(1.730)	(1.726)
AssTurn	-0.029	-0.029	-0.027	-0.041**	-0.040**	-0.028	-0.027	-0.027	-0.035*	-0.035*
	(-1.483)	(-1.503)	(-1.522)	(-2.013)	(-2.077)	(-1.572)	(-1.569)	(-1.633)	(-1.793)	(-1.927)
DealVal	-0.000	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	0.000	0.000
	(-1.158)	(-1.175)	(-0.973)	(-1.259)	(-1.069)	(0.050)	(0.018)	(0.286)	(0.100)	(0.313)
Constant	0.049	0.051	0.088	0.116	0.160	0.166	0.150	0.146	0.203*	0.183*
	(0.486)	(0.493)	(0.749)	(1.068)	(1.393)	(1.514)	(1.433)	(1.434)	(1.824)	(1.753)
Observations	85	85	85	85	85	78	78	78	78	78
R-squared	0.313	0.313	0.323	0.340	0.349	0.307	0.319	0.303	0.314	0.314

F-test	1.047	1.057	1.254	5.012	5.202	0.880	0.967	0.894	0.844	0.902
Prob > F	0.420	0.411	0.259	0.000	0.000	0.584	0.496	0.569	0.626	0.565

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.5 Panel A OLS Regressions for MBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruDe	ProdCos	AccruDe	DisExp	AccruDe	Res&Dev	AccruDe	SGA	AccruDe
Sign	(-)	(-)	(+)	(-)	(-)	(-)	(?)	(-)	(-)	(-)
Accruals	0.008		0.350		-0.211		0.020		-0.172	
	(0.054)		(1.429)		(-0.919)		(1.363)		(-1.521)	
CFO		-0.012								
		(-0.161)								
ProdCos				0.055						
				(1.498)						
DisExp						-0.038				
						(-1.541)				
Res&Dev								2.424		
								(1.414)		
SGA										-0.079
										(-1.653)
ROA	0.244**		-0.156		-0.535		-0.011		-0.409***	
	(2.540)		(-1.186)		(-1.447)		(-1.133)		(-3.831)	
MarketSh	1.198		-0.542		-12.068*		-0.079		-1.645	
	(0.679)		(-0.129)		(-1.957)		(-0.567)		(-0.750)	
Z-score	-0.003		0.002		0.006		0.000		0.011***	
	(-1.370)		(0.555)		(0.606)		(0.784)		(4.270)	
InsShare	-0.019		-0.064		0.213		-0.000		0.171***	
	(-0.442)		(-0.484)		(1.264)		(-0.065)		(2.880)	
PE Ratio	-0.002*		-0.000		-0.003		0.000		-0.000	
	(-1.759)		(-0.314)		(-1.509)		(0.118)		(-0.026)	
BoardSz	-0.002		-0.000		0.001		0.001		-0.013	
	(-0.302)		(-0.011)		(0.088)		(1.463)		(-1.171)	
NED%	0.098		-0.118		-0.388		-0.004		-0.076	
	(1.368)		(-0.736)		(-0.905)		(-0.842)		(-0.856)	
Big5		0.003		0.004		-0.003		0.007		-0.005
		(0.160)		(0.216)		(-0.150)		(0.354)		(-0.240)
LNAuditTn		-0.004		-0.004		-0.004		-0.007		-0.004
		(-0.375)		(-0.315)		(-0.229)		(-0.511)		(-0.285)
AudComSz		0.006		0.005		0.012		0.004		0.011
		(0.682)		(0.572)		(1.130)		(0.535)		(1.099)
AudShare		0.105		0.115		0.091		0.129		0.082
		(0.902)		(0.968)		(0.728)		(1.060)		(0.672)
OpeCycle		-0.000		-0.000		-0.000		-0.000		-0.000
		(-0.975)		(-1.042)		(-0.994)		(-1.041)		(-0.943)
LnAssets	-0.010	0.000	-0.003	0.001	0.078	0.003	0.001	-0.000	-0.010	0.000
	(-0.735)	(0.051)	(-0.104)	(0.143)	(1.296)	(0.274)	(0.638)	(-0.019)	(-0.503)	(0.011)
Mark2Book	0.005	0.004	-0.006	0.004	0.012	0.010	-0.000	0.006	-0.003	0.008
	(0.680)	(0.721)	(-0.364)	(0.892)	(0.353)	(1.463)	(-0.354)	(1.215)	(-0.124)	(1.148)

Leverage	-0.240*	0.054	0.045	0.056	-0.085	0.042	-0.004	0.068	-0.011	0.040
	(-1.769)	(0.653)	(0.192)	(0.729)	(-0.383)	(0.492)	(-0.562)	(0.962)	(-0.097)	(0.455)
DealVal	0.000	0.000	-0.000	0.000	0.000***	0.000	0.000	0.000	0.000	0.000
	(0.880)	(0.626)	(-1.281)	(0.761)	(4.061)	(0.391)	(0.042)	(0.598)	(1.406)	(0.281)
Constant	0.052	-0.041	0.175	-0.053	-0.836	-0.093	-0.007	-0.035	0.138	-0.053
	(0.424)	(-0.431)	(0.707)	(-0.572)	(-1.560)	(-0.865)	(-0.701)	(-0.374)	(0.777)	(-0.467)
Observations	114	112	113	112	96	94	113	111	96	94
R-squared	0.294	0.065	0.047	0.087	0.225	0.099	0.114	0.114	0.242	0.102
F-test	2.211	1.031	2.898	1.183	8.664	1.444	0.604	1.429	3.721	1.731
Prob > F	0.016	0.423	0.002	0.000	0.000	0.176	0.834	0.178	0.000	0.087

Note: Robust t-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.5 Panel B OLS Regressions for MBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruDe	CFO+DisEx	AccruDe
Accruals	0.458		0.216	
	(1.203)		(0.689)	
Prod+DisEx		0.038*		
		(1.855)		
CFO+DisEx				0.031
				(1.191)
ROA	0.144		0.310	
	(0.450)		(0.790)	
MarketSh	9.547		9.832	
	(1.152)		(1.503)	
Z-score	0.000		-0.003	
	(0.048)		(-0.335)	
InsShare	-0.401		-0.186	
	(-1.626)		(-1.005)	
PE Ratio	0.003		0.006	
	(1.352)		(1.637)	
BoardSz	0.020		0.003	
	(0.689)		(0.176)	
NED%	0.324		0.331	
	(0.645)		(0.747)	
Big5		-0.002		-0.002
		(-0.096)		(-0.104)
LNAuditTn		-0.003		-0.003
		(-0.209)		(-0.176)
AudComSz		0.011		0.012
		(1.068)		(1.142)
AudShare		0.096		0.088
		(0.759)		(0.698)
OpeCycle		-0.000		-0.000
		(-1.036)		(-0.980)
LnAssets	-0.075	0.003	-0.067	0.002
	(-1.058)	(0.273)	(-1.077)	(0.207)
Mark2Book	-0.016	0.010	-0.020	0.010
	(-0.279)	(1.522)	(-0.516)	(1.557)
Leverage	-0.107	0.052	0.249	0.040
	(-0.286)	(0.654)	(0.886)	(0.475)
DealVal	-0.000***	0.000	-0.000***	0.000
	(-3.335)	(0.549)	(-3.778)	(0.436)
Constant	0.866	-0.096	0.743	-0.088
	(1.351)	(-0.879)	(1.360)	(-0.790)
Observations	95	94	96	94

R-squared	0.156	0.114	0.236	0.098
F-test	8.585	1.560	7.452	1.327
Prob > F	0.000	0.133	0.000	0.230

Note: Robust t-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.6 Panel A OLS Regressions for IBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruDe	ProdCos	AccruDe	DisExp	AccruDe	Res&Dev	AccruDe	SGA	AccruDe
Sign	(-)	(?)	(+)	(?)	(-)	(?)	(?)	(?)	(-)	(?)
Accruals	-0.274*		0.356		0.325		-0.002		-0.181	
	(-1.814)		(0.813)		(1.056)		(-0.198)		(-0.783)	
CFO		-0.119								
		(-1.397)								
ProdCos				0.030						
				(0.668)						
DisExp						0.039				
						(0.853)				
Res&Dev								-1.268		
								(-1.304)		
SGA										-0.094
										(-1.100)
ROA	-0.183**		0.020		0.449**		0.002		0.117	
	(-2.604)		(0.104)		(2.342)		(0.386)		(1.091)	
MarketSh	0.534		-0.567		0.969*		0.007		0.534	
	(1.309)		(-0.777)		(1.862)		(0.449)		(1.622)	
Z-score	0.032***		0.002		-0.072***		-0.002**		-0.024*	
	(3.043)		(0.100)		(-2.984)		(-2.433)		(-1.824)	
InsShare	0.009		0.130		-0.006		-0.005		0.006	
	(0.206)		(0.811)		(-0.030)		(-0.978)		(0.073)	
PE Ratio	0.000		0.000		-0.000		0.000		-0.000*	
	(0.951)		(0.036)		(-1.049)		(0.943)		(-1.988)	
BoardSz	-0.014**		0.027*		-0.020		-0.001*		-0.014*	
	(-2.196)		(1.710)		(-1.315)		(-1.816)		(-1.679)	
NED%	-0.051		0.400**		-0.189		0.001		-0.188*	
	(-0.679)		(2.170)		(-1.137)		(0.181)		(-1.728)	
Big5		-0.013		-0.015		-0.018		-0.011		-0.020
		(-0.643)		(-0.710)		(-0.812)		(-0.517)		(-0.920)
LNAuditTn		0.009		0.012		-0.003		0.011		0.000
		(0.883)		(1.292)		(-0.334)		(1.128)		(0.048)
AudComSz		-0.006		-0.006		-0.009		-0.009		-0.007
		(-0.950)		(-0.923)		(-1.209)		(-1.266)		(-1.018)
AudShare		0.157		0.177		0.191*		0.174		0.146
		(1.312)		(1.363)		(1.785)		(1.654)		(1.198)
OpeCycle		0.000		0.000		0.000		0.000		0.000
		(0.745)		(0.706)		(1.017)		(0.966)		(0.619)
LnAssets	0.005	-0.010	-0.037	-0.010	0.030	-0.003	0.000	-0.009	0.005	-0.002
	(0.364)	(-1.141)	(-1.158)	(-1.136)	(1.283)	(-0.236)	(0.417)	(-1.064)	(0.313)	(-0.192)
Mark2Book	0.002***	-0.001	0.001	-0.001	0.000	0.000	-0.000	-0.001	-0.001	0.000
	(4.000)	(-1.045)	(0.668)	(-1.349)	(0.167)	(0.290)	(-0.311)	(-1.368)	(-1.241)	(0.731)

Leverage	-0.124	0.126	0.287	0.160*	-0.111	0.098	-0.006	0.158*	-0.046	0.092
	(-1.118)	(1.664)	(0.972)	(1.839)	(-0.591)	(1.124)	(-1.337)	(1.954)	(-0.427)	(1.076)
DealVal	0.000**	0.000*	0.000	0.000*	-0.000	0.000	-0.000	0.000	-0.000	-0.000
	(2.056)	(1.891)	(1.038)	(1.728)	(-0.831)	(0.142)	(-0.648)	(1.558)	(-0.847)	(-0.015)
Constant	-0.010	0.088	0.014	0.089	-0.066	0.054	0.010	0.088	0.156	0.038
	(-0.074)	(1.133)	(0.044)	(1.057)	(-0.215)	(0.445)	(1.028)	(1.088)	(0.913)	(0.323)
Observations	82	80	79	78	67	65	82	80	67	65
R-squared	0.365	0.170	0.210	0.182	0.234	0.090	0.198	0.164	0.182	0.099
F-test	6.739	1.622	1.753	1.511	12.01	1.305	1.556	1.464	2.572	1.583
Prob > F	0.000	0.118	0.075	0.155	0.000	0.251	0.126	0.172	0.009	0.137

Note: Robust t-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3.6 Panel B. OLS Regressions for IBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruDe	CFO+DisEx	AccruDe
Accruals	-0.287		-0.167	
	(-0.468)		(-0.492)	
Prod+DisEx		-0.017		
		(-0.645)		
CFO+DisEx				-0.028
				(-0.632)
ROA	-0.677**		-0.383**	
	(-2.068)		(-2.069)	
MarketSh	-1.882*		-1.577***	
	(-1.998)		(-2.770)	
Z-score	0.108***		0.048*	
	(2.902)		(1.918)	
InsShare	0.116		0.025	
	(0.279)		(0.111)	
PE Ratio	0.001		0.000	
	(0.923)		(0.806)	
BoardSz	0.040		0.027*	
	(1.390)		(1.685)	
NED%	0.556		0.246	
	(1.617)		(1.202)	
Big5		-0.017		-0.018
		(-0.774)		(-0.814)
LNAuditTn		-0.001		-0.003
		(-0.080)		(-0.281)
AudComSz		-0.009		-0.009
		(-1.143)		(-1.161)
AudShare		0.219*		0.188*
		(1.968)		(1.716)
OpeCycle		0.000		0.000
		(1.040)		(1.029)
LnAssets	-0.032	-0.005	-0.010	-0.002
	(-0.811)	(-0.363)	(-0.400)	(-0.165)
Mark2Book	0.003	0.000	-0.001	0.000
	(1.020)	(0.578)	(-0.560)	(0.316)
Leverage	0.300	0.127	0.119	0.102
	(0.885)	(1.258)	(0.574)	(1.170)
DealVal	0.000	0.000	-0.000	0.000
	(0.312)	(0.161)	(-0.238)	(0.069)
Constant	-0.298	0.062	-0.167	0.042
	(-0.562)	(0.484)	(-0.527)	(0.362)
Observations	64	63	67	65

R-squared	0.171	0.104	0.197	0.087
F-test	2.910	1.441	18.59	1.269
Prob > F	0.004	0.189	0.000	0.271

Note: Robust t-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.4.1 Panel A Robustness 3SLS regressions for MBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruJo	ProdCos	AccruJo	DisExp	AccruJo	Res&Dev	AccruJo	SGA	AccruJo
Sign	(-)	(-)	(+)	(-)	(-)	(-)	(?)	(-)	(-)	(-)
AccruJo	-1.152***		2.825***		1.579**		0.117***		-0.286	
	(-4.408)		(4.858)		(2.349)		(7.695)		(-0.776)	
CFO		-0.274***								
		(-3.601)								
ProdCos				0.199***						
				(6.561)						
DisExp						0.055				
						(1.296)				
Res&Dev								8.203***		
								(8.959)		
SGA										-0.063
										(-1.011)
ROA	0.167*		-0.012		-0.085		-0.001		-0.371**	
	(1.858)		(-0.063)		(-0.320)		(-0.330)		(-2.564)	
MarketSh	0.251		1.370		-10.759		0.003		-1.766	
	(0.109)		(0.278)		(-1.620)		(0.032)		(-0.490)	
Z-score	-0.003		0.002		-0.004		0.000		0.010**	
	(-0.927)		(0.296)		(-0.431)		(0.296)		(2.175)	
InsShare	-0.038		0.002		0.208		0.000		0.164**	
	(-0.745)		(0.018)		(1.369)		(0.224)		(1.993)	
PE Ratio	-0.002***		-0.000		-0.003***		-0.000		-0.000	
	(-4.205)		(-0.291)		(-2.683)		(-0.030)		(-0.011)	
BoardSz	0.003		-0.009		-0.016		0.000		-0.014	
	(0.413)		(-0.521)		(-0.768)		(0.161)		(-1.248)	
NED%	0.099		-0.086		-0.427**		-0.001		-0.087	
	(1.270)		(-0.509)		(-1.992)		(-0.212)		(-0.750)	
Big5		0.002		0.005		0.004		0.002		-0.001
		(0.147)		(0.408)		(0.225)		(0.251)		(-0.033)
LNAuditTn		-0.009		-0.007		-0.012		-0.002		-0.013
		(-1.126)		(-0.911)		(-1.159)		(-0.537)		(-1.257)
AudComSz		0.002		0.001		0.008		-0.000		0.007
		(0.427)		(0.120)		(1.024)		(-0.164)		(0.910)
AudShare		0.000		0.031		0.038		0.015		0.005
		(0.005)		(0.504)		(0.472)		(0.435)		(0.061)
OpeCycle		-0.000		-0.000		-0.000*		-0.000		-0.000**
		(-1.373)		(-1.589)		(-1.795)		(-0.187)		(-2.098)
LnAssets	-0.004	0.003	-0.020	0.006	0.079**	0.002	0.000	-0.001	-0.006	0.004
	(-0.275)	(0.491)	(-0.685)	(0.871)	(2.281)	(0.201)	(0.202)	(-0.178)	(-0.323)	(0.488)
Mark2Book	0.011	0.006	-0.018	0.004	-0.007	0.008	-0.001*	0.007*	-0.001	0.007
	(1.601)	(1.340)	(-1.149)	(1.125)	(-0.285)	(1.496)	(-1.703)	(1.807)	(-0.102)	(1.224)

Leverage	-0.150	-0.016	-0.034	0.023	-0.149	0.005	-0.006	0.050	-0.036	0.007
	(-1.462)	(-0.258)	(-0.148)	(0.375)	(-0.562)	(0.078)	(-0.745)	(0.775)	(-0.260)	(0.105)
DealVal	0.000	0.000	-0.000	0.000	0.000	-0.000	-0.000	0.000	0.000	-0.000
	(0.522)	(0.339)	(-0.664)	(0.496)	(1.470)	(-0.126)	(-0.296)	(0.306)	(0.529)	(-0.089)
Constant	-0.066	-0.054	0.418	-0.089	-0.696**	-0.036	0.002	-0.015	0.105	-0.059
	(-0.506)	(-0.770)	(1.420)	(-1.302)	(-2.059)	(-0.441)	(0.194)	(-0.222)	(0.587)	(-0.754)
Observations	111	111	110	110	93	93	109	109	93	93
R-squared	-0.076	-0.092	-0.353	-0.101	-0.022	0.015	-0.337	-0.310	0.193	0.123
Wald chi2	54.90	20.11	33.43	47.91	27.08	14.41	82.48	96.58	21.74	12.24
Prob > chi2	0.000	0.028	0.001	0.000	0.008	0.155	0.000	0.000	0.041	0.269

Note: z-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.4.1 Panel B Robustness 3SLS regressions for MBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruJo	CFO+DisEx	AccruJo
AccruJo	1.671		-0.143	
	(1.568)		(-0.181)	
Prod+DisEx		0.060***		
		(2.607)		
CFO+DisEx				0.023
				(0.686)
ROA	0.213		-0.075	
	(0.515)		(-0.242)	
MarketSh	9.837		9.179	
	(0.976)		(1.190)	
Z-score	0.000		0.006	
	(0.017)		(0.658)	
InsShare	-0.370		-0.153	
	(-1.560)		(-0.868)	
PE Ratio	0.003		0.006***	
	(1.636)		(4.309)	
BoardSz	0.013		0.014	
	(0.432)		(0.575)	
NED%	0.321		0.349	
	(0.980)		(1.407)	
Big5		0.002		0.002
		(0.114)		(0.135)
LNAuditTn		-0.012		-0.013
		(-1.159)		(-1.192)
AudComSz		0.007		0.008
		(0.861)		(1.002)
AudShare		0.006		0.015
		(0.072)		(0.180)
OpeCycle		-0.000**		-0.000**
		(-2.262)		(-2.202)
LnAssets	-0.086	0.008	-0.075*	0.006
	(-1.634)	(1.045)	(-1.923)	(0.697)
Mark2Book	-0.028	0.008	-0.018	0.008
	(-0.787)	(1.499)	(-0.654)	(1.554)
Leverage	-0.088	0.028	0.231	0.008
	(-0.227)	(0.416)	(0.782)	(0.115)
DealVal	-0.000	0.000	-0.000	-0.000
	(-1.328)	(0.103)	(-1.344)	(-0.028)
Constant	1.048**	-0.122	0.774**	-0.087
	(1.993)	(-1.539)	(2.019)	(-1.072)
Observations	92	92	93	93

R-squared	0.151	0.141	0.235	0.126
Wald chi2	19.38	17.28	29.56	12.16
Prob > chi2	0.080	0.069	0.003	0.275

Note: z-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

Table 4.4.2 Panel A   Robustness 3SLS regressions for IBOs

Models	REM(1)	AEM(1)	REM(2)	AEM(2)	REM(3)	AEM(3)	REM(4)	AEM(4)	REM(5)	AEM(5)
Depend.Var	CFO	AccruJo	ProdCos	AccruJo	DisExp	AccruJo	Res&Dev	AccruJo	SGA	AccruJo
Sign	(-)	(?)	(+)	(?)	(-)	(?)	(?)	(?)	(-)	(?)
AccruJo	-2.050**		4.260**		2.362*		0.068		-1.506	
	(-2.193)		(1.982)		(1.716)		(1.127)		(-1.374)	
CFO		-0.311***								
		(-3.452)								
ProdCos				0.147***						
				(3.408)						
DisExp						0.178***				
						(3.349)				
Res&Dev								0.353		
								(0.191)		
SGA										-0.382***
										(-4.963)
ROA	-0.134		0.038		0.394		0.004		0.034	
	(-1.122)		(0.132)		(1.513)		(0.384)		(0.226)	
MarketSh	0.337		-0.223		0.737		0.005		0.090	
	(0.487)		(-0.138)		(0.559)		(0.089)		(0.127)	
Z-score	0.025		-0.019		-0.064*		-0.002*		-0.010	
	(1.455)		(-0.387)		(-1.838)		(-1.750)		(-0.454)	
InsShare	0.044		0.002		-0.040		-0.008		-0.003	
	(0.483)		(0.009)		(-0.198)		(-1.117)		(-0.021)	
PE Ratio	0.000		-0.000		-0.000		0.000		-0.000	
	(0.737)		(-0.246)		(-0.828)		(0.537)		(-0.401)	
BoardSz	-0.008		0.020		-0.014		-0.001**		-0.011	
	(-1.044)		(1.023)		(-0.873)		(-2.229)		(-0.991)	
NED%	-0.042		0.228		-0.154		0.002		-0.078	
	(-0.454)		(1.030)		(-0.778)		(0.223)		(-0.657)	
Big5		-0.002		-0.000		-0.013		-0.002		-0.011
		(-0.095)		(-0.010)		(-0.526)		(-0.089)		(-0.493)
LNAuditTn		-0.002		0.001		-0.004		0.012		-0.002
		(-0.171)		(0.117)		(-0.277)		(0.847)		(-0.165)
AudComSz		-0.003		-0.005		-0.001		-0.007		-0.008
		(-0.461)		(-0.698)		(-0.141)		(-0.725)		(-0.834)
AudShare		0.068		0.080		0.116		0.184		0.080
		(0.661)		(0.790)		(0.905)		(1.491)		(0.661)
OpeCycle		0.000		0.000		0.000		0.000		0.000
		(0.513)		(0.422)		(1.057)		(1.122)		(0.436)
LnAssets	-0.027	-0.015**	0.026	-0.010	0.058*	-0.014	0.002	-0.016**	-0.004	-0.004
	(-1.356)	(-1.974)	(0.577)	(-1.310)	(1.878)	(-1.376)	(1.244)	(-2.033)	(-0.170)	(-0.397)
Mark2Book	0.005**	0.002***	-0.006	0.002**	-0.004	0.001	-0.000	0.002**	0.003	0.002**
	(2.147)	(2.648)	(-1.081)	(1.972)	(-0.997)	(1.616)	(-0.915)	(2.067)	(0.957)	(2.083)

Leverage	0.099	0.082	-0.327	0.099*	-0.379	0.129*	-0.018	0.192***	0.088	0.088
	(0.536)	(1.388)	(-0.706)	(1.711)	(-1.626)	(1.928)	(-1.410)	(3.438)	(0.519)	(1.271)
DealVal	0.000*	0.000*	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	-0.000
	(1.790)	(1.650)	(-0.745)	(1.050)	(-0.615)	(0.300)	(-0.831)	(1.294)	(-0.485)	(-0.251)
Constant	0.260	0.145*	-0.368	0.091	-0.402	0.165	-0.001	0.141*	0.145	0.058
	(1.340)	(1.858)	(-0.827)	(1.131)	(-1.189)	(1.481)	(-0.091)	(1.758)	(0.651)	(0.530)
Observations	76	76	75	75	62	62	74	74	60	60
R-squared	-1.353	0.157	-1.454	0.091	-0.434	0.041	-0.234	0.219	-0.698	-0.009
Wald chi2	19.53	31.41	18.89	35.57	14.52	21.53	11.98	22.71	23.30	40.54
Prob > chi2	0.077	0.001	0.091	0.000	0.269	0.018	0.447	0.012	0.025	0.000

Note: z-statistics in parentheses,
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4.4.2 Panel B Robustness 3SLS regressions for IBOs

Models	REM(6)	AEM(6)	REM(7)	AEM(7)
Depend.Var	Prod+DisEx	AccruJo	CFO+DisEx	AccruJo
AccruJo	-1.702		-1.975	
	(-0.710)		(-1.495)	
Prod+DisEx		-0.043		
		(-1.338)		
CFO+DisEx				-0.193***
				(-3.397)
ROA	-0.755		-0.312	
	(-1.470)		(-1.211)	
MarketSh	-1.872		-1.166	
	(-0.759)		(-0.883)	
Z-score	0.125		0.044	
	(1.471)		(1.322)	
InsShare	0.211		0.028	
	(0.511)		(0.140)	
PE Ratio	0.001		0.000	
	(0.812)		(0.654)	
BoardSz	0.038		0.018	
	(1.251)		(1.086)	
NED%	0.491		0.215	
	(1.296)		(1.092)	
Big5		-0.017		-0.013
		(-0.599)		(-0.508)
LNAuditTn		-0.002		-0.004
		(-0.139)		(-0.270)
AudComSz		-0.006		-0.002
		(-0.513)		(-0.221)
AudShare		0.177		0.131
		(1.271)		(0.990)
OpeCycle		0.000		0.000
		(1.210)		(1.189)
LnAssets	-0.043	-0.007	-0.032	-0.010
	(-0.866)	(-0.684)	(-1.065)	(-0.984)
Mark2Book	0.006	0.002**	0.002	0.001
	(0.888)	(2.019)	(0.588)	(1.319)
Leverage	0.437	0.129*	0.414*	0.156**
	(1.014)	(1.864)	(1.817)	(2.269)
DealVal	0.000	0.000	-0.000	-0.000
	(0.335)	(0.135)	(-0.186)	(-0.109)
Constant	-0.206	0.089	0.131	0.126
	(-0.356)	(0.787)	(0.394)	(1.149)
Observations	61	61	62	62

R-squared	0.082	0.155	-0.312	-0.001
Wald chi2	10.30	12.60	14.18	21.75
Prob > chi2	0.590	0.247	0.289	0.016

Note: z-statistics in parentheses,
*** p<0.01, ** p<0.05, * p<0.1

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